Behavior and Philosophy, *29*, 79-93 (2001).

Editor's Note:

James Chisholm is an associate professor at in the Department of Anatomy and Human Biology in the University of Western Australia who is interested in the relations between human culture and biology. Like our two reviewers, he believes that "in principle everything about us must ultimately be explainable in terms of evolutionary theory. . . . " But his provocative book *Death, Hope, and Sex: Steps to an Evolutionary Ecology of Mind and Morality.* (Cambridge University Press, 1999) inclines much more towards one side of the nature-nurture debate than the other. Our two reviewers present both sides of this lively debate.

EVOLUTIONARY PSYCHOLOGY RETURNS TO ITS BOWLBIAN ROOTS

Tamer Amin
Nicholas S. Thompson
Clark University

A review of *Death, Hope, and Sex* by James Chisholm. Cambridge, UK: Cambridge University Press, 1999, 296pp.

James Chisholm's ***Death, Hope and Sex*** is an important step for the field of evolutionary psychology. Evolutionary psychology is unique among the fields dedicated to applying Darwinism to human behavior because of its explicit interest in the evolution of development. But this aspect of the field has been largely neglected for such contemporary hot topics as mate choice, jealousy, and social exchange theory. Chisholm's book takes the field back to its roots in the mother /infant attachment theory of John Bowlby (1969). Bowlby held that the relation that develops between a primary caregiver and a child is an adaptation to the conditions under which human beings evolved. From this base in Bowlby's attachment theory, Chisholm reaches out to population biology, behavioral endocrinology, adolescent development, economics, ethical philosophy, and ultimately social policy. Despite the breadth of its ambition, the book is neither windy nor vague. Chisholm achieves this balance by arguing from a few key texts.

AUTHORS' NOTE: We are grateful to David Sloan Wilson for bringing Chisholm's book to our attention and to Chisholm, himself, for a thoughtful commentary on an earlier draft of this review. Please address all correspondence to Nicholas S. Thompson, Departments of Psychology and Biology, Clark University, Worcester, MA 01610. Email: nthompson@clarku.edu.

So, for instance, much of what he has to say about ethical matters is a response to Martha Nussbaum's work (e.g., Nussbaum & Sen, 1993), and many of his conclusions concerning development are derived from Harpending, Draper, and Belsky (see e.g., Belsky, Steinberg, & Draper, 1991; Draper & Harpending, 1982). ***Death, Hope, and Sex*** manages to be both an academic book with implications for specialists in many fields and a generalist's book with wide implications for the governance of human affairs.

Chisholm's Argument

Chisholm's is a comprehensive and complex theory of human social development. Its presentation in ***Death, Hope, and Sex*** is organized from premises to conclusion. From foundations in philosophy of science, Chisholm argues for naturalism as an approach to the study of human behavior. This approach leads him to evolutionary biology as a basis for understanding human development. Using evolutionary principles, he integrates literatures on infant development, adolescent development, and parenting to reach an understanding of the vicissitudes of human development.

This bottom-up presentation works well for Chisholm, but we will represent the work in the opposite way: that is, instead of building upward from the foundations, we start with Chisholm's conclusion and show how he got there. In our words, Chisholm's conclusion is:

> Because of stable features of human nature arising from human evolutionary history, contemporary political planners should minimize the perception of risk in as many people as possible. (paraphrasing DHS, chap. 6, particularly pp. 235-236)

This view implies that if social planners are to bring out the best in their fellow human beings, they first have to see whether people conceive of themselves as having a more or less secure future. The reason is that humans do not behave well when they are standing at the edge of what Chisholm calls a "fitness cliff." Good citizenship and stable family relations are not called forth when one false move can result in the removal of a person's genome from the population. The reason is that,

> Humans produce short-term oriented behavior in a risk-filled environment. (DHS, chap. 5, particularly summary at p. 150)

This characteristic of human nature comes about via two routes. The first route is a direct effect upon adults who are experiencing the risks.

> People who fear for their futures are less healthy, die younger, are more inclined to short term pursuit of pleasure at the expense of planning, have more difficulty maintaining marriages, are less able to buffer their children from the hazards of their environments, and raise less well attached children. (DHS, *ibid.)*

So far, this pattern seems like a rational "oh-what-the-hell" response to living under irrational circumstances. But, as we shall see, Chisholm makes more of it.

The second route by which risky environments produce undesirable behavior is intergenerational.

> Children raised in risky environments become insecurely attached, manifest endocrine stress, mature early, grow to smaller size, engage in sex younger and more urgently, have more children at a younger age, are less caring of others, and are more inclined to divorce their spouses and abuse their children as adults. As adults, males in this category are more inclined to rape, murder, and suicide and are more likely to desert their children. (DHS, *ibid.)*

These effects are more likely to occur in adults raised in uncertain environments even if they are fortunate in their adult circumstances. Thus, social planners should strive particularly to provide institutions that buffer ***children*** from the effects of social stress because, in Chisholm's theory, a failure to do so fosters a generation of adults that are likely to engage in antisocial behavior. Moreover, once this intergenerational trend is started, it is likely to be self-sustaining, since the antisocial behavior of one generation increases the hazards for the next and fosters the development of children who are likely to engage in the same sorts of behaviors when they are adults.

In Chisholm's view, the connection between uncertainty of the environment and the future reproductive behavior of the child is mediated through the attachment relation. In this relation, the child forms internal working models of its social environment, internal working models that guide its behavior through life. At this point, Chisholm's account becomes mentalistic. The child's future will be determined largely by the kind of models it builds of the minds of the people around it. Securely attached and insecurely attached children build very different "internal working models." Human infants are utterly helpless physically but socially have many tools by which they can elicit care from those around them. The response of that social environment to the employment of those tools forms the basis of the infant's model of the kind of social world into which it has been delivered. Securely attached children develop more complex theories of mind of the individuals around them, theories that serve them well when they are called upon to raise families in the tightly ordered social relations typical of a stable social order. Insecurely attached children develop simpler theories of mind, theories that likewise serve these children well, maximizing their likelihood of genetic persistence through times of social and environmental chaos.

The connection between adult misbehavior and poor childhood attachment has long been known and conceptualized as a form of social pathology. Secure attachment within a stable nuclear family has been regarded as the natural form of childrearing and other arrangements have been seen as poor substitutes for this normative one. Chisholm sees the connection quite differently. He believes that human beings are designed to facultatively switch between two pathways of development and that one of the functions of the attachment relation is to provide

the information that determines which pathway the child chooses. Again, to recapitulate Chisholm's argument:

> One function of the attachment relation is to provide developing infants with knowledge of the riskiness of the social environment into which development is delivering them. For those infants that can form secure attachments, their secure attachment is a cue that the world in which they themselves will parent children is stable and that accumulating the resources for future reproduction is a strategy that is likely to succeed. When such securely attached individuals reach adulthood, they are likely to delay reproduction and to channel reproductive effort toward raising relatively few, higher quality offspring in a secure environment. For those infants that are unable to form secure attachments, their insecure attachment is a cue that the world in which they themselves will parent children is unstable and unpredictable, and that the effort of accumulating resources for future reproduction is likely to be wasted. When such insecurely attached individuals reach adulthood, they are likely to begin reproduction sooner and to channel reproductive effort toward producing as many offspring as possible with relatively little regard to offspring quality or the security of their environments. (DHS, chaps. 3 & 4.)

The distinction is oddly reminiscent of Ruth Benedict's (1934) application of Nietzche's distinction between Dionysian and Apollonian cultures.[1]

Once again, we might believe that Chisholm is working with a rational actor model in the ordinary sense. On that assumption, the argument might so far be summarized as follows: under difficult circumstances, people take what pleasure and comfort they can without regard to the future, and such people tend to raise children like themselves. But Chisholm's is ***not*** a rational actor model in the ordinary sense; it is an evolutionary model. In an evolutionary model, rationality is something that needs to be explained, not something that can itself serve as an explainer. From this point of view, the problem is not to explain why those in doubt for their future should succumb to the lure of pleasure, but why has natural selection designed us so that in circumstances of doubt we find pleasure in doing things that are contrary to our long-term interests. The kind of "rationality"

[1] We don't quite know what to make of this echo, but it is so striking to us that we feel compelled to quote a paragraph from *Patterns of Culture* to raise the issue. "The basic contrast between the Pueblos and the other cultures of North America is the contrast that is named and described by Nietzsche in his studies of Greek tragedy. He discusses two diametrically opposed ways of arriving at the values of existence. The Dionysian pursues them through 'the annihilation of the ordinary bounds and limits of existence;' he seeks to attain in his most valued moments escape from the boundaries imposed upon him by his five senses, to break through into another order of experience. The desire of the Dionysian, in personal experience or in ritual, is to press through it into another order of experience. The closest analogy to the emotions he seeks is drunkenness, and he values the illuminations of frenzy. With Blake, he believes that 'the path of excess leads to the palace of wisdom.' The Apollonian distrusts all this, and has often little idea of the nature of such experiences. He finds means to outlaw them from his conscious life. He 'knows but one law, measure in the Hellenic sense.' He keeps the middle of the road, stays within the known map, does not meddle with disruptive psychological states. In Nietzche's fine phrase, even in the exaltation of the dance he 'remains what he is, and retains his civic name.'" (Benedict, R. [1934]. *Patterns of culture* [p. 72]. New York: Mentor Books.)

displayed by Chisholm's actors is that they act in their ***genetic*** interests. By definition, an organism acts in its genetic interests if distribution of the genes controlling the action is favored by the performance of the action. ***No forethought, weighing of options or consciousness of consequences is implied by this sort of biological rationality.*** Genetically interested behavior is often highly destructive to the particular organism that performs it. The mother cat that flies in a fury at the face of the predator or tomcat that threatens her kittens may be sacrificing her own personal interests, but she is surely acting in the interest of the genetic substrate that makes such behavior possible, because that substrate would not now exist if her ancestors had not performed this behavior under equivalent circumstances in the past.

Because Chisholm uses Darwinism to explain the premises on which our rationality is founded, his is an evolutionary theory of the origins of value.

> Our pleasures, like our motives and fears, are evaluative mechanisms. They tell us what is good and bad about the world with which we are interacting. They are the way they are because in the history of the species natural selection has favored values (pleasures, fears, desires) that favor reproduction. (DHS, chap. 2.)

In an evolutionary context, understanding values means understanding how natural selection produced, in the context in which the human species was evolving, evaluative mechanisms—pleasures, emotions and motives—that both fostered long-term careful child-rearing behavior under stable and predictable circumstances and fostered casual, exploitative, and sometimes violent reproductive behavior under chaotic circumstances.

Here Chisholm appeals to a principle well established in population biology known as Life History Theory. According to life history theory,

> the developmental trajectory of organisms is itself an adaptation. (DHS, chap. 1)

Which kind of developmental trajectory—how long the organism lives, how much of its lifetime is spent in immaturity, how many mates it has, how many offspring it has, how much effort is dedicated to the care and protection of each, whether it continues to live after its offspring have been produced—all these features are determined by natural selection. In the early days of this literature, biologists identified two broad syndromes, nicknamed r-selection and k-selection. Very roughly speaking, an r-selected organism has been selected to have so many offspring that how *well* it cares for them does not matter, while a k-selected organism has been selected to take such good care of its offspring that how ***many*** it has does not matter. Creatures vary greatly between the pole of r-selected and k-selected. In general, those creatures facing unpredictable environments tend to be of the r-selected type and those facing stable and predictable environments tend to be of the k-selected type. Human beings, primates, and most mammals are, compared with most other creatures, rather on the k-selected side of this

distinction. Humans, in particular, have rather fewer offspring and devote rather more effort to raising them than most of their fellow creatures.

This generalization about mammals needs to be qualified in one important way. Although it applies to mammals overall, it applies more to the females of a mammalian species than to the males. Because a female bears her offspring within her body at considerable metabolic cost to herself, the cost of replacing any current offspring with a future one at the same stage of development is always greater for her than for her mate. Consequently, for her, selection is more inclined to favor investment of time and resources in a current offspring and less inclined to favor abandoning current offspring in favor of a future one. On the other hand, selection may reward her mate for disregarding current offspring in favor of the opportunity to father others, particularly if females are inclined to provide for them. Thus, the physiology of mammalian mating favors a differentiation of reproductive effort in the two sexes, females focusing on taking good care of a relatively few offspring and males focusing on fathering as many offspring as possible. Mammalian males are, in general, more sexually aggressive and promiscuous than females of the same species who are more nurturing and protective of young than the males.

Chisholm would like us to recognize that this differentiation between the two sexes is a differentiation in what they ***value***. Among mammals generally, females value present offspring more than do males, and males value future offspring more than do females. To Chisholm, value and genetic interest are synonymous. Organisms will tend to evaluate their opportunities according to the potential for distributing the genes underlying the evaluations. Emotions and motivations are the psychological terms we use to name these evolutionarily evaluations. The relative nurturance of mammalian females constitutes an evaluation of the relative importance of present offspring; the relative sexual aggressiveness of males constitutes an evaluation of the relative importance of future young. Notice that nothing about this notion of value requires us to be talking about humans and their cultures. A bean sprout that pushes up through the turf values light, in this sense, just as surely as a man who fights his way out of prison values freedom.

Defining value as that which natural selection promotes constitutes a naturalized ethics. Chisholm's stoutly defends a naturalized philosophy in the first chapter of his book, explicitly warning his reader to be skeptical about the bugbear of the naturalistic fallacy. Where else, he argues, but from human emotions are values to arise? Are not emotions value experiences? And having conceded a positive answer to these questions, who is to say that a knowledge of the evolutionary foundations of these value experiences is irrelevant to planning for the future of the human species?

Because of human evolutionary history, humans are to some degree an exception to the general rule that males and females value present and future reproduction differentially. In humans, selection has favored learning, with the large brain and the large skull, altricial birth, and long period of dependency that goes with it. Dependent children are both demanding and encumbering and the evolution of their increased dependency has meant that female humans have been less able to raise and nurture offspring without the help of others. This fact has in

part dampened the selection on human males for sexual aggressiveness, because selection can favor a human male in taking risks to mate a human female if and only if there are resources available to raise her offspring. This limitation on the value of male promiscuity has made available an alternative mating strategy for males, more similar to the female mating strategy. Under circumstances in which the male has the opportunity to gather resources and focus them on the offspring of a single female, selection may favor foregoing the hazards and gains of a sexually aggressive and promiscuous mating strategy in favor of protecting and nurturing the offspring of a single female.

This, then, is the basis for the duality in male reproductive and social behavior that Chisholm concludes should be factored into the social planning. If social planners can guarantee the stable circumstances that will cause males to value their long-term reproductive possibilities, then males are more likely to father the young of a single female and provide the resources necessary for the rearing of her young. They are also more likely to nurture the social organizations necessary for the safety of their mates and offspring. On Chisholm's account, a similar logic applies to females. Under stable circumstances, females are less likely to opt for early sexuality and likely to have fewer, healthier young, later in life. These young will be raised securely attached and inclined to provide stable and predictable environments for their own offspring. If, on the other hand, social planners provide the chaotic circumstances that will cause males to value only their short-term reproductive possibilities, then males are more likely to mate aggressively and promiscuously, to behave irresponsibly toward their young, and to disrupt social arrangements that block their access to females. Females are likely to try to reproduce rapidly before the stresses of the situation take their toll. Young raised in such circumstances are likely to have poor survival, and those that manage to be raised at all will be insecurely attached and inclined thereby to provide unstable and unpredictable environments for their own young, with the cascade of unfortunate intergenerational consequences that follows.

A Critique

In this way Chisholm's framework pushes theorizing in evolutionary psychology forward. His use of life history theory emphasizes the interaction between phylogenetic and ontogenetic explanations of behavior. Moreover, by integrating findings from a variety of different research areas—cognitive, social and evolutionary psychology—Chisholm presents an account that is faithful to the complexity of developmental phenomena. This step is welcome for research in psychology generally and evolutionary psychology in particular. While the integrative attempt of Cosmides, Tooby, and Barkow (1992) was of comparable scope, it offered a less productive treatment of the nature/nurture issue. Indeed, their effort focused largely on bringing natural selection to bear on the nativist/empiricist debate (and the closely related domain specificity/generality) debate, coming down in support of the former. While Chisholm's approach shares a great deal with the framework described by Cosmides, Tooby, and Barkow

(1992), he goes beyond these dichotomies by treating developmental mechanisms themselves as adaptations (as we have described above). Moreover, Chisholm's theoretical integration is more compelling because it ***illustrates*** how findings from cognitive science and social psychology can be integrated and used to construct complex accounts of evolved developmental mechanisms.

We are particularly grateful for Chisholm's reconnection of evolutionary psychology to its Bowlbian origins. We find intriguing the idea that natural selection has designed motives and emotions to evaluate our surroundings, that attachment is likely to determine the manner in which young people evaluate their futures, and that these evaluations may determine the quality of life for all of us.

The theory is powerfully heuristic in that it suggests a myriad of investigations that relate specific experiences in childhood with specific adult personality types. On Chisholm's account adult personality types are not the result of pathological rearing or cultural role determination but are specific responses called out in childhood by specific information about the likely states of the world in which the developed individual will be reproducing. Such a theory might serve as the basis for a radical reconceptualization of such "pathologies" as autism, attention deficit disorder, and psychopathic personality "disorder."

Because we believe that the theory is important and likely to be influential, we also believe that we should take the occasion of this review to begin a discussion of its flaws.

A. Flawed Because Too Strong

Some may object that the heurism of the theory comes at the expense of a grandiosity verging on the absurd. The theory simply is TOO strong, predicts too much that we already know to be false. While there are many statistically significant results that support Chisholm's arguments, still these results represent relatively small biases in the relative frequencies in different categories of outcome under different categories of circumstances. For instance, Chisholm reminds us of studies that show that a greater proportion of youngsters raised under stable circumstances are securely attached when compared to youngsters raised under unstable circumstances. Chisholm correctly sees these data as supporting his theory because they are inconsistent with the hypothesis that unstable circumstances lead to the same proportion of securely attached children as stable circumstances. But the same data also show that a substantial proportion of youngsters raised under unstable circumstances are SECURELY attached, and Chisholm's theory gives us no obvious way to account for these many exceptions.

We recognize that this criticism applies to most of the investigations performed by psychologists. It arises from the backwards way in which behavioral scientists use statistics, first casting their beliefs as alternatives to some unfavorable hypothesis and then disproving the unfavorable hypothesis (Cohen, 1994). But the criticism applies particularly harshly to an evolutionary psychologist like Chisholm because he is making attributions to human ***nature***. The studies to which Chisholm refers demonstrate that we can reject the hypothesis

that disruptive and irresponsible mating behavior in adulthood is unrelated to insecure attachment in childhood. But Chisholm's hypothesis seems to imply that insecure attachment in childhood is a sufficient condition for irresponsible adult reproductive behavior. Thus, the hypothesis is falsified if there are ANY instances of insecurely attached children who grow up to be responsible adults. Strong as the data may be in support of Chisholm's hypothesis, they obviously falsify this hypothesis. Obviously, further elaborations of theory may offer ancillary principles to account for subjects that do not follow trends predicted by the basic theory. But because of the kind of theory that evolutionary psychology is, evolutionary psychologists need to be particularly assiduous in offering such principles because their absence drains the theory of much of its force as an explanation of an evolved, species-specific human nature.

Our approach to testing hypotheses suggested by evolutionary arguments draws attention to another problem. Chisholm explains that an evolutionary psychology is dependent for its power on an "optimality assumption:" that is, if some aspect of the relationship between the human organism and the environment in which it was evolving would have resulted in differential fitness between variants of an organism, then we can assume that the relevant trait will have become optimally designed. This optimality assumption allows one to generate hypotheses about human behavior by reverse engineering the problems thought to have faced our ancestors in the historical environment in which our current traits evolved. But, as Chisholm warns, optimal here does not mean "perfect" or "best imaginable," but rather "best available given existing circumstances." Thus, the problem with this approach to testing single hypotheses based on an evolutionary argument is that the "existing circumstances" with respect to which optimality is assumed include other adaptations. The beaks of both the woodpecker finch and the downy woodpecker are adaptations to picking at bark. But both are also related to the behavior pattern of the two birds, the former to using a tool, the latter to striking the bark directly. This sort of inter-relation among adaptations makes the optimality assumption very difficult to apply in practice, and it may ultimately cast doubt on the entire project of reverse engineering. Suddenly, the organism is conceived as optimizing to itself, rather than to the environment, and self optimization would seem to be an odd sort, since the thing optimized and the thing to which it is optimized are one in the same (Thompson, 1981). Moreover, this brief mention of the complexity underlying an optimality assumption and the potential difficulties of reverse engineering should remind the reader of the call for restraint in adaptationist theorizing voiced by Gould and Lewontin (1979). Structural and behavioral traits may be anything from adaptations proper, to exaptations, and finally to by-products of adaptations, that are of no functional significance to the organism, further complicating the strategy of reverse engineering.

B. Flawed Because Unnecessarily Mentalistic

There is a coming battle for the "mind" of evolutionary psychology. The battle will concern whether to understand mind in a descriptive sense—as referring to complex patterns in human behavior—or to use it in an explanatory sense—as referring to internal representations that cause behavior. Regrettably and unnecessarily, Chisholm casts his lot with the mentalists, unleashing on his readers a flock of initials referring to hypothetical internal entities and processes: IWM (innate working models), MI (machiavellian intelligence), and ToM (theory of mind.) As is commonly true with mentalistic terms, their intuitive charms are overwhelmed by their capacity to obscure the actual organization of behavior. Consider the idea that insecurely attached male infants turn into aggressive and sexually exploitative young adults. Such males are presumably much more responsive to cues to sexual opportunity and less responsive to cues to the dangers of exploiting such opportunities. Chisholm would say, they are so because their internal working model of their social environment is one in which they have very little chance to pass on their genes to the next generation. Their early attachment experiences cause them to have such an internal working model, and the internal working model causes them to behave in aggressive and sexually exploitative ways. Such a way of talking leads to a fruitless search for the chunk of neural tissue that "represents" the unpredictable environment. But one likely explanation for this phenomenon is that the early environment causes an up-regulation of testosterone output and the high levels of early testosterone make these young men particularly sensitive to sexual opportunities and insensitive to their hazards. Unless we are prepared to think of "up-regulated testosterone production" as a "representation" of an unpredictable social environment, we can see how misleading is the idea of an internal working model. To say that insecure early attachment sensitizes young adults to cues to sexual opportunities and desensitizes them to the hazards of exploiting these opportunities provides a fully satisfying account without mentalistic residue (Thompson, 2000a).

C. Flawed Because of an Unwillingness to Consider the Role of Group Selection in Explaining the Consequences of Variations in Early Attachment

A more important criticism is that Chisholm's theory is greatly impoverished by his refusal to consider group selection (the interests of groups) as a possible cause of some of his most puzzling phenomena (see Sober & Wilson, 1998; Thompson, 2000b; Wilson & Sober, 1994). Three phenomena stand out as being implausibly explained on Chisholm's account and more plausibly explained by the introduction of group selection: the avoidant behavior of some insecurely attached children, the hyper sexuality of "father absent" and insecurely attached daughters, and the hyper aggressiveness and reproductive irresponsibility of their "father absent" brothers. Each of these phenomena is implausibly explained by Chisholm's theory and more plausibly explained by selection operating at the group level.

1. Avoidant and Ambivalent Behavior in Infancy. One of the most puzzling behaviors in infancy to provide an evolutionary account for is the avoidant behavior displayed by some insecurely attached infants in a strange situation. For an infant in an isolated nuclear family to avoid his mother simply does not make sense. Chisholm's account is that such infants are responding to cues that the mother is unwilling to invest in them. Chisholm is correct that such cues might be enormously important for an infant to pick up. According to evolutionary psychology, a mother should always be teetering on the balance between investing in current offspring and minimizing the current reproductive effort in favor of a later effort to be made under more favorable circumstances. Minimizing the current reproductive effort is a slippery slope leading to infanticide. In the absence of extra-maternal care or a dramatic reversal of circumstances, an infant that because of its questionable status receives less care today will be more questionable tomorrow and therefore less worthy of care. One cue that a mother might use to make the decision whether to step on this slippery slope is the relation between her current ability to provide for the infant and the level of its demands. Thus, nature might select for infants that, under circumstances in which the mother is giving cues to approaching the end of her rope, limit their demands on her . . . that is, avoid her.

But such a strategy makes sense only if an infant has other potential sources of care. In the circumstances faced by the hunting-gathering peoples of the Pleistocene, an infant that avoided its mother would be at great risk unless that infant was cared for by others. While elsewhere acknowledging the necessity of maternal care for infant survival, Chisholm provides no account of the source of such necessary care in the case of avoidant infants.

The behavior of ambivalent children is only slightly less puzzling. Ambivalent attachment is characterized by clingy, whiney, and dependent behavior. An ambivalently attached infant is reluctant to venture forth from its mother and is not easily comforted when she returns from a brief separation. Chisholm sees such behavior as an adaptive response to a mother who is unable to reliably provide resources to her infant. But, once again, it is hard to see how such behavior would provide benefits for its genetic substrates in a world in which only the mother is available to respond. In fact, evidence suggests that such behavior is a risk factor for child abuse and even infanticide.

In the course of our work on the form and effects of babies' cries, we have toyed with the idea that babies' cries are directed not toward parents but toward the group. This bizarre notion makes sense in the light of the fact that babies' cries are too loud for a communication system designed for exchanges of information between proximate intimates. Our contrary hypothesis is that infants are designed to be raised only partly by parents; in part, they are designed to be raised as a part of a crèche of similar aged infants cared for by group members at large. Thus, infants that avoid their primary caretakers can afford to do so because they are receiving support from elsewhere and infants that cry in the presence of their primary caregivers are appealing over the heads of their parents for care by other

group members (See, Thompson, Dessureau, & Olson, 1998; Thompson, Olson, & Dessureau, 1996).

2. The Hyper Aggressiveness of Father-Absent Sons. It has been frequently documented that male children who are raised in households lacking a male display "hypermale" behavior in early adulthood. They are given to violence and casual and exploitative sexuality. On Chisholm's account, this behavior is not an adaptation to father absence per se, but to the correlates of father absence, which constitute cues to the presence of a chaotic social environment unlikely to reward long-term reproductive strategies. (Recall that in rodents, just the presence of unfamiliar males in proximity to a pregnant female is sufficient to cause her to reabsorb her fetuses.)

The logic, as we have reviewed above, stems from the manner in which selection might act on males to toggle them from one reproductive strategy to another. In a situation in which some dominant males have cornered resources and are successful reproducers while other males are excluded, selection would favor excluded males that made violent attempts to break into the circle of breeders over excluded males that did not, no matter the cost. Why? Because the genetic substrates underlying nonviolent behavior in these circumstances have no chance of being passed on whereas the genetic substrates underlying violent sexuality have *some* chance of being passed on. It is on the basis of such Hobson's choices that natural selection constructs many adaptations.

But while it seems to accord with experience and theory to say that young males from chaotic backgrounds are inclined to risky behavior, violence, and exploitative sexuality, the theory does not take account of the fact that much of this behavior seems to occur in more or less organized groups. In fact, the violence that young males seem particularly prone to is group violence. This might just be a sociological observation concerning humans were it not for the fact that groups of young males in many species overwhelm and intrude on resource-holding males and their mates. Given that males who control resources are likely to be dominant males, a single violent male is unlikely to be able to disrupt social arrangements sufficiently to secure a mating. On the other hand, a group of violent males may be successful, and their only problem is how to divide amongst themselves the spoils of their violence.

3. The Hyper Sexuality of Father-Absent Daughters. The behavior of father-absent daughters makes even less sense. No matter how stressful a female's circumstances—in fact, particularly under stressful circumstances—she should avoid pregnancy unless there is some chance that her offspring will survive to reproduce. So Chisholm's idea that the early and promiscuous sexuality of father-absent daughters is an adaptive response to uncertain conditions for reproduction seems entirely off the mark. A female who reproduces early without support would seem to have less chance of distributing the genetic substrates of her behavior than would a female who deferred reproduction on the unlikely chance that conditions might improve.

Unless, of course, there were somebody else to help her raise her offspring. If, for instance, groups of related females (e.g., sisters) were to mate promiscuously, choosing their mates for genetic quality rather than resource-holding potential, and then raise these offspring under the protection of male relatives (e.g., brothers), then early promiscuous mating of females could be seen as apart of an alternative childrearing strategy, not just as a desperate attempt at lineage continuance under hopeless circumstances.

4. The Group Selection Alternative. But once one has conceptualized the early sexuality of females in this way, the hyper-aggressiveness of their brothers begins to make more sense. In fact, these considerations have led us to toy with the notion of a different pair of alternative breeding strategies, like Chisholm's related to stress, but unlike Chisholm's, not based on the unreasonable assumption that females are actually seeking to breed in the absence of adequate resources to do so successfully. The two alternatives we will call the Polygynous/Patrilineal Strategy and the Promiscuous/Matrilineal Strategy. In the Polygynous/Patrilineal strategy, the individual male attempts to corner the reproductive output of one female (or at most, a few) and accumulate the resources to assure the quality of their offspring. Females choose males on the basis of their resource-holding potential. In the Promiscuous/Matrilineal strategy, groups of related females ("sisters") raise offspring under the protection of male relatives ("brothers"); females mate promiscuously and choose their mates on the basis of their quality. Meantime, their brothers use force and guile to gather resources from surrounding single male groups to support their sisters. In addition, they may take advantage of an occasional opportunistic mating. The basic idea is that in the environment in which humans evolved, these two mating systems would exist in some sort of dynamic equilibrium. The success of the Polygynous/Patrilineal strategy would create a class of nonreproductive males whose greatest chance at reproduction would be to (a) aggressively seek promiscuous matings while (b) focusing resources on their sister's young. The success of the Promiscuous/Matrilineal strategy would create temptations for brothers to secure resources for themselves as individuals, capture a female, and defect from the sibling association to raise their own families.

D. Because Chisholm Does Not Escape the Naturalistic Fallacy

As summarized above, according to Chisholm our experiences of value are components of evolved mechanisms that allow us to continue to maximize fitness even as our circumstances vary along dimensions of stability and predictability. Specifically, he argues that the perception of high degrees of environmental risk and uncertainty triggers a strategy of short-term investment in reproduction, whereas perception of low risk and uncertainty triggers a long-term investment. This "triggering" mechanism is embodied in the experience of value being directed toward the opportunities for one or another type of reproductive behavior.

Such an account is sufficient to provide an explanation of why we value. But like all naturalized value systems, it falls short of telling us what we *should* value.

Chisholm argues that "if value itself comes from fitness, then political planning should be aimed at bringing as many people as possible to functionings that maximize long-term fitness." (p. 235). But surely there is confusion here between long-term fitness and long-term measures. Both of the strategies that Chisholm describes are designed to maximize long-term ***fitness***, but one of them does so (on his account) by taking short-term measures in uncertain circumstances, the other by taking long-term measures in other circumstances. There is nothing in evolutionary theory that would lead one to value one reproductive strategy over another as long as each is considered an adaptive solution to an environmental contingency. When a lineage is negotiating a tight spot in evolutionary time and its members are engaging in behavior we find reprehensible, they are none the less functioning as highly as the members of a lineage in flush times who are behaving in manners we would find praiseworthy. Thus, there must be a value system at work here that is entirely external to Chisholm's evolutionary argument.

We suspect this confusion slipped by because Chisholm, like most of our readers, values the kind of behavior displayed by individual humans in stable circumstances. But isn't that "just" a value? We suppose we might naturalize it by pointing out that most readers of this review (and presumably Chisholm himself) had the sort of rearing that would cause us to value this sort of behavior. But such a naturalization leaves room for a Chisholm doppelganger, called perhaps "Schmisholm," similar to Chisholm in every respect except in the conditions of his rearing, who is at this moment preparing a book extolling the courage, fearlessness, and sexual heroics of children raised in uncertain environments and urging that political planners design environments to foster these conditions. So far as we can see, there is nowhere to stand within the framework of evolutionary theory to value Chisholm's values over those of Schmisholm.

To say that Chisholm's is not a successful naturalized ethics is not to deny the possibility that evolutionary arguments may be useful in suggesting interventions that promote "well-being as we understand it." In fact, Chisholm's book does point to many such interventions. But if this promise is to be fulfilled, the pointing has to be much more precise. If evolutionary psychology is to make a contribution that is distinct from common sense, it must be because it points to very specific cues that toggle development from one track to another. Hopefully, Chisholm's book will stimulate further studies of the transactions between parent and child and the cue relations that send children down one developmental track or another. Such precision in our understanding of the mechanisms by which adult reproductive styles develop is absolutely essential before evolutionary psychologists start proposing practical solutions to society's problems.

Conclusion

Chisholm's project in ***Death, Hope and Sex*** is an ambitious one. Drawing on a diverse array of theoretical sources he makes broad meta-theoretical arguments integrating phylogenetic and ontogenetic thinking. In addition, he gives a complex account of adaptive developmental mechanisms (including cognitive and social

components) that lead to different reproductive strategies. He goes further to argue that these ideas can form the basis for therapeutic interventions that would enhance human well being. The scale of Chisholm's ambitions guarantees that many of his specific claims will be contested. But we also believe that if the framework he has woven together is given the attention it deserves, it will generate greatly needed discussion and research, both within evolutionary psychology and across crucial disciplinary boundaries.

References

Belsky, J., Steinberg, L., & Draper, P. (1991). Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development, 62,* 647-70.

Benedict, R. (1934). *Patterns of culture* (p. 72). New York: Mentor Books.

Bowlby, J. (1969). *Attachment: Vol. 1. Attachment and loss.* New York: Basic Books. (2nd edition published 1982)

Chisholm, J. (1999). *Death, hope, and sex*. Cambridge, UK: Cambridge University Press.

Cohen, J. (1994). The earth is round ($p < .05$). *American Psychologist, 49,* 997-1003.

Cosmides, L., Tooby, J., & Barkow, J. (1992). Introduction: Evolutionary psychology and conceptual integration. In J. H. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 1-19). New York: Oxford University Press.

Draper, P., & Harpending, H. (1982). Father absence and reproductive strategy: An evolutionary perspective. *Journal of Anthropological Research, 38,* 255-73.

Gould, S., & Lewontin, R. (1979). The spandrels of San Marco and the Panglossian paradigm: A critique of the adaptationist program. *Proceedings of the Royal Society of London, B205,* 581-98.

Nussbaum, M. C., & Sen, A. (1993). Introduction. In M. C. Nussbaum & A. Sen (Eds.), *The quality of life.* Oxford: Clarendon Press.

Sober, E., & Wilson, D. S. (1998). *Unto others: The evolution and psychology of unselfish behavior.* Cambridge, MA: Harvard University Press.

Thompson, N. S. (1981). Toward a falsifiable theory of evolution. In P. P. G. Bateson & P. H. Klopfer (Eds.), *Perspectives in ethology* (Vol. 4, pp. 51-73). New York: Plenum Publishing Corp.

Thompson, N. S. (2000a). Z.-Y. Kuo and the historical amnesia of contemporary evolutionary psychology. *From past to future, 2*(2), 53-56.

Thompson, N. S. (2000b). Shifting the natural selection metaphor to the group level. *Behavior and Philosophy, 28,* 83-101.

Thompson, N. S., Dessureau, B., & Olson, C. (1998). Infant cries as evolutionary melodrama: Extortion or deception? *Evolution and Communication, 2*(1), 25-43.

Thompson, N. S., Olson, C., & Dessureau, B. (1996). Babies cries: Who's listening? Who's being fooled? *Social Research, 63*(3), 763-784.

Wilson, D. S., & Sober, E. (1994). Reintroducing group selection to the human behavioral sciences. *Behavioral and Brain Sciences, 17,* 585-654.