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17 The Plausibility of Adaptations for Homicide

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> *A partner of mine said he might come over to my pad with some broads, so I hurried over to the liquor store right around the corner to get a case of beer. As I was walking across the parking lot of the store, this guy almost ran me over. I flipped him off. The driver and his partners jumped out of the car and rat-packed me. They knocked me down, and the driver pushed my head into the dirt next to the cigarette butts. Then they went into the store. I just felt, "What a low fucking thing to do to somebody. They are just a bunch of yellow motherfuckers." In my mind I suddenly thought, "I've got to get back at these dirty motherfuckers," and I ran back to my pad for my rifle.*
>
> *I got back to the liquor store as fast as I possibly could and waited for them about twenty yards from the front door of the store. Finally his two partners popped out the door. I said to myself, "Fuck it, I'll shoot all of them." I fired two quick, wild shots but missed them both, and they got away. I decided then that I better put the barrel to the chest of the motherfucker who I really wanted—the driver—and make sure that I didn't miss him. I had stone hatred for him, and I righteously couldn't wait to see the look on his face when I blew him away. As soon as he popped out of the liquor store door, I charged right up to him, rammed the barrel in his chest, and pulled the trigger.*
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> (Athens, 1997 p. 10)

1 Introduction

People kill other people in every known culture around the world. The question is why. This chapter presents a new theory of homicide, Homicide Adaptation Theory, which proposes that humans evolved adaptations to facilitate killing. The new theory is contrasted with two competing conceptions of why people kill: The Byproduct Hypothesis and the Evolved Goal Hypothesis. Prior to presenting these competing views of homicide, we discuss the concept of "innateness" in relation to our conception of evolved homicide adaptations.

2 The Concept of Innateness from the perspective of Evolutionary Psychology

The term "innateness" is used to refer to many different phenomena (see Elman, Johnson, & Bates, 1996). Our conceptualization of innateness falls in line with the standard definition used by evolutionary psychologists and biologists when referring to any adaptation. Selection has shaped the genes that pattern human ontogeny. These genes provide the blueprint for the development of adaptations. Like the blueprints for a house, they rely on resources and information present in the environment to construct the adaptations for which they code. These features of the environment were presumably recurrent in all or most generations of individuals in

the evolutionary history of an adaptation in order for selection to have made them an integral part of reliable adaptation development.

Tooby and Cosmides (1992) refer to the statistical composite of selection pressures that shaped an adaptation as its environment of evolutionary adaptedness or EEA. Different sets of selection pressures contributed to the evolution of every, individual adaptation, tailoring each to have a specific function in contributing to the solution of a specific problem of survival and reproduction. Thus, each adaptation has its own unique history of selection pressures and therefore its own unique EEA.

The function of a given adaptation can be affected by recurrent adaptive problems in three primary ways. First, by their presence or absence, characteristics of the environment can determine whether or not an adaptation develops at all. Take, for example, the visual system. Forced to live in an environment without any visual light from the time a person was born until adolescence, his visual system would not develop normally. If he was suddenly exposed to visual light during adulthood, he would have difficulty focusing his eyes, distinguishing between objects, and orienting himself with visual cues (Sacks, 1995). The human visual system evolved in ancestral environments where visual light was a recurrent feature and depends on the presence of this environmental feature in abundance for its reliable development.

Second, the presence, absence, or amount of a feature of the environment may contribute to the developmental trajectory of an adaptation. At certain points in people's lifetime, particularly during childhood, individuals come to a developmental fork in the road. The contingency of environmental features that they face or have faced thus far in their development determines in large part their future developmental trajectory. Belsky, Steinberg, and Draper (1991), for example, argue that pubertal onset and patterns of adult sexual behavior are influenced by father presence or absence in the home. Their research findings suggest that, among female offspring, father absence is associated with earlier onset of menarche, earlier first intercourse, and a greater number of sexual partners. This pattern is proposed to be the result of adaptations fashioned to recognize that there is a low probability of reliable male investment in reproduction. Such psychological adaptations are argued to function outside of conscious awareness.

Third, adaptations can be designed by selection to be prepared with different adaptive contingencies in different environments. As situations change, one adaptive contingency may be reversed or abandoned in favor of a different contingency. For example, the skin, like any organ, is vulnerable to injury. Depending on the kinds of tasks in which an individual routinely engages, some areas of the skin may be more likely to be injured than others. As a protective measure, callous production has evolved as a defense mechanism against repeated friction, preventing injury to the skin (Buss, 2004). Callous production is an adaptive contingency that is active only in response to specific environmental inputs (repeated friction to the skin). When the friction disappears, callous production may stop as well.

Each of these examples describes an innate adaptation. They are evolved, functional solutions to adaptive problems that reliably develop in normal environments. They evolved in response to recurrent contexts of ancestral environments and require the presence of the same features to develop and function normally. The conceptualization of innateness explained in this section forms the foundation of our hypotheses about adaptations for homicide.

3 Adaptations for Homicide

We propose that humans possess adaptations that evolved to produce homicide (Buss & Duntley, 1998; Buss & Duntley, 2003; Buss & Duntley, 2004). Psychological adaptations for homicide were selected when they contributed to better fitness outcomes, on average, than competing designs present in the population at the time. Certain information processing adaptations in our brains were shaped by selection specifically to scrutinize and sometimes produce homicidal behavior when an individual faces an adaptive problem similar to one recurrently solvable by homicide in the past. In this chapter, we will (1) discuss our theory that humans evolved adaptations for homicide, (2) discuss two alternative evolutionary theories of homicide, and (3) review relevant homicide data that will help us to evaluate the plausibility of our theory and the other theories of homicide.

3.1 The Nature of Selection Pressures for Homicide Adaptations

A description of adaptations for homicide begins with the recurrent adaptive problems they evolved to solve. We hypothesize that a combination of simultaneously relevant contextual factors, not any one single factor, acted as selection pressures that shaped psychological adaptations for homicide. Therefore, it is not possible to point to just one feature of a context that will activate a psychology of homicide in every instance, in every person. There are always other, mitigating environmental factors present in any real world situation that were also part of the overall selection pressures that shaped homicide adaptations. In other words, any set of contextual cues to an adaptive problem that was ancestrally solvable by homicide is made up of multiple inputs. The presence or absence, as well as the severity of inputs demonstrated to contribute to the activation of homicide adaptations can help us to predict when homicide will be more or less likely to occur. Homicidal behavior is not under the control of a simple "ON—OFF" switch that can be manipulated with a push from a single factor. The activation of evolved psychological mechanisms for homicide requires the presence of co-occurring sets of circumstances, made up of factors such as: (1) the degree of genetic relatedness between killer and victim, (2) the relative status of the killer and victim, (3) the sex of killer and victim, (4) the size and strength of the killer's and victim's families and social allies, and (5) the relative reproductive values of the killer and victim.

3.2 Recurrent Adaptive Problems Solvable by Homicide

Homicide could not have evolved as a strategy unless it was ancestrally associated with greater reproductive success than competing strategies in circumscribed conditions. In most sets of circumstances, the extremely high costs of committing homicide would have outweighed the benefits of adopting it as a strategy. We propose, however, that rare sets of circumstances reliably recurred in our evolutionary history in which the benefits of homicide would have outweighed the costs, selecting for a psychology that would lead to homicide when a person confronted such circumstances.

This characterization of the ancestral costs and benefits of homicide, leading to the evolution of psychological adaptations for homicide is different from arguing that humans decide whether or not to kill by actively weighing the costs and benefits of killing in the present moment. The first argument is about the cumulative effects of the costs and benefits of a strategy over multiple generations of our evolutionary history, shaping heritable adaptations. The second argument is about decision-making conducted by existing psychological mechanisms in the present. When we make arguments about the costs and benefits of homicide, they are arguments about

ancestral fitness costs and benefits that we hypothesize shaped adaptations for homicide. These adaptations may have the appearance in the present of actively weighing the costs and benefits of a homicidal strategy in response to particular sets of circumstances. But we caution that this interpretation, though intuitive, may be misleading (see Carruthers, 2003; Wegner, 2002).

In outlining some of the adaptive problems for which homicide would have been a possible solution, we are making the case that homicide could have been beneficial enough to our ancestors' reproductive success to lead to the evolution of adaptations for murder. We are not arguing that homicide would have evolved to be the preferred strategy for each or any of these adaptive problems. Different strategies are appropriate in different contexts. In certain sets of recurrent circumstances, we propose that homicide was the best of available strategies. Specifically, we hypothesize homicide was functional in solving adaptive problems such as:

1. Preventing the exploitation, injury, rape, or killing of self, kin, mates, and coalitional allies by conspecifics in the present and future
2. Reputation management against being perceived as easily exploited, injured, raped, or killed by conspecifics
3. Protecting resources, territory, shelter, and food from competitors
4. Eliminating resource-absorbing or costly individuals who are not genetically related (e.g. step-children)
5. Eliminating genetic relatives who interfere with the investment in other vehicles better able to translate resource investment into genetic fitness (e.g. deformed infants, the chronically ill or infirmed).

This list represents a sample of some of the more obvious adaptive problems that could have been addressed with homicide. The purpose in outlining them is to demonstrate that adaptive problems solvable by homicide are numerous. The strategic deployment of homicide to solve them could have substantially increased the reproductive success of ancestral killers. If conspecific killing was a good strategy in specific contexts that included these adaptive problems, there would have been significant and unique selection pressures for the evolution of adaptations for homicide. There is no a priori reason, therefore, to dismiss the possibility that homicide adaptations could have evolved.

4 The fitness costs of being killed

Homicide is the elimination of another individual. Once eliminated, his or her ability to impact the future disappears. But a murder victim's death has a much larger impact on his or her inclusive fitness than just the loss of the genes housed in the person's body. Death by homicide often has cascading deleterious effects on a victim's inclusive fitness, including:

4.1 Loss of future reproduction

A victim of murder loses all chances of future reproduction with all the mates he may have had during the rest of his life. Thus, the average reproductive costs are greater for those killed at younger ages.

4.2 Damage to existing children

The child of a murdered parent receives fewer resources, is more susceptible to being exploited or injured by others, and may have more difficulty in leveraging their future

status trajectory or mating relationships, which likely will lead to poorer fitness outcomes. Children of a murdered parent may see their surviving parent's investment in them diverted to a new mating relationship and to children who are the product of that relationship. A single parent, who can invest only half of the possible investment of two parents, would be more likely to abandon children in favor of better mating prospects in the future. And the children of a murdered parent risk becoming step children, a condition that brings with it physical abuse and homicide risks 40-100 times greater than among children who reside with two genetic parents (Daly & Wilson, 1988).

4.3 Damage to extended kin group

A homicide victim cannot protect or invest in his extended kin. A victim's entire kin network can gain the reputation of being vulnerable to exploitation as a result of his murder. A murder victim cannot affect his family member's status trajectories or mating relationships. And the open position left by the murder victim in a kin network's status hierarchy could create a struggle for power among the surviving family members. In sum, the death of a key member of a kin group imposes important costs on his or her surviving relatives.

4.4 A murder victim's fitness losses are a rival's gains

The residual reproductive and parenting value of the mate of a homicide victim may go to a rival, often at the expense of the victim's children with that mate. The murder of a man or woman creates an opening in a social group's hierarchy into which a rival can ascend. The children of rivals who had two surviving genetic parents would thrive relative to the victim's children, who would be deprived of the investment, protection, and influence of two parents.

Human intuition tells us that it is bad to be killed. But being the victim of murder is much worse than intuition or previous theories of homicide have fully appreciated. The costs of being killed cascade down through successive generations of a victim's kin group, damaging not only their immediate fitness and that of their children, but the fitness of their family members and descendants for generations. Many who would have survived if the person lived will die before they can reproduce. And many more will never be born.

5 Homicide Defenses

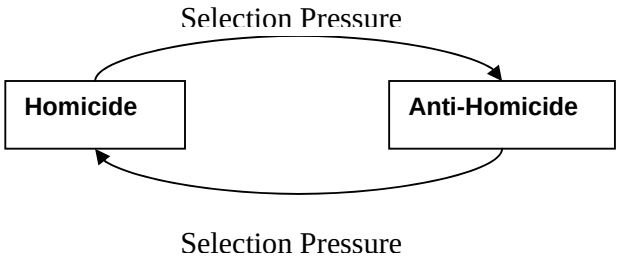
We propose that the great costs resulting from being murdered would have selected for adaptations to: (1) avoid being killed, (2) punish killers who damage one's inclusive fitness by murdering kin, mates, or coalitional allies, and (3) eliminate or otherwise control individuals who presented a persistent threat of homicide to the larger social group of which an individual, his kin, and coalition are a part (e.g. psychopaths, hostile members of other groups). We propose that inflicting costs on killers is part of an evolved strategy to avoid or stanch the inclusive fitness costs of being victimized by another individual or group.

In order to avoid being killed, the intended victim must be sensitive to cues indicative of situations in which someone else might want them dead. Individual insight into the likelihood that one will be the victim of homicide before the homicide occurs requires that murders be committed in predictable sets of circumstances. If homicide reliably occurred in response to predictable sets of circumstances over our evolutionary history, it would have selected for homicide defense mechanisms capable of recognizing those circumstances and trying to change or avoid them. The

evolution of such homicide defense mechanisms, in turn, would have selected for homicide strategies that could circumvent the evolved homicide defense strategies. In this way, adaptations to avoid being murdered would have served as selection pressures for the refinement of psychological adaptations for homicide over evolutionary time. These new homicide adaptations would have selected for further refinements in homicide defense adaptations—homicide and homicide defense locked in a perpetual, coevolutionary arms race through the generations.

Demonstration of the existence of a psychology of homicide defense that appears to have been designed to defeat specific homicidal strategies would provide evidence that: (1) homicide was likely a recurrent feature of ancestral environments, (2) homicidal strategies occurred in predictable patterns over our evolutionary history, and therefore (3) there may be adaptations specifically for homicide. The greater the corresponding specificity of design in the psychologies of homicide and homicide defense, the stronger the evidence that the two have had a co-evolutionary relationship.

Figure 1: The Co-evolution of Adaptations for Homicide and Anti-Homicide



6 Alternative Evolutionary Explanations for Homicide

A number of alternative hypotheses and theories have been proposed to explain why people kill. For the purposes of this chapter, we will focus on two explicitly evolutionary hypotheses. For a more complete discussion of alternative theories of homicide, please refer to Buss and Duntley (under review).

At least 3 competing evolutionary theories have been proposed to explain why people kill. The first, which is the primary focus of this chapter, argues that humans possess adaptations specifically for homicide. Others have also suggested this possibility (Ghiglieri, 1999; .Pinker, 1997) though none have gone into depth in exploring the adaptive design of these adaptations (see a notable exception dealing with warfare: Tooby & Cosmides, 1988).

6.1 The Byproduct Hypothesis

One evolutionary explanation of killing was proposed first by Daly and Wilson in their book Homicide (1988). According to Daly and Wilson, homicide may be considered an over-reactive mistake, the byproduct of psychological adaptations designed for non-lethal outcomes. For example, the behavior of a teenage mother who abandons her newborn in a dumpster to die may be explained by the failure of her psychological mechanisms for parenting to engage. Similarly, in the case of a husband who kills his wife for being sexually unfaithful, Daly and Wilson have argued that male mechanisms for sexual jealousy and the coercion and control of their mates may slip, leading the man to mistakenly kill his wife. Although these two contexts are drastically different, the same explanation is applied to both—homicide

is an over-reactive mistake, a byproduct of mechanisms designed by selection to serve other functions.

Wilson, Daly, and Daniel (1995) argue that "Using homicides as a sort of 'assay' of the evolved psychology of interpersonal conflict does not presuppose that killing per se is or ever was adaptive" (p. 12). If it is the case that homicide has never been adaptive, then selection could not have fashioned adaptations for homicide. The only remaining possibilities are that homicide was neutral in terms of selection or that it had negative selective consequences. In contexts where homicide yielded recurrently negative fitness consequences, there would have been active selection pressure against homicide.

How could a behavior with negative selective consequences be maintained over our evolutionary history? To our knowledge, Daly and Wilson have not directly addressed this issue. But there are at least two possible explanations. First, it could be the case that the overall benefits of psychological adaptations that sometimes produce homicide as a byproduct have outweighed the occasional costs associated with killing a conspecific over our evolutionary history. Another, related possibility is that selection has operated to eliminate byproduct homicide in contexts where it was too costly, modifying or fashioning new psychological mechanisms for this purpose. This explanation, however, is no longer a strict byproduct hypothesis of the origins of homicide. It suggests that selection has acted to inhibit homicide in some contexts, while allowing it to persist in others. Instead of an argument against adaptations for homicide, this seems a plausible explanation for the origins of homicide adaptations—through the gradual recognition of the rare subset of situations in which homicides lead to greater benefits than costs.

6.2 Evolved Goal Hypothesis

Another evolutionary explanation for homicide proposes that humans and other species have evolved specific goals that were ancestrally associated with greater reproductive success. These are not suggested to be general goals, like "maximize fitness." Instead, they are more specific, such as "ambitiously strive for status" or "acquire a mate." These goals are reached through the use of evolved problem solvers that function to figure out ways to achieve them. By this argument, there need not be any evolved mechanisms to engage in any specific behavior, including killing. All selection needed to shape is a goal and the psychological machinery required to figure out how to achieve it. According to the strong form of this argument, there are no evolved psychological mechanisms for homicide per se. Instead, there are general problem-solving mechanisms that become aware of homicide as a means to achieve goals through exposure to the environment or through rational means-ends calculations. According to the weak form of the argument, there may be some psychological adaptations specifically for homicide, such as a desire to kill certain individuals. But the majority of the information processing that needs to take place in deciding whether or not to kill is done by a general problem solving mechanism or a small number of mechanisms, capable of figuring out solutions to problems as diverse as which travel agent to use, who to pursue as a mate, and when it's appropriate to commit murder. The ultimate or evolved goals may or may not be part of the conscious awareness of the person who has them, but the proximate goals are thought to be consciously articulated.

Little has been written about this perspective in the academic literature. The most specific account we have found comes from Sarah Hrdy's book, Mother Nature (1999), where she wrote,

> "My own guess is that the behavior of infanticidal men is homologous to that of their primate cousins in only the most general sense. They are motivated to strive for status, to compete for access to females, to avoid investing in unrelated infants, to adopt patterns of behavior more likely to enhance than to decrease long-term inclusive fitness. The specific similarities, then, are merely analogous solutions to common problems these variously endowed animals confront," (p. 244).

> "Human raiders consciously evaluate costs and benefits, as well as future consequences of their actions. They calculate contingencies: How much more slowly, for example, are mothers burdened by infants likely to travel? What are the chances that a son spared will grow up to avenge his father? Might these children be useful alive? (p. 243)"

In both examples, Hrdy argues that the goals of homicidal behavior evolved, but not homicide as a strategy itself. Instead, she proposes that a general calculus of costs and benefits would arrive at homicide as the best solution in certain situations.

7 Comparison of Explanations Based on Available Evidence

It is important to note that specific descriptions of how mechanisms purported by the Byproduct Hypothesis and the Evolved Goal Hypothesis function have not been offered in nearly the detail that we have offered for our theory of adaptations for homicide. The Byproduct Theory and perhaps in some instances the Evolved Goal Theory require that homicide be a byproduct of many different sorts of mechanisms or many different sorts of goals. The mechanisms of which homicide may be a byproduct or goal need to be specified before either of the two theories can be appropriately evaluated. Because of the lack of explicitness and detail provided by authors of these alternative hypotheses, comparison of the three explanations is an extremely difficult task. Our theory has generated specific, a priori predictions about the evolutionary past of adaptations for homicide and the present functioning of homicide adaptations. We have had less success in generating specific, a priori predictions that follow directly from the alternative Byproduct or Evolved Goal Hypotheses.

7.1 Comparative Evidence

Humans are not the only species that kill their own kind. Numerous species kill conspecifics in predictable contexts. Among insects (including mantids, black widow spiders, jumping spiders, and scorpions), the female murder of her male mate is quite common when her subsequent consumption of the male leads to a greater number and increased viability of her offspring. Males of these species are not willing food sources for their mates. In the sexually cannibalistic black widow spider *Latrodectus mactans*, for example, males that survive copulation can often fertilize multiple partners (Breene & Sweet, 1985). Males across sexually cannibalistic species use a diverse array of strategies to decrease their chances of being eaten by their mates: Male scorpions sometimes sting their mates after depositing their spermatophore

(Polis & Farley, 1979); male crab spiders (Bristowe, 1958) and black widows (Gould, 1984) often restrain females in silk before mating with them.

Among mammals there are many well-documented patterns of conspecific killing. Male lions, wolves, hyenas, cougars, and cheetahs have been observed to kill the offspring of rival males (Ghiglieri, 1999). Killers often benefit because the mothers of the infants that are killed often go into estrus sooner, allowing the infanticidal males to impregnate them with offspring of their own. Among primate species, conspecific infanticides have been documented in similar contexts among a number of species, including langur monkeys (Hrdy, 1977), red howler monkeys (Crockett & Sekulic, 1984), mountain gorillas (Fossey, 1984), chimpanzees (Bygott, 1972), and others (Hausfater & Hrdy, 1984). The killing of rival, adult males has also been well documented among mountain gorillas (Fossey, 1984) and the chimpanzees of Gombe (Wrangham & Peterson, 1996), two of our closest genetic relatives.

7.1a Evolutionary Explanations of the Comparative Evidence

Homicide Adaptation Theory. Most researchers do not doubt that conspecific killings in other animal species are the product of adaptations to kill (Ghiglieri, 1999; Hrdy, 1977; Crockett & Sekulic, 1984; Johnson, Topoff, Vander Meer, & Lavine, 2002). Because they occur in such predictable circumstances, benefiting the reproductive success of the killer, it is taken for granted by most animal researchers that killings are the product of adaptations designed by selection to solve specific adaptive problems. The widespread occurrence of conspecific killings in predictable contexts across multiple, different animal species provides strong support that adaptations for conspecific killing also could have evolved in humans, perhaps having early roots in the homicide adaptations of a common ancestor with extant primates or even further back in our evolutionary heritage. If it is possible for other animals to have co-evolved strategies of homicide and homicide defense, there is no reason a priori to be skeptical about the hypothesis that selection could have fashioned psychological adaptations for homicide and anti-homicide in humans as well.

Byproduct Hypothesis. If conspecific killings in animals are byproducts of mechanisms that evolved for other purposes, what are those mechanisms? How do they function to reliably produce homicide in response to such predictable and similar circumstances across species lines? It seems unlikely that humans would have been immune to essentially the same selection pressures that shaped adaptations for killing conspecifics in other species.

Evolved Goal Hypothesis. If conspecific killings in animals are the products of evolved goals, what are those goals and how does an organism figure out how to achieve them? The burden of proof falls squarely on the shoulders of the Evolved Goal Hypotheses to specify this information. To date, this has not been done in a way that is empirically testable.

7.2 Homicide Rates

Roughly 1 in 15,000 people is murdered in the United States each year (Stolinsky & Stolinsky, 2000). On first glance, this seems like a fairly rare event. But computed over a 75 year lifespan, this equates to a 1 in 200 chance of being murdered at some point during an individual lifetime (Ghiglieri, 1999). In 1999, Homicide ranked 14th among the leading causes of death for men and women of all ages (CDC, 2002). But for men between the ages of 15 and 35, it was the second leading cause of death. For black men between 15 and 35 homicide was the leading cause of death.

Homicide rates in the United States are much higher than in many industrialized nations, exceeding those in the United Kingdom and Japan by a factor of 10; exceeding those in France, Austria, Sweden, and Germany by a factor of 9; and exceed the rates in Canada, Italy, Portugal, Korea, and Belgium by a factor of 5. But the homicide rates in many other countries are equivalent to or exceed those in the United States (United Nations, 1998). The lifetime likelihood of being murdered in Venezuela and Moldova is 1 in 90, twice that of the United States. In Estonia and Puerto Rico, the likelihood is 1 in 60, three times that of the United States. And in Colombia and South Africa, the likelihood is better than 1 in 20 that a person will die at the hands of a murderer, more than 10 times the lifetime homicide risk in the United States.

These within-culture rates of homicide typically do not include casualties of warfare or genocide. The murder rates in these nations would undoubtedly be much higher were it not for emergency medical interventions that were not available to our ancestors for most of our evolutionary history. This is precisely the point made by Harris, Thomas, Fisher, & Hirsch (2002) in their Ambulance-Homicide Theory. They found that faster ambulances and better emergency room care were significantly responsible for the decrease in homicide rates over the last 3 decades. In fact, Harris, et. al. estimate that there would be 30,000 to 50,000 additional murders in the U.S. each year – doubling or tripling the current rate – without advanced emergency-care technology.

The homicide rates in the industrialized nations discussed pale in comparison to risk of being murdered in many primitive cultures. Homicides account for roughly 1 in 10 deaths of adult men among the Huli; 1 in 4 deaths among the Mae Enga; and 1 in 3 deaths among the Dugum Dani and Yanomamo (Chagnon, 1988). Even among the so-called "gentle people" or "peaceful" !Kung San of Botswana, there were 22 murders over a 25 year period among a population of 1,500, more than 4 times the rate of homicide in a typical year in the United States (Lee, 1984).

7.2a Evolutionary Explanations of Homicide Rates

Homicide Adaptation Theory. If the rates of killing, particularly in tribal cultures, are similar to the rates of killing over our evolutionary history, it is quite plausible that selection has acted on a psychology in humans, both to commit homicide and to avoid being killed. Selection over deep time is a powerful force for change. As Nilsson and Pelger (1994) have demonstrated, a complex adaptation can evolve in a as few as 364,000 generations, even when (1) each improvement on its design confers only a one percent advantage in reproductive success, (2) any surviving mutation has only a 50 percent chance at making it to the next generation, and (3) only one part of the adaptation can change in each generation. We propose that, given the likely frequency of homicide in ancestral environments, the tremendous costs of being killed, and the substantial benefits that can accrue to killers, there was more than ample selection pressure for the evolution of adaptations for homicide.

Byproduct Hypothesis. The Byproduct Hypothesis differs from the Homicide Adaptation Hypothesis in arguing that homicide most likely is not the product of adaptations specifically for killing, Despite the fact that they have drawn parallels between the lives of people in isolated, tribal groups and the lives our ancestors (1988), Daly & Wilson (1999) are clear in their arguments that homicide likely was too costly over our evolutionary history for homicide adaptations to evolve.

Evolved Goal Hypothesis. On the surface, the Evolved Goal Hypothesis is consistent with evidence about homicide rates from around the world. The psychological mechanisms that determine how to best achieve a particular goal are assumed to be domain-general and sometimes choose homicide. It is likely, however, that there were recurrent high costs associated with choosing homicide inappropriately and recurrent high benefits of killing in appropriate contexts over our evolutionary history. Many of these historic costs and benefits of homicide are likely hidden from individuals who are trying to figure out the best course of action in the present. An individual with evolved thinking biases that function to account for the likely costs and benefits of homicide in a particular situation would be at a significant advantage in choosing whether or not to kill.

7.3 Homicidal Ideation

Although homicides are statistically rare, making them difficult to study, people's homicidal thoughts or fantasies are not. Kenrick and Sheets (1993) conducted two studies of homicidal fantasies on a total of 760 undergraduate participants. They asked participants to provide demographic information, and then describe their most recent fantasies about killing someone else. They also asked for descriptions of the circumstances that triggered the fantasies and their content, such as how the participant thought of going through with the murder. Finally, they asked about the frequency of participants' homicidal fantasies and their relationship to the victim in their thought.

The studies yielded similar findings, so our discussion will focus only on the second. The survey of homicidal fantasies found that more men (79 percent) than women (53 percent) reported having at least one homicidal fantasy in their lifetime. Men (38 percent) also were more likely than women (18 percent) to report having more than one homicidal fantasy in their lifetime. And men's homicidal fantasies tended to last longer than those experienced by women.

The sexes also differed in the triggers of their homicidal fantasies. Men's homicidal fantasies more often than women's were triggered by personal threats, theft of their belongings, a desire to know what it is like to kill, conflict over money, and public humiliation.

7.3a Evolutionary Explanations of Patterns of Homicidal Ideation

Homicide Adaptation Theory. According to the Homicide Adaptation Theory, homicidal ideation can provide a window into the functioning of psychological adaptations for homicide. The accuracy of the information about actual homicide that can be gleaned from homicidal fantasies is an open question. But certain of the characteristics of homicidal thoughts can provide us with clues to help evaluate evolutionary hypotheses for homicide.

Given the existence of adaptations for homicide, we would expect that males would be more likely to have homicidal thoughts than women, have more frequent thoughts, and have thoughts for longer periods of time, just as they are more likely to actually commit homicide. We would also expect that their thoughts would be triggered by contexts that are likely to precipitate the commission of actual homicides and that the end product of homicidal thoughts, just as in homicidal reality, is the willful killing of another person. All of these characteristics of homicidal thoughts are consistent with homicidal reality.

Byproduct Hypothesis. Homicidal ideation is much less consistent with the Byproduct Hypothesis. If homicide is the byproduct of mechanisms designed for

other purposes, what might be the function of producing thoughts of killing someone else? If the function of an adaptation (that occasionally produced homicide as a byproduct) was coercion and control, wouldn't fantasies of coercion and control better serve this function than fantasies of killing the person? It has been proposed that homicidal thoughts may make coercive threats more convincing, enabling those wishing to control the behavior of others greater leverage in exerting their control. A difficulty with this explanation is that the introduction of elaborate homicidal thoughts into the stream of information processing in a given context may have the effect of increasing the likelihood that homicide would actually be committed. Finally, the Byproduct Hypothesis cannot account for pre-meditated murders where careful thought and elaborate planning of a murder occur and absolutely no attempt is made to control the behavior of another individual beyond ending his or her life.

Evolved Goal Hypothesis. Patterns in homicidal ideation present a number of problems for the Evolved Goal Hypothesis. It does not explain why homicide would be chosen as the topic of scenario building at such high frequencies. Why would almost 80 percent of college age men in the United States have had a homicidal fantasy when only a tiny fraction of all men actually commit homicide? It also does not explain how homicidal content is brought into scenario building in the first place. The causal process that is responsible must be described for adequate empirical comparisons of the Evolved Goal Hypothesis and Homicide Adaptation Theory.

8 Conclusions

Humans kill other humans at non-trivial frequencies across cultures. Homicide, as well as the varieties of homicide, must be explained. Our theory of Evolved Homicide Adaptations proposes the existence of certain circumstances over human evolutionary history in which the fitness benefits of killing outweighed the costs. These circumstances are highly varied—those promoting killing a deformed infant differ from those promoting going to war.

We consider three sources of evidence bearing on the competing theories of homicide—comparative evidence from other species, homicide rate data, and homicidal ideation. The three theories of homicide are then evaluated on their conceptual power and adequacy for explaining these sources of empirical data. Given the recency of Homicide Adaptation Theory, definitive conclusions about its power, scope, and explanatory adequacy would be premature. Nonetheless, the theory of evolved homicide adaptations appears to account for existing empirical data better than competing theories and generates specific and novel predictions not generated by the competing theories. Although future empirical work is needed to properly evaluate the theory that humans have evolved specialized adaptations for killing, no compelling evidence or arguments currently rule out the possibility of evolved adaptations for murder.

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