

Research Topic White Paper #5
Institute for Research on
Unlimited Love
Altruism, Compassion, Service

EVOLUTIONARY PERSPECTIVES ON OTHER REGARD

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I. Introduction

One of the discomfiting, often lamented, but potentially fruitful tensions in modern intellectual life is the gulf between the meaning-affirming perspectives of traditional knowledge systems, and the mechanism-inferring perspectives of the natural sciences, which vary from each other not only with respect to methodology, but not infrequently with respect to conclusions on important issues. A quintessential example of this entails the nature of human love, widely regarded by religious and wisdom traditions as both an essential means toward human flourishing and a crucial end of human fulfillment, but largely ignored as an object of inquiry or explicitly rejected as a significant feature of life, by scientific study over the last century.

This may be understood, at least in part, as a general consequence of the objectivist aspirations of natural science, which provoked a reticence to employ interior experience or personal agency in any causal explanation, and also as a specific consequence of (prevailing interpretations of) Darwinian biology, which since Huxley (1894) and Spencer (1897), have tended to view altruism and sacrificial other regard as incommensurable with the process of natural selection. In the last several decades however, biological sciences in general and evolutionary theory in particular have witnessed an upsurge of interest in altruism and other forms of love, because they have been recognized to constitute an unresolved evolutionary quandary, because we have important new theoretical and methodological tools for their elucidation, and because there is increased acknowledgement that the sciences should not – indeed, cannot – flourish in isolation from the valuational disciplines which inform and give meaning to their findings.

It is the purpose of the **Institute for Research on Unlimited Love (IRUL)** to foster scientific research and interdisciplinary scholarship which advances our understanding of the origin, nature, conditions, and consequences of the manifold forms of other regarding attitudes and behaviors. The term “unlimited love” is intended to stimulate and not truncate breadth of inquiry, and by it we mean caring that is a) extensive with regard to domain (e.g., caring for outsiders, enemies, or others unable or unwilling to effect compensatory return), b) intensive with respect to motivation (e.g., love for near and dear that is unconditional in its offer and inextinguishable in its persistence), or c) auto-catalytic or emergent in its outcomes (e.g., other-regard that stimulates rather than attenuates further caring by synergistically promoting health or other aspects of well being in the giver and/or recipient). While an explicit goal of the Institute is to promote constructive, scholarly dialogue between scientific and religious understandings of love, and to support scientific investigation of religion’s role in enhancing and/or impeding love, the IRUL is not simplistically concordist in its agenda: we are not seeking to use science as a confirmation of traditional religious “answers”, but rather we seek to fund and empower scientific investigation of open-ended questions with religious significance.

Central Disciplinary Themes

The field of evolutionary biology is widely regarded as having been instrumental in the historical transition from Romantic to Victorian reformulations of love’s role in nature (Gliserman, 1975; Oates, 1988) and has arguably played a leading role in influencing the most recent understandings of human love as well. Subsequent to the initial Darwinian disenfranchisement of love as “Creation’s final law” (in Tennyson’s marvelous phrase), there was a nearly century-long hiatus in evolutionary engagement with this issue, until E.O. Wilson (1975) declared it “the central theoretical issue in evolutionary biology.” Over the last several decades, there has been a succession of widely divergent explanatory epochs, each with very distinct and profoundly significant implications for our understanding of the conditions for, constraints on, and consequences of love in human flourishing.

Kin selection (Hamilton, (1964) and reciprocal altruism (Trivers, 1971) constituted the first break throughs in our ability to make sense of cooperative and sacrificial behaviors from an evolutionary point of view. The theoretical and empirical fruitfulness of these theories, plus the widely accepted refutation of group selection (Williams, 1966), ushered in the ascendance of selfish-gene theory (Dawkins, 1976, 1982) and sociobiological reductionism (Wilson, 1975, 1978; Barash, 1977; Alexander, 1979; Ghiseln, 1974) – both of which sought to deconstruct all ostensible other regard in terms of reproductively self-interested benefits to kin or compensation via reciprocity. While widely critiqued for its cynicism and naive triumphalism, the initial formulations of sociobiology have been influenced – sometimes nuanced, sometimes extended - by animal behavior studies (Wrangham, 1997, 1996; DeWaal, 1996; Dugatin, 1997, 2000) and game theoretic models (Axelrod, 1985; Skyrms, 2000). And a second generation of sociobiological theory has emerged, which is no less adaptationist, but which emphasizes the unique importance in human communities of indirect reciprocity (Alexander, 1987; Frank, 1989), sexual selection (Miller, 2000), theories of mind (Alman, 2000'), and self-deception theory (Cosmides & Tooby, 1992; Trivers, 1985, 1991). These are all competing accounts, though they are not mutually exclusive and have in common the assertion that all cooperative behavior must still generate, though not always optimize, reproductive benefit for the individual actor.

In contrast to the above approaches, and in an attempt to both explain and make provision for the existence of behavior that appears to be unconstrained by individual reproductive benefit (one manifestation of what we might regard as “unlimited love”), a large number of population geneticists, Darwinian anthropologists, and evolutionary psychologists have been exploring various versions of hierarchical selection theory. Some have revisited previously discredited notions of group selection (Sober & Wilson, 1998; Boehm, 1999), postulating that group level benefits can compensate for individual disbenefits. The upside of such theories is that they provide a plausible account for the establishment of genuinely sacrificial attitudes and behaviors within groups. The downside, is that such behaviors are promoted by inter-group competition, and therefore we cannot account for, or even allow for, the existence of outgroup care, and in fact outgroup hostility becomes the necessary adjunct of within group commitment.

In an attempt to make sense of distinctively human behaviors that appear to confer neither individual nor group level reproductive payoff, numerous workers have been exploring coevolutionary or dual inheritance versions of hierarchical theory (Durham, 1991; Plotkin, 1999; Blackmore, 1999; Cronk, 1999). These notions posit nested levels of material (genetic) and ideational (memetic) replicators which are differentially reproduced and transmitted by selective processes that may interact but have been at least partially uncoupled from one another. This represents a landmark development in modern biological thought because, first, the efficacy of ideational causation is reaffirmed after a century of Marxist, Freudian, and Skinnerian materialism and, second, it is conceded to have power “over” or at times in “opposition to” (Durham, 1991) genetic influence. There are many variants of these theories, which differ vastly in their views of the existence or non-existence of human volitional agency and whether memes or minds constitute the telos of human cognitive function. However, an upside of all these theories is they make provision for the reality of genuinely counter-reproductive sacrifice – biologically transcendent behavior. The downside, is that to the very extent they make this provision, the most radical human altruism becomes, in a sense, the least deeply “human” -- an imposition upon rather than a fulfillment of our biological natures. We have no proposal for how these two streams of genetic and memetic information interact neurologically, developmentally, or culturally, and therefore no template for conceiving of love as an appropriate means toward and end of human flourishing.

Long-term Significance

It is an unusually exciting time in the development of evolutionary theories of human nature in general, and altruistic love in particular, because the explanatory resources are highly varied, extensive, but empirically under-determined. We are arguably at the threshold of important theoretical break-throughs, yet in need of fundamental empirical and experimental studies to test competing hypotheses. Moreover, each of the above accounts has profoundly contrasting theological implications, but also has verifiable empirical correlates. And provocatively, it should be noted that the above-described continuum in evolutionary theory corresponds to longstanding differences in traditional theological understandings of love. On the one hand, those traditions that emphasize grace as the refinement or fulfillment of nature and see altruism or agape' as an extension of the God-honoring natural loves which are part of the human legacy via creation (Singer, 1966, 1986, 1988, 1995; Pope, 1994; Post, 2002) -- have much in common with adaptationist perspectives that posit both the constrained extensivity and interior reward of human cooperativity. On the other hand, those theological traditions that emphasize human selfishness and the concomitant need for radical redemption, and which view agape' not as an extension of our natural loves, but as a reformulation of them upon a recalcitrant biological substrate (Nygren, 1984), have much in common with the dualistic or emergentist hierarchical accounts.

These are not idle speculative controversies, for they have concrete implications for how we understand and seek to promote love itself, and how we understand the role of familial bonding, friendship, mate recruitment, group cohesion, symbolic systems, and religious experience in cultivating and being cultivated by unlimited love. As is often the case in intellectual history, recurring perspectival differences may crop up in varying conceptual garb at different times, and these tensions may reflect intrinsic ambiguities in human nature itself (Boehm, 1999; Schloss, 2002). As is not often the case, though, the present conceptual wardrobe of these fundamental perspectives entails genetic, neurological, developmental, psychometric correlates that are empirically testable and theoretically distinguishable. With ensuing research, we may be able to adjudicate between them, or we may develop synthetic new paradigms in light of which, the ancient dichotomies appear contrived (Chisholm, 1999; Oyama, 2000).

Major questions for research are described below. These questions are grouped by theoretical paradigm, and not by discipline, e.g., many paradigms raise questions that have distinctly interdisciplinary research implications. Fields involved include population genetics, mathematical modeling, ethology & animal behavior, anthropology, neuroscience, and molecular & cognitive development.

II. Key Research Questions

A. Foundational Empirical Questions

Because natural selection requires fitness differentials (selective transmission) in heritable traits, the two most crucial – and currently unresolved – questions in the evolution of all forms of love involve the habitability and fitness impacts of other regarding behavior.

Question 1

To what extent are differences in other regarding attitudes and behaviors heritable?

This question has not only substantial practical significance (in terms of the cultivation and transmission of loving behaviors and their attendant virtues), but is theoretically significant to the development of any empirically-grounded evolutionary account. If variance in attitudes, capacities, or care-related activity is not demonstrably heritable, it favors accounts that emphasize emergence of this capacity as an epiphenomenon or incidental by-product, on which selection does not act. If there *is* a heritable component, we may then assess the dynamics of heritability to address question of whether the stream of transmission is genetic and/or cultural. This is crucial to evaluating traditional Darwinian, dual-inheritance, and emerging “holistic” developmental accounts of altruism.

There are few studies in the heritability of altruism, and those that exist reflect methodological limitations of earlier genotype-phenotype models that do not have a nuanced understanding of developmental interactions (Rushton, 1989). This area of research is in need of methodologically imaginative solutions to two complicated problems. First, measuring a behavioral or attitudinal altruistic phenotype is made difficult both by problems of ontology, i.e., how to demarcate behavioral characteristics that are not as observationally distinct as anatomical traits, discerning, as it were, “the correct typology of description, the natural suture lines along which the phenotype of the individual is to be divided” (Lewontin, et. al. 1984: 247), and also by problems of ontogeny, i.e., however we define the phenotype, it is likely to be highly inconstant across developmental life history. Second, while we can distinguish between heritable and random environmental influences on phenotype by pedigree, twin, and correlational studies, it turns out to be very difficult to tease apart genetic and cultural sources of heritability, since they may ride on or mask each other. With respect to altruism, as a hypothetical example, there could be any number of genes or gene complexes that influence basic physical characteristics which, in a given social environment, positively or negatively influence acceptance into a cooperative social matrix and therefore attend the development of prosocial affinities. This would generate phyletic or correlational data indicative of genes “for” altruism, even in mono & di zygotic twin studies, but in fact would be a heritable artifact of social mediation. Religious implications include a) the way in which differing religious belief and experience might mediate expression of varying genetic legacies and b) the extent to which and mechanisms by which religious beliefs that influence altruisms are heritable and selectively transmitted.

Question 2

To what extent is variance in altruistic attitudes or behaviors associated with fitness differentials?

This may be the single most important and most difficult empirical question in evolutionary theories of altruism and human behavior. Even if we can distinguish and reliably measure appropriate behavioral phenotypes, and demonstrate they are heritable, we must determine whether phenotypic variance results in differentials in fitness.

A starting point in such analysis would be to ask whether there is an association between various manifestations of altruism and morbidity, mortality, mate recruitment, social status, resource acquisition, inclusion in reciprocal alliances, or even fecundity. There are virtually no systematic

studies on these topics. But none of these measures – not even fecundity – translate directly into fitness, which, especially for a kin-selected species, must integrate individual reproductive output and inclusive fitness resulting from kinship reproduction. Virtually all of the contrasting and speculative explanations of altruism – from the adaptationist accounts of indirect reciprocity, sexual selection, or self deception theory, to group selectionist and dual inheritance theories – are based on hypothetical but untested scenarios of the positive or negative effects of various behaviors on factors related to fitness. Monroe’s (1996) comprehensive sociological study is probably the most significant in its suggestion that major patterns of altruistic aid do not conform with empirical predictions of adaptationist theories, but the fact is, we are in desperate need of empirical biological studies.

What we really need here, are not only specific empirical studies of various forms of altruism and fitness-related parameters, but ultimately we need a comprehensive demography and natural history of altruism: under what social and environmental conditions does it flourish, and how if at all does it vary as a function of life history, i.e., across age, gender, social status, family structure, birth order? In addition to constituting an empirical question that is significant for evolutionary theory, this issue has two important implications for religion. First, the empirical question of whether and to what extent humans are capable of counter-reproductive or “biologically transcendent” behaviors is intrinsically significant theologically. Second, however this comes out, there is room for biologically informed theologies of embodiment that do not anchor *imago dei* in the transbiological, but root it more hospitably in the organic creation.

B. Traditional Sociobiological Accounts

Question 3

To what extent is kin selection – and familial bonding dynamics which may emerge therefrom– a necessary and/or sufficient substrate for the development of deeply caring, richly benevolent other regard?

Kin selection and inclusive fitness theory have offered a potent explanation for previously mystifying sacrificial behaviors in social insects and primates. Because it is “hard-wired” (Wilson, 1978) rather than relationally contingent, it can support unconditional love for others. However, it achieves this at the price of genetic constraints and outgroup hostility. Thus, understood evolutionarily, family love raises as many questions as it answers regarding unconditional love: specifically, we really do not know whether kin selected affective and cognitive capacities promote, or ultimately restrain extensive other regard. Some argue radical altruism is a pleiotropic extension of regard for kin (Boehm, 1999); others that it is a triumph over hard-wired familial boundaries by reciprocal altruism (Wilson, 1978); others still, that it is a coevolutionary transcendence of both (Plotkin, 1999).

There are at least three areas in need of empirical study. First, we need neurophysiological studies that address the relationship between the affective capacities for and impacts of familial bonding, and the development other regarding dispositions and behaviors: are the latter neurological capacities homologues of the former? Second, we need psychometric and developmental studies of the relationship between family nurture and other-regarding virtues or dispositions. While we already know positive familial environments enhance to tendency to seek affiliative solutions, this does not resolve the larger question of the relationship between familial nurture and altruism

because a) altruism may not be a bonding phenomenon at all (suggested by studies of Oliner & Oliner, 1988, and Monroe, 1996) and b) it is theoretically possible that there could be a negative relationship between familial well-being and altruistic disposition if a nurturing familial environment accentuated in-group proclivities or a moderately but not disablingly negative one provoked development of empathy or outgroup sensitivity. The theological relevance of this entails the significance of an experience of brokenness, perhaps marginalization, and possibly even redemptive healing by being loved across – not just within – boundaries, as a precondition for the development of richly other-regarding love. This is embodied in the Johannine contrast of the socially accepted religious leader with the marginalized woman who “loved much, because she has been forgiven much.”

The methodological challenge here is that it is entirely possible if not likely that both patterns are at work simultaneously. There are undoubtedly minimal requirements for familial nurture and positive associations this and the capacity for healthy other regard. But microvariation in this relationship, as well as range extensions, could be influenced by woundedness in certain developmental periods. Moreover, subsequent experiences of unusual (and contingently unpredictable) extensions of care or forgiveness in adolescent or later stages of life could exercise further influence.

Question 4

To what extent is reciprocal altruism – and the social & affective structures that emerge therefrom – a necessary and/or sufficient substrate for the development of deeply caring, richly benevolent other regard?

The two major and competing “expanding circle” views of human altruism are that it represents an extension of unconditional familial affections (above), or a generalization of highly conditional reciprocal alliances. This latter view involves the notion that humans have expanded the circle of cooperative reciprocity both spatially and temporally (across larger time-scales than can be easily monitored or foreseen, and across larger populations than can be relationally tracked) through the enlargement of our forebrain and enhancement of symbolic representation and capacity for moral commitment (Irons, 1991; Deacon, 1997).

This view, like that above, raises the question of whether enlargement of the cooperative circle is ultimately tied to a process that, though expanding, nevertheless reifies the circle’s boundaries. Neurobiologically, it would be helpful to know whether various forms of other regard are related to cognitive functions in the neocortex or more deeply-rooted affections in the brain stem (and recent work suggests both may occur under differing circumstances, Greene et al, 2001). Developmentally, we would like to know if there is a relationship between actual helping behaviors and measures of general cognitive and specifically moral development, and also whether helping behaviors have a directional bias toward those who share ones moral framework (regarded by sociobiologists to function as a signal of group membership). Significant theological questions related to this issue include a) the what extent does religion function as a mechanism for promoting in-group identity and cohesion, b) to what extent and under what circumstances does religion facilitate enlargement or transcendence of group boundaries, c) how do comparative and historical studies of religion help us understand coevolutionary dynamics between the biology of reciprocity and changing cultural variables (like group size, symbolic representation, technology)?

Question 5

To what extent is altruism a sexually-selected trait, and under what conditions does it function positively or negatively in mate recruitment?

Sexual selection has been advanced to explain altruism, empathy, and other regard in several ways. First, it has been widely regarded as especially important to maternal care, and thus has been viewed as a factor in mate choice of females by males. Second, in a more typical sexual selection scenario, radical altruism – the extravagantly maladaptive giving away of life-sustaining resources – has been viewed as an ostentatious display by resource-rich males, in an effort to recruit females through costly and hard-to-fake signals (Miller, 2000; Diamond, 1992; Konner, 1991). These contrasting but not mutually exclusive employments of sexual selection theory highlight several areas in which we lack data. First, we lack fundamental psychometric and behavioral data on age-specific sexual dimorphism in altruistic attitudes and behaviors. How do men and women compare, and more importantly, how do these comparisons change across pre-reproductive, mate-recruiting, reproductive, and post-reproductive states of life history? Finally, it would be very helpful to have cross-cultural data on criteria of mate choice, and success of mate recruitment, as they relate to measures of altruism. While Cronk's (1994) attempt to explain Jesus' altruism on the basis of social status and mate attractiveness of religious elites clearly does not work in the case of a martyred celibate, we do need to know how altruistic behavior – both private and publicly displayed – relates to mating success.

C. Evolutionary Psychology and Second-generation Sociobiology

Question 6

To what extent do patterns in moral and altruistic behavior conform to expectations of indirect reciprocity?

Original formulations of reciprocal altruism have been substantially extended and nuanced to entail behavior that is not restricted to closely monitored reciprocal relationships, but involves sacrifice on behalf of strangers, that nevertheless pays off by indirect compensation. This has been suggested to occur in two ways. First, reputation is enhanced or subverted by cooperative investment or defection, which entails positive or negative downstream impacts on resource exchange with others. In this case, conscience is a “reputation alarm” that goes off when we are cheating in a way likely to negatively impact resource flow (Alexander, 1987). Second, and related to theories of virtue and habituation, Frank (1988) suggests that it is precisely situations in which reputation cannot possibly be influenced, where prosocial investment in others ironically has the greatest potential payoff: by cultivating internal habits of character that exist without desire to enhance reputation, the individual acquires hard-to-fake signals of fidelity, which end up having significant payoffs for inclusion in the cooperative social matrix.

These theories have clear empirical ramifications that have not been tested. In Alexander's account of conscience in general and altruism in particular, are individuals more likely to be troubled by conscience when the risk of discovery is greater? With respect to the fitness-enhancing function of conscience as a reputation alarm, is there empirical evidence that reputation correlates with fitness, or even resource acquisition? If it does, under what circumstances is reputation enhancement through cooperation a better or worse strategy than reputational disregard which acquires resources through force and coercion (Irons, 1991)? With respect to Frank's more positive, virtue-affirming account, we need to know, first, to what extent habitually other-regarding behaviors induce measurable changes in involuntary, autonomic signals (body posture, papillary dilation, etc.) and second, to what extent these effects, if existent, are discernable by human observers.

Both these theories, by the way, are not inconsistent with the teaching of many religious traditions, including the biblical tradition which asserts, in the wisdom literature, that "in a good reputation are riches, honor and life," and in the Synoptic teachings of Jesus, "he who gives will receive in return, pressed down and without measure." Both Alexander's and Frank's accounts affirm that doing good is a way to do well, though only Frank's view affirms virtue as a motivational end (that entails unsought reward) rather than an instrumental means.

Question 7

To what extent do patterns in moral and altruistic behavior conform to expectations of self deception theory?

The most novel and influential theory to emerge out of evolutionary psychology and revisionist sociobiology entails the significance of self-deception to human care and cooperation. Just as Frank's theory suggests that good behavior can facilitate development of certain hard-to-fake autonomic cues of good character that have payoffs in terms of cooperation, self-deception theory posits a "short-cut" to these cues by a person's being self-deluded about the depth and extent of their other-regard. Through unconscious self-deception (not conscious hypocrisy), they exude sincere but inauthentic other-regarding signals that are uncoupled from their actual motives and behaviors. This is a powerful theory, with potentially helpful implications for our understanding of self-bias, religious self-deception, and the prophetic traditions that confront it in many religions.

There are a number of questions for neurophysiological, psychometric, and behavioral research. We now have techniques for measuring autonomic cues of at least some forms of self-deception (Sackheim, 1983), and it would be important to determine whether exemplars of altruistic profession or religious benevolence exhibit differences – positive or negative – in these signs. Second, self-deception often involves internal dissonance and/or self-defeating inability to recognize the dimensions of problems needing solution (Lopreato, 1984), and it would be helpful in assessing the self-deception thesis to determine whether psychometric profiles of those with strongly altruistic attitudes comported with correlates of substantial self-deception. Finally, the self-deception hypothesis requires that professions of highly altruistic other regard be uncoupled from actual behaviors, i.e., that professions of unconditional love be professions only – and the association, if any between rhetorical affirmations of benevolence and actual giving patterns deserves to be investigated. One particularly interesting implication of self-deception and hard-to-fake signaling theory, is that one might expect religious groups that were demarcated by dramatic, involuntary manifestations (e.g., shaking, glossalalia, hysteric weeping, ecstatic fainting) would have more resolute boundaries of cooperation, regardless of professions of unconditional love.

D. Multi-level Selection

Question 8

How plastic is the influence of group-selection, and must genuinely sacrificial other regard inevitably come at the cost of intensely exclusionary disregard or hostility?

Group selection theory posits that individuals can be genuinely sacrificial on behalf of others, so long as the context of their sacrifice is inter-group conflict, the recipients of their care are within their own group, and the intra-group fitness penalties to altruists are more than compensated for by inter-group benefits. This is a powerful reformulation of initially errant group selectionist accounts, which both unifies kin selection and reciprocal altruism theories as notions of differently scaled groups, and explains the clear (and in many ways distinctive) human penchant for genuinely sacrificial care that is not conditional upon reciprocation. It does, however, have a “dark side” (Wilson, 2002), because the most radical self-relinquishment for clan is wedded to the most radical hostility to outsiders - as testified to by extraordinarily valorous acts warfare or terrorist assault.

There are a number of theoretical questions raised by group selection theory, which have very significant practical implications. Do perceptions and feelings of group membership entail a co-opting of the affective neurological apparatus employed to establish family membership? If so, and if it has been restructured by higher level cognitive functions that denote group membership through use of appropriate symbols, how can we extend markers of group membership? Are there intrinsic constraints, i.e., are some markers themselves “hardwired” in the human cognitive-developmental apparatus, and difficult or impossible to expand or modify (e.g., suggested candidates for non-negotiable group boundaries are linguistic dialects and accents, appreciation of proverbial and idiomatic expressions, nuances of humor and sense of fashion, racially-coupled morphometric characteristics)? Finally, some recent group-selectionist theories of religion have viewed it not as a pathology, but as a potentially valuable adaptation by which within-group fitness differentials are reduced through egalitarian attenuation of variance in altruism: i.e., everybody helps and nobody cheats. We need empirical studies to determine the extent to which, and circumstances under which, this is true. More importantly, we need to know whether, in order to function in this way, religions must be outgroup eschewing rather than embracing (a claim made by Wilson, 78).

Question 9

Are the most radical forms of altruism evolutionarily “uncoupled” (Plotkin, 1997) from the human genetic/neurological substrate?

Hierarchical selection theory is the most innovative, most provocative, and most explanatorily robust approach currently on the table for understanding the extensiveness of human altruism. Unfortunately, it does not yet have a program for helping us understand the intensiveness of love, i.e., there is no connection between the deeply embedded neuropsychological wellspring of human affection and fundamental cognitive modules (if such exist) that enable us to feel compassion for and affiliation with others, and the memetic information that supposedly expands without restraint, the boundaries on the objects of our concern. Coevolutionary theory is presently beset by

fundamental methodological limitations (unlike the analogues in genetics, there is no operational definition for memes, we do not know how to measure them, or their transmission, or their impact on behavioral phenotypes). Moreover, there are wildly diverging accounts of human mentality, from those which take human cognitive and volitional agency seriously (Cronk, 1999) to those which reduce the mind to a causally impotent robot vehicle for the transmission of viral, memetic replicators (Blackmore, 1999). Finally, there is extensive disagreement in whether memetic information must ultimately have genetically beneficial consequences (Cronk, 1999), or whether the selectional processes are largely uncoupled (Plotkin, 1997, 1999), or whether they each involve “selfish replicators” that are often at odds with each other (Blackmore, 1999).

While these questions are fundamental to coevolutionary theory itself, they have specifically emerged from observations of human altruism, which appeared to be intractable to non-hierarchical explanations. Thus current research on the evolution of altruism has been driven to the point of considering imaginative and in many respects revolutionary extensions of or alternatives to traditional selection theory, but we are in need of increased rigor and sustained attention to fundamental methodological and theoretical refinement (Auger, 2000). We would welcome any attempt to understand self-relinquishing behavior in coevolutionary terms, but especially those which are empirically rooted and/or seek to investigate interactions between cultural evolution and neurological or developmental receptivity to altruistic memetic influences, particularly religious ideas and practices.

E. Interdisciplinary Approaches

Question 10

Can game theoretic models of cooperativity be extended to account for genuine sacrifice, by reformulation in light of group or hierarchical selection?

Game theoretic approaches did much to advance our understanding of how cognitive processes and selectional payoff matrices could favor the establishment of cooperative behaviors in the context of unproven reciprocators. However, most present formulations are constrained by reciprocity, and simply provide mechanisms for getting across the “commitment barrier” rather than across the compensation divide. Two largely unexplored options exist for traversing this domain. First, most formulations use self-benefit as the conscious valuational calculus, and are insensitive to an individual’s valuing of the other. For example, what if the other prisoner were a friend, cherished member of the community, or just a valued “partner in crime” whose suffering or flourishing were as (or incrementally) important as one’s own? This would change the payoff calculus in a way that biased stable strategies toward greater altruism (Sober, 2002). Second, payoff and penalties are calculated solely in terms of years in prison (or other externally administered sanctions or rewards), and are insensitive to the influence of interior state on “hard time” versus “easy time”. That is, one’s affiliative disposition may influence the effects of external circumstance – both through internal resilience and establishment of supportive networks (Schloss, 2002). These two options correspond to the effects of group and hierarchical selection upon the cooperative calculus, and deserve to be explored in more robust models of game theory.

Question 11

How far can animal models take us in our understanding of human altruism?

In a dramatic turnabout from prevailing perspectives over the last century and especially since the groundbreaking ethological work of Lorenz and others, much of the most innovative work in altruism over the last decade has emphasized processes that are unique to or distinctively important in human beings: indirect reciprocity, self-deception, symbolic consensus building, runaway sexual selection, theories of mind, group selection, and dual inheritance theories of ideational causation. There are still at least three ways in which animal studies continue to be very important for our understanding of altruism. First, we need a more comprehensive natural history of altruism across the animal phyla. Dugatkin (1997) has done the most extensive analysis of cooperation among various animal phyla, but, as with humans, we still lack extensive empirical studies which link various forms of cooperation and risk or investment, with fitness effects. Second, we need a broader understanding of mechanisms of attachment in animals (Insel, 2000), and the manifestations of empathy, reconciliation, and theories of mind that animate animal behavior (de Waal, 1996; Beckoff, 2000). Third, we need to understand how far endocrinological models of bonding and ethological understandings of behavior take us in explaining, or making provision for, behaviors that do not conform to strict reciprocity or kin selection. In a very recent and groundbreaking paper, Riolo & Axelrod (2001) develop a model to explain the emergence of cooperation in animals without strict reciprocity or indirect reciprocity, both of which require capacities for individual recognition, memory, and valuational judgments.

Question 12

What is the relationship between organismal well-being and altruistic behaviors and disposition, i.e., is unlimited love a homeostatic adaptation for life in groups?

Although selfish gene theory tended to deconstruct organismal function in light of the ultimate telos of the gene, selection is widely agreed to operate at group scales that involve at least integrated genomic function and concomitant organismal teleonomy. Thus, a final and crucially important area of research concerns the interaction between neuroimmunological processes, psychobiological development, and fitness effects. With the exception of hierarchical selection theory, which is effectively transbiological, virtually all of the above paradigms are sub-biological, i.e., they entail econometric assessments of resource flow without consideration of how the biological organism itself processes resources in ways that influence fitness. Specifically, we need to know whether other regarding dispositions and actions have internal payoffs in terms of immunological vigor, homeostatic resilience, affective or cognitive integration, or other aspects of organic well-being which may stand to positively influence fitness in ways that could compensate for genuine generosity in expenditures of physical, temporal, or social resources on behalf of others.

This is a persistent question in various other areas emphasized by the IRUL, and highlights the interdisciplinary nexus of questions central to our understanding of unlimited love. This integrative perspective is potentially important to evolutionary theory because it represents a proposal for how love could be genuinely unconditional with respect to reciprocation, unconstrained with respect to familial or social in-group associations, yet fulfilling of rather than at odds with evolved biological needs and inclinations. Moreover, it represents an analytic approach at the distinctly organismal, as opposed to the genetically atomistic, level of integration.

What we earnestly need are comparative and longitudinal studies that relate various measures of altruistic attitudes and behaviors, to manifold indices of personal well-being, including morbidity, mortality, psychometric measures of emotional health and cognitive integration, immunological vigor, and homeostatic resilience. It is especially important to design research in a way that avoids false positives that emerge through causal conflation, i.e., increased well-being could be a precondition for rather than a consequence of altruism, by reflecting a bounty of physical or emotional resources which support it (Hardin, 1977). On the other hand, if pleiotropic, epigenetic, or self-deception accounts of altruism are correct, then more radical forms of sacrifice may have a negative association with indices of well-being, by virtue of manipulation, codependence, or other psychological pathology. Distinguishing these options empirically is especially tricky, since they may occur concurrently, there could simultaneously be negative and positive associations between altruism and organismal flourishing, with causal arrows in either (or simultaneously both) directions, depending on a variety of contingent factors related to individual or social context. For this reason, great care must be exercised to design studies that do not rest on simplistically concordist premises, and go beyond multivariate fishing for correlations, to distinguishing simultaneous influence of interacting and often opposing covariates.

Question 13

How can religious beliefs, experiences, and institutions be understood in terms of evolutionary (genetic selection) or coevolutionary (memetic transmission) processes, and in what ways are they biologically adaptive and/or altruism-promoting?

This is obviously not a single question, but a capstone marker for a suite of widely divergent issues relating to the above paradigmatic questions. Thus, for each of the above research questions, we have indicated theological implications and opportunities for research that integrates religious issues. Two limitations with evolutionary accounts of religion in general and religion's relationship to morality and altruism in particular, have been a) a frequent lack of distinction between religious beliefs, practices, institutions, and experiences and b) the assumption that different religions (however religion is defined) are evolutionary homologues if not functional analogues, i.e., that the evolutionary or neuro-developmental origin is shared and that the adaptive function (or pleiotropic lack thereof) is generalizable. There is no reason to accept the simplifying assumption of uniformity, and we particularly welcome proposals for research that is sensitive to comparative differences between religions or that distinguishes the various facets of religion (experience, practice, belief, social institution) – in an effort to test theory-driven hypotheses. Examples of questions that relate to the above questions include:

- a. How do patterns of religious profession and actual giving conform (or not conform) to the self-deception thesis? How can we understand the ancient and widespread recognition and condemnation of religious self-deception, by the prophetic or reformative traditions in many religions? Can this be understood as reifying self-deception, or establishing community by effectively unmaking it?
- b. What is the relationship between religious experience and altruism? Are there comparative (interpersonal) or developmental (intrapersonal) differences in those who claim to have personally experienced God's love? How may involuntary or ecstatic religious manifestations be understood by theories of "hard-to-fake" displays and how do they

- influence group cohesion and individual acceptance? What are the social and environmental correlates of revivalism or other eruptions of emphasis on religious experience?
- c. In what ways and under what conditions does religion facilitate group or super-organismal cohesion and cooperativity? Are there genetic or cultural antecedents for receptivity to such ideas?
 - d. What is the relationship between religions' employment of familial images and both in-group sacrifice & out-group hostility? Under what circumstances can the latter be attenuated?
 - e. Is the historical emergence of religious altruism (in more recent, cosmopolitan religions) a potentially fruitful extension of evolutionary theories of morality as an adaptation to large group size?

III. ANNOTATED BIBLIOGRAPHY FOR EVOLUTION AND ALTRUISM

The following several dozen articles and monographs are must-reads for anyone doing research in evolution and altruism. Those titles marked with “*” are seminal, or especially topical representatives of emerging perspectives.

Alexander, Richard D. 1979. *Darwinism and Human Affairs*. University of Washington Press.

Alexander's monograph was a seminal and groundbreaking application of general sociobiological theory to human behavior and culture, and helped launch the field of human sociobiology. While taking a reductive, gene-centric approach, Alexander does not merely extrapolate sociobiological theory to humans, but posits developmental and cultural mechanisms unique to human beings. Although highly deterministic and speculative, Alexander was one of the few sociobiologists who from the start acknowledged the crucial developmental factors we didn't understand about the mediation of genes to behavioral phenotypes.

Alexander, Richard D. 1987. *The Biology of Moral Systems*. Aldine De Gruyter, Inc., New York.

As his 1979 *Darwinism and Human Affairs* helped launch human sociobiology, Alexander's theory of moral evolution both stimulated the “second generation” of interdisciplinary sociobiological theorizing and posited the first comprehensive evolutionary proposal for human morality that went beyond kin selection or reciprocal altruism, without invoking hierarchical processes. Alexander elaborates a robust notion of indirect reciprocity (conscience is a “reputational bank account” and guilt is “the alarm that goes off when we are cheating in a way likely to be detected”). He maintains the evolutionary significance of competition between groups, though with selection at the individual and not group levels. In many respects, Wright's widely read popularization of ev psych is recycled Alexander. However, popularized dilutions of Alexander's treatment do not do it justice. It contains an unusually comprehensive and nuanced analysis of human morality in the context not only of evolutionary origins, but larger biological concepts of both organismal development and life history. It is still the most expansive location of human morality within biological theory to date.

Aunger, Robert. 2000. *Darwinizing Culture: The Status of Memetics as a Science*. Oxford University Press, Inc., New York.

This is the definitive – indeed the only serious - assessment of the scientific merits of memetics. It is both scientifically rigorous and perspectively balanced. There are excellent chapters by advocates, agnostics, and critics of memetics from evolutionary, neuroscientific, sociological, and philosophical perspectives. Susan Blackmore has an excellent chapter-length summary of her book. For anyone interested in memetics, this is the place to go.

Badcock, C.R. 1986. *The Problem of Altruism: Freudian-Darwinian Solutions*. Basil Blackwell Ltd.

Badcock was the first person to attempt an integration of evolutionary and Freudian perspectives on human altruism, and in so doing, he suggested connections between Darwinian fitness and libido, parental investment and Oedipal conflict, sibling rivalry and kin selection, etc. This work anticipates what has become the development of evolutionary psychiatry.

Barkow, Jerome H., Cosmides, L., and Tooby, J. 1992 (editors). *The Adapted Mind: Evolutionary Psychology and the Generation of Culture*. Oxford University Press, New York.

This is the book that both launched and defined the field of evolutionary psychology. Virtually every major area of investigation and significant theoretical insight of ev psych is represented in the anthology. There is a superb introductory section on the psychological foundations of culture and the use and misuse of Darwinism in studying human behavior. Whether or not ev psych is an adequate explanatory perspective, it is not simply recycled sociobiology, and this volume clarifies how the field takes human psychology seriously, as a mediation of selected genetic endowments. There are sections on cooperation, mating and sexual systems, parental care, language, and gossip & social stratification. The chapter by Cosmides & Tooby on cognitive adaptations for social exchange is a classic and must reading for any student of biopsychological perspectives on human nature and cooperation.

Blackmore, Susan. 1999. *The Meme Machine*. Oxford University Press, New York.

This is the most current and substantial articulation of memetics available. Blackmore takes Richard Dawkins' original idea of a meme, and develops it into a theory that attempts genuine (if not successful) explanatory work. There are two new and significant ideas she elaborates. First, that of memetic drive, by which memes not only are transmitted independent of, and often in opposition to, genetic transmission, but the notion that they often drag genes along with them. This is classic "top down" causation, and (like Deacon's analysis, below) suggests under certain circumstances, ideas may have priority over matter as causal agents. Second, Blackmore elaborates the case for human minds being the passive vehicles for memetic replication just as bodies are the robot slaves for genetic replication. While she has elevated the status of ideational causal efficacy, she completely deconstructs the status of conscious volitional agency.

*Boehm, Christopher. 1999. *Hierarchy in the Forest: The Evolution of Egalitarian Behavior*. Harvard University Press, Cambridge.

In many respects, Boehm's book is a sequel to the group selectionist argument made by Sober & Wilson in *Unto Others*. Like S & W, Boehm recognizes that human beings have a unique capacity for altruism and locates the origin of this in the unique role group selection played in our evolutionary origin. However, he doesn't stop there, and maintains that the influence of group selection became more pronounced with the origin of egalitarian morality or social systems, by reducing the costs for being a cooperator in groups with such values. One of the most interesting – and theologically significant – implications of his account is that human nature thus entails a deep

ambiguity about cooperation. The cognitive underlayment that developed early on entails affective dispositions that reflect hierarchy and status conflicts of most primate societies. An accretion “onto” this foundation over the course of social evolution, was egalitarian or cooperative dispositions. Boehm argues this deeply embedded ambiguity in human nature is part of what accounts for the wildly discrepant optimistic and pessimistic accounts of human nature in both evolutionary theory and theology. Whether or not his account of origins is adequate, he is one of the few scholars who is not crusading for a monolithic construction of human nature, but portrays humans as torn or divided between conflicting native dispositions.

Brown, Andrew. 1999. *The Darwin Wars: How Stupid Genes Became Selfish Gods*. Simon & Schuster, London.

This is a well-written, fascinating, and largely accurate summary of the major controversies between and two major camps in evolutionary biology, and their implications for human nature and purpose. One camp entails the selfish gene approach, with its twofold emphasis on reduction to genes and the preeminence of natural selection in filtering genes (hence adaptationism). Richard Dawkins and Daniel Dennett represent this approach. The other camp entails a pluralistic view of evolutionary processes (hence no assumption of invariant adaptationism is warranted), and a rejection of genetic reductionism (especially in humans, but in other organisms as well, the organismal integration of genes is important). Brown very helpfully explores the implications of genetic reductionism not just at causal or mechanistic level, but at a metaphysical level – i.e., the notions that genes are the “primary reality” or “driving force” of life. He argues that these are essentially religious contentions, and argues against the position of gene-centrism.

*Chisholm, James S. 1999. *Death, Hope and Sex: Steps to an Evolutionary Ecology of Mind and Morality*. Cambridge University Press.

For the last 20 years, while boundary work conflict has raged between those advocating biological, psychological, and sociological explanations of human behavior, the most insightful (and honest) analyses have admitted that what we need most and sadly know the least about, is how these processes contribute to and are mediated by development. Chisholm attempts to integrate notions of biological development (ecologically informed life history theory) with psycho-social development (informed especially by attachment theory). There is nothing like this available, and he does a masterful job – the review of several vast literatures is itself extraordinarily helpful. His general thesis suggests that genuine other-regard (or attachment) is central to human nature, but the way we attach and, in particular, the family and mating systems we converge upon reflects biologically under-determined openness that is itself a biologically useful adaptation to uncertain environmental challenges. Values are in part a reflection of an anticipated future. Especially helpful is ecological-developmental reflection upon review of the relationship between behavioral syndromes and attachment (e.g., the “absent father syndrome” and male violence & promiscuity). A deficiency would be the unexamined assumption that his framework is a wholly adequate general foundation for behavioral analysis.

Cronin, Helena. 1991. *The Ant and the Peacock: Altruism and Sexual Selection From Darwin to Today*. Cambridge University Press, New York.

Cronin’s book is quintessentially representative of a niche occupied by *The Origin* itself – a scientific argument made without theoretical dilution, but made for consumption by both scientific and popular audiences. This may well be the most scientifically accurate and nuanced, broadly accessible exposition of sociobiological theory available. While unabashedly apologetic (Cronin is a

student and longtime personal companion of Richard Dawkins), it also eschews the incautious excesses of “vulgar popularizations”. Each section has a helpful survey of both contemporary and historical thinking. The main focus of the book is how evolutionary theory accommodates ostensibly counter-reproductive anomalies through sexual selection and selfish gene theory. The section on altruism is the very best articulation of the selfish gene “solution” to the problem available.

Cronk, Lee. 1999. *That Complex Whole: Culture and the Evolution of Human Behavior*. Westview Press, Oxford.

Cronk’s book is the very first attempt to map a detailed middle road between essentially reducing culture to genetic inclinations (ala traditional sociobiology) and largely uncoupling it from natural selection (ala dual inheritance models). In dual inheritance memetic models, cultural units of information become the replicators which, like genes, manipulate organisms for their own reproductive ends. Cronk turns that on its head, and argues just the opposite – culture is what individual organisms use to manipulate others. Rather than memes being viruses which infect unwitting human agents, they are weapons that humans use to do reproductive battle with each other. Thus Cronk very much preserves – and extends – the self-interest perspective of sociobiology, while rejecting the deconstructive approach of memetics and attempting to affirm the importance (though pessimistic appraisal) of both cultural anthropology and human agency.

Dawkins, Richard. 1989 (revision of 1976 version). *The Selfish Gene*. Oxford University Press.

While E.O. Wilson may have launched the sociobiological revolution by integrating the ideas of William Hamilton (kin selection) and Robert Trivers (reciprocal altruism), Richard Dawkins both brought it into the public eye, and substantially extended the notion of reproductive self interest. This book makes the argument that organisms – including humans – are robot vehicles enslaved to the reproductive agenda of their masters, genes. It advances not only genetic determinism, but evolutionary reductionism – what behaviors are deterministically conformed to, is the reductive telos of replication. In many respects, these ideas are not just extensions of sociobiology, but of the more fundamental gene-centrism advanced by George Williams a decade earlier. Although Dawkins rode the crest of gene-centrism for some time, limitations of this approach have been widely recognized, and his agenda has come under increasing scientific fire. In response to this, Dawkins turns up the heat and maintains that his is not a mere metaphor.

Dawkins, Richard. 1982. *The Extended Prototype: The Long Reach of the Gene*. Oxford University Press, New York.

Though it received much less popular attention than his *Selfish Gene*, this book may be much more theoretically significant. The *Selfish Gene* pretty much extrapolated the gene-centric notions previously developed by George Williams and other theoretical population geneticists, although it did so with imaginative and aggressive consistency. This genuinely novel notion of Dawkins is an attempt to solve the altruism problem, so challenging to Darwinian theory in general and selfish gene theory in particular. Dawkins “solution” is to completely deconstruct the organism; not only is it a mere robot vehicle that exists to transmit genes, but what “it” is does not have a concretely demarcated existence at all. Because genes have influence outside traditional organismal boundaries (e.g., beaver dams) and because the genes of one organism obviously influence the behavior of another organism (e.g., the appearance or behavioral displays of babies that invoke maternal care), then Dawkins argues that the boundaries of organisms are relative. He posits the existence of a skinless organism or extended phenotype, which solves by rhetorical innovation

Darwin's problem of a "characteristic in one organism that exists for the benefit of another" – because characteristics are defined as belonging to the organism whose genes benefit. Thus, there is no altruism; and there are no fixed organismal identities, aside from association of phenotypes with the genome they benefit. There has been ongoing and vigorous debate over the biological and philosophical implications of these notions, and even many gene-centric sociobiologists have rejected Dawkins' elimination of organismal function.

de Waal, Frans. 1996. *Good Natured: The Origins of Right and Wrong in Humans and Other Animals*. Harvard University Press, Cambridge.

De Waal's very explicit goals in writing this book were, first, to confront the nihilistic picture of human nature painted by selfish-gene theoreticians and, second, to argue against the dualistic bifurcation of human nature into biological and transbiological domains, with "goodness" being restricted only to the latter domain. With a variety of amply documented primate studies and theoretical argumentation, he successfully debunks the most extreme versions of the new sociobiological gnosticism. But he does not succeed or even attempt – on either empirical or theoretical grounds – to demonstrate how the most dramatic aspects of radical self-relinquishment – ostensibly unique to human beings – arise from analogues in nonhuman animals.

Deacon, Terrence W. 1997. *The Symbolic Species: The Co-evolution of Language and the Brain*. W. W. Norton & Company, New York.

This is an expansive, erudite, and nonpolemical approach to issues fraught with controversy. As the title suggests, Deacon argues for a coevolutionary account of human origins, but he does much more than this. First, he strongly and repeatedly asserts the uniqueness of human beings, arguing that there are no "simple languages" or precursors to anything like language in the animal kingdom. He rejects dichotomous nativist and externalist accounts of language acquisition, and holds that it is neither from neurologically encoded rules for syntax nor from culturally mediated expressions, but reflects a more profound capacity for symbolic thought. On this issue and others, he is much opposed to the genetic and neurological reductionism of Dennett (*The Language Instinct; Darwin's Dangerous Idea*). In a chapter entitled "The Word Became Flesh" he states that "an idea changed the brain", and argues that coevolution not only entails dual modes of inheritance (genetic and ideational), but that the latter exerts material influence on the former. In other words, the brain did not give rise to mind, but in some sense, the mind also, and perhaps primarily, drives the development of the brain – in both evolutionary and developmental scenarios. While he recognizes and overtly rejects the mystical or religious implications of the primacy of logos – "in the beginning was the word" – there are fascinating opportunities for interaction between his accounts of evolutionary history, human altruism, and divine purpose or logos.

Dugatkin, Lee Alan. 1997. *Cooperation Among Animals: An Evolutionary Perspective*. Oxford University Press, New York.

Dugatkin provides the most comprehensive theoretical and empirical review of cooperation in the animal kingdom, surveying historical and contemporary theoretical approaches, and then describing state of the art descriptions of what we know of cooperation in fish, birds, mammals (nonprimate), primates (nonhuman), and insects. This is an excellent review, and contains a new proposal for an integrative taxonomy of cooperation.

Dugatin, Lee. 2000. *The Imitation Factor: Evolution Beyond the Gene*. The Free Press.

One of the important controversies in cultural evolution theory in general, and memetics in particular, is over how memes are transmitted. We know how genes are transmitted, but replication and transmission of their ideational counterparts is debated. Memeticist Susan Blackmore argues it is primarily imitation (Dawkins derived the word memetics, or mimetics from mime or imitation). Other options are coercion or independent logical discovery (in which case memes would not, technically, be transmitted at all). Dugatin has done the most extensive empirical study of imitation in animals, and develops a theoretical model for social evolution based on adaptationist reasoning.

*Durham, William H. 1991. *Coevolution: Genes, Culture, and Human Diversity*. Stanford University Press, California.

This mammoth volume is widely considered to be the seminal work in coevolutionary theory. Durham exhaustively reviews all the alternative approaches in both the theoretical literature on gene-culture interaction, and the relevant anthropological literature. He then develops an integrative account, which he terms dual-inheritance, in which he argues for two streams of information transmission in human evolution: material (genetic) and ideational (memetic). He proposes five major ways in which genes and memes interact with each other, and provides extensive empirical case studies for each. Two important claims emerge: first, there is a rejection of materialistic and serious rehabilitation of ideational concepts of human nature, along with recognition of “top down” causation – ideas have consequences. Second, ideas may influence both behavior and evolution in ways that are contrary to the genetic or reproductive self-interests of individuals.

*Frank, Robert. 1989. *Passions Within Reason: The Strategic Roles of the Emotions*. Norton.

Frank is one of several economists (e.g., Herbert Simon, Marvin Becker) who has made important contribution to the evolutionary literature. This book presents an evolutionary interpretation of human emotions as an adaptation to social exchange. But it does more than that. While Frank accepts the necessity of fundamental human dispositions contributing to reproductive “profit,” he soundly rejects the sociobiological (and economic) notion that human behavior is restricted to that which is consistent with rational self-interest. Rather, he recognizes that humans do things – both altruistic and malicious – that can be reasonably expected to have no net payoff, and even negative consequences. He posits irrational emotions driving such behaviors, which ironically, do end up paying off in the context of social exchange. If someone demonstrates levels of beneficence or loyalty that are not constrained by the logic of compensation, Frank suggests others will trust them more easily (overcoming “commitment barriers”) and enter more freely into cooperative alliances. On the other hand, if someone is known to pursue revenge at self-injurious personal cost, others won’t mess with him. Thus there is an adaptive logic to human emotion, but its functionality entails the paradox that the behaviors it motivates cannot be pursued because they have payoffs, but precisely because reason suggests they don’t.

Holcomb III, Harmon R. 1993. *Sociobiology, Sex, and Science*. State University of New York Press.

Sensationalistic title notwithstanding, this monograph is widely regarded as the fairest, most scholarly, most scientifically astute analysis of sociobiology from the perspective of philosophy of science. Interestingly, EO Wilson (who comes under fire from Holcomb) describes him as the “leading authority on sociobiology” among philosophers. Holcomb argues that sociobiology

constitutes a scientific revolution, with theoretical reconceptualization just as significant as the original Darwinian and subsequent synthetic revolutions. While he is supportive of and hopeful for this revolution, he argues it is presently incomplete. Holcomb's analysis is unique in that, while emphatically positive about sociobiology, it virulently criticizes the rhetorical excesses of sociobiological extremism and the popularizers thereof, and especially relevant to the IRUL project, it repeatedly and strongly points out the current explanatory inadequacies and theoretical incompleteness of evolutionary theory (specifically, it has done a tremendous job with advances over the last 20 years in explaining animal behavior, but human altruism still poses an unexplained challenge to the expectations of evolutionary theory). This criticism is all the more significant coming from Holcomb, since he advocates the most adaptationist and gene-centric versions of sociobiology. He actually was a graduate student of (and had a severe parting of the ways with) Elliott Sober, who is a critic of gene-centrism and advocate multi-level selection. Thus Holcomb eschews what he regards to be present compromises in selection theory to make peace with empirical anomalies; instead, he recognizes tension between prediction and observation, and hopes for resolution if the revolutionary "new synthesis" in evolutionary theory is to be complete.

Jolly, Allison. 1999. *Lucy's Legacy: Sex and Intelligence in Human Evolution*. Harvard University Press.

Jolly integrates the reproductive, individual self-interest of traditional Darwinism with the emphasis on cooperation of some symbiotic (Lynn Margulis) or coevolutionary accounts. She argues for a directional, if not progressive view of evolution, though the thresholds of cellularity, multicellular organisms, and social communities. Cooperation is not driven by group selection, but by mutualistic benefits to individual participants. She ventures an almost eschatological vision of the fifth level of evolution – biospheric integration.

*Katz, Leonard. 2000. *Evolutionary Origins of Morality: Cross-Disciplinary Perspectives*. Imprint Academic, Ohio.

The most scholarly, perspectively diverse, up to date, and (in my view) downright interesting volume on evolution and ethics available. The volume is put together in four sections, each representing a major contemporary controversy, and each entailing a substantial principle paper by an architect of the field, followed by responses from 10 or so leading scholars from a variety of disciplines, concluded with response by the primary author. The first section is on human uniqueness vs. continuities between humans and primates by primatologist Frans de Waal (author of *Good Natured: The Origins of Right & Wrong in Humans and Other Animals*). The second starts with an ascription of uniqueness in human altruism, positing a biologically-mediated theory of social evolution for its origin. It is written by Christopher Boehm (*Hierarchy in the Forest*). The third section is by Elliott Sober and David Wilson, and is essentially a chapter length summary of their argument in the seminal book, *Unto Others*. This is an excellent review of the group selection hypothesis, and the social-psychological data underlying it. The responses by a wide variety of leading scholars – both supporters & critics – is outstanding. Finally, Brian Skyrms contributes a description of the state of the art in the application of game theory to evolution & rational self-interest, with scientific and ethical critiques following. We considered this fine volume for a course text, but rejected it only because it was too narrowly focused on morality, and the multi-disciplinary contributions represent such a range of scholarship, it would not be accessible to all participants. But, like the visitors to Jerusalem on Pentecost, there are perspectives here for everyone.

Loye, David. 2000. *Darwin's Lost Theory of Love: A Healing Vision for the New Century*. toExcel Press.

The book is a radically revisionist interpretation of Darwin, which argues on the basis of his notebooks and changes in editions of the *Descent of Man*, that Darwinism neither requires nor intends the marginalization of altruistic love from the cosmic process. Loye's belief of why Darwin has been so dramatically and persistently misinterpreted – and misrepresented – entails the notion that there is actually a conspiracy in modernity against the notion of genuine love.

*Miller, Geoffrey F. 2000. *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*. Doubleday, New York.

This book is to the origins of mind what Dawkins' *The Selfish Gene* was to the origins of organisms and Ridley's *The Origins of Virtue* was to morality: it is an attempt to explain mind and its origins in terms of unadulterated reproductive benefit. The two explicit assumptions of the work are a) a high degree of genetic determinism (he is confident we will find discrete genes influencing specific cognitive capacities) and b) our genetic constitution is primarily due to natural selection (as opposed to selection at other levels, or non-selectional processes). The major question addressed is why the human mind is so replete with capacities that appear to have no direct adaptive value, and may even involve the investment of resources in ways that are counter-adaptive. Miller's argument is that the human mind is much like the peacock's tail – it is an extravagant display, put in place by sexual selection, to attract mates. Sexual selection has been invoked to explain a number of specific, ostensibly non-adaptive human behaviors (e.g., investment in art); this invokes it to explain the huge investment in mentality in general, and is by far the most extensive application of sexual selection theory to human beings. It addresses the same paradox Deacon engages, though from a much more reductionistic perspective.

*Monroe, Kristen Renwick. 1996. *The Heart of Altruism: Perceptions of a Common Humanity*. Princeton University Press.

Monroe's sociological study assesses the motives, behaviors, and historical-cultural context along a gradient of helping behaviors: entrepreneurs (reciprocal business alliances), philanthropists (those who give unilaterally, out of excess), heroes (those who undertake genuine risk, in a one time valorous act), and rescuers (harborers of Jews who assumed extreme risk over extended periods of time). She concludes that prevailing perspectives of rational self-interest in economics, egoism in psychology, and reproductive maximization in evolutionary biology account well for the first and some of the second class of human behaviors, but completely fail for the third or fourth. While by no means anti-evolutionary, Monroe explicitly argues that evolutionary theory, in particular, has nothing to contribute to understanding human altruism, and we need another paradigm altogether.

Oliner, Pearl M.; Oliner, Samuel P.; Baron, Lawrence; Blum, Lawrence A.; Krebs, Dennis L.; and Smolenska, M. Zuzanna (editors). 1992. *Embracing the Other: Philosophical, Psychological, and Historical Perspectives on Altruism*. New York University Press.

This is the definitive interdisciplinary examination of altruism, from the perspectives of biology, social & developmental psychology, and philosophy. Unfortunately, the section on sociobiology contains neither a survey of the sociobiological position, nor a critique of it, nor a presentation of alternatives. The paper by Ian Vine, however, is one of the most imaginative and affirming attempts to solve the "evolutionary paradox" of altruism to date. He does this not so much by critiquing evolutionary theory, but reformulating the notion of the self wrongly extracted from

genetic individualism. He argues the primary human identity, arising from primal attachment, is not I but we.

Oliner, Samuel P. & Oliner, Pearl M. 1988. *The Altruistic Personality: What Led Ordinary Men and Women to Risk their Lives on Behalf of Others?* The Free Press.

Founders of the Center for Research on Altruism, and Holocaust survivors themselves, the Oliners have conducted the most extensive study on Holocaust survivors. Extensive interviews, questionnaires, and longitudinal studies compared rescuers with bystanders and non-rescuers, in an attempt to illuminate the familial, social, personality, and contingent factors that influenced dramatic sacrifice for others. It also followed through on outcomes. The two strongest correlates with rescue were conviction of the unity of humankind, and confidence one individual could make a difference.

*Oyama, Susan. 2000. *Evolution's Eye: A Systems view of the Biology-Culture Divide*. Duke University Press.

Oyama is one of a small but growing number of critics of sociobiological gene centrism, of the standard social science model of cultural autonomy, and even of the integrative attempts of dual-inheritance theory to bring the latter two together through hierarchy. She maintains that all of these positions are dualistic in their view of the relationship between genes and environment or nature and nurture. She advocates developmental systems theory (DST), which posits not just interaction between genes and environment, but codetermination in a way that makes their very delimitation illegitimate. She takes issue with the biological ontogeny assumed by mainstream evolutionary theory, and proposes a new, more holistic account of development. A potentially important, currently less explored alternative to sociobiological or coevolutionary theory; little empirical data in this treatment.

*Plotkin, Henry. 1998. *Evolution in Mind: An Introduction to Evolutionary Psychology*. Harvard University Press, Cambridge.

While purporting to be an introductory treatise on evolutionary psychology, this fine monograph is neither unadvanced nor doctrinaire ev psych. Plotkin breaks ranks with the American ev psych community and argues not only that humans have torn free of the genetic leash, but that cultural processes constitute an important, higher (tertiary) level of human behavior, on top of individual psychology. The book also includes one of the best single-chapter descriptions of the sociobiological revolution, and its importance for biological explanations of behavior, along with an assessment of the various forms of reductionism found in sociobiology. What he wants to explore, is a similarly Darwinian, but non-genetic, explanation of cultural evolution.

*Pope, Stephen J. 1994. *The Evolution of Altruism and the Ordering of Love*. Georgetown University Press, Washington D.C.

This is the only monograph in English that squarely addresses the conflicts and congruencies between Darwinian theories of altruism and Christian theology from a traditional rather than process perspective. Pope argues that sociobiology can help us understand both the origin of and present constraints on our embodied existence. But he argues against deconstructing human nature to fit an extreme, "selfish gene" pole of sociobiological analysis. He takes Catholic "ladder of loves" as opposed to an agapeist approach (as taken by CS Lewis), and maintains that altruism is not a spirit-mediated transformation of or imposition on natural loves, but an extension of the natural affections for & affiliations with the near and dear, to the more remote. While he rightly rejects (on both scientific and theological grounds) a nihilistic "self-interested" view of human morality, he does not

adequately engage the challenge from virtually all sociobiological theory that – even if we allow humans are built for cooperation – such cooperation is tightly constrained to the near & dear. The unresolved challenge to Pope’s approach is that no current version of sociobiological theory is amenable to an extension of natural affections to genuine altruism.

*Ridley, Mark. 2001. *The Cooperative Gene: How Mendel’s Demon Explains the Evolution of Complex Beings*. Free Press.

Ridley maintains that it is the cooperative gene and not the selfish gene that constitutes a driving force for the evolution of complexity from cellular to organismal to social integration. Yet how do such structures emerge from a reproductively self-interested process? The answer is while selection is reproductively conservative, mutation is not – and random variations can generate interactive alliances with benefits attending complexity. Ridley ends up positing a directionality to evolution not unlike the case made by Denton and Wright, though with more scientific rigor.

Riolo, Rick, Cohen, Michal; and Axelrod, Robert. 2001. “Evolution Of Cooperation Without Reciprocity.” *Nature* 414, 441 – 443.

A long-standing problem in biological and social sciences is to understand the conditions required for the emergence and maintenance of cooperation in evolving populations. For many situations, kin selection is an adequate explanation, although kin-recognition may still be a problem. Explanations of cooperation between non-kin include continuing interactions that provide a shadow of the future (that is, the expectation of an ongoing relationship) that can sustain reciprocity, possibly supported by mechanisms to bias interactions such as embedding the agents in a two-dimensional space or other context-preserving networks. Another explanation, indirect reciprocity, applies when benevolence to one agent increases the chance of receiving help from others. Here we use computer simulations to show that cooperation can arise when agents donate to others who are sufficiently similar to themselves in some arbitrary characteristic. Such a characteristic, or 'tag', can be a marking, display, or other observable trait. Tag-based donation can lead to the emergence of cooperation among agents who have only rudimentary ability to detect environmental signals and, unlike models of direct or indirect reciprocity, no memory of past encounters is required.

*Rolston, Holmes. 1999. *Genes, Genesis and God: Values and Their Origins in Natural and Human History*. Cambridge University Press, Cambridge.

Along with the Pope volume, this is the only theological monograph to explicitly engage sociobiological views of human nature. In contrast to Pope’s treatment, Rolston emphasizes values rather than altruism. In concord with Pope, he rejects extreme sociobiological reductionism, although unlike Pope, Rolston clearly recognizes that even a modestly functionalist (reproductive) account of values, makes mischief for ethics. Rolston’s clear engagement with the challenge of sociobiological explanations is helpful. However, he often dismisses the science that has implications he disagrees with, without appearing to acknowledge the full weight of the science itself, appealing to emergentism without much empirical support. And, on the other hand, many evangelical Christians will feel he has made untenable theological compromises.

Rose, Hilary and Steven. 2000. *Alas, Poor Darwin: Arguments Against Evolutionary Psychology*. Harmony Books, New York.

One of the fascinating things about the history of sociobiological theories over the last 25 years, is that after a spate of fierce condemnations in the 1970’s, and a modest flowering of more reasoned critiques in the early 80’s, there has been little criticism in either the popular or scholarly

press, even though the discipline itself has continued to develop under new labels of evolutionary psychology, Darwinian anthropology, etc. Indeed, many of the early critics (e.g., Philip Kitcher, Peter Singer) have become cautious advocates. This is the first major criticism of second generation sociobiology to emerge, and the only concerted scholarly counterattack in over a decade. There are excellent chapters critiquing the adequacy of ev psych's account of religion (Dorothy Nelkin), memes (Mary Midgley), Dawkinsian gene-centrism (Gabriel Dover), Darwinian fundamentalism ala Dennett (Stephen Gould), the reduction of mind to cognitive modules, reducing the human behavioral to biological sciences, a feminist critique of individual self-interest, etc. This is the best and most extensive single critique of evolutionary. Unfortunately, it is not at all commensurate with the substantive and manifold articulations of the discipline itself. Written in essay format reminiscent of the exchanges on these issues that have appeared in *New York Review of Books*, the chapters are sparsely documented and do not engage the scientific issues at a level of detail or nuance comparable to the proponents they critique.

Rushton, J. Phillippe. (1989), "Genetic Similarity, Human Altruism, And Group Selection," *Behavioral and Brain Sciences*, 12: 503-559.

One of the only analyses of potential genetic sources of variance in altruism, employing a group selectionist perspective on heritable differences in cooperativity. The research addresses important ideas, though Rushton's analysis of human group differences betrays misunderstandings of r and K selection, and is widely critiqued for its attribution of racially based cognitive and behavioral dispositions.

Seegerstrale, Ullica. 2000. *Defenders of the Truth: The Battle For Science in the Sociobiology Debate and Beyond*. Oxford University Press, New York.

This recent book is far and away the very best critical evaluation of the sociobiology debate, and one of the very best studies of scientific controversy I have ever encountered. It is impressively – almost intimidatingly – complete and accurate. Virtually every major and minor skirmish is chronicled, and both the scholarly and popular literatures are exhaustively reviewed. The book is scientifically accurate and even astute; moreover, the controversy – or, better, controversies – inherent in sociobiological debates are assessed both from the sociology and philosophy of science (more the former). It contains a superb historical assessment of the initial debates over sociobiology; less emphasis on the recent explosion of manifold critiques and modifications. What it does not offer is an assessment, or even thorough representation, of the evidential basis for the scientific debates. Indeed, the author maintains the debates may be more over worldview than naked evidence.

*Sober, Elliott and Wilson, David. 1998. *Unto Others: The Evolution and Psychology of Unselfish Behavior*. Harvard University Press, London.

This is one of the most controversial and significant books to emerge on human evolution, and on altruism, since the sociobiological revolution. It is divided into two sections, on the evolution & psychology of altruism. The evolutionary section provides a historical survey of the altruism issue and the longstanding debates over the nature and levels of selection. It argues very compellingly for a rehabilitation of "group selection" theory, and moreover, demonstrates that when appropriately mathematically understood, group selection does not even conflict with, in fact is contained within, sociobiological models of selection. Then the book surveys and critiques the literature on psychological egoism and altruism, concluding it is much more ambiguous than proponents of either pole acknowledge. The book is one of the most accessible presentations of population genetics and one of the fairest and most genuinely self-critical interpretations of the

altruism issue available. Sober & Wilson provide a chapter length summary of their arguments in the Katz anthology.

Swinburne, Richard. 1997. (revised edition; original 1986). *The Evolution of The Soul*. Clarendon Press, Oxford.

Swinburne provides an expansive apologetic for substance dualism, which fully recognizes the interaction between body and soul, but which denies the latter is an epiphenomenon of the former. He has an excellent section on biological explanations of both animal and human soul and argues cogently against a) a physico-chemical explanation of the causes of sensation and b) an evolutionary account of the origin of sensation (or mind), if sensation is held to be epiphenomenal. That is, if any aspect of mind is epiphenomenal, by definition it does not influence behavior and therefore can confer no evolutionary advantage. Swinburne makes a number of mistakes and oversimplifications in his representation of biology, but they are not lethal to his argument.

*Tooby, John and Cosmides, Leda. (1997), "Friendship and the Banker's Paradox: Other Pathways to the Evolution of Adaptations for Altruism." in W.G. Runciman, John Maynard Smith, and R. I. Dunbar (eds.), *Evolution of Social Behavior Patterns in Primates and Man. Proceedings of the British Academy*, (Oxford: Oxford University Press), 88: 119-143.

One of the most imaginative, thoughtfully adaptationist, yet altruism-affirming studies of human other regard, breaking new ground and violating stereotypes of evolutionary psychologies elevation of other disregarding self-interest. Tooby and Cosmides argue strongly for the internalization of human needs for deep commitment, resulting in intimate relationships that are not based on vigilant reciprocity and, in fact, are valued and pursued to the very extent that involvement is not dynamically conditional upon an individual's ability to pay back.

Williams, George C. 1966. *Adaptation and Natural Selection*. Princeton University Press.

Williams seminal critique of group selection and argument for the primacy of individual selection laid the foundation for selfish gene theory, for the sociobiological revolution, and was determinative in defining evolutionary orthodoxy for four decades.

Wilson, Edward O. 1978. *On Human Nature*. Harvard University Press, Cambridge.

This is the book where Wilson came "out of the closet" and confirmed the suspicions his early detractors had about his intentions to apply sociobiological determinism to human beings. It is an over t apologetic not only for what he terms scientific materialism, viewed through a Darwinian lens, but also for the replacement of traditional religion by this worldview. Two chapters are seminal. His treatment of altruism provides the clearest (and most cynical) sociobiological deconstruction of human love available (Mother Theresa and the Black Panthers differ in form, are identical in substance). And his chapter on religion attempts not only the first functionalist account of religion from the perspective of sociobiology, but argues on this basis for the necessity of religion to human flourishing. He argues that the history of engagement between religion and scientific materialism is a history of retreat and defeat for religion, and all that is left is an anemic deism or process theology. Wilson argues that once an entirely adequate materialistic account of not only the function, but mechanism of religious belief is provided, theology will disappear.

Wilson, E.O. 1975. *Sociobiology: The New Synthesis*.

The book that started it all. Wilson combined kin selection and reciprocal altruism theory to attempt "a biological explanation of all social behavior". Although the expansive volume only

included one chapter on humans, furor arose over implications for reductionism (confirmed in his next book *On Human Nature*) and also his disciplinary imperialism – not implied, but over – in asserting the goal of biologizing the social sciences and replacing epistemologists with endocrinologists.

*Zahavi, A. and Zahavi, A. 1997. *The Handicap Principle: A Missing Piece of Darwin's Puzzle*. Oxford University Press.

One of the upshots of reciprocal altruism theory is that the best strategy would involve cheating or nonreciprocation in a group of cooperators. To solve this problem, cooperators demand displays of group membership, much as mate choice demands displays of viability. In response, deceptive displays develop to attract both mates and reciprocators. This volume develops an extensive theory of how organisms handicap themselves by costly displays that are hard to fake, because of the compensatory gain by mate attraction or inclusion in the reciprocating alliance. This is an important (though difficult to falsify) attempt to explain ostensibly maladaptive behaviors or anatomical features.

*Zahn-Wexler, Carolyn et. Al (eds). 1986. *Altruism and Aggression: Biological and Social Origins*. Cambridge University Press.

This collection of papers constitutes one of the few attempts to explore biological and anthropological approaches to human behavior that does not attempt either to enfold one into another or syncretistically integrate the two. For this reason alone, it is a helpful and unique treatment, and the more so because it rightly perceived development as the bridge between biological and social influences. There are two shortcomings with the volume: first, an outgrowth of the attempt to avoid syncretism is the fact that there is little integration. Genetic, evolutionary, developmental, personality, and sociological approaches are portrayed. Second, and very significantly, is that “altruism” is frequently conflated with “prosocial behavior”, and thus the difficult challenges to and from evolutionary theory are not squarely engaged.