

## CHAPTER 5

### An Evolutionary Psychological Perspective On Homicide

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Spend some time perusing an archive of homicide cases and you are likely to find that certain conflict typologies, characteristic of particular victim-killer relationship categories are common. Barroom interactions among unrelated men became heated contests concerning dominance, deference, and face, and escalated to lethality. Women seeking to exercise autonomy were slain by proprietary ex-partners.

Thieves killed victims they feared might cause them trouble later. Children were fatally assaulted by angry caretakers.

How are we to understand why certain recurring types of conflicts of interest engender passions that are sometimes so intense as to motivate these prototypical sorts of homicides? A satisfactory answer to this question seems to require an understanding of what interpersonal

conflicts of interest are fundamentally about, and such an understanding must itself be predicated on a basic theory of the sources and substance of individual self-interests. Fortunately, scientists have been developing, testing, and refining the requisite body of theory for decades, with the result that it is now sufficiently complex, nonintuitive, and well verified to be of real value to criminologists and other social scientists. The area of intellectual endeavor to which we refer has come to be called evolutionary psychology (Barkow, Cosmides, & Toobv. 1992; Bock & Cardew, 1997; Daly & Wilson. 1988a, 1988b, 1995, 1997; Simpson & Kenrick. 1997; Wright, 1994). This chapter is intended to provide an overview of this perspective and to demonstrate its utility for enhancing the understanding of homicide.

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## ■ A SHORT INTRODUCTION TO EVOLUTIONARY PSYCHOLOGY

The evolutionary view is that the basic perceptions of self-interest shared by all normal members of a given species are products of a long history of natural and sexual selection and thus may be expected to exhibit "design" for promoting fitness (genetic posterity) in ancestral environments. The phrase "perceptions of self-interest" should be interpreted broadly. We intend that it should encompass appetites and aversions both for relatively specific pleasures and pains and for such intangibles as social status and self-esteem, and even that it should encompass processes that are not psychological in any ordinary sense of that word. Our immune systems and cell membranes, for example, operate outside our awareness, but they participate in perceiving and defending our interests nonetheless.

In this view, it is often useful to analyze an individual organism into its constituent adaptations, that is, components with specific functions. A human being, for example, is a complex integrated system in which distinct tasks such as respiration, learning, digestion, visual scene analysis, killing parasitic microorganisms, and so forth are carried out by distinct bits of anatomical, biochemical, and psychological machinery. The properties of these bits of machinery are largely to be understood in terms of their separate functions, but a fuller understanding requires consideration of how they fit into the functionally integrated, higher-order agenda of the whole organism. From an evolutionary perspective, the essence of that higher-order agenda is the manufacture of additional, similar creatures, because reproductive posterity is the sole criterion by which all that complex functionality was accumulated through generations. Darwinian selection is the only source of functional design in evolution, and *selection* is nothing more or less than the differential reproductive success of alternative attributes (phenotypes) within populations and within each sex. It follows that selection favors any attribute that enables individuals to outreproduce others of the same sex and species, and it also

follows that these reproductively efficacious attributes are the constituent adaptations referred to above.

Adaptationist reasoning about the functional designs of the organism's component parts and processes is a ubiquitous and inescapable element of all life sciences (Mayr, 1983). Assumptions and hypotheses about adaptive function pervade psychology for the same reason that they pervade physiology—because the mechanisms under study are obviously organized in such a way as to achieve something (Daly & Wilson, 1995). Psychological research is guided by conceptions of what that "something" might be; this includes objectives such as signal detection, social comparison, the reduction of frustration, and the maintenance of self-esteem. Unfortunately, adaptationist thinking in psychology has often been naive because of failures to make use of contemporary understandings of evolution by selection, the process that creates adaptations. Had Freud better understood the implications of Darwinism, for example, the world might have been spared such fantastic notions as "death instincts" and "Oedipal" desires.

Psychologists have long been aware of hierarchies of function. Lateral inhibition in the retina, for example, is interpreted as a means to the end of edge detection, which is a means to the end of object recognition, which is a means to such ends as finding food and avoiding predators, which are means to the ends of energy accrual and survival. Psychologists who lack an evolutionary overview, however, have wandered down innumerable garden paths by imagining that the summit to this hierarchy of functions—the end to which one's immediate objectives are subsidiary—is homeostatic quietude, personal growth, longevity, the reproduction of the species, or even death. What people and other organisms are organized to achieve is, of course, none of these. It is *fitness*: the expected value (in the statistical sense) of a phenotypic design's success in promoting the replicative success of its bearer's genes relative to their alleles (alternative variants at the same genetic locus), in the environment(s) in which that phenotypic design evolved.

The implication is that psychological phenomena--appetites and aversions, attentional priorities, memory systems, time horizons, thrill seeking, maternal love, and so forth--have all evolved to facilitate behavioral choices with the best expected fitness consequences in ancestral environments. Sweet tastes acquired their appeal because they were useful indicators of the presence of valuable nutrients. Infidelity of one's mate is aversive because of the threats to fitness that it has entailed.

We stress *ancestral environments* because the evolved psychology and physiology of any species are historical artifacts, designed by a natural selective process that required persistent relationships between cue and consequence through many generations. When environments change rapidly, evolved psychological mechanisms will not necessarily promote fitness, even on average (Symons, 1990; Tooby & Cosmides, 1990). Mechanisms whose function is the detection of nutrients can be deceived by evolutionarily novel substances such as saccharine. Mechanisms whose function is the assessment of a potential mate's fertility can be deceived by evolutionarily novel cosmetic interventions. The point here is not that an evolved psyche is a simple stimulus-response machine, which it clearly is not, but simply that fitness is not itself a goal that people and other animals could have evolved to monitor or pursue. Our most basic aims are things that led to fitness in past environments, and they do not necessarily do so in the present environment. Thus, although we will not repeat the phrase "ancestral environments" whenever we speak of such things as "statistically expected fitness consequences," the reader should assume that meaning.

It is easy to accept the idea that such psycho-physiological phenomena as sweetness detection exist and take their present forms by virtue of their past contributions to survival and reproduction. Where readers are more likely to balk is at the notion that selection has also imparted complex structure to the seemingly more voluntary and rational psychological processes by which people choose and execute the means to gain their ends. Introspection and folk psychology can be misleading in these

matters, however, and we maintain that a more subtle evolutionary psychological conception better reflects the diversity of processes that actually mediate "choice" among behavioral alternatives.

What is the essence of decision making? Evolutionists routinely model the costs and benefits of alternative decision rules about such matters as how many eggs a bird should lay before incubating them and rearing the chicks, or when a plant should stop putting all its accumulated energy into further growth and start putting some into reproduction. To everyday folk psychology, this use of the term *decision* is likely to sound metaphorical; *real* decisions are surely the products of deliberation by conscious human beings! Unfortunately for this folk conception, however, experimental psychologists have demonstrated repeatedly that people do not necessarily enjoy privileged insight into the determinants of their own decisions and that the phenomenology of deliberation and reasoned choice can be illusory and reconstructive (Kahneman, Slovic, & Tversky, 1982; Nisbett & Ross, 1980). People provide and defend sincere, coherent explanations for their own choice behavior that are demonstrably incorrect (e.g., Nisbett & Wilson, 1977), and this retrospective theorizing about the reasons for our actions not merely leads us to misunderstand why we did what we did but even makes us misrecall the actions themselves, sometimes rather dramatically. Some researchers in this area have concluded that human decision making and the inferential procedures that inform it are inept, but that is not our intended point here. (Human inference and choice procedures apparently deal with naturalistic inputs very well; see Cosmides & Tooby, 1995; Gigerenzer & Hoffrage, 1995.) Rather, the point we stress is that decision processes are not so transparent to introspection as one might suppose. A great deal of inaccessible information processing, carried out by complex evolved machinery designed by selection specifically to make such decisions, is involved.

This complex evolved machinery includes the emotions, which are readily interpreted as functional operating modes whose specific elements are design features facilitating effective response to the situations that arouse them (Nesse, 1990). Anger, for

example, entails physiological mobilization that clearly represents preparation for violent action. Jealousy directs attention to specific types of subtle social cues. Thus, to an evolutionist, the popular notion that emotion is the antithesis and enemy of rationality misconstrues both. If fear, anger, jealousy, and other emotional states interfered with our capacities to make decisions that furthered our interests, we would have evolved to be affectless zombies. That humans have not done so is testimony to the functionality of emotional states, as is the incapacity of people whose emotional mechanisms are operating abnormally (Nesse, 1990).

Once the complexity of the psychological machinery generating even our "rational" choices is acknowledged, it no longer seems odd to speak of a physiological "decision" about when to ovulate or to refer to "choice" points in growth and development, using the same language that we apply to the process that selects among behavioral options. In all these cases, certain courses of action are selected over alternatives by elaborate and only partially understood procedures that use evolved information-processing machinery to respond to some combination of contemporary extrinsic inputs and trace representations of past experience. And it is in this sense of decision making that evolutionary psychologists address such problems as how the human mind assesses prospective costs and benefits, discounts the future, responds to cumulative and immediate social inputs, and ... opts for committing murder.

#### ■ HOMICIDE AS A CONFLICT ASSAY

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The proposition that expected fitness is the currency underlying perceptions of self-interest entails an implicit theory about where interests intersect and where they diverge. If the exigencies that enhance person A's expected fitness enhance person B's, too, then we may expect that the two will perceive their interests as harmonious, and each will ordinarily be happy to let the other pursue his or her aims unobstructed. An example is the case of monogamous mates with a shared interest in the welfare

of their offspring. Conversely, two creatures are likely to perceive their interests as discordant, and hence to experience conflict, to the degree that the exigencies that raise one's expected fitness diminish the other's. Each party suffers when the other actively promotes its self-interest, and inclinations to thwart one another are likely. An example is the case of rivals for the same mate.

Clearly, where interpersonal violence is a response to apprehended conflict, this conceptual framework has implications about who is likely to use violence against whom and about the circumstances that will exacerbate or mitigate the risk of violence in particular relationship categories. That has been the unifying idea behind our evolutionary psychological approach to the epidemiology of homicide (Daly & Wilson, 1988a, 1988b, 1997; Wilson & Daly, 1985, 1993a, 1996). Any theory of the nature of human conflict ought to shed some light on who is likely to kill whom, when, why, and under what circumstances.

Homicides are extreme manifestations of interpersonal conflict and, for that reason, are detected and recorded in a more reliable, less biased way than more frequent but less extreme types of conflict behavior such as assaults and slanders. An assay, such as the color change that an acid induces in litmus paper or the ovulatory behavior that a pregnant woman's urine induces in a frog, is a conspicuous manifestation of some otherwise cryptic quantity of interest. Because they are relatively reliably detected and recorded, homicides provide a *conflict assay*-- an index of relationship-specific, demographic, and situational variations in the intensity of interpersonal conflict.

It must be emphasized that using homicides as an assay of the evolved psychology of interpersonal conflict does not presuppose that killing is (or even that it necessarily ever was) an effective way to promote one's fitness. There may or may not be aspects of the human psyche that have been shaped by selection to deal specifically with lethal intraspecific conflict, but that is immaterial for present purposes. Regardless of whether killing is interpreted as effective self-interested action or as an overreactive "mistake:" we may expect that the factors that

exacerbate or mitigate conflict will raise or lower the likelihood of homicide accordingly. Insofar as killings represent the extreme tail of a distribution--rare products of psychological processes whose more usual, nonlethal manifestations have useful social effects such as successful resource expropriation, deterrence of infidelity, coercion, and intimidation--then factors that influence the likelihood of violence in the pursuit of these valuable social outcomes may be expected to affect the risk of homicide, too.

Although homicides are often, perhaps typically, overreactions whose net effects are not in the perpetrators' interests, it does not follow that violence is a pathology. Pathologies are failures of anatomical, physiological, and psychological entities and processes, reducing their effectiveness in achieving the adaptive functions for which they evolved (Nesse & Williams, 1994; Williams & Nesse, 1991). Violence cannot be dismissed as a mere by-product of such failures because people and other animals possess psychological and physiological machinery that is clearly *designed for* the production and regulation of violence (Archer, 1988; Daly & Wilson, 1997; Huntingford & Turner, 1987). The evidence for this claim is broad. For example, violent inclinations are aroused in contexts in which they are likely to be useful, such as in response to the usurpation of valued resources, and the motivational states of readiness for violence entail complex psychophysiological and postural mobilization for effective agonistic action. There are morphological structures that function solely or primarily as intraspecific weapons, and they are often sexually differentiated and characteristic of delimited life stages. There is neural machinery dedicated to aggression, and this too is often sexually differentiated. Moreover, the sexual differentiation of physical aggression is itself variable across species, and the magnitude of sex differences in both overt weaponry and in intrasexual aggressive behavior is systematically related to the breeding system (Daly & Wilson, 1983). These facts are testimony to the potency of Darwinian selection in shaping the anatomy and psychology of aggression.

The mistaken idea that human violence is merely pathological has perhaps been reinforced by the modern conviction that it is a product of disadvantaged backgrounds and environments. But this association is by no means universal. In face-to-face societies without central authority, violent capability and action are prevalent among the most successful men, too, and contribute to their success (see, for example, Betzig, 1986; Chagnon, 1988, 1996). In modern state societies, the welfare of most people no longer depends on their personal violent capability or that of their allies, and violent action is therefore relatively likely to reflect psychological pathology (but see Furlow, Gangestad, & Armijo-Prewitt, 1998). However, a disproportionate number of violent offenders are drawn from precisely those groups who lack access to the opportunities and protective state services available to more fortunate citizens and who therefore find themselves in "self-help" circumstances much like those experienced by most of our human ancestors. It is not at all clear that violence in such circumstances is usefully deemed pathological, and even in those cases in which the perpetrator suffers from a defect, there remains a functional organization to violence's contingent controls.

Thus, although evolutionary psychological hypotheses about risk factors for homicide do not presuppose that killing per se is an evolved adaptation, they *are* predicated on the assumption that the arousal of violent inclinations is systematically and functionally related to self-interest and interpersonal conflict.

#### ■ *EVOLVED NEPOTISM AND FAMILY VIOLENCE*

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One hundred fifty years ago, the adaptive complexity of living creatures could be interpreted only as a reflection of the incomprehensible aesthetic preferences of one or more creators. Darwin (1859) radically reinterpreted biological adaptations as components of *reproductive strategies*, a view that remained essentially unchanged for more than a century, until

Hamilton (1964) pointed out that personal reproductive success is not really the fundamental criterion of success or failure in the evolutionary sweepstakes. The more basic criterion is one's impact on the replicative success of one's phenotypic and genotypic elements, whether in one's descendants (one's *direct fitness effects*) or in other kin (*indirect fitness effects*).

Imagine a woman we shall call Ego. Any one of Ego's genes has a 50% chance of having a descendant copy in her daughter, D. Each such gene also has a 50% chance of being represented in Ego's sister, S, by virtue of descent from the same parental gene. D and S are equally related to Ego and equally likely to share any of her heritable traits. Any child produced by S would provide exactly the same expected contribution to Ego's long-term genetic posterity as would a child of D. Hence, it is at least possible for selection to favor sororal as well as maternal beneficence. Whether it will do so in any given species depends on its ecology and on the average effects of alternative ways of allocating one's efforts.

Hamilton's (1964) *inclusive fitness* theory formalized and generalized this nepotistic logic, providing the single most important stimulus to recent theory and research on social evolution (for an elaboration, see Cronin, 1991). By extending the concept of fitness to include indirect as well as direct fitness effects, he solved the problem of accounting for the evolution of altruistic actions that reduce the actor's expected reproductive success while enhancing someone else's. In the process, Hamilton replaced the classical Darwinian conception of organisms as evolved *reproductive strategists* with the notion that they have evolved to be *nepotistic strategists* (Alexander, 1979).

One implication of this theory is that any socially complex species is likely to possess psychological adaptations tending to soften potentially costly conflicts among genetic relatives. If the rival in a contest for a limited resource is my brother, for example, it makes less difference to my fitness who wins than if the rival were unrelated, so the benefit of victory is diminished. Moreover, the cost of using dangerous competitive tactics is higher in the case of

fraternal rivalry because injury to either party damages the fitness of both. One implication is that evolved social psychologies are likely to be structured such that they respond to cues indicative of close kinship by turning down the heat of conflict, and a large body of research on non-human animals has confirmed this expectation. For example, in some species of fig wasps, coresidency inside a fig is a reliable cue of probable brotherhood, and males engage in a non-violent scramble competition for mating opportunities, whereas in related species in which coresidency is not indicative of kinship (because females move between each act of oviposition), males fight to the death (Hamilton, 1967). In ground squirrels, adult females treat younger adult females who were seen affiliating with their own mothers relatively tolerantly because the affiliation is a cue that they are at least maternal half-sisters, but they also favor litter-mate full sisters over littermate half-sisters (those with different fathers as a result of polygamous mating by the mother), probably on the basis of odor cues of kinship (Holmes & Sherman, 1982).

The general rule is that the intensity of conflict is adjusted nepotistically in relation to available cues of kinship. There is no obvious reason why human beings should be an exception. Nevertheless, that is how our species is sometimes portrayed. Even the professional literature on family violence often implies that rather than being relatively subdued, conflicts with close kin are especially violent. According to Gelles and Straus (1985), for example,

With the exception of the police and the military, the family is perhaps the most violent social group, and the home the most violent social setting, in our society. A person is more likely to be hit or killed in his or her home by another family member than anywhere else or by anyone else. (p. 88)

To an evolutionary psychologist, these assertions are too surprising to escape critical scrutiny. The first concept needing scrutiny is *family*. Following Wolfgang (1958), homicide researchers have commonly partitioned the

victim-killer relationship into three categories: stranger, acquaintance, and relative. But the third of these is far too general, encompassing relationships whose qualitative distinctions greatly surpass those distinguishing "strangers" from "acquaintances." Within the family, the evolutionary psychological basis of the parent-child relationship is different from that characterizing the marital relationship because parent and child are genetic relatives with an indissoluble overlap in expected fitness, whereas a comparable overlap in the expected fitness of marriage partners is predicated on reproduction and sexual fidelity. It follows that the specific potential sources of conflict in these two family relationships are likely to be quite different, and indeed they are (Daly & Wilson, 1988a).

The proposition that social motives are functionally nepotistic implies mitigated conflict among blood (but not necessarily marital) relatives. Testing the hypothesis that kinship softens conflict is trickier than it may first appear, however, because one must somehow take account of the differential opportunities for interaction that characterize different relationships as a result of routine activities and social organization. One way to control for opportunity, at least in part, is to consider only within-household relationships, for which the numbers at risk in a relevant population at large can be derived from census or survey information. We conducted such an analysis of within-household homicides in Detroit (Daly & Wilson, 1982), and the results strongly upheld the distinction between genetic and marital relatives; specifically, rates of homicide by victim-killer relationship category were vastly higher both for spouses and for other coresiding persons who were not genetic relatives than for any category of blood kin.

A second way to control for opportunity while testing for nepotistic discrimination is to compare the distribution of victim-killer relationships with that of co-offender relationships. Although opportunity variables presumably influence the two in parallel, the distributions are always different; close genetic relationships are far more prevalent among collaborators in violence than among victim and killer in each of a wide variety of human societies, whereas the

reverse is consistently true about inlaws (Daly & Wilson, 1988b). Even in patrilineal social systems in which brothers are one another's principal rivals for familial lands and titles, there is evidence that close genealogical relationship softens otherwise equivalent conflicts and reduces the incidence of violence.

We have discussed opportunity models as if they were alternatives to Hamiltonian nepotism, but they need not be. Kinship cannot be apprehended magically; nepotistic allocations of benefits depend on *cues* of kinship, and those cues might in principle be the ones invoked as determinants of behavior in an opportunity model. Many animals indeed "recognize" their kin on the basis of mere exposure, for example, but that usually means exposure at a specific life stage (Hepper, 1991). If one's nest mates are reliably one's siblings in a given species, then selection may favor learning the individual identities of putative siblings in infancy and continuing to treat such early nest mates preferentially throughout life. The effect will be nepotistic discrimination in favor of close genetic relatives unless some mishap (such as an evolutionarily unforeseen cross-fostering by an experimenter) has uncoupled genetic relatedness from infantile familiarity. Familiarity in general (that is, regardless of life stage), however, is unlikely to be an even remotely reliable cue of kinship, and it is certainly not the basis of familial solidarity in *Homo sapiens* (Daly, Salmon, & Wilson, 1997).

### *Child Homicide*

Evolutionary thinking led to the discovery of the most important risk factor for child homicide—the presence of a *stepparent* (Daly & Wilson, 1996). Parental efforts and investments are valuable resources, and selection favors those parental psyches that allocate effort effectively to promote fitness. The adaptive problems that challenge parental decision making include both the accurate identification of one's offspring and the allocation of one's resources among them with sensitivity to their needs and abilities to convert parental investment into fitness increments. A mistake in identification can

obviously incur a huge natural selective penalty, and countless animals have been found to be sensitive to species-appropriate cues that help parents avoid squandering resources on nonrelatives. Nevertheless, parents can be deceived, especially because selection is also acting on those unrelated usurpers to evolve means of bypassing parental defenses, as is dramatically illustrated by cuckoos and other brood parasites that lay eggs (which often mimic those of their hosts) in the nests of other species.

More puzzling than such deception are instances in which adults who have access to reliable cues of nonparenthood take on parental duties nonetheless. In the animal kingdom, this happens mainly after forming a new mateship with a mate that already has dependent young. In many species, such young are likely to be killed, but in species in which the single parent has some leverage, the replacement mate may assume the role of stepparent, with varying degrees of effort and enthusiasm. The human animal is clearly such a species: New mates make pseudoparental investments in their predecessors' children as part of the reciprocal exchange involved in courting and establishing a relationship with the widowed or divorced parent.

Human stepparents invest considerable effort and may even come to love their wards. But it would be surprising if the psychology of genetic parenthood were fully engaged, with full commitment, in this situation. It is adaptive and normal for genetic parents to accept nontrivial risks to their own lives in caring for their young, but selection is likely to have favored much lower thresholds of tolerable cost in stepparenting. Stepchildren were seldom or never so valuable to one's expected fitness as one's own offspring would be, and those parental psyches that were easily parasitized by just any appealing youngster must always have incurred a selective disadvantage. It is little wonder, then, that the exploitation and mistreatment of step-children are thematic staples of folktales all around the world (Thompson, 1955). And little wonder, too, that stepparental obligation demonstrably enters into remarriage decisions as a cost, not a benefit, with dependent children from past unions both detracting from the single parent's marriage market value and raising

the chance that the remarriage will fail (White & Booth, 1985).

In light of these considerations, one might suppose that child abuse researchers hardly needed an evolutionary perspective to wonder about the factual basis of Cinderella stories. Are parents really more likely to neglect, assault, exploit, and otherwise mistreat their stepchildren than their genetic children, and if so, just how important a risk factor is this? Surprisingly, however, in the explosion of child abuse research that followed the proclamation of a battered-child syndrome in 1962, this seemingly obvious question was not raised. The first published study addressing it was Wilson, Daly, and Weghorst's (1980) demonstration that stepchildren constituted an enormously higher proportion of child abuse victims in the United States than their numbers in the population-at-large would warrant. Subsequent research by many workers has shown that this excess risk is crossnationally and cross-culturally ubiquitous and is most extreme with respect to the most severe outcomes, namely, child homicide (Daly & Wilson, 1996).

Homicides perpetrated by stepfathers differ from those by genetic fathers not just in their incidence but in qualitative attributes, too. In both Canada and Great Britain, for example, a substantial proportion of children killed by genetic fathers, but virtually none of those killed by stepfathers (Daly & Wilson, 1994), are slain in the context of a suicide, and the distraught father may even construe the homicide as a "rescue" (Wilson, Daly, & Daniele, 1995). By contrast, steppaternal cases are especially likely to involve a violent, assaultive rage reaction; whereas most small children killed by stepfathers are beaten to death, genetic fathers are relatively likely to have disposed of the child by gunshot or asphyxiation (Daly & Wilson, 1994). These contrasts support the evolutionary psychological theorizing that led to their discovery.

Infants are taxing. They wail and soil them- selves and can be hard to soothe. But the very commotions that can grate on the nerves of bystanders are likely to evoke only attentive concern from a committed parent. Potentially damaging, angry responses are inhibited by parental

love, an evolved psychological adaptation that makes the efforts of child rearing tolerable and even delightful. Stepparents assuredly vary in their degrees of personalized affection for the children, as do genetic parents, but it is equally sure that the average stepparent loves the child less. As we anticipate from the argument that excess risk derives ultimately from the stepparent's lesser commitment to that individual child's welfare, stepparents are overrepresented in all forms of child maltreatment, including neglectful as well as assaultive cases, and in sexual misuse, too. The higher rates of homicide incurred by stepchildren are the most dramatic, but by no means the only, consequences of a difference in the distributions of parental and step-parental affection, supporting the proposition that homicides may be used as a "tip-of-the-iceberg" assay of the differences between relationships in their degrees and types of conflict.

Because parental care is costly in time and resources, evolutionists expect parental psychologies to have evolved to allocate investments even in one's own genetic offspring with sensitivity to the young's needs and capabilities (Clutton-Brock, 1990). A compelling selectionist model of parent-offspring conflict was outlined by Trivers (1974), who noted that an asymmetry of relatedness within the family makes such conflict inescapable. From the perspective of any particular offspring, one's self is twice as valuable as a potential generator of inclusive fitness as a sibling, all else equal, whereas the two young have equal value from the maternal perspective. It follows that each party will have a different optimum when a familial resource is divided, and this chronic conflict explains the existence of such wasteful and even dangerous phenomena as weaning conflict and tantrums, as well as accounting for a number of otherwise puzzling phenomena in pregnancy (Haig, 1993).

Wilson and Daly (1993b) used this theoretical framework to generate a set of predictions about the patterning of maternal and paternal solicitude as a function of the time since birth and the parents' ages, and confirmed that rates of parentally perpetrated homicide exhibit the patterns that would be expected if such killings

are deemed a *reverse assay* of parental solicitude. Voland (1984) used an extension of the same theory (see Trivers & Willard, 1973) to generate hypotheses about parental discrimination in relation to the child's sex and found support for his model in patterns of sex-differential child mortality in historical data. Parentally perpetrated filicide, although rare and perhaps seldom an adaptive means of reallocating parental efforts, does seem to be exacerbated by a number of circumstantial factors that detract from the expected fitness consequences of continued investment (Daly & Wilson, 1988b, 1995).

### *Marital Homicide*

We noted earlier that the Hamiltonian view of organisms as evolved nepotists implies that blood kinship is likely to be psychologically distinct from other sorts of relationship. Mateship is another qualitatively distinct category of relationship, with some similarities to blood kinship. By the production of shared fitness vehicles, namely children, mates forge a deep commonality of interest. Indeed, in a species in which most reproductive effort is parental (as opposed to investment in collateral kin), the fitnesses of long-term mates are more highly correlated than those of even the closest genetic relatives. Any state of affairs that promotes or damages one partner's expected fitness will affect the other's identically, and this situation inspires a convergence of perspectives, as is often conspicuous in long-standing marriages (Alexander, 1987). But although the indissolubility of blood kinship is a force favoring forgiveness of breaches and reconciliation, the marital relationship is fragile, especially if the couple is still childless. Most notably, the basis for marital solidarity is undermined by adulterous inclinations, perhaps especially those of the wife, because the risks of misattributing parenthood and investing one's parental efforts in a rival's offspring are sexually asymmetrical (Wilson & Daly, 1992a). These considerations suggest that a crucial arena of potential conflict in the marital arena will be

sexual entitlements and fidelity, a proposition that is upheld by a variety of studies addressing the ostensible motives and perceived grievances precipitating cases of spousal homicides (Campbell, 1992; Daly & Wilson, 1988b; Polk & Ranson, 1991; Wilson & Daly, 1996).

To predict and understand risk factors for marital homicide, we have explored the joint implications of two propositions: first, that marital conflict and violence are largely the results of male sexual proprietariness and female efforts to escape male control, and second, that homicides usually represent the tip of the iceberg of coercive control rather than a motivationally distinct phenomenon. These considerations have motivated explorations of such issues as the risk of uxoricide in the aftermath of separation (Wilson & Daly, 1993c), the relevance of age and age disparity (Wilson & Daly, 1992b; Wilson, Daly, & Wright, 1993), the social determinants of variation in the relative risk of lethality for wives versus husbands (Wilson & Daly, 1992b), the effects of stepchildren on uxoricide risk (Daly, Wiseman, & Wilson, 1997), the social-structural and ecological correlates of cross-cultural variations in marital violence (Wilson & Daly, 1993a), and the similarities and differences in demographic risk patterns between lethal and nonlethal violence against wives (Wilson, Johnson, & Daly, 1995).

#### ■ HOMICIDE OUTSIDE THE FAMILY

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We have devoted much of our attention to the minority of homicides that are intrafamilial, precisely because they have seemed the most challenging from a Darwinian perspective. But most killers are not related to their victims, neither by blood nor marriage, and an evolutionary psychological approach sheds considerable light on these cases, too.

Perhaps the most conspicuous fact about such violence is that it is sexually differentiated. Men kill unrelated men vastly more often than women kill unrelated women, everywhere (Daly & Wilson, 1988b, 1990). Tales of exotic societies in which this sex difference is reversed

are fantasies. It is no use attributing this cross-culturally universal difference to local aspects of particular societies, as many criminologists have done (e.g., Wolfgang, 1978), or to construct explanatory theories (e.g., Hagan, 1990) premised on assumptions about sex role socialization that are known to be false (see Daly & Wilson, 1988b, 1997). A more promising approach is to try to understand the psychological design differences between the sexes in the light of evolutionary understandings of the male-female phenomenon.

Sex-differential violence appears to be one of many manifestations that the human male psyche has evolved to be more risk accepting in competitive situations than is the female psyche (Daly & Wilson, 1990; Wilson & Daly, 1985). The sex difference in intrasexual violence is one that humans share with other species with "effectively polygynous" mating systems: species in which the variance in fitness among males exceeds that among females. The evidence that human beings evolved under a mild degree of effective polygyny is abundant and consistent, and the natural selective link between such a mating system and sex differences in competitive violence is well understood and non-controversial (Daly & Wilson, 1983). Basically, greater fitness variance selects for greater acceptance of risk in the pursuit of scarce means to the end of fitness. Furthermore, "recklessly" life-threatening risk proneness is especially likely to evolve where staying alive by opting out of competition promises to yield no fitness at all and is therefore the natural selective equivalent of death.

Lethal violence between unrelated men is transparently competitive. *Competition* refers to any conflict of interests in which one party's possession or use of a mutually desired resource precludes another party's possession or use of the same. Robbery homicides are unequivocal instances, as are many "sexual triangle" cases. More subtle examples are the "face" and "status" disputes that constitute a large proportion (perhaps the majority) of all homicides in the United States; the social resources contested in these cases are limited means to the end of more tangible resources. Not all conflicts are

competitive. For instance, if a woman spurns one suitor for another, then she and the rejected suitor have a conflict of interest, but they are not competitors, whereas the male rivals are. In general, competition is predominantly a same-sex affair because same-sex individuals are usually more similar in the resources they desire than are opposite-sex individuals.

The rate at which men kill unrelated men is the most variable component of the overall homicide rate (Daly & Wilson, 1988b). The incidence of such male-male killings in a given time and place can be interpreted as a reflection of the local severity of male-male competition. One attractive hypothesis that has yet to receive a good test is that conditions or policies that promote stable monogamy will tend to reduce both the gross homicide rate and the sex difference. A better established hypothesis is that inequity in the distribution of material resources is an important source of variation in homicide rates (Hsieh & Pugh, 1993; Krahn, Hartnagel, & Gartrell, 1986). The United States has by far the most inequitable income distribution in the modern West and by far the highest homicide rate; moreover, in comparisons among the 50 states of this highly homicidal country, inequity measures predict homicide rates even more highly than they predict other components of mortality rates (Kennedy, Kawachi, & Prothrow-Stith, 1996).

There is considerable evidence that persons who engage in risky criminal activities discount the future relatively steeply (Wilson & Herrnstein, 1985). Such inability to delay gratification is usually interpreted as a sign of immaturity and pathology, but this seems to us unduly pejorative. The psychological and behavioral tendencies that are disparaged as indicative of a "lack of impulse control" sound instead a lot like adaptive adjustment of risk acceptance. Steep discounting of the future is just what a properly functioning evolved psyche might be expected to do in the sorts of social and material circumstances that are especially-likely to foster violent crime (Daly & Wilson, 1988b).

One sort of information that ought to affect discounting of the future is information bearing on the likelihood that the future will ever come.

Reason to doubt that one will be alive tomorrow is reason to grab what one can today. An increase in mortality in one's reference group increases the appeal of risky action in pursuit of quick returns, especially if the sources of that excess mortality are independent of the actor's choices. But what sort of evidence would bear on such risk adjustment? One possibility is some sort of semistatistical apprehension of the distribution of local life spans. This need not be so complex as it sounds. If a young man's grandfathers were both dead before he was born, and more than a couple of his primary school classmates are already dead too, and gray-haired men stand out in his neighborhood by virtue of their rarity, there may be something going on that he should attend to. In Chicago, there are large variations in life expectancy between neighborhoods, and expected future life span is a good predictor of neighborhood-specific homicide rates, even if expected life span is computed with the mortality effects of homicide itself removed (Wilson & Daly, 1997). Of course, more traditional measures of poverty are highly correlated with both expected life span and homicide, but expected life span is at least as good a predictor as any other. Whether readiness to commit violence is indeed affected by the sorts of "life expectancy cues" suggested above is a question deserving considerable future research.

In this context, the common misconception that evolutionary thinking has reactionary implications is ironic. *Evolutionary psychological theory and research come down firmly in support of the proposition that inequity and desperation are the principal, remediable causes of crime and violence.* This is true not only because people are obsessive about social comparison and escalate their competitive tactics when they are losing out but also because purely punitive crime control, without remediation of inequity and desperation, actually invites increased recklessness. More generally, there is no basis for social Darwinism in evolutionary biology, and there never was. Those seeking ideological support for policies whose beneficiaries are the rich and privileged will have to look elsewhere.

### *A Final Comment About the Generation of Evolution-Minded Hypotheses*

Like other scientists, evolutionists frequently formulate alternative hypotheses that cannot simultaneously be true. When we began studying spousal homicide, one of us (Daly) proposed that wives would incur increasing risk as they aged because their declining reproductive value would make their husbands value them less. The other (Wilson) hypothesized instead that uxoricides are largely to be understood as maladaptive by-products of coercive and proprietary motives and emotions that husbands feel most extremely when their wives are young. Although it has proved difficult to separate the effects of female age from the correlated effects of male age, marital duration, and parity, it is now clear that Wilson's hypothesis was much closer to the facts than Daly's. Young wives incur the greatest risk, and this is not an incidental consequence of their tendency to be married to young husbands (Wilson et al., 1993).

In correspondence in the journal *Science*, Harcourt (1988) accused us of engaging in untestable pseudoscience because our brand of "evolutionary social psychology" could accommodate these alternative hypotheses. But of course, the fact that evolutionists can and do generate conflicting hypotheses is not an embarrassment, any more than is the fact that one can generate alternative neurophysiological or sociological hypotheses. The source of confusion seems to be that evolutionary psychology has sometimes been portrayed, by enthusiasts as well as critics, as another addition to the Babel of rival psychological theories and systems. It is not. We know, as surely as scientists know anything, that living things and their attributes have evolved and that insofar as those attributes exhibit complex functionality, their properties have been shaped through many generations by selection (Dawkins, 1986).<sup>1</sup> Thus, when an enthusiastic Darwinist refers to some particular pet idea as "the evolutionary prediction" and professes to test it against "nonevolutionary" alternatives, this framing misstates what is actually being done. The proposition that the psyche

evolved under the influence of selection and exhibits functional organization for the promotion of fitness is not itself being tested, nor is it even controversial. Although removed from direct observation and highly abstract, this proposition is a "fact" in the same sense as it is a fact that "information" is "transmitted" across synapses in the nervous system or that "molecules" are composed of "atom".

Whatever the results of research in the behavioral sciences, we can be sure that evolved psychological adaptations are involved. The question is not whether this is so, but "so what?" Just as one may ask whether learning some neuroscience is a good intellectual investment for a psychological scientist, the question here is simply whether paying serious attention to theory and research in evolutionary biology can help psychologists and other social scientists do their own scientific work better. It is increasingly clear that the answer is a most definite yes.

#### ■ NOTE

1. The only alternative yet proposed is that an unconstrained supernatural power simply "created" everything, a proposition that is devoid of empirical or practical implications until supplemented by additional supernatural revelations, as it invariably is. This is pseudoscience.

#### ■ REFERENCES

- Alexander, R. D. (1979). *Darwinism and human affairs*. Seattle: University of Washington Press.
- Alexander, R. D. (1987). *The biology of moral systems*. Hawthorne, NY: Aldine.
- Archer, J. (1988). *The behavioural biology of aggression*. New York: Cambridge University Press.
- Barkow, J., Cosmides, L., & Tooby, J. (Eds.). (1992). *The adapted mind*. New York: Oxford University Press.
- Betzig, L. L. (1986). *Despotism and differential reproduction: A Darwinian view of history*. Hawthorne, NY: Aldine de Gruyter.
- Bock, G., & Cardew, G. (Eds.). (1997). *Characterizing human psychological adaptations*. Chichester, UK: Wiley.
- Campbell, J. (1992). "If I can't have you, no one can": Power and control in homicide of female partners. In

- J. Radford & D. E. H. Russell (Eds.), *Femicide: The politics of woman killing* (pp. 99-113). New York: Twayne.
- Chagnon, N. A. (1988). Life histories, blood revenge, and warfare in a tribal population. *Science*, 239, 958-992.
- Chagnon, N. A. (1996). Chronic problems in understanding tribal violence and warfare. In G. Bock & J. Goode (Eds.), *Genetics and crime* (pp. 202-236). Chichester, UK: Wiley.
- Clutton-Brock, T. H. (1990). *The evolution of parental care*. Princeton, NJ: Princeton University Press.
- Cosmides, L., & Tooby, J. (1995). Are humans good intuitive statisticians after all? Rethinking some conclusions of the literature on judgment under uncertainty. *Cognition*, 58, 1-73.
- Cronin, H. (1991). *The ant and the peacock*. Cambridge, UK: Cambridge University Press.
- Daly, M., Salmon, C., & Wilson, M. (1997). Kinship: The conceptual hole in psychological studies of social cognition and close relationships. In J. A. Simpson & D. Kenrick (Eds.), *Evolutionary social psychology* (pp. 265-296). Mahwah, NJ: Lawrence Erlbaum.
- Daly, M., & Wilson, M. (1982). Homicide and kinship. *American Anthropologist*, 84, 372-378.
- Daly, M., & Wilson, M. (1983). *Sex, evolution, and behavior* (2nd ed.). Belmont, CA: Wadsworth.
- Daly, M., & Wilson, M. (1988a). Evolutionary social psychology and family homicide. *Science*, 242, 519-524.
- Daly, M., & Wilson, M. (1988b). *Homicide*. Hawthorne, NY: Aldine de Gruyter.
- Daly, M., & Wilson, M. (1990). Killing the competition. *Human Nature*, 1, 83-109.
- Daly, M., & Wilson, M. (1994). Some differential attributes of lethal assaults on small children by stepfathers versus genetic fathers. *Ethology and Sociobiology*, 15, 207-217.
- Daly, M., & Wilson, M. (1995). Discriminative parental solicitude and the relevance of evolutionary models to the analysis of motivational systems. In M. S. Gazzaniga (Ed.), *The cognitive neurosciences* (pp. 1269-1286). Cambridge: MIT Press.
- Daly, M., & Wilson, M. (1996). Violence against stepchildren. *Current Directions in Psychological Science*, 5, 77-81.
- Daly, M., & Wilson, M. (1997). Crime and conflict: Homicide in evolutionary psychological perspective. *Crime and Justice*, 18, 251-300.
- Daly, M., Wiseman, K. A., & Wilson, M. (1997). Women with children sired by former partners incur excess risk of uxoricide. *Homicide Studies*, 1, 61-71.
- Darwin, C. (1859). *On the origin of species by means of natural selection, or the preservation of favored races in the struggle for life*. London: John Murray.
- Dawkins, R. (1986). *The blind watchmaker*. Harlow, UK: Longman.
- Furlow, B., Gangestad, S. W., & Arnijo-Prewitt, T. (1998). Developmental stability and human violence. *Proceedings of the Royal Society of London: Series B*, 265, 1-6.
- Gelles, R. J., & Straus, M. A. (1985). Violence in the American family. In A. J. Lincoln & M. A. Straus (Eds.), *Crime and the family* (pp. 55-110). Springfield, IL: Charles C Thomas.
- Gigerenzer, G., & Hoffrage, U. (1995). How to improve Bayesian reasoning without instruction: Frequency formats. *Psychological Review*, 102, 684-704.
- Hagan, J. (1982). The structuration of gender and deviance: A power-control theory of vulnerability to crime and the search for deviant exit roles. *Canadian Review of Sociology and Anthropology*, 27, 137-156.
- Haig, D. (1993). Genetic conflicts in human pregnancy. *Quarterly Review of Biology*, 68, 495-532.
- Hamilton, W. D. (1964). The genetical evolution of social behaviour. *Journal of Theoretical Biology*, 7, 1-52.
- Hamilton, W. D. (1967). Extraordinary sex ratios. *Science*, 156, 477-488.
- Harcourt, A. H. (1988). Letter to the editor. *Science*, 243, 462-463.
- Hepper, P. G. (Ed.). (1991). *Kin recognition*. Cambridge, UK: Cambridge University Press.
- Holmes, W. G., & Sherman, P. W. (1982). The ontogeny of kin recognition in two species of ground squirrels. *American Zoologist*, 22, 491-517.
- Hsieh, C., & Pugh, M. D. (1993). Poverty, income inequality, and violent crime: A meta-analysis of recent aggregate data studies. *Criminal Justice Review*, 18, 182-202.
- Huntingford, D., & Turner, A. (1987). *Animal conflict*. London: Chapman & Hall.
- Kahneman, D., Slovic, P., & Tversky, A. (Eds.). (1982). *Judgment under uncertainty*. New York: Cambridge University Press.
- Kennedy, B. P., Kawachi, I., & Prothrow-Stith, D. (1996). Income distribution and mortality: Cross sectional ecological study of the Robin Hood index in the United States. *British Medical Journal*, 312, 1004-1007.
- Krahn, H., Hartnagel, T. F., & Gartrell, J. W. (1986). Income inequality and homicide rates: Cross-national data and criminological theories. *Criminology*, 24, 269-295.
- Mayr, E. (1983). How to carry out the adaptationist program? *American Naturalist*, 121, 324-334.
- Nesse, R. M. (1990). Evolutionary explanations of emotions. *Human Nature*, 1, 261-289.
- Nesse, R. M., & Williams, G. C. (1994). *Why we get sick*. New York: Random House.
- Nisbett, R. E., & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgment*. Englewood Cliffs, NJ: Prentice Hall.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, 84, 231-259.
- Polk, K., & Ranson, D. (1991). The role of gender in intimate homicide. Australia and New Zealand *Journal of Criminology*, 24, 15-24.
- Simpson, J. A., & Kenrick, D. (Eds.). (1997). *Evolutionary social psychology*. Mahwah, NJ: Lawrence Erlbaum.
- Symons, D. (1990). Adaptiveness and adaptation. *Ethology and Sociobiology*, 16, 427-444.
- Thompson, S. (1955). *Motif-index of folk literature*. Bloomington: University of Indiana Press.
- Tooby, J., & Cosmides, L. (1990). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology*, 16, 375-424.

- Trivers, R. L. (1974). Parent-offspring conflict. *American Zoologist*, 14, 249-264.
- Trivers, R. L., & Willard, D. (1973). Natural selection of parental ability to vary the sex-ratio of offspring. *Science*, 179, 90-92.
- Voland, E. (1984). Human sex-ratio manipulation: Historical data from a German parish. *Journal of Human Evolution*, 13, 99-107.
- White, L. K., & Booth, A. (1985). The quality and stability of remarriages: The role of stepchildren. *American Sociological Review*, 50, 689-698.
- Williams, G. C., & Nesse, R. M. (1991). The dawn of Darwinian medicine. *Quarterly Review of Biology*, 66, 1-22.
- Wilson, J. Q., & Herrnstein, R. J. (1985). *Crime and human nature*. New York: Simon & Schuster.
- Wilson, M. I., & Daly, M. (1985). Competitiveness, risk-taking and violence: The young male syndrome. *Ethology and Sociobiology*, 6, 59-73.
- Wilson, M. I., & Daly, M. (1992a). The man who mistook his wife for a chattel. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind* (pp. 289-322). New York: Oxford University Press.
- Wilson, M. I., & Daly, M. (1992b). Who kills whom in spouse killings? On the exceptional sex ratio of spousal homicides in the United States. *Criminology*, 30, 189-215.
- Wilson, M. I., & Daly, M. (1993a). An evolutionary psychological perspective on male sexual proprietariness and violence against wives. *Violence and Victims*, 8, 271-294.
- Wilson, M. I., & Daly, M. (1993b). The psychology of parenting in evolutionary perspective and the case of human filicide. In S. Parmigiani & F. vom Saal (Eds.), *Infanticide and parental care* (pp. 73-140). Chur, Switzerland: Harwood Academic.
- Wilson, M. I., & Daly, M. (1993c). Spousal homicide risk and estrangement. *Violence and Victims*, 8, 3-16.
- Wilson, M. I., & Daly, M. (1996). Male sexual proprietariness and violence against wives. *Current Directions in Psychological Science*, 5, 2-7.
- Wilson, M. I., & Daly, M. (1997). Life expectancy, economic inequality, homicide, and reproductive timing in Chicago neighborhoods. *British Medical Journal*, 314, 1271-1274.
- Wilson, M. I., Daly, M., & Daniele, A. (1995). Familicide: The killing of spouse and children. *Aggressive Behavior* 21, 275-291.
- Wilson, M. I., Daly, M., & Weghorst, S. J. (1980). Household composition and the risk of child abuse and neglect. *Journal of Biosocial Science*, 12, 333-340.
- Wilson, M. I., Daly, M., & Wright, C. (1993). Uxoricide in Canada: Demographic risk patterns. *Canadian Journal of Criminology*, 35, 263-291.
- Wilson, M. I., Johnson, H., & Daly, M. (1995). Lethal and nonlethal violence against wives. *Canadian Journal of Criminology*, 37, 331-361.
- Wolfgang, M. E. (1958). *Patterns in criminal homicide*. Philadelphia: University of Pennsylvania Press.
- Wolfgang, M. E. (1978). Family violence and criminal behavior. In R. L. Sadoff (Ed.), *Violence and responsibility* (pp. 87-103). New York: Spectrum.
- Wright, R. (1994). *The moral animal*. New York: Pantheon.