

**Missing the Revolution:
Darwinism for Social
Scientists**

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The Male Flash of Anger: Violent Response to Transgression as an Example of the Intersection of Evolved Psychology and Culture

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Scope of Inquiry

A great deal of scholarly attention has been devoted to three questions: why, in general, men are more violent than women; why some individuals are more violent than others; and why some societies are more violent than others. Traditionally, these questions have constituted contested turf in the struggle between explanations focusing on nature and those emphasizing nurture. However, like the other authors in this volume, I believe that evolutionary psychology can constitute the foundation for vertically integrated analyses that take account of multiple levels of causality (Barkow, 1989). In the following essay I will attempt to demonstrate that central questions in the study of violence are usefully addressed using multiple, mutually complementary forms of explanation.

At first glance, broad questions as to the causes of violence seem to be unanswerable, since specific instances can plausibly be explained by reference to factors as disparate as, say, the presence of attractive women in a bar or the rising price of crude oil. However, this wide variation is reduced if we adopt the position that (contrary to some popular portrayals) there are critical differences between spontaneous, face-to-face aggression and calculated, organized combat, particularly at the level of the nation-state. While in some instances powerful leaders may initiate international combat in response to interindividual events akin to those that lead to a barroom brawl, it is nevertheless likely that most large-scale wars are fought for other reasons. More-

over, in such warfare the soldiers doing the fighting lack personal conflicts with those whom they are directed to kill.¹ A useful first step in the investigation of violence is therefore to draw a distinction between events in which actors are spontaneously motivated to respond to the actions of a specific individual and those in which actors participate because of the influence of complex political institutions.² I will focus exclusively on the former. I take as a starting point the following observations: (a) subjective experience is importantly influenced by evolved predispositions; (b) subjective experience is an important locus of culture's influence on individuals; and (c) subjective experience is the source of raw materials in the creation of cultural ideas. In short, it is at the psychological level that evolutionary and cultural processes most importantly interdigitate.

The Evolution of Anger and Violent Response to Transgression

A wide variety of sources, from ethnographic accounts (cf. Gladwin & Sarason, 1953; Lee, 1993; Burbank, 1994; Chagnon, 1997; Otterbein, 2000) to police reports (see Daly & Wilson, 1988; also, Ghiglieri, 1999), suggest that in cases of spontaneous violent conflict, the emotion which English speakers label "anger" is a principal feature of the actors' subjective experiences.³ Although there are important cross-cultural differences in both its eliciting conditions and its nuanced associations, it is likely that anger is one of the most universally identifiable emotions (Ekman, 1994; Haidt & Keltner, 1999). Moreover, while eliciting stimuli vary, many share a common theme: Notions of goals, rights, property, and even the definition of a person are culturally variable; but howsoever these things are defined, when they are transgressed, people react with anger. While it may take many forms, the most common behavioral outcome of anger is an attempt to inflict some kind of harm on the transgressor.

Often, when people are very angry, they act in ways that seem to make no sense to observers, or even to the actors themselves when reflecting on their behavior later—in English we speak of being "blinded by anger," while the Bengkulu of Sumatra with whom I worked metaphorically described the state as *kemasukan*, possession by an evil spirit. Inspection reveals that the "irrationality" of the angry person's behavior has two components: risk indifference and disproportionality. First, angry individuals may seek to inflict costs on transgressors that greatly outweigh the costs suffered as a result of the transgression—murderous assaults may stem from a disrespectful glance or gesture, or even a quick lane change on the freeway. Second, when attempting to inflict harm on the transgressor who elicited the emotion, the angry person often seems indifferent to the potential costs entailed by

their actions. Actors may confront opponents who are much more powerful than themselves, or may risk costly social sanctions ranging from ostracism to execution.

Generations of philosophers have dismissed anger, like other emotions, as a primitive mental state with no utility, a crude limitation that detracts from, rather than promotes, the individual's ability to cope with the world. However, evolutionary psychologists take a different approach, asking instead what adaptive function this feature could have performed in the past such that this capacity would have been uniformly selected for among our common ancestors. Consider first the utility of aggressive response to transgression, the behavioral outcome resulting from anger. Prompt responses that inflict high costs on the transgressor are likely to deter future transgressions, both from the original transgressor and, to the extent that others learn of the response, from other potential transgressors as well. Moreover, the greater the costs inflicted on the transgressor, the greater the resulting deterrence effect (Daly & Wilson, 1988). Hence, while the reaction to transgression may seem disproportionate to the costs suffered as a result of the transgression, this inequality disappears when one considers the sum of the costs that would occur were future transgressions not deterred. Seen in this light, anger, the compelling desire to inflict significant harm on transgressors, is highly functional (see also Trivers, 1971; McGuire & Troisi, 1990; Edwards, 1999, pp. 140–141). Lastly, this functionality would have been especially marked in the small-scale, face-to-face communities characteristic of most of our species' history, as reputations have much greater impact in such groups than they do in the mobile, largely anonymous social world of contemporary industrialized nation-states.

As lawmakers and insurance salespeople know only too well, in everyday thinking, immediate costs loom larger than future potential costs—people often choose not to wear seat belts or buy auto insurance because the costs (hassle, expense, etc.) are immediate, and these overshadow potential future costs (injury or liability resulting from an accident). Although responding to transgressions in an apparently disproportionate fashion may protect the actor from large potential future costs, it entails incurring more salient immediate costs, something that people would normally avoid. There is therefore great utility in a biasing mechanism that overcomes reticence to incur immediate costs, and anger serves exactly this purpose (Frank, 1988).

Developmental Pathways and the Calibration of Risk Sensitivity

In general, risk-taking behavior is adaptive when it is inversely proportional to the actor's future prospects: individuals who are likely to have a rosy future ahead of them should be averse to significant risks, while those who

have poorer prospects should be more willing to gamble (as the song says, "If ya got nothin', ya got nothin' to lose") (Daly & Wilson, 1988). Moreover, no two individuals face exactly the same future prospects, and individuals are not born knowing their futures—experience is the only grounds for prognostication. Accordingly, we can expect that individuals should be equipped to use past experiences in order to assess their future prospects, and they should adjust their risk-taking behavior in light of this (ongoing) assessment. In otherwise healthy humans, highly traumatic experiences often produce a syndrome characterized by impulsiveness, aggressivity, and reduced serotonergic functioning (Southwick et al., 1999). Experimental modification of rearing conditions in a nonhuman primate model indicate that adverse early experiences result in subnormal levels of serotonin, a neurotransmitter implicated in impulsive risk-taking (Rosenblum et al., 1994; see also Higley & Linnoila, 1997). Similar patterns characterize boys raised in families characterized by frequent parental physical punishment and anger (Pine et al., 1996). Among incarcerated adult male violent offenders, recidivism is predicted by indices of low serotonin levels, and this in turn is correlated with a childhood history of paternal alcoholism and violence, paternal absence, and the presence of (presumably similarly aggressive) brothers in the home (Virkkunen et al., 1996).

The Origin of Sex Differences in the Response to Transgression

The greater the stakes to be won or lost in transgressions, the more important defensive measures become. In a (mildly) polygynous species such as our own, the variance in male reproductive success is greater than that in female reproductive success: that is, in the EEA, or environment of evolutionary adaptedness, the difference in the number of offspring between highly successful and highly unsuccessful men was larger than the corresponding difference among equivalent women. As a result, in our ancestral state, males had more at stake in defending against transgressions than did females.⁴ Furthermore, unlike all other apes, human males often invest significantly in their mates and offspring. As a consequence, being cuckolded poses a grave threat to a man's fitness, for he risks wasting his investment on another man's genes. The advent of hominid paternal investment thus raised the potential costs of transgressions, further increasing the selective advantages of male psychological attributes that function to deter transgression (Wilson & Daly, 1992; Buss et al., 1992). Together, these factors are likely to have selected for a sex difference in the subjective response to transgression. Because the stakes to be won or lost in transgressions are likely to have been consistently higher for males than for females, it is plausible that se-

lection favored males who, in comparison with females, were both more easily and more dramatically blinded by anger. This psychological difference corresponds with morphological differences, as the greater size and muscularity of men is reasonably explained as the product of intrasexual selection (i.e., men are in part designed for combat).⁵ This combination of psychological and morphological differences corresponds with manifest differences in behavior: around the globe, spontaneous murderous violence is largely the domain of men (Daly & Wilson, 1988, 1990; Ghiglieri, 1999; Campbell, this volume; Walsh, this volume).⁶

Culture, Information, and Behavior

Although the gender difference in homicidally violent responses to transgression bridges diverse cultures, there is enormous cross-cultural variation in attitudes toward, and frequency of, male violence (cf. Ghiglieri, 1999). To explain this more global variation, we begin by leaving considerations of biological evolution behind for the moment and turn instead to the question of cultural evolution. Because the concept of culture, always much debated, has come under increasing scrutiny lately (cf. Aunger, 1999), it is necessary to begin with a definition. Following Swartz and Jordan (1980), I take “culture” to be the sum of the morally forceful understandings acquired through learning and shared with members of a learner’s group, where such sharing need not be universal but, on the contrary, is often distributed in a patterned way across the population (see also Swartz, 1991). Culture is composed of ideas varying greatly in specificity, from the meaning of an observable gesture, such as an erect middle finger, to the existence of an invisible property, such as “honor.” Similarly, while some ideas have overt moral connotations, other forms of socially transmitted information may only exhibit moral force at a far more subtle level—people care, for example, not only with whom others conduct their sexual relationships, but also how they court, or even how they tie their shoes. Clearly, much of the difference between “warlike” societies and “peaceful” societies derives from the meaning attached to violence itself (cf. Robarchek & Robarchek, 1992). However, in keeping with the position introduced at the beginning of this essay, I suggest that the reason that such meanings are deeply internalized by many of the members of a given society is that they are congruent with more profound subjective experiences (see Spiro, 1997), experiences which are the product of the interaction between evolved propensities and acquired ideas.

Evolutionary theorists frequently point out that selective processes often give rise to proclivities rather than to iron-clad behavioral directives, in large part because the former allow for fitness-enhancing adjustment in light of local circumstances (cf. Belsky, 1999; Chisholm, 1999). This

inherent flexibility opens the door for cultural influence via two paths. First, by indirectly shaping the behavioral environment in which an individual matures, culture patterns the inputs processed by evolved calibration mechanisms, thereby increasing the likelihood that some evolved propensities will be enhanced, while others will be dampened. Of direct relevance here, culturally shaped parental attitudes and prescribed socialization practices are likely to interact with the serotonergic risk sensitivity mechanism described earlier, resulting in a partial patterning of the degree of impulsivity across members of a single culture-sharing group. Second, because human mental experience is profoundly shaped by socially acquired information, the process of enculturation can influence the subjective salience and motivational significance of different evolved propensities. In particular, both lexical labels and the organized, hierarchically embedded information structures called cultural schemas which accompany such labels provide individuals with cognitive tools that make it easier to anticipate, identify, and reflect on given types of mental events (D'Andrade, 1995). Such cultural marking, or *hypercognizing* (Levy, 1973), increases the impact of the labeled mental events. By the same token, the selective absence of cultural information regarding a given type of experience (*hypocognizing*, in Levy's terms) decreases its significance. Third, those subjective experiences that are culturally marked may be either pre- or proscribed, with the result that individuals may strive to prolong or curtail them, and may seek out or avoid circumstances that elicit them. Finally, it is important to recognize that, because cultural understandings are not uniformly distributed within a population, all three of these processes can lead to both similarities and differences between individuals within any one group. However, because individuals within a given society are often influenced by a larger number of the same understandings than are individuals in different societies, variation within societies is expected to be generally lower than variation between societies.

Culture and the Male Flash of Anger

I suspect that the male flash of anger, with its overwhelming subjective change and drastic behavioral outcome, is both sufficiently dramatic and sufficiently far-reaching in its social consequences as to preclude its ever being hypocognized—I would be greatly surprised if any culture were to be found to lack lexical labels for “anger,” or to not contain cultural schemas describing the potential for aggressivity and risk-taking characteristic of men. However, a predicted absence of hypocognizing in no way means that we should expect uniformity in the manner and degree to which cultures influence both the experience and the manifestation of this evolved propensity. Quite

the opposite is true, since, depending upon socioenvironmental circumstances, the male flash of anger can constitute either a vital asset or a perilous threat in patterned social relations.

If the male flash of anger is "designed" to diminish transgressions in the service of acquiring and maintaining control over a variety of economic and social resources, then it follows that three distinct considerations will affect the utility or importance of this psychological feature. First, the more easily that valuable resources can be appropriated, the more damaging any transgression is likely to be, and hence the more important it is to curtail transgressions. Second, the less that overarching social institutions protect actors from transgressions or allow them to seek redress, the greater the significance of those individual actions that curtail transgressions. Third, the less that actors depend on others in crucial political and economic endeavors, the less important it becomes to preserve social relationships, and hence the fewer the costs associated with aggressive responses to potential transgressions. Accordingly, we can expect that concepts or experiences associated with the male flash of anger will be both hypercognized and valorized in societies in which (a) vital resources are highly appropriateable, (b) little protection is provided for the individual, and (c) cooperation is not highly relevant to resource acquisition. While a definitive examination of this proposition awaits systematic ethnological comparison, the following cases illustrate prospective polar types on the spectrum of the world's cultures.

Nisbett and Cohen (1996) argue that the violent "culture of honor" characteristic of the U.S. American South and Southwest is a legacy passed down from the Scots-Irish immigrants who settled these regions. In contrast to the English farmers who settled the Northeast, the Scots-Irish were pastoralists. Unlike wheat or barley, cattle and sheep are mobile and can be easily taken away from their owner. Animals do not require the periodic, brief investment of large amounts of labor that make collective action valuable in planting or harvesting. Finally, the independence that pastoralism allows, combined with the mobility that pastoralism requires, constitutes an obstacle to the formation of complex overarching social institutions and diminishes the importance of dispute-resolution mechanisms. In short, pastoralism is often highly conducive to the hypercognizing of circumstances surrounding the male flash of anger (see also Goldschmidt, 1965; Edgerton, 1971).⁷ The southern concept of "honor" can be thought of as a reified representation of a well-guarded individual, free of transgressions: "honor" is "slighted" or "offended" by "insult," and must then be "defended"—that is, transgressions elicit an aggressive response. Not surprisingly, it is men who are most often called upon for such defense, and it is men who seem most sensitive to questions of honor. Nisbett and Cohen present experimental evidence showing that transgressions elicit stronger physiological correlates of anger in southern men than in New Englanders. Hence, in this culturally constituted

reality, it is not the male flash of anger per se that is elaborately hypercognized but, rather, the social integrity which that response protects, with the result that the male flash of anger is both more easily elicited and more violently acted upon.

Next, consider the "street" culture of North Philadelphia described by Anderson (1994). For the young men of the street, wealth and prestige are advertised in the form of jewelry and clothing, items that are easily taken by force. Money is acquired through activities that require only minimal social connections. Chaotic family lives, neighborhood entropy, and police apathy (or overt hostility) add up to an absence of mechanisms of social control. Here, the highest value is placed not on "honor" but on "respect," a reification of the behaviors that indicate an awareness of another's propensity to react violently to transgression: young men crave "respect" and are ferociously angry if they believe that others are questioning or testing their ability to respond to transgressions. Risk-taking and reputational conflict are an inherent part of daily life. Men who live to maturity either struggle to maintain the same degree of ferocity or essentially withdraw from male-male social competition; public space generally belongs to young men. Finally, childhood experiences are congruent with those of later life: Aggression within the family is overt, economic needs are inconsistently met, and family structure is highly labile. Hence, once again we find a cultural meaning system, functionally congruent with the socioenvironmental context, that enhances both the ease of elicitation and the behavioral intensity of the male flash of anger.

In contrast to the utility of the male flash of anger for societies in which individual defense against transgression is paramount, this same evolved propensity constitutes a significant hazard in societies where adverse circumstances both necessitate cooperation and entail vulnerability to revenge. Consider the Scandinavian-derived inhabitants of the Faeroe Islands, an isolated archipelago in the North Atlantic. As described by Gaffin (1995), the principal male economic activities consist of team fishing in turbulent waters, shepherding (which is communal due to frequent absences while fishing), and the harvesting of sea birds from steep sea cliffs. All of these endeavors put men in considerable danger, and many require cooperation. It is therefore not surprising that the Faeroe Islanders place a premium on the ability to avoid becoming angry. Indeed, this is a defining characteristic of proper adult masculine behavior. So central is this feature to the male ideal that Faeroe Island culture contains an elaborate schema concerning the type of man who fails in this regard. Villagers constantly taunt one another, testing each others' capacity to control anger. Men who fail such tests are pejoratively labeled and taunted at length, thereby repeatedly demonstrating both their own inability to conform to the cultural ideal and the explosive danger inherent in giving in to anger.

Perhaps the most complete psychocultural portrait of a society for which the male flash of anger constitutes a hazard is Briggs's (1970) study of the Utkuhikhalingmiut Eskimos (or Utku), tellingly titled *Never in Anger*. At the time of Briggs's research, Utku society consisted of 35 individuals, the only inhabitants in an arctic region of more than 35,000 square miles. This environment, characterized by extreme weather conditions and marked fluctuations in food availability, is arguably the primary determinant of a wide range of features of Utku culture. Importantly, although individual households are largely self-sufficient, social networks provide the only source of security in the event of misfortune or illness. In a small population subject to seasonal restrictions on mobility, open social conflict could seriously imperil an entire community. Moreover, because hunting and fishing activities require men to brave hazardous conditions alone or with a few partners, men are extremely vulnerable to retribution. Under these circumstances, it is understandable that for the Utku the sine qua non of maturity is emotional equanimity. Anger in particular is proscribed and elaborately hypercognized, importantly including a cultural schema in which angry thoughts are seen as having the power to magically harm others. By definition, individuals who openly experience and express anger are not adults, and men in particular are held to a stringent standard. As Briggs documents in great detail, Utku socialization practices reflect these ideals, as adults' interactions with children are characterized by a remarkable absence of aggression. Briggs also makes much of the warmth and intimacy of caretakers' behavior during early childhood. Although children display predictable resentment at the decrease in parental attention following the birth of a sibling, this fades away. Indeed, the overriding message of Utku childhood is that others care for one, one's needs will be met, and the world is a stable and predictable place. In short, Utku childhood typically involves experiences which indicate that the future is bright. As noted earlier, on both economic and neurophysiological grounds we can expect that impulsive risk-taking and aggressivity will be minimal under such circumstances, thus furthering the correspondence between cultural ideals and subjective experience.

Interindividual Variation and Cultural Evolution

Although marked differences in both behavior and ideation occur between groups, such differences do not preclude variation within the group. Intra-group variation can stem from a variety of causes, including (a) genetic variation in the propensity to anger (Cates et al., 1993), aggressivity (Vernon et al., 1999; Eley et al., 1999), and impulsivity (Hur & Bouchard, 1997; Seroczynski et al., 1999; Saudino et al., 1999); (b) variation in those life

experiences, including both resource availability and exposure to parental anger, that contribute to the calibration of risk sensitivity; and (c) heterogeneity in the possession and/or interpretation of cultural understandings (cf. Aunger, 1999). In addition to internal heterogeneity, societies also exhibit change over time in shared understandings. Moreover, it is likely that these two phenomena, intragroup variation and cultural change, are causally linked.

The heterogeneity of motivational dispositions found within any given group at any given time may constitute a key element in the process of cultural change. Central cultural understandings may develop as a result of the social dynamics that emerge from the intersection of interindividual variation and local parameters of utility. Given some defining features of a local socioecological environment at a given moment in time, because of interindividual variation resulting from a combination of genetic differences, differing life experiences, and differing cultural schemas, a fraction of the population will possess patterns of emotions, inclinations, and other motivators that "fit" well (or, at least, better than others) with the demands of that environment. These individuals are likely to succeed where other individuals, possessing different motivational constellations, are likely to fail. However, because cultural information, unlike genetic information, can be transmitted horizontally, this initial partitioning of the population (in part) on genetic grounds will not persist. As soon as substantial differences in success become apparent, less successful members of the group will begin to strive to imitate the newly successful individuals (Boyd & Richerson, 1992). As a consequence, the locally adaptive behavior pattern will spread within the population. Public self-justification by those who achieve success, combined with a growing awareness of the increasingly normative pattern, will then lead individuals to create and promulgate schemas that both describe and prescribe these locally optimal behavioral features and the psychological orientations that underlie them. Over time, these schemas will become increasingly refined as people reflect on both their own subjective experiences and the pervasive behavioral patterns. In turn, cultural schemas will affect both subjective experience and the attractiveness of other, related ideas, including those concerning child-rearing practices. The net result is often the gradual creation of elaborate and somewhat integrated sets of ideational and behavioral patterns that differ substantially across groups.

As the case of the southern "culture of honor" demonstrates, integrated systems of belief and practice can be quite stable, sometimes even outliving the socioecological conditions that initially gave rise to them. However, while the general determinants of such stability are as yet unclear, it is nevertheless apparent that cultures can also change dramatically. The above reasoning suggests one factor that may facilitate substantial, and often rapid, cultural reconfiguration: In the event that a change occurs in the basic socio-

ecological parameters within which a society operates, the existing inter-individual variation in endogenous motivational patterns will constitute a pool from which new patterns of thought and behavior can emerge (compare with Hollan, 2000). For example, as a combined result of the economic opportunities created by the introduction of the horse (and, later, the gun) and increasing attacks from neighboring groups, within a relatively short period of time a number of North American Indian societies, including the Cheyenne, the Arapaho, and the Teton Dakota, transformed from sedentary horticulturalists into nomadic hunter-gatherers. Dramatic modifications of the social structure reflected fundamental changes in the underlying value systems, as hereditary offices were largely replaced by a meritocracy based on individual performance in the male activities of hunting, raiding, and fighting (Oliver, 1962). Although we lack information on the interpersonal dynamics of those changes, it is likely that the temperaments which best suited the earlier social form differed substantially from those which best suited the later social form.⁸

Thus far I have stressed the functionality of cultural beliefs and practices. However, it is important to recognize that the feedback relationships between the demographic distribution of an idea and its cultural elaboration are such that change can sometimes carry societies down one-way paths that lead to increasing social disruption and disorganization or, at the very least, limit the growth of social complexity (cf. Edgerton, 1992). For example, there may be cases in which, independent of the initial socioecological costs or benefits of aggressivity, a critical mass of aggressive men achieves success. This could then lead to increasing valorization of violence, with the result that warfare becomes endemic and internal conflicts prevent groups from ever growing large enough to pacify their neighbors (cf. Chagnon, 1997). Conversely, the prior development of elaborately hypercognized concepts may limit a group's ability to adapt to changing circumstances (cf. Fessler, 1995). For example, a culturally entrenched fear of anger and aggressivity is likely to hinder groups that are faced with external competition, with the result that they are simply marginalized, assimilated, or killed (cf. Dentan, 1979). The lesson from these examples is that the internal dynamics that generate cultural change do not guarantee functionality at the group level, since change is frequently the product of the actions of individuals who may be self-interested, short-sighted, or both.

A striking feature of the transformations that occurred on the North American Plains is the remarkable convergence of cultural forms. The various Plains societies originally stemmed from groups possessing markedly different means of production (ranging from foraging to horticulture), different social structures (from egalitarian to hierarchical), and different attitudes toward violence (from valorization to abhorrence); but after only a few centuries, the Plains were populated by a relatively homogeneous set of

nomadic hunter/warrior societies, a highly efficient form in the given socioecological setting (Oliver, 1962). Given that the social dynamics that generate cultural change are themselves undirected, and hence can conceivably produce a wide range of outcomes that differ markedly in their functionality at the level of the group, the convergent cultural evolution evident in the Plains case suggests that a process termed “cultural group selection” was at work. Essentially, this is a form of “survival of the fittest” at the level of both cultural information and the populations that hold, act on, and transmit that information.⁹ The combination of the heterogeneity of the original forms that gave rise to Plains societies and the homogeneity of the resulting complex suggest that those sociocultural variants which did not lead to the locally optimal form were eliminated, displaced, or assimilated by those which did. By the same token, it is likely that the exquisite fit between the entailments of Faeroe Islander fishing or Utku foraging and the respective cultural conceptions of the male flash of anger is the product of cultural group selection—societies in which successive cultural changes have produced locally highly functional attitudes toward male anger and violence will ultimately outlive societies possessing less functional cultural schemas.

In conclusion, the case of the male flash of anger illustrates how evolutionary psychology and cultural anthropology provide complementary components in vertically integrated explanations of important human phenomena. Evolutionary approaches both shed light on the functionality of anger as a response to transgression and account for the age- and sex-biased distribution of violent risk-taking behavior. Evolutionary psychology also provides an ultimate explanation for the process whereby, via alterations that occur at the level of the neurotransmitter, childhood experience influences adult risk-taking propensities. In turn, culturally constituted socialization practices and interactional patterns shape childhood experience, inscribing culturally preferred responses to transgression on individual actors; these tacit lessons are further reinforced by overt morally weighted cultural schemas and lexicons. However, despite the redundancy of cultural mediation, intragroup variation in the response to transgression persists due to genetic variation, idiosyncratic life experiences, and incomplete sharing of cultural information. This variation constitutes the raw material for culture change, as some orientations will be more congruent than others with the demands of the current socioecological setting, and hence some individuals will be more likely to succeed and, thereafter, to be imitated. At a still larger scale, cultural group selection can occur when differing socio-cultural systems come into contact with one another, as those systems that most successfully meet the challenges posed by the socioecological setting are most likely to prosper and spread. These processes explain why there is often an exquisite fit between the demands of the socioecological setting and the culturally shaped response to transgression. However, because optimal-

ity is relative to a given set of competing sociocultural systems, and because any given system is the product of unique and often random historical events, non- or even dysfunctional beliefs and practices may also persist, thus explaining the existence of societies that are mired in perpetual internecine warfare, or those that are so pacifistic that they are easily displaced by newly arrived competitors.

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Notes

1. For discussion of how culturally evolved institutions motivate participation in anonymous warfare by exploiting emotions that normally operate at the interpersonal level, see Richerson & Boyd (1999); also, see Feshbach (1994).

2. Large-scale violence directed at civilians, such as that which occurred in the Balkans or Rwanda, often seems to have a personal flavor, and survivors frequently report that they were acquainted with their assailants. The same is often true of raiding and warfare in traditional societies (cf. Chagnon, 1997). Accordingly, events such as these may be amenable to explanation in the framework discussed herein.

3. Elsewhere (Fessler, 2001) I have argued that “shame,” which is intimately linked to “anger,” is also a critical contributor to violent conflict.

4. Note that this should not be interpreted as meaning that females were not, or are not, both socially competitive and aggressively responsive to transgression. Rather, the difference between the sexes is one of degree, as males are expected to be generally willing to risk incurring substantially higher costs than females given the higher stakes involved.

5. This argument rests upon cross-species comparisons that reveal a positive correlation between sexual dimorphism (in both size and armaments) and degree of intrasexual competition, i.e., the higher the reproductive stakes, the more that male physiological resources are dedicated to combat (see Daly & Wilson, 1983; Plavcan & Van Schaik, 1997).

6. Note that this argument seeks to explain differences in the degree to which men and women put themselves and others at risk when they experience anger—the same economic logic selected for angry reactions in males and females, but the sex difference in costs and benefits resulted in greater aggressivity and greater indifference to risk as part of anger in males than in females. As a consequence, even in cultures which enhance the violent potential of female anger, we can expect women to generally resort to lethal violence less often than men (cf. Burbank, 1992).

7. Recent findings from Mongolia (F. Gil-White, personal communication) and Africa (R. McElreath, personal communication) call into

question the universality of the association between pastoralism and the male honor complex. I suspect, however, that pastoralist societies lacking an elaborate honor complex will possess overarching mechanisms of social control, such as age-grades that perform corporate functions in protecting property, which reduce or obviate the need for individual aggressive response to transgression.

8. By way of comparison, Tuzin (1989) has documented how changes in the socioecological context of the Ilahita Arapesh of Papua New Guinea led to a dramatic cultural revolution; significantly, these changes involved the meteoric rise of a man whose personality had previously relegated him to the sidelines of social life.

9. Though long implicit in anthropological theories, cultural group selection has only recently been examined in a rigorous fashion. See Soltis et al., 1995; Richerson & Boyd, 1998.

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