Incorporating a Theory of Cultural Evolution into Explanations of Male Dispute-Related Violence

Brian M. Paciotti

Peter J. Richerson

Ecology Graduate Group—Human Ecology
University of California—Davis
Davis, CA 95616

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ABSTRACT

Evolutionary, structural, and rational choice theories explain why males compete—sometimes violently—with other males. Although based on different assumptions, these theories predict that various social and physical environments such as inequality and poverty increases the likelihood males will compete violently. In contrast, cultural evolutionary theory stresses the importance of social institutions (culture) on behavior, and thus can predict dynamic patterns of behavior occurring over short time scales, and that is not associated, at least directly, with ecological changes. Theoretical perspectives are contrasted and evaluated with regard to pre-existing literature on violence and social control. Recommendations are offered with respect to the benefits of considering cultural evolutionary theory when analyzing interpersonal dispute-related violence.

There is abundant evidence that interpersonal violence among males[1] is related to the ecology of competition for mates through both direct means, and through the differential access of material and symbolic resources as dictated by the social environment. However, humans rely heavily on cultural transmission to acquire adaptive strategies (Boyd and Richerson, 1985), and ongoing cultural evolution leads to the emergence of various types of *institutions of social control* that either decrease or increase the likelihood of violent contests and disputes between males. Institutions of social control are sets of rules specifying how disputes should be settled, who should participate, and how rewards and punishments should be distributed to both male contestants and third parties. In some societies, third parties encourage violent self-help resolutions of male disputes, whereas in others strong peacemaking institutions encourage third parties to suppress male competition and violence. Thus, identifying the relative strength of self-help and peacemaking institutions is an important method for predicting intra-societal rates of violence.

We contrast different models of human behavior from traditions in innatist evolutionary psychology, structural sociology, rational choice theory, and cultural evolutionary theory. Then, we highlight the ecological processes of mate competition to explain male violence. (Any resources necessary to survive and reproduce will be similar to direct mate competition). Finally, we argue that most evolutionary theories (other than cultural evolutionary theory) are *ecological* theories, in that an assumed human nature, and knowledge of the local ecology, is enough to predict human behavior. Although ecological theories produce many empirically supported predictions of male violence, they are unable to explain many of the dynamic patterns and extreme variations in societal levels of violence. Thus, we compare ecological to cultural evolutionary theories, and test predictions specific to a cultural evolutionary theory of institutions of social control. Evolving cultural systems lead to observations that cannot be explained by ecological theories. Institutions of social control can 1) reduce male competitive violence through the altruistic sanctioning of peacemaking rules 2) produce lags and other non-equilibrium temporal patterns 3) pre-adapt future institutions and 4) stabilize on diverse equilibria.

We conclude that ecological theories are important in explaining male interpersonal violence, but are incomplete without attention to cultural evolutionary processes, and the institutions that arise because of these processes.

Theoretical Background

{ TC \l5 "}Genes, structural and physical environments,[2] and culture all influence human behavior. Thus, homicide—an extreme form of interpersonal competition and conflict—is likely caused by innate pre-dispositions (Daly and Wilson, 1988), social structures such as poverty and

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[1] Violence is defined here as any conflict between individuals or groups that results in injury or death. Although this broad definition could include warfare, we focus here on male interpersonal violence resulting from conflict between individuals and coalitions such as extended families, gangs, and tribal clans. Violence against women and violence perpetrated by women is by no means unimportant or unrelated to our theme here. We focus on male violence for simplicity and because most violent events involve males.

[2] Structural environment refers to attributes of social systems such as degree of inequality, proportion of unmarried males, or degree of social stratification. In general, this term refers to attributes of social systems without specific attention to institutions and related sanctions. Sociologists often define such conditions as *structural* factors contrasting with cultural or biological factors. Physical environment refers to ecological variables such as climate, soils, vegetation, and pollution.

inequality (Messner and Rosenfeld, 1999), social and physical environmental factors influencing motives and opportunity (Cohen and Felson, 1979), and institutions of social control comprised of cultural rules (Anderson, 1999; Paciotti, 2002). Empirical evaluation of aggregate homicide statistics, case files, and reports from offenders and witnesses substantiate all these theoretical proposals to some extent—homicide events are complicated transactions influenced by individual motivations to compete for symbolic and material resources, all within the context of the social and cultural environment.

Because, genetic, structural and cultural forces are important in explaining human behavior, our goals should be to measure *how much*, and under *what circumstances* such forces explain specific behavior such as violence among different groups (e.g., Phillips, 1997). Some criminologists (Akers, 1999) advocate theory competition (contrasting theories to identify which are the most parsimonious), or theory integration (meshing theoretical concepts into one theory). Although much can be said in favor of such approaches, it is likely that theoretical pluralism and question-based research strategies will ultimately prove the most fruitful (Vila, 1994). For example, violent crime is likely more common among some ethnic groups such as African Americans because of the structural differences in many of their communities (Krivo and Peterson, 1996). However, just because resource deprivation, discrimination, and concentrated poverty are "strong forces" in determining violent behavior, we should not discount the possible importance of other forces linked to cultural institutions that do vary among ethnic groups. In sum, it is important to acknowledge the complexity of human systems, and search to understand all the important causal processes.

Genes and Evolutionary Theories

Genetic traits have been found to correlate with personality traits which pre-dispose individuals to violence (Caspi, et al., 1994). As a result, there is likely variation in how well individuals readily conform to cultural rules, find legitimate opportunities, and thus desist from criminal behavior as they age (Moffit, 1993). Of more interest here, evolutionary theories provide explanations for *normal* human behavior, rather than explanations for individuals with extreme traits or abnormal genetically linked traits. Evolutionary psychologists such as Daly and Wilson (1988) argue that psychological dispositions have been shaped through the course of human evolution, resulting in sets of tools for individuals to solve adaptive problems such as competing for mates.

Evolutionists provide a convincing argument that male violence can largely be explained by mate competition. From this perspective, males gain more fitness benefits from additional mating opportunities than from other parental strategies, thus, intense mating competition through the course of human evolution has produced a variety of strategies for males to acquire mates. Flinn and Low (1986) suggest that males follow a limited number of mating strategies. These include competing for mates by 1) controlling resources to attract females, 2) advertising phenotypic qualities for underlying genetic qualities, 3) preventing other males from accessing females, and 4) searching for receptive females. In categorizing the types of events leading to homicide, Daly and Wilson (1988) show that patterns of male conflict fit Flinn and Low's (1986) categories. First, males without access to resources are forced to use status and other symbolic currencies to attract mates. Thus, male contests and disputes over reputation or honor translate into status that can ultimately be important to the fitness among disputants (Daly and Wilson, 1988, p.127). In fact, insults and displays between competing males precipitate the majority of U.S. homicide cases. Further, Daly and Wilson (1988: 137-140) illustrate how the variance of

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male reproductive success is often high—some males will have many mates, while others have none at all. As a result, those with few resources or mating opportunities who adopt risky strategies may be behaving adaptively—individuals with few channels to find mates have plenty to gain and possibly not much to bose. Another important category of violence involves *control* because a large proportion of homicide cases involve sexual jealousy and domestic abuse; males use violence or threats of violence to control other men from gaining access to their wives or girlfriends, and to control their partners from seeking other mates.

Rational Choice Theory

Rational choice theory has been incorporated into theories of interpersonal violence. With respect to physical and social environments, Cohen and Felson (1979) convincingly show that violence is more common when individuals place themselves at greater risk for violent victimization (e.g., spend time in public places) or reduce the guardians capable of protecting them from victimization (e.g., travel alone at night). Rational choice theory also is used to explain the benefits of using violence as a strategy to obtain resources (e.g., robbery), in contrast to the costs and risks such as possible incarceration by the state (Taylor et al., 1973 p. 61; Paternoster and Bachman, 2001 chapter 2). Finally, classic rational choice theory focuses on the potential marginal deterrence effect of state justice institutions on criminal behavior. Thus, most rational choice theories are similar to evolutionary psychological theories of violence in that an assumed human nature is used to make predictions of individuals based on their environmental constraints (e.g., individuals will react to increased costs and risks associated with state punish or to the increased benefits of violent predatory behavior such as robbery). The main difference is that human nature (e.g., preferences for maximizing fitness) is assumed by the evolutionists to have been shaped by natural selection over the long-run, while rational choice theorists do not have a theory to explain preferences (Becker, 1976; Hirshleifer, 1977). Some rational choice theorists have followed Simon's (1990) bounded rationality approach, and consider that culture and institutions influence human preferences. The constraints and cultural factors are still exogenous to rationality itself in these models. The empirical case for the bounded rationality approach is strong, but without an evolutionary component, forswears any contribution from theories of ultimate causality.

Structural Environments and Culture

Many criminological theories of violence are "structural" because they predict that social environments or societal structures such as family disorganization, poverty, or income inequality influence violent behavior (Messner and Rosenfeld, 1999). Structural theories vary with respect to the mechanism of violence resulting from social structures. Anomic and strain theories assume humans normally abide by societal rules, but under some abnormal conditions such as extreme poverty or inequality (in conjunction with cultural defined goals), societal anomie or individual strain leads to violation of social rules and a proclivity to behave violently (Paternoster and Bachman, 2001 chapter 6). Social disorganization theories also assume that changes in social structures as a result of high residential mobility, ethnic mixing, and resource deprivation influences violence in a number of ways. Conflict theories (related to the organization of powerful capitalistic institutions, interest groups, or gender structures) blame violence on group conflict an oppression (Paternoster and Bachman, 2001 chapter 9). Finally, many criminological theories are more oriented toward social psychological factors such as social learning and self-control rather than to macro-level societal structures (Messner and Rosenfeld, 1994 p. 49).

However, Akers (1999) has worked towards integrating social learning theory[3] with societal structures such as class and socio-economic status (Pasternoster and Bachman, 2001 p. 198), and self-control theorists discuss possible links between crime-prone individuals and problem families. In sum, most theories of violence attempt to explain the empirical pattern that at least serious crime is more common in areas with concentrated poverty, inequality, social conflict, or general social malaise (Blau and Blau, 1982).

Although variable, cultural theorists generally agree that societal environments are related to violence (i.e., poverty and inequality), but stress the sub-cultural values or rules that condone violence are critical in explaining variation in rates of violence among different sub-populations (Sutherland, 1924; Wolfgang and Ferracuti, 1982; Gastil, 1971; Curtis, 1975; Katz, 1988; Lundsgaarde, 1977). Concerning emergence, structural conditions such as poverty or discrimination are thought to generate subcultures that condone violence (see Cloward and Ohlin, 1960). A number of problems emerge from cultural theories of violence. First, many structuralists have made the mistake of mixing the concepts of social structure and culture together. Messner and Rosenfeld (1994 p. 55) rightly argue: "Social structure should be limited in scope to the "relational" or interactional component of social systems. Culture should be limited to the dimension of value, belief, and knowledge." We would go further to stress that although culture includes information and values, it also includes the rules of institutions. Second, cultural and structural forces have become exceedingly dichotomized in the literature. For example, the massive literature on violence in the American South is often divided into positions stressing either the importance of southern poverty (Parker, 1989), or cultural forces (Brearley, 1935; Gastil, 1971). Finally, culture is often treated as static sub-cultural units without attention given to the micro and macro evolutionary properties of cultural evolution. We address these issues below.

Integrating Cultural Evolutionary Theory

In this section, we define cultural evolutionary theory, and contrast it to theories described above. We lump together evolutionary, structural, and rational choice theories together because all of these, although variable, make similar assumptions about the interaction of human nature with environmental variables. Further, most of these theories pay inadequate attention to the role of culture in explanations of violent behavior. Finally, we agree with many of the findings from cultural theories of violence, but argue that cultural theories require attention to the origins and maintenance of cultural processes.

Cultural Evolutionary Theory

Like many evolutionary psychologists, cultural evolutionary theorists (Richerson and Boyd, 1998; 2000; 2001) emphasize social learning mechanisms as well as more specialized psychological instincts, but argue that the cultural system is an adaptive system of considerable generality *and* one that pays a considerable price to achieve such generality. Specialized tactics for solving many problems are likely to be cultural complements or implementations of innate features of human psychology. In contrast to evolutionary psychology, Richerson and Boyd (2000) argue that the Pleistocene environment was variable on time scales important to

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[3] It is important to recognize that social learning theories are especially amenable to fit with cultural evolutionary theory which also stresses the importance of learning socially and imitating others.

Pleistocene hominids, making it unlikely that selection favored specific cognitive modules to track the changing environments. Instead, a more general and flexible cognition evolved allowing individuals to learn socially. By learning from others, individuals could learn adaptive behaviors though culturally transmitted information rather than relying on the relatively costly individual learning. Once rudimentary cultural traditions arose, it is likely that genes and culture co-evolved to further shape human adaptive psychologies. Our tribal social instincts hypothesis holds that innate propensities for ingroup cooperation co-evolved in the late Pleistocene by group selection on cultural variation leading to social selection for behavior adapted to live under a regimen of cooperative institutions (Richerson and Boyd, 1998; 1999). In effect, our innate social psychology is adapted to live in a community governed by institutions much as our auditory and vocal apparatus is adapted to live in a community with a spoken language. Recent cross-cultural experimental evidence (Henrich, 2001) suggests that humans universally behave more fairly toward anonymous second parties than is easily accounted for by models assuming individual selfish rationality or individual fitness maximization, although these data also document considerable differences in degrees of fairness in different societies, presumably reflecting different institutions (see also Paciotti and Hadley, N.d.).

We do not pretend that the current data with regards to violent behavior are sufficient to describe the exact division of labor between genes, culture, and direct environmental effects at the individual level. Certainly, attempts to socialize chimpanzees as humans fail in ways that surely show that innate differences underpin species-typical behavioral differences (e.g., Temerlin, 1975). Further, human universals are sometimes taken to signal innate determination (Brown, 1991), but in principle "cultural universals" could be conservative cultural characters found among all populations. Individual learning, culture, and genes are all adaptive systems predicting the same behavior as regards universal features of the human environment, such as many aspects of maternal care. When multiple adaptive mechanisms tend to the same prediction, equifinality (multiple theories predicting the same outcome) greatly weakens the epistemological leverage we have to distinguish between hypotheses generated by evolutionary psychologists, social structuralists, rational choice theorists, and cultural evolutionists. Other methods have to be brought to bear, such as the characteristic rates of change each theory predicts.

Comparing Ecological and Cultural Evolutionary Theory

The relationship between cultural evolutionary theory and the theories of interpersonal violence discussed above is rather complex because we agree that human behavior is often rather elegantly adapted to local ecological circumstances and that innate aspects of our psychology are important. Evolutionary psychology, many sociological theories, and rational choice theory all have in common the strategy of explaining behavior in terms of a fixed human nature interacting with a specific environment. For short, we will call this the *ecological* explanatory strategy hereafter. The ecological approaches do not necessarily hold that culture is unimportant, only that it doesn't act in a way that will cause behavior to differ from that predicted from evolved human nature and environment alone. Ecological explanations are not to be taken lightly; very often they are highly plausible. For example, the evolutionary theory of mate competition succinctly explains how male competition for mates leads males to be more violent aggressors than females. Further, regarding sociological theories, it is likely that racial discrimination, lack of economic opportunities, and concentrated poverty creates an environment favorable to frustration and violence. However, in both cases, institutions of social control can mitigate

competition resulting from mate competition or from competition emerging from barriers to economic success.

Ecologists are rightly critical of cultural "explanations" of patterns of behavior that have no theoretical foundation and that are not tested rigorously against competing ecological explanations. Anthropologists, sociologists, and historians have been prone to attribute most differences between populations to cultural variation in a purely descriptive sense, not taking care to consider other explanations, and taking little or no interest in the mechanisms behind the variation of cultures. By contrast, we submit that cultural variation and cultural evolution are proper theoretical constructs on just as secure conceptual footing as organic evolution, rational choice theory, and societal conflict analysis (Boyd and Richerson, 1985; Cavalli-Sforza and Feldman, 1981). Cultural evolutionary models have every bit the rigor that genetic evolutionary models have. The quantitative empirical estimation of cultural variation is no more difficult to operationalize in the field than genetic variation or the results of individual choice in variable environments (which is really to say that the three threads are always more or less difficult to disentangle). We hope to demonstrate here that cultural explanations can be mated to important ecological theories of interpersonal violence, and that our theories and methods can begin to tease apart the tangled web of genetic, cultural and direct environmental effects that jointly drive variation in human behavior. Attempts to simplify the problem of understanding male violence or any other pattern of human behavior by ruling out one of these classes of effects will, in general, be a false economy.[4]

Cultural evolutionary explanations can account for *three* sorts of deviation from the predictions of strictly ecological theories. First, cultural evolutionary models sometimes predict qualitatively different behavior than models not including cultural effects. Concerning cooperation, cultural group selection is probably much stronger on cultural variation than on genetic variation, and thus can explain why cooperative social institutions are so much more important in humans than in most other animals. Because cooperation is likely related to prosocial instincts and pre-dispositions to learn and sanction institutional rules, ecological theorists may overestimate the potential for cooperation to be achieved through individual self-interest and reciprocity. Evolutionary psychologists posit that individual self-interest, reciprocity, and signaling of intent are enough to explain why non-kin cooperate.[5] Sociologically oriented theorists focus on behavioral social networks, and argue that cooperation occurs when communities are tightly knit, or when cross-cutting ties promote cohesion (e.g., Cooney, 1998). However, both theories downplay the importance of institutions that generate the trust required for cooperation. If our perspective on cooperation is correct, much of the current research on cooperation that focuses on the mechanisms of reciprocity and cross-cutting social networks is misguided; the cultural rules of institutions (and different types of institutions) must be considered.

Second, if culture is important, it will generate time lags of a characteristic time scale. Evolutionary psychologists imagine time lags to be very long, governed by the time taken for complex mental structures to be modified by natural selection, whereas rational choice theorists

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[4] We do not mean to rule out a well-reasoned argument for simplicity in specific cases. Some laboratory experiments and simple mathematical models justifiably isolate particular causal factors for independent analysis. Further, investigators are forced to make many tactical simplifications in the interests of getting any results at all. The canny investigator makes these simplifications in light of the problem to hand, not on the basis of bogus general principles.

[5] An important mechanism for cooperation among genetic kin is inclusive fitness. Individuals cooperating with close kin, indirectly receive the benefit of having their genes propagated by their kin (Hamilton, 1964).

and many sociological theorists follow the economists' notion that human behavior adjusts instantly to the current environment. Because cultural evolution is typically faster than genetic evolution, but involves population level processes and not just individual decision making, its time lags should be intermediate.

Third, cultural evolution is a potential cause of path dependent diversity among human societies. Disregarding lags, human social organization probably has multiple stable equilibria in any given environment, and may be subject to complex dynamics. For example, chaotic behavior may lead to failures of societies to converge on common adaptations in similar environments and to divergences in historically related societies even if they remain in similar environments (Boyd and Richerson 1992a). Ecological models predict that societies in the same environment should behave identically; they typically envision no mechanism to generate path dependence. Cultural evolutionary theory gives attention to the fact that individuals learn institutional rules, follow them because of sanctions, and subsequently behave either hyper-violently or peacefully regardless of other ecological conditions—at least temporarily. Overall, to assume that culture will *always* match with fitness enhancing optima, especially a single optimum, is highly problematic. Culture cannot be relegated to a distinctly subordinate place in proper evolutionary arguments as some argue (e.g. Alexander, 1979: 73-86; Coleman, 1990).

A classic study demonstrating the insufficiency of purely ecological explanations is Edgerton's (1971) analysis of cultural variance among eight villages from four East African tribes. In each village, ethnographers studied one community at the pastoral (livestock rearing) extreme and one at the farming (horticultural) extreme in terms of subsistence activities. The time of separation between the farming and pastoral wings of each tribe was not known with precision, but was at least a few generations in every case. Edgerton's structured interview and questionnaire data included several variables related to male violence, including respect for authority, aggression, insults, desire to avoid conflict, and need for self-control. In every case, pastoralists differed from farmers in the expected direction; pastoralists more often mentioned direct aggression. However, tribal affiliation often had a larger effect than subsistence type, and subsistence by tribe interaction effects were large in several cases. Two of the tribes in the study were speakers of Bantu family languages and the other two were Kalenjin family speakers. Some quite significant differences exist between these superordinate groupings as well, reflecting cultural differences and similarities that most have persisted for many centuries, if not a few millennia.

Simple lags probably explain much of the failure of ecological explanations in Edgerton's data, however, multiple optima may be just as important in general. For example, many anthropologists have argued that cultures of honor are common adaptations among populations living in stateless regions or that depend upon easily stolen herds. Nevertheless, there is more than one way to skin a cat. McElreath (2001) in a partial replication of Edgerton's study, discovered that Sukuma pastoralists in Tanzania lack the relatively high levels of respect for authority that was one of the most consistent differences between pastoralists and farmers in Edgerton's sample. We document elsewhere the highly institutionalized *Sungusungu* justice system of the Sukuma (Paciotti, 2002), which explicitly forbids and strongly sanctions the self-help violence so common in pastoral societies. The Sukuma elect leaders to guide the enforcement of sanctions, although boys and young men do most of the work. Sukuma are very quick to turn out leaders who abuse authority even in minor ways so that such men gain no personal respect. Nevertheless, the Sukuma are the most successful and most pioneering pastoral group in Tanzania. *Sungusungu* arose as an adaptation of pre-existing Sukuma tribal institutions

to an outbreak of cattle thievery by heavily armed demobilized soldiers, and subsequently acquired a considerable array of third party justice functions that obviate the need for individual self-help violence in virtually any Sukuma dispute.

Social Institutions and Interpersonal Violence

In this analysis, we are concerned with the evolution of the cultural rules that comprise institutions of social control. Although applied to cultural evolutionary theory here, the idea that institutions of social control influence violent behavior, and crime in general, is not new to criminologists (see Akers, 1999 chapter 7). Recent studies have argued that various community informal institutions of social control capable of reducing crime are influenced by differing degrees of collective efficacy (Sampson et al., 1997), social altruism (Chamlin and Cochran, 1997), and informal community controls which shame an re-integrate offenders (Braithwaite, 1989). We first offer definitions of different types of social institutions relevant to interpersonal violence.

Institutions of Social Control

A Dallas detective was quoted as saying that most homicides "…begin over little old arguments about nothing at all…"(Daly and Wilson, 1988 p.127). In fact, empirical data suggest that over half (and likely up to 70%) of homicides in the U.S. and other countries result from interpersonal arguments (Cooney, 1998). In recognizing different types of homicide, many criminologists disaggregate homicide cases that precipitate from disputes or arguments (sometimes termed expressive) from those that are predatory in nature and often related to other felonies (termed felony-related or instrumental). Although dispute-related and felony-related categories often overlap due to the complexities of violent events, these types likely fit well with the categories of institutions discussed below.

Black (1983) argued that many acts of violence deemed as crimes by the state are viewed by participants and bystanders as legitimate personal justice. Following Black's social control and dispute resolution framework, Cooney (1998) argues that theories of dispute resolution should be central explanations of violence, and what needs explanation is why individuals choose self-help justice to resolve disputes with violence, rather than the use of third parties to settle disputes peacefully. In his detailed analysis of sociological and anthropological literature, he illustrates that a strong predictor of rates of violence is the availability of third parties who intervene to settle disputes. If societal third party mechanisms for dispute resolution are absent or weak, self-help justice is a substitute (Knauft, 1987).

Cooney's (1998) argument can be made clearer by adopting Ellickson's (1991) definition of institutions of social control. In this typology, a system of controllers, rules, and sanctions constitutes a society's institution of social control. Different types of informal social controllers (e.g., community gossip networks, organizations) and formal social controllers (state legal systems) are comprised of *actors*, who *sanction* sets of *rules* defining normative behavior. With regards to *controller* types, informal institutions such as vigilante organizations, churches, and even closely knit communities can resolve disputes and punish deviants as effectively as formal state legal systems—sometimes more effectively—by forcing arbitration on disputants and punishing deviants. Such behavior is a form of peacemaking (even though violent punishments may be used) because third-parties get involved in disputes, and reduce conflict, even when they may have no direct personal interest. To the extent that peacemakers are unavailable, self-help

justice is the alternative—individuals or groups provision their own justice, and violence is often a useful strategy (Black, 1983; Cooney, 1998). For example, two men disputing over a fence boundary may resort to violence without consulting with other parties. Although informal organizations such as vigilante groups use self-help strategies when formal state controllers are absent or weak (Abrahams, 1998; Horwitz, 1990), we limit the definition of self-help justice to dispute resolution between the disputants themselves, without intervention by others.

Rules and *sanctions* institutionalize social controllers. Peacemakers, and those involved in self-help justice, administer sanctions to individuals through a tripartite system of material or symbolic incentives to <u>reward</u> individuals for exceptionally upholding rules, <u>punish</u> them for violating them, and do nothing upon routine conformance. Sanctions result from prescriptions of behaviors, or rules, that *should* be followed. Rules can be categorized into primary and secondary rules. Primary rules specify socially accepted behaviors for substantive behavior such as resolving disputes peacefully or violently. Secondary rules are higher-order rules that specify the sanctions to be given to social controllers themselves for not punishing or rewarding individuals breaking primary rules. For example, a gang member failing to kill a gang rival as his initiation may be ridiculed, along with the gang members who do not participate in the shaming process.

It is easy to see that organizations and state controllers have a complex of primary and secondary rules. Police enforce primary rules by apprehending thieves, but are also influenced by formal secondary rules that criminalize police corruption and conflicting informal secondary rules against informing on fellow officers. Just as peacemakers are institutionalized, self-help justice strategies can become institutionalized with rules. Thus, so-called "cultures of honor," or honor institutions are in actuality institutionalized self-help strategies—rules specify that those turning to other controllers, such as the police, should be punished by enforcers of secondary rules

Life-course Institutions

Although it is likely that violence researchers should pay particular attention to institutions of social control, or how people resolve their disputes and protect their property, { TC \l3 "}a variety of different institutions (labeled life-course institutions hereafter) influence other aspects of peoples' lives such as defining preferences for careers, leisure, and marriage (see the categories in Fischer, 1989). For example, criminologists have long recognized the importance of cultural rules that define how individuals should obtain resources, regardless of individual and societal constraints (Merton, 1938). Messner and Rosenfeld (1994) make a convincing argument that cultural rules specifying the importance of the "American Dream," are important determinants of American violence. The authors argue that mainstream American culture stresses the importance of monetary wealth. Following Merton (1938), they discuss the problems when structural barriers (e.g., racism, bad economies) prohibit individuals from realizing their societal cultural goals. Regarding felony-related violence, it is likely that life-course institutions defining goals such as the "American Dream" could motivate individuals to take the resources of others, regardless of the risks of violence. Although, the remaining arguments in this paper discuss institutions of social control, it is likely that analysis of the cultural dynamics and evolution of life-course institutions embodied in Messner and Rosenfeld's "American Dream," would prove enlightening.

Distinctive Predictions of Cultural Evolution Theory

Our definition of institutions implies that institutional phenomena form part of the *social environment* that influences the contingencies of individuals' decisions. We believe that many scholars have disregarded the importance of institutions because of poor definitions about what institutions are, and poor operationalization of empirical measures of institutions and institutional influences.[6] Further, some scholars assume that institutions can be ignored because the direct payoff of individual action explains why, for example, males compete violently. The contingencies produced by institutions, however, often explain patterns of male interpersonal violence, and ignoring them makes it difficult to explain the dynamic nature of violence. In particular, institutions of social control exemplify all three general situations in which cultural evolution makes distinctive contributions to understanding human behavior—qualitatively different outcomes concerning altruism and cooperation, time lags, and multiple equilibria.

Large-scale Peacemaking Institutions

Generating cooperation in large groups with the mechanisms of kinship, reciprocity or signaling is difficult without some additional "glue" to create and signal *trust*. Thus, the cultural rules of institutions are important, and especially if these evolve by group selection (Boyd and Richerson, 1982; Campbell, 1983). Recent modeling efforts illustrate that costly punishment should be more common than costly rewards, and empirical observation supports this; punishments resulting from institutions are often material (fines, incarceration, corporal punishment) and rewards are often symbolic (medals, verbal praise, honorific titles). To see this, consider how when systems of moralistic punishment are well entrenched, those willing to punish are common, and those willing to risk punishment are few (see also Ellickson, 1991). Thus, many share the cost of the relatively few acts of punishment the system requires (Boyd et al., N.d.), hence such systems can evolve with relative ease by group selection once society gets the requisite high frequency of punishers established. The Sukuma exemplify these ideas almost perfectly. In virtually every Sukuma community in Tanzania, every member of the community participates in *Sungusungu* and malefactors are quickly apprehended and fined or beaten. Such is the deterrent effect of *Sungusungu* that a couple of boys armed only with small spears effectively deter thieves armed with guns. The direct material rewards for *Sungusungu* service are extremely scanty (fines levied in livestock are slaughtered to throw a party for the village), although of course everyone benefits substantially from the efficient justice services of the institution. The main rewards to individuals are symbolic—the pride taken in being community member in good standing and in being recognized by election to positions of leadership (Paciotti 2002). Attention to secondary rule enforcement is intense, as theory tells us it should be (Henrich, 2001). Well-regulated communities in more complex societies are similar to the Sukuma except that most community members merely pay taxes, and the justice officials are paid professionals rather than a posse of the whole.

To adequately interpret patterns of male interpersonal violence, one needs to understand the institutional rules found among different societies and ethnic groups. One option is to evaluate the strength of honor institutions among different societies. For example, it is likely that groups of males mitigate competition to gain mates (and material and symbolic resources)

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[6] The study of institutions can be objective and scientific because their existence, and the rules that comprise them, can be measured by the sanctions that result when rules are violated or exceptionally upheld.

by cooperating to collectively gain the benefits of deterrence—groups of males are more formable enemies than individuals. Numerous studies of fraternal interest groups (e.g., youth gangs, patriarchal clans) illustrate that males are able to gain more resources for themselves by organizing cooperative coalitions (Thoden and van Wetering, 1960; Otterbein and Otterbein, 1965; Chagnon's (1983). However, because honor institutions are likely to be collinear with populations of males experiencing competitive environments (e.g., inequality, skewed sex ratio), it is difficult to understand the influence of cultural factors forces beyond genetic and environmental factors. For example, the case of violence in the American South as discussed below is complicated by the fact that many southern counties are poor with high degrees of inequality. Thus, it is difficult, at least with large-sample quantitative (e.g., Parker, 1989), to untangle the effects of culture from environment. In sum, because of the collinearity between the evolutionary psychology of male mating behavior and the cultural forces such as honor institutions, many studies would profit from focusing on peacemaking institutions that function to limit competition within and between groups. This is because peacemaking institutions can be measured independently of violent behavior to explain variable patterns of violence among different populations.

Peacemaking institutions capable of reducing violence are more likely to emerge in societies that receive greater payoffs for larger-scale cooperation. Societies requiring cooperation in activities such as waging war, building irrigation systems, and trading between ethnic groups benefit the most by limiting internal conflict. Further, peacemaking institutions evolve slowly, and once they emerge, they may spread to other populations with difficulty. Richerson and Boyd (2001) discuss a number of factors that limit the tempo and mode of institutional evolution such as climate changes, bio-cultural co-evolution (domestication), and cultural evolutionary processes. Regions in the world today with the highest rates of male interpersonal violence occur in places like New Guinea where geographical isolation, and limited agricultural support for hierarchical political systems, have constrained either the independent evolution or diffusion of complex institutions capable of limiting violence (Knauft, 1993). Wiessner et al., (1998) show how a sudden increase in agricultural productivity led over several generations to considerable institutional evolution in the Enga New Guinea Highlanders, albeit evolution constrained by a deeply engrained egalitarian ethos of the Enga. In contrast, the emergence of Islam in the Middle East was associated with the emergence of trade economies. Religious peacemaking rules were created to limit honor-precipitated violence and raiding between competing tribal clans (Firestone, 1999).

Numerous case studies illustrate the existence of peacemaking institutions among different countries, societies and ethnic groups. First, considering national variation, Adler (1983) analyzes ten nations with low rates of interpersonal violence, and concludes that institutions of social control are likely an important cause. Adler's analysis shows that structural factors seems less important than peacemaking institutions found among all nations with low crime rates. Countries such as Japan, Switzerland, Peru, and Saudi Arabia all share high rates of participation in state criminal justice institutions. More importantly, all the societies have strong nuclear families, with the traditional clan or extending family, being replaced by strong informal organizations following modernization (see also Clinard, 1978). A more recent study that includes Iceland (a country with extremely low crime rates) shows that both structural factors favorable to equality and strong informal institutions are important determinants (Gunnlaugsson and Galliher, 2000).

Concerning ethnic groups, criminologists continue to debate whether variation among different ethnic groups with respect to violence is related to structural or cultural factors. Hawkins (1999) presents homicide rates from Flowers' (1988) analysis of ethnic-specific UCR data from 1985. Blacks have the highest rates (28.5), followed by Hispanics (15.1), Native Americans (7.7), Whites (4.1) and Asians (3.6). Although further research remains to untangle the forces involved, it is likely that institutions of social control play an important role. For example, Asian and Hispanic rates of violence are considerably low compared to the extreme resource discrimination many of these immigrant groups have faced (see Liu, et al, 2001; Martinez, 2002). Although related to discrimination, Native American homicide rates conform to culture regions such as the Southwest Pueblo region where peacemaking institutions were stronger. This contrasts to the much higher rates among groups from the Great Basin. Cornell and Kalt (1995) have shown that institutions have persisted among many tribes despite Anglo colonialization, and quite plausibly, homicide rates might vary predictably by cultural region (Paciotti, 2002).

Finally, even societies facing endemic and pathological violence because of male competition and associated honor institutions have at least rudimentary peacemaking institutions to control feuds. Rules emerge so that deadly conflict caused by fronts to individual or group honor can be remunerated with "blood price" payment rather than a retaliatory killing. Miller's (1990) data on Icelandic feuds show that third-parties could gain status by mediating conflicts between disputing males. Boehm's (1984) analysis of feuding in Montenegro highlights the importance of clan honor, but also the peacemaking institutions that allowed clans to control escalating feuds, especially when clans needed to cooperate to protect themselves from Turkish invaders. Knauft's (1985; 1987) analysis of "good company" rules among the Gebusi in New Guinea is an example of an informal peacemaking institution (although imperfect as shown by extreme rates of violence) that encouraged peaceful community dispute resolution. The culture of honor of the American South was not an impediment, and may even have been an indirect aid (Nisbett and Cohen, 1996), in forming high morale armies in the Civil [p1]War (Sword, 1999). Finally, the Nuer balanced the need for honor with the peacemaking authority of the leopard-skin chief who could prevent resulting feuds from escalating (Evans-Pritchard, 1940, p.151). In effect, even simple societies with endemic violence all have peacemaking institutions—albeit often weak ones—to limit the escalation of honor feuds.

Temporal Lags in Emergence and Decay of Institutions

The simplest prediction of cultural theory is that social institutions (e.g., peacemaking or honor institutions) will often lag behind environmental changes, resulting in the persistence of maladaptive behavior for a period of time.[7] On the other hand, adaptive cultural evolution is comparatively rapid so that institutions are generally closer to equilibrium than analogous rules

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[7] The exact length of lags that cultural evolutionary processes will generate is difficult to predict *a priori*. Theoretical models suggest that cultural systems have potential advantages at quite short time scales for the diffusion by horizontal transmission of useful information that is easy to spread socially compared to reinventing individually. On longer time scales, human culture has adaptive advantages deriving from its ability to generate complex social and technological adaptations over many generations, just more rapidly than unaided organic evolution could assemble such adaptations (Richerson and Boyd, 2001). At one extreme, simple technical innovations diffuse within a society in a generation or less (Henrich, 2001; Rogers, 1995). At the other extreme, the scale of human social organization has gradually increased in most parts of the world, though at very different rates, throughout the Holocene. The evidence suggests that some cultural-evolutionary processes have time scales measured in millennia rather that in generations (Richerson, 2001).

coded in genes. Several authors (e.g., Bettinger and Baumhoff, 1982, North and Thomas, 1973) have argued that social institutions evolve more slowly and diffuse less readily than technical innovations. Thus, we might expect that the rapid technical evolution of the last few centuries will have opened up significant lags with social institutions. More generally, the last major change in the earth's environment was the transition from the Pleistocene to the Holocene 11,500 years ago. Progressive increases in technical sophistication, and hence population density, have resulted in a slow, halting increase in the complexity of societies ever since. The evolution of institutions should be rich in phenomena that have rates of change consistent with the time scales of cultural evolution—one to many generations—but too rapid for organic evolution, too slow for individual level adjustment to ecological variation, and often not correlated with environmental changes.

The emergence of institutions of social control is often a slow process, and such patterns are important for interpreting patterns of interpersonal violence. Daly and Wilson (1988 Chapter 12) suggest that their ecological approach may be useful in explaining "cultural" patterns of interpersonal violence. They show that homicide rates in England between the years 1200 and 1300 AD were estimated to be at 1000 and 500 per million people each year in some cities, with the rate gradually dropping below 10 in recent times (Gurr, 1981). Reviewing data from Holland, Spierenburg (1996) finds similar trends, and follows Elias's (1994) argument that citizens became "civilized" by deferring the job of justice to state institutions. Similarly, Karonon (2001) using longitudinal homicide data from Sweden (1540-1700) finds that rates of violence declined through time as the church and state increased their peacemaking functions.

Daly and Wilson (1988 p.246) consider how a psychology of vengeance could motivate individuals to relinquish their duty of revenge (i.e., blood feuds) when they *trust* that the state will punish deviants and deter future transgressions. Daly and Wilson (1988 p.241–251) do attribute importance to the emergence of state institutions that replace honor institutions, but in general complain that cultural theories are merely pseudo-explanatory labels (1988 p. 277-290). The fact that historical patterns show that rates of violence changed over time scales of a few hundred years—too fast for evolutionary psychologists and too slow for many rational choice and structural processes—strongly suggests that cultural variation is extremely important, absent some ecological change hypothesis. (We are not aware of any significant ecological variation between London, Holland and Sweden during the study periods that is not a consequence cultural evolution of one kind or another). If we accept historical cultural changes such as the rise of state-sponsored legal institutions in the West beginning in the Middle Ages, then the hypothesis that communities with different cultural histories will tend to have different institutions becomes nearly inescapable. Invoking ecological differences in such cases is exactly as pseudo-explanatory as invoking cultural differences when ecological explanations are correct.

Just as institutions of social control are often slow to emerge, they can also be slow to change with new environments. A exemplary case of institutional lags is found in the criminological literature seeking explanation of high rates of violence in the American South. Violence was historically much more common in the southern states as compared to northern states, and has remained high into modern times (Land et al., 1990; McCall et al., 1992). Although ecological theorists have hypothesized that poverty or inequality cause southern violence (Parker, 1989), substantial evidence supports the institutional lag hypothesis—honor

institutions emerged as adaptive strategies in the Antebellum South, and continue to be important into contemporary times regardless of ecological changes (Brearley, 1932; Gastil, 1971).[8]

Nisbett and Cohen (1996) tested the hypothesis that honor institutions continue to be important in at least parts of the South and West. They conducted experiments in which northern and southern undergraduates were insulted in a laboratory situation. Upon being insulted, southern subjects were much more likely to display aggressive behavior and develop elevated testosterone and cortisol (a stress hormone) levels.[9] The authors also look at regional institutions and showed that southern states have institutionalized honor rules within state legal systems to allow individuals the freedom to resolve disputes and protect property *personally*. Using data available from the General Social Survey, they show that Southerners state stronger preferences to resolve disputes with violence as compared to Northerners. Finally, the authors use homicide data to find that homicide rates are higher in dispute-related homicides, but not in predation-precipitated homicides (e.g., robberies) among White Southerners as compared to White Northerners. Although recent work (Chu, et al., 2000; Weirsema et al., 2000) regarding missing data in the FBI supplementary homicide reports casts doubt on studies illustrating that Southern violence is more common in areas favorable to herding or that have remained more stable with respect to residential mobility (Cohen, 1998; Paciotti 2002, chapter 7), most studies reveal that the South as a whole has higher rates of dispute-related violence (Land et al., 1990; McCall et al., 1992).

From an *ecological* perspective, the South and the North have become increasingly similar through modernization (McKinney and Bourque, 1971). Thus, property crime rates have converged to similar levels between the two regions (Jacobson, 1975). However, dispute-related interpersonal violence remains high in the modern South, and even if maladaptive, it may reflect the persistence of honor institutions. A number of cultural evolutionary processes may explain

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[8] With respect to the origins of southern honor institutions, Nisbett and Cohen (1996) reviewing historical literature (Fischer, 1989; McWhiney, 1988; Gorn 1985) argue that violence in the American South is linked to the immigration of British "borderlanders", or the Scotch-Irish whose main subsistence strategy was frontier farming and herding. They argue that honor institutions emerge among herders throughout the world because they often have a need to protect their easily expropriated livestock and lack services of third-party state institutions capable of offering protection. Wyatt-Brown (1982) stresses the importance of southern slavery in creating a need to uphold group and individual honor. White elites needed to signal that they were willing and able to maintain their rule over slaves and poor Whites. Similarly, Cash (1941) argues that inequality between poor Whites and wealthier yeomen and aristocrats created the need to compete for one's honor. Finally, Ayers (1984) suggests that the emergence of market economies and industry in the North along with stronger Puritan third-party institutions led to peaceful forms of dispute resolution in the New England. In contrast, the southern agrarian economy inhibited the emergence of state justice institutions and larger-scale Protestant religious sects capable of reducing violent competition among southern males.

[9] Another basic prediction of cultural evolutionary theory is that institutions should have measurable effects on individual behavior, controlling experimentally or statistically for environmental effects. By contrast, proponents of ecological hypotheses in which human nature must confront environments unmediated by cultural effects must hold that individuals behave alike in identical environments. Nisbett and Cohen's (1996) experimental data provide a good example. Their undergraduate experimental subjects, students all living in the same Michigan town, responded in behaviorally and psychologically different ways upon being insulted. Hormone levels rose substantially among southern students but not among northern students. Ecologists have difficulty explaining why students with similar demographic and economic characteristics living in the same town behave so differently. Cultural evolutionary theory offers a simple explanation—socialization into different regional institutional traditions explains why individuals with similar ecological attributes vary behaviorally, cognitively, and physiologically upon being insulted. Nisbett and Cohen (1996: 32-35, 86-87) provide some evidence that attitudes toward socialization and actual socialization practices are different in the North and the South.

such an institutional lag. First, sanctions uphold institutional rules, and once in place, the system of sanctioning can stabilize patterns of behavior such as honor (Boyd and Richerson, 1992b). As a result, institutions evolve slowly in many cases, with a self-reinforcing character that will cause persistence in unfavorable environments. Second, Cohen and Vandello (2001) test the hypothesis that honor institutions persist because of pluralistic ignorance; individuals may not privately subscribe to honor rules themselves, but think others do, and thus they are willing to fake honorable intentions. This process might reflect an arms race between individuals committed to their honor stance and those faking honor to reap the benefits. Interestingly, the final step in the arms race occurs when cheaters are detected through costly displays and rituals such as duels. For example, Simpson (1988) argues that pistol dueling took away individual advantage, thus making the duel a risky interaction that would show only the honorable intentions of the combatants. In one case, the detection of cheaters was less enforced among the English middle classes emulating the dueling institution—sometimes individuals faked their "honorability" by not loading bullets in their pistols. Similarly, modern southerners may fake honorable intentions without being caught because many rituals such as brawling and dueling are now rare.

Institutional Pre-adaptations

Having the right institutions may often act as a pre-adaptive factor in the acquisition of a new adaptation. The field of male violence and its regulation furnishes examples. Honor institutions are thought to be adaptations to environments where state support for peacemaking institutions is weak, and self-help violence is the only way to protect oneself and one's family. Within state societies, some forms of lucrative business, such as the provisioning of many recreational drugs, are illegal. In such businesses, self-help violence, codes of honor for regulating it, and distinctive institutions of cooperation are likely to be adaptive. Such enterprises cannot depend upon legal institutions to protect their businesses from predators, nor can they avail themselves with civil law to enforce contracts. As new niches of this type come into being by changing tastes in recreational drugs for example, how are they filled? Ecological explanations in terms of the costs and benefits of illegal enterprises compared to legal ones must account for some of the variation. Cultural evolutionary theory adds the prediction that pre-adapted institutions are likely to play a large role. Groups with appropriately regulated cultures of honor, and appropriate systems of cooperation, are likely to preempt such niches in the face of others equally, or are more motivated by ecological circumstance.

Light's comparative analysis of ethnic enterprise in general (1972; see also Light and Gold, 2000) and specific analysis (1974; 1977) of the vice industry among different ethnic groups from 1880 to 1944 supports the pre-adaptation prediction nearly perfectly. Although the supply of vice certainly involved rational choices with respect to supply and demand, and associated structural impediments such as racism and poverty, Light (1977) argues that divergent demographic and cultural patterns between Chinese and Blacks explains much of the variation. The Chinese immigrants came from specific regions in China, and brought with them specific social institutions that defined loyalties to regions and clans. Further, the Chinese had a history of secret societies and secret criminal organizations (e.g., Triads) that could be used to create illegal organizations. In contrast, immigrant Blacks coming from different regions had weak regional loyalties (or national loyalties), and few pre-existing institutions other than vaguely defined churches and sects to encourage larger-scale cooperation for the supply of vice. Thus, the Chinese provided vice though highly organized groups, whereas the Blacks conducted prostitution in three mutually competitive groups. In outlining Black competitive markets, Light

(1977 p. 471) describes the largest group as the independent Black streetwalkers, followed by pimps who used guns to maintain "strings" of 1-15 black and non-black prostitutes. At the highest level, Black enclaves contained syndicated brothels. Each level competed with others for customers (pimps protected their business with their reputation or "honor" backed with violence), and the result was high levels of homicide among Blacks, but little cooperative warfare. In contrast, the more organized Chinese competed at the organizational level, resulting in lower homicide rates but more gang warfare. Of specific relevance to peacemaking institutions, the Chinese eventually controlled tong warfare with community level institutions such as the Chinese Peace Society (Light, 1974). This society, with interests to turn the San Francisco Chinatown into a tourist destination (rather than a vice destination with news of tong violence), effectively arbitrated tong disputes. In sum, "the black vice industry consisted of pimps who settled quarrels with fights. The Chinese vice industry consisted of syndicated brothels which resolved severe business rivalries by gang wars, but adjudicated individual quarrels" (Light, 1977).

The case of Italian organized crime is similar. Although having weaker community or clan institutions as compared to the Chinese, southern Italians like the Chinese used family lineages to create strong organizations useful in supplying services such as protection (Banfield, 1958; see also Putnam et al., 1993). Although families might have relied somewhat on the Italian state, self-help justice and associated honor institutions were important. Mafia organizations emerged in many areas to provide "protection" and enforce contracts because of the distrust between individuals and families (Gambetta, 1993). Southern Italian immigrants coming to the United States brought with them the institutional capital to start criminal organizations that sold protection, as well as illegal drugs and alcohol during prohibition. Jewish, Irish, and German crime organizations (and later Black, Columbian, Russian and Chinese organizations) emerged in the twentieth century as well, although none have reached the sophistication (at least until recently) of the Italian organizations (Jacobs and Gouldin, 1999). With pre-existing codes of honor mandating silence and loyalty, or *omerta*, the Italians controlled their members effectively—even family members suspected of being disloyal to the organization are killed. In sum, culture history helps explain organized crime and associated patterns of interpersonal violence; attention to the rational choice of supply and demand and important structural features of the environment is only part of the story.

Diversity due to multiple equilibria and dynamic complexity

Complex social systems are probably prone to having many alternative equilibria (Boyd and Richerson, 1992a). For example, moralistic punishment can, in principle, stabilize any behavior (Boyd and Richerson, 1992b). Game theorists discovered that games of any complexity typically have many equilibria, to the extreme that most strategies are equilibria if common enough (Rasmusen, 2001). We predict that institutions of honor, other forms of male violence like warfare, and peacemaking will be highly variable as a consequence. Societies with independent cultural evolutionary histories should often show marked differences in such institutions, even when operating in very similar economies and in the same environment.

Alternatively, we might imagine that large areas of the multi-dimensional space in which complex institutions are evolving is fairly flat or that the dynamics of political interaction are chaotic. Intuitively, the evolution of institutions of social control are prone to lags—only when violence becomes a serious problem do rigorous control institutions begin to evolve, and excessively rigorous controllers may turn on relatively minor deviants after they successfully

control major ones (Paciotti, 2002). Lagged effects are likely to generate complex dynamic trajectories. In such cases, even if equilibria exist, dynamic processes may cause ceaseless change without any strong tendency to remain at a single equilibrium much less to a single common equilibrium. Complex societies are notorious for showing patterns of expansion and collapse (Tainter, 1988) and examples like the societies documented in Edgerton (1992) suggest that simple societies may also often evolve in pathological or merely divergent directions due to complex dynamic properties of cultural evolution (Day, 1993).

An excellent example of cultural evolution exhibiting distinctly different political institutions in a common environment comes from Knauft's (1993) comparison of ethnic groups on the southern coast of New Guinea. Seven language-culture areas (Asmat, Kolopom, Marind, Trans-fly, Kiwai, Purari, Elema) are all located in similar ecological coastal areas. They share many historically derived features, yet have extremely different institutions to limit internal violence and wage war on neighboring groups. The Marind benefited from the strongest peacemaking institutions, and although uncentralized and without political hierarchy, were able to limit violence both within and between villages, and focus their aggression on other groups. Knauft (1993 p.139) writes, "Intra-Marind relations were amazingly non-violent among a population of 8,500 to 10,000 coastal Marind…most remarkable of all is that, in spite of the absence of intervillage authority and organization, they manage to maintain relatively peaceful conditions among themselves." From the perspective of Ellickson's (1991) framework, the Marind do not have organizational social controls due to an absence of hierarchal leadership, but have strong informal community institutions. By controlling internal violence, the Marind formed intra-ethnic alliances and large headhunting expeditions against different ethnic groups. In addition, unlike headhunters from other tribes, Marind headhunters could pass unmolested through Marind territories far from their local village.

Although possibly not as efficient as the Marind in limiting disputes and controlling violence, the Elema had peacemakers in their society (men wearing large masks exerted social control and mediated disputes within villages), and reduced intra-ethnic raiding. When war was waged between Elema, the conflicts were extremely rule-governed compared to other tribes—agreements were made about when fights would occur, temporary hostages were exchanged, and exact reciprocity through material compensation for killed or wounded men was mandated. In contrast, the Purari, Kolopom, and Amat were polarized into warring villages, and headhunting expeditions were directed at other intra-ethnic villages. In these three ethnic groups, peacemaking institutions were much weaker, and intra-ethnic feuding was endemic.

From our perspective, these distinct institutions for controlling violence are the result of cultural evolutionary trajectories that either stabilized on different optima or are evolving in response to complex dynamics, regardless of similar ecological conditions. Knauft's interpretation is similar: "These intra-regional differences do not correspond in direct fashion to basic contrasts in ecology, subsistence strategy, or social organization. Mythical and ancestral beliefs exerted decisive influence on subjective experience and on both political and ritual action" (Knauft, 1993 p.172). Contrary to a long tradition that opposes "scientific" and "historical" styles of explanation, rigorous scientific models of historical processes are perfectly possible (Boyd and Richerson, 1992a).

Conclusions

Our general conclusions are likely unsurprising to many; historical trajectories influence communities, regions and nations. Most are unsurprised that racist attitudes persist in the

American South, albeit diminishing, and we should similarly be unsurprised that weak peacemaking institutions and stronger honor institutions persist in at least parts of the South. However, specifically we have provided a sound theory of cultural evolution based on analysis of numerous models and empirical data that clearly illustrate why we should incorporate cultural analyses in many studies. Concerning violence, institutions of social control will vary because of the variable evolutionary trajectories of peacemaking institutions. Thus, institutional lags, pre-adaptations, and diverse outcomes in similar environments should be unsurprising in many analyses.

We believe cultural evolutionary theory offers great potential to be integrated with other theoretical models of interpersonal violence because institutions of social control that function to limit violent outcome of interpersonal disputes (or not) are cultural, and thus subject to interesting dynamics. Thus, we offer the following conclusions.

Pluralism: Ecological predictions from evolutionary, structuralist, and rational choice traditions offer important insights into causal forces associated with male violence. However, because humans obtain a substantial amount of their information culturally, and have pre-dispositions to sanction institutional rules, institutions of social control will often be the result of ecological forces. In other words, mate competition (Daly and Wilson, 1988) or discriminatory economic institutions (Krivo and Peterson, 1996) may create conditions favorable for the emergence of honor institutions that result in increased rates of violence. Further, other forces may create strong peacemaking institutions that limit aggressive competition. In sum, both ecological and institutional forces are tightly interconnected, and considering each force in isolation is bound to produce false dichotomies. We believe cultural evolutionary theory is a good candidate to integrate these different forces because it explicitly incorporates effects from genes, culture and environments in a manner that links micro-processes such as social learning to macro-level outcomes such as institutions.

Institutions and Cooperation: Our models suggest that the cultural rules of institutions are the required "glue" to make large-scale institutions function. Mathematical models suggest that without shared institutional rules, it is difficult to generate the required trust among strangers with indirect reciprocity or signaling. This is an important result, because it suggests problems with research efforts to understand both cooperative and competitive behavior overstresses the importance of social networks. Further, behavioral measures of "social capital" often focus on behavioral measures of organizational participation. For example, Putnam (1993, 2000) and Rosenfeld et al. (2001) use survey measures of interpersonal trust and participation in organizations such as bowling clubs and Elks organizations to explain civic participation and presumably peacemaking institutions that limit violence. These measures are more obtainable than network data (and possible more valid measures of cooperation), and likely function as good proxy measures of "social capital" or cooperative "glue." Nevertheless, attempts to develop methods to measure institutions *directly* will likely prove fruitful. If institutions are the causal force explaining institutional participation, and these have dynamic properties of their own, it is preferable to study institutions directly. Luckenbill and Doyle's (1989) recommendation to measure different types of institutions with scenarios, although possibly in many communities and regions, is one way to advance the institutional approach (see the also the important work of situational criminologists studying violent events (Luckenbill, 1977; Felson and Steadman, 1983; Felson, 1995)).

Historical Lags: Institutions evolve slowly and persist even when ecological or structural factors have changed. Numerous historical studies of interpersonal violence illustrate this pattern. Thus, violence researchers should not underestimate the power of institutions evolving over generational and longer time scales when attempting to understand modern patterns. A good example is Lane's (1986 p. 170) historical analysis of both the structural and cultural conditions in Philadelphia among African Americans. His data led him to the same conclusion concerning cultural evolution, albeit with a slightly different theoretical perspective:

> The underlying reason for these patterns among contemporary blacks, though related to the long history of economic discrimination, are not themselves simply or directly economic in nature. Culture, the product of history, is in this case more important than poverty or income.

By paying attention to historical data, violence researchers can begin to estimate lagged effects of institutions of social control on interpersonal violence. Once again, this is not the same thing as saying history is destiny! Clearly modern ecological and structural forces will be important, but one must keep a watchful eye for institutional lags and pre-adaptations that moderate the effects of other forces.

Multiple equalibria: Because complex systems stabilize on diverse equalibria, there are a myriad of ways to organize institutions of social control (Richerson, et al, 2002). As a result, researchers of institutions should expect to see institutional diversity in spite of ecological or structural similarities between units of comparison. For example, even though two countries have very similar structural conditions, their institutions of social control may have evolve in extremely different directions, with some coming to equilibrium on less functional local peaks Finally, classical deterrence theorists and advocates of formal criminal justice institutions should not be surprised that state institutions are less suited to control crime and violence than informal community institutions. Informal institutions, because of myopic evolutionary processes, have likely stabilized on functional outcomes to control violence. Attempts to reform these with "more advanced" formal institutions may only result in the destruction of a complex system without a viable replacement.

In conclusion, although evolutionary psychologists, structuralists, and rational choice theorist have yet to resolve their differences, each tradition offers important explanations of male violence. Further, although cultural explanations are often avoided, or viewed as post hoc descriptions, a large body of theoretical and empirical research suggests that ignoring culture, or using it as a last resort, is sure to fail in explaining behavior such as interpersonal violence. We have argued that institutions of social control, when clearly defined, can be objectively studied, and provide testable hypotheses about patterns of male violence. More specifically, because institutions are cultural phenomena, they can be analyzed with the rigorous models developed by cultural evolutionary theorists. Advocating on the principle of parsimony that mate competition or poverty is a simpler theory of male violence downplays the importance of understanding how social systems function and change. Parsimony that leaves important phenomena unexplained is a false principle.

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