

Chapter Six

Integrating Social Psychological Research on Aggression within an Evolutionary-based Framework

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The Perspective of This Chapter

An integrative perspective

In this chapter we review some recent social psychological research on the topic of aggression. To this task we bring the view that there is much to be gained from jointly applying evolutionary and more traditional social approaches to this phenomenon, as has been successfully done in some other areas of scholarship (e.g., Barkow, 1989; Fletcher, Simpson, Thomas, & Giles, 1999). Unfortunately, our view is not yet widely shared. This is evident in another recent review of the aggression literature, in which Geen (1998a) accurately notes that most researchers have largely ignored or dismissed evolutionary models. He further concluded that “it is too soon to tell whether social psychologists and psycho-evolutionists will eventually find much common ground” (1998a, p. 318). Since we believe that achieving such common ground would be exceptionally fruitful in aggression research, we will devote considerable attention to this issue.

Social learning theories typically have emphasized that “people are not born with preformed repertoires of aggressive behaviors; they must learn them in one way or another” (Bandura, 1973, p. 61). As Tremblay et al. (1999) note, this is an image dating back to Rousseau’s (1762/1911) model that children are born good and become bad under the influence of the environment. The integrative evolutionary-based approach we emphasize in this chapter uses a different conceptual framework. People are born neither “good” nor “bad.” They are born with evolved psychological modules that were “selected” by evolutionary forces because they helped solve the adaptive problems of our ancestors. These modules

include those underlying the use of aggressive tactics. This is no more “biological pessimism” than the recognition that humans are also born with innate modules underlying characteristics such as empathy and morality (e.g., Buck & Ginsburg, 1997; Darwin, 1871) is “biological optimism” (DeWaal, 1996). As emphasized here, most of these innate modules are relatively open or facultative programs that are also shaped in critical ways by social learning experiences.

The view of many social psychologists

The view of many social scientists is illustrated by Tedeschi and Felson’s (1994) discussion of so-called “biological” perspectives:

Although lower organisms may inherit instinctual behavior, humans do not. Furthermore, the development of language and culture by humans has transformed, redirected, and obscured whatever biological tendencies that may be coded in the genes . . . Biological capacities do not provide an adequate explanation for complex human actions . . . In general, we view biological factors as playing a remote causal role . . . (1994, p. 36)

While there appear to be a number of reasons (with which we generally disagree) why researchers such as Tedeschi and Felson have adopted such a view, two are particularly noteworthy. First, much of the research conducted by social psychologists has focused on the role of symbolic concepts, such as justice, revenge, honor, etc., which seem to play central roles. These researchers find no connection between such concepts and biologically relevant factors (e.g., physiological processes, evolved mechanisms, cross-species comparisons, etc.). Second, many researchers equate “biological” explanations with outdated models (see Buss, 1999, for a fuller discussion of this issue) and have little knowledge of recent theoretical formulations. In particular, they erroneously think of evolutionary-based approaches as necessarily suggesting inflexible behavior. After discussion of some key issues pertaining to the social psychology of aggression, we will summarize a recent evolutionary-based approach and then illustrate its utility for advancing aggression research.

Some Key Issues in the Social Psychological Literature

Defining and understanding aggression

Silverberg and Gray (1992) note that exasperation with adequately defining the concept of aggression has led many social scientists “. . . to accept the term as polythetic and to define it by adopting Justice Stewart’s ‘I know it when I see it’ stance on pornography” (1992, p. 3). Most social psychologists define aggression as a behavior directed toward the goal of harming or injuring another living being, who is motivated to avoid that harm (e.g., Baron and Richardson, 1994). This definition includes several key elements, wherein (1) aggression is a behavior, not an attitude, motive, or emotion; (2) an intention exists to cause harm to the victim; (3) some type of aversive consequences occur; (4) the victim is a living

being; and (5) the victim is motivated to avoid the harm (Baron, 1977; Berkowitz, 1993).

Aggression as tactic

Quigley and Tedeschi (1996) note that even though researchers typically “settle” on the type of definition given above, their actual research procedures are not well linked to the definition. For example, they note that researchers have not developed any measures of the intentions of the aggressors, even though intention has been a key feature of the typical definition. In their work Tedeschi and colleagues have reconceptualized aggression and have preferred to avoid using the word in favor of the term *coercive actions*, which they define as “an action taken with the intention of imposing harm on another person or forcing compliance” (Tedeschi & Felson, 1994, p. 168). They further note that actors expect that their coercive actions will lead to some valued proximate goal, either a tangible benefit to the coercer or a value such as justice, which is primarily based on retribution.

Although our perspective differs in key ways from that of Tedeschi and associates, in certain respects we agree with their critique of existing definitions. We particularly welcome their emphasis on understanding aggression as a tactic of influence. Our interchangeable use of the terms “aggression” and “coercive tactics” will reflect this perspective. We see this conceptualization as a positive step to better integrating the aggression literature within related work on social relations, both in humans and among other primates. For example, in relevant research employing such a “tactics conceptualization” in non-human primates, Humphrey (1976) has noted that “. . . the life of social animals is highly problematical. In a complex society, such as those we know exist in higher primates, there are benefits to be gained for each individual member both from preserving the overall structure of the group, and at the same time from exploiting and out-maneuvering others within it” (pp. 303–317). Coercive influence is one of the various tactics that can be used in such a social context. In research on humans, there has been a growing literature on the use of various social tactics that one person (the agent) exerts on someone else (the target) to induce a change in the target: reward, coercive, legitimate, referent, expert, and informational tactics (Raven, 1999). This research highlights the conditions under which one type of influence may be more effective than others. For example, if reward and coercion are used in relatively long-term interactions, they require the agent’s effective surveillance of the target’s behavior to insure compliance. In contrast, none of the other four influencing tactics requires such surveillance because the targets “internalize” this influence (e.g., when a person’s behavior has been changed via information or persuasion) (also see Molm, 1997).

Other social psychologists have also recognized, at least to some degree, the tactical functions of some aggressive acts in the context of the widely used distinction between *hostile* and *instrumental* aggression (Baron, 1977; Geen, 1998a). Similar distinctions have been successfully used to distinguish among various types of aggressors (e.g., Dodge & Coie, 1987). Definitions of *instrumental* aggression emphasize that any harm is primarily a tactical means of attaining other goals, such as social status, or money (e.g., Berkowitz, 1993). Such behavior has been described as a “learned” behavior (Berkowitz, 1998) involving relatively conscious, calculated analysis. Typically, the definition of the *hostile*

aggression emphasizes that harm or injury to the target is the primary goal of the behavior. Berkowitz (1993) suggests that in contrast to instrumental aggression, hostile (also called impulsive or emotional) aggressive acts involve little conscious analysis or calculation:

Many social scientists and mental health specialists have neglected impulsivity in emotional aggression. They seem to believe that virtually every act of aggression follows a more or less deliberate calculation of the action's possible costs and benefits. I argue that such considerations and evaluations are at times short-circuited, especially under the heat of intense feelings. The failure to recognize this factor . . . results in a seriously incomplete understanding of human aggression. (Berkowitz, 1993, p. 17)

Berkowitz (1993) particularly links hostile aggression with anger in response to frustration, but emphasizes the distinction between aggressive behavior and other correlated responses, such as emotions. He makes the following point (also see Richardson & Green, 1997):

Anger . . . doesn't necessarily have any particular goal . . . and doesn't serve any useful purpose for the individual in that particular situation . . . In my hypothetical example of the abusive husband . . . the man might or might not have an anger experience at this time, but if he does, this experience only goes along with his aggressive inclination and does not directly create it. (Berkowitz, 1993, pp. 20–21)

Berkowitz's model is based on the network theory of emotion which argues that emotions, cognitions, and even action tendencies are connected in memory through association. The activation of one element (e.g., anger) can spread to other "nodes" in the associative network, such as aggression. He and other social scientists do not question "why" many people's psychology would include behavior that does not seem to take into consideration the costs and benefits of their acts. Interestingly, Berkowitz (1994) incorporates in his description the observation that impulsive aggressors can be stimulated to increased violence by viewing the "pain cues" of their victims. Berkowitz here draws an analogy with hunger: "In a sense, the 'pain cues' function much like a hungry person's first bite of food and tell the aggressors that they are approaching their goal; they are coming close to satisfying their appetite; getting an adequate meal or, in the latter case, hurting their victim sufficiently" (p. 35). In the section below where we discuss the concepts of proximate and ultimate functions, the feeding system will also be used. It will hopefully illustrate how incorporating such concepts provides a better understanding of the evolved psychology of emotional (or hostile) aggression.

Rather than considering hostile and instrumental aggression as distinct entities, some researchers have argued that both types of aggression actually share some common underlying mechanisms (e.g., Dodge & Coie, 1987). For instance, Huesmann (1998) suggests that a key distinguishing element is the degree to which emotional anger underlies the aggressive response. He proposes that a continuum is the most suitable conceptualization, with instrumental and hostile aggression being at opposite ends of this emotional anger continuum. We believe that embedded in these types of ideas are evolutionary-based concepts about the functional design of the mind's architecture which would be enhanced considerably if social psychologists were to anchor their models more explicitly in the evolutionary literature regarding such concepts as the proximate and ultimate causes and functions of emotions. We discuss these concepts below.

Aggression in social relationships

It is important not only to recognize that coercive tactics are one of several influence strategies, but also that in other species it is evident that they are often embedded in the larger context of social relationships:

It must be obvious that war and violence are not human inventions in the same sense as are, say, the wheel and parliamentary government. Aggressive patterns are too transcultural and too similar to patterns observed throughout the animal kingdom. Neither can peacemaking be regarded as a uniquely human capacity. Over the past decade, my research team and several other primatologists have documented powerful behavioral mechanisms of social repair after aggressive disturbance among monkeys and apes. These mechanisms allow aggressive behavior to become a well-integrated part of relationships, so much so that it is fruitless to discuss this behavior outside the relational context. We need to think of aggression as one way in which conflicts of interest are expressed and resolved, and to be open to the possibility that its impact on future relationships ranges all the way from harmful to beneficial. (DeWaal, 1992, p. 37)

In anticipation of the model we will present below, we argue that humans and members of many other species inherit evolved modules (or specific psychological mechanisms) that *potentiate* the use of coercive tactics in response to particular environmental stimuli. Support for this point includes the observation that aggression occurs universally in all cultures (Segall, Ember, & Ember, 1997), that aggression-related emotions such as anger are universal (Ekman & Davidson, 1994), that they are evident in infants generally at very young ages (Sternberg & Campos, 1990; Lemerise & Dodge, 1993), that most children have had their "onset" of physical aggression by the time they are two years old (Tremblay et al., 1999) and that there are neural circuits in human brains that clearly appear designed to orchestrate affective attack (Panksepp, 1998). As emphasized below, although the capacity to aggress may reflect the workings of inherited mechanisms, this does not imply that aggressive behavior is justified or inevitable. Such coercive tactics are clearly one of several delimited alternative responses (see the earlier discussion of various tactics or bases of power) to a specific set of adaptive problems that were recurrent in our ancestors' environments. As Lore and Schultz (1993) note in their review of the extensive literature supporting the existence of evolved mechanisms potentiating aggression in various primate species: "... Even in so-called violence-prone animals, aggression is always an optional strategy . . . All organisms have co-evolved equally potent inhibitory mechanisms that enable them to use an aggressive strategy selectively or to suppress aggression when it is in their interest to do so" (p. 16).

Although we believe that cross-species comparisons can be very useful in developing understanding of the use of coercive tactics, we also suggest that some unique features of humans' cognitive capacities enable forms of social learning, particularly via social imitation and complex reasoning, that provide options for social influence that differ substantially from mechanisms of influence in other species. Similarly, humans' technological advances in weaponry (e.g., guns, nuclear weapons, etc.) have created a high risk of lethality from what some may describe as "common aggressive tendencies." Therefore, tolerating

some aggression as an integral part of normal social relationships, a phenomenon common in many other species, is not tenable for humans in their personal and international interactions. In consequence, a comprehensive understanding of the causes and effective preventative strategies of human aggression is much needed.

A Comprehensive Framework

A multi-level model

Tedeschi and Felson (1994) correctly note that research relevant to the topic of aggression has often failed to be well integrated among various disciplines and approaches and they call for bridge-building across some social science disciplines. However, as noted earlier, they largely exclude so-called “biological” approaches from this enterprise. We strongly support a more comprehensive integration of different levels of scientific analysis. This bridge should transcend traditional disciplinary boundaries by integrating knowledge derived from various “embedded” analysis levels, including evolutionary, genetic,¹ cultural, and developmental levels. These, in turn, should be used to examine how their interactions affect the characteristics of the individual today. Such an integrative framework in turn enhances understanding of the role of the more proximate “person by situation” interactional level that social psychologists often use to analyze behaviors.

Figure 6.1 illustrates critical elements that might be integrated within a multilevel model designed to explain human behaviors. In this case, it focuses on the factors leading to the enactment of various alternative influence tactics, including coercive tactics (i.e., aggression). This model, which incorporates both ultimate and proximate causal levels, includes some ideas from Malamuth and Malamuth (1999) and Geary (1998). This figure is designed to emphasize the interrelationships and interactions among different levels of analysis, with arrows indicating “causal” influences. This model incorporates (1) psychological mechanisms resulting from evolutionary-based adaptation at the species level, (2) the calibration of these mechanisms resulting from individual life-history adaptation, and (3) the activation of these evolved, calibrated mechanisms via proximate environmental input.

We suggest that the impact of each level on behavior can be better conceptualized by considering it within the framework of the other levels. A key starting point is at the level of the evolved psychological mechanisms or “mental organs” of humans. These include social, biological, and physical modules (Geary, 1998). Such evolved psychological mechanisms underlie the development of cultures and individuals, which we have subsumed in the section of figure 6.1 labeled Mechanism Calibration.² A focus on the interaction between cultural environments and individual developmental histories can greatly enhance analyses of the current characteristics of people and how they select, shape, and are affected by particular situational dynamics. The social psychological literature has particularly centered on variables we would classify within this figure’s Mechanism Calibration and Mechanism Activation levels (particularly the “person by situation” interactional level).

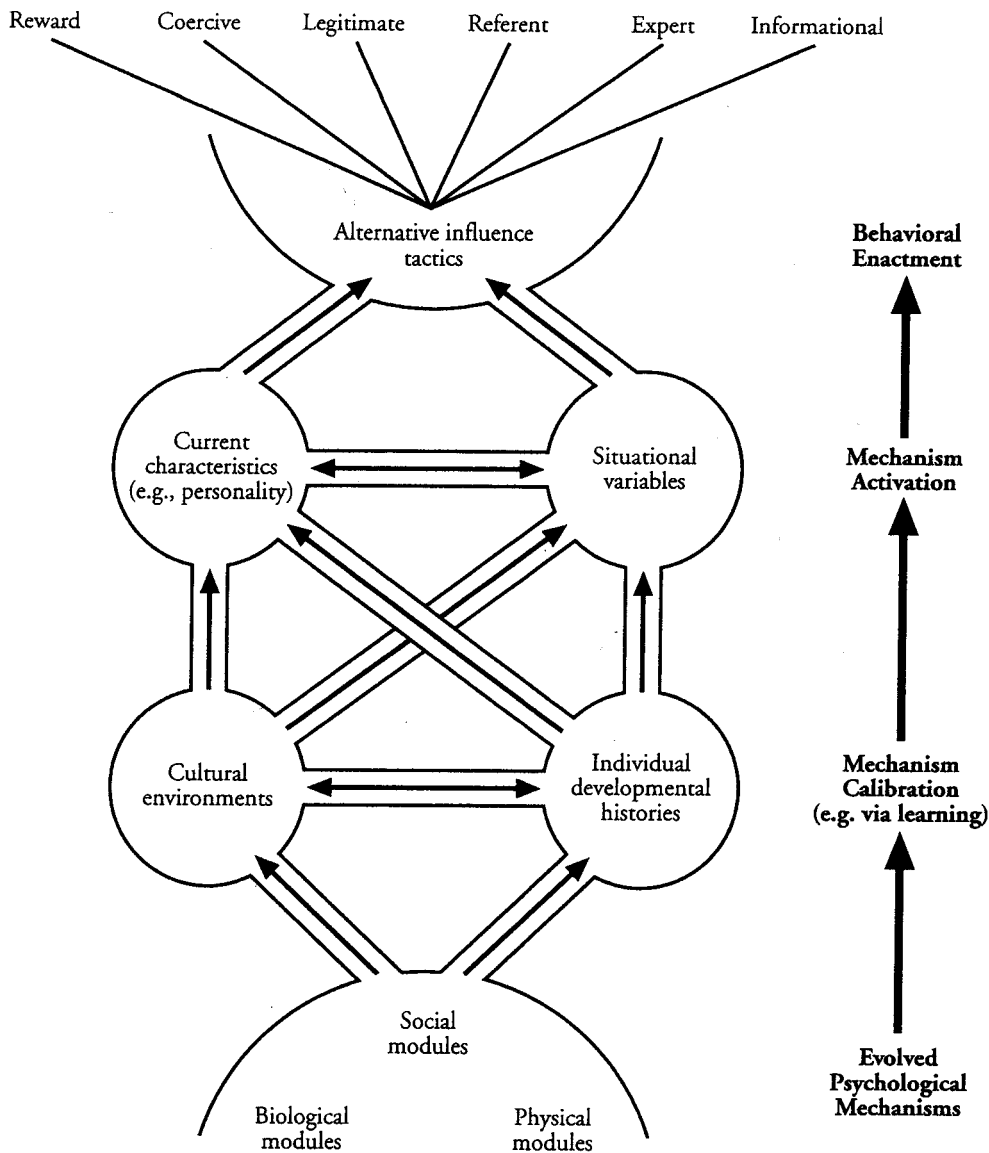


Figure 6.1 Conceptual framework showing how evolved modules are calibrated and activated to affect the enactment of alternative influence tactics.

The evolutionary model and computational theory

We would like to apply the framework outlined in figure 6.1 to an integration of the social psychological research on aggression with evolutionary psychology and associated computational theories of the mind (Buss, 1999; Cosmides & Tooby, 1995; Pinker, 1997). Such a perspective understands all human and other animal behavior as a function of the inter-

related blend of "nature and nurture," with each species possessing some unique evolved psychological mechanisms.

This approach clearly places emphasis differently than some reviews of the social psychological research on aggression. For example, Geen (1994) states that "social psychological approaches to aggression begin with the assumption that aggression is a reaction to situations . . . Other antecedents of aggression, whether genetic, temperamental, social or cultural in origin, are usually considered to act as moderators of situational effects but not to motivate aggression in and of themselves" (p. 51). Embedded in this conceptualization must be the recognition that some psychological mechanisms in the mind cause an aggressive reaction. How else could "situations" cause aggression? In our view, conceptualizing this issue as "aggression as human nature versus aggression as response" (Geen, 1998a, p. 317) obscures a critical point: a better understanding of the features of situations that may elicit an aggressive response can be gained by first understanding the nature of the psychological mechanisms that process the relevant situational information.

In his recent book, Pinker (1997) gives an excellent presentation of the evolutionary/computational approach. The following quote illustrates some central concepts particularly relevant to social psychologists:

Most intellectuals think that the human mind must somehow have escaped the evolutionary process. Evolution, they think, can fabricate only stupid instincts and fixed action patterns . . . But if evolution equipped us not with irresistible urges and rigid reflexes but with a neural computer, everything changes. A program is an intricate recipe of logical and statistical operations directed by comparisons, tests, branches, loops, and subroutines embedded in subroutines . . . Human thought and behavior, no matter how subtle and flexible, could be the product of a very complicated program, and that program may have been our endowment from natural selection . . . The mind, I claim, is not a single organ but a system of organs, which we can think of as psychological faculties or mental modules. (1997, p. 27)

Pinker notes that the computational theory of the mind explains how such abstract concepts as beliefs, attitudes, and desires are coded in the neurons of the brain, thus providing the link between symbols and physical states. In turn, this theory reveals how symbols affect our information processing mechanisms to influence behavior. We believe this is very important for social scientists to appreciate since some have rejected so called "biological models" largely because of difficulties in understanding how symbolic information can be related to "biological" entities. As Pinker notes, although brains differ in some key respects from computers (e.g., brains are parallel, doing millions of things at once, whereas computers are serial, doing one thing at a time), they share some important properties that illustrate how "symbolic information" can be coded in physical matter. This integrative theory demonstrates that the same fundamental neural tissue underlies the programs which guide the behavior of all species. It also demonstrates how differences in the connections and patterns of activity among neurons represent differing mind programs within and between species (Cosmides & Tooby, 1995).

In defining instincts as specialized programs (or decision rules), Pinker (1997) notes that humans actually have more of these than other species and that "our vaunted flexibility comes from scores of instincts assembled into programs and pitted in competitions"

(p. 184). In trying to better understand such a program, the focus of social psychologists may be described as centering primarily on:

- 1 "inputs" to the program (e.g., understanding what types of "content situations" are more likely to activate it);
- 2 calibration of the relevant mechanisms via social experiences (i.e., relatively long-term alteration in various information processing elements, such as the encoding and decoding of stimuli that can affect the way individuals respond to their environments);
- 3 making explicit the decision rules involved in the various stages of the program.

To illustrate the utility of the evolutionary-grounded approach, let us consider the typical definition of aggression used by most social psychologists (see above). We believe that a shortcoming has been the definition's emphasis on the goal of harming another without understanding, particularly in the context of hostile aggression, the functions of such harm for the aggressor. Many researchers continue to adopt this definition (e.g., Gustafson, 1994) without asking why such a seemingly "sadistic" decision rule might be embedded as part of the mind's architecture.

We suggest that understanding aggression within the framework of evolved underlying decision rules sheds light on why causing harm may have become an embedded heuristic, an agent's response to certain environmental inputs, such as perceived threats. Consider the possible utility of the following decision rule: (1) When threatened, identify the source of the threat, (2) cause losses (i.e., harm) to those people responsible for the threat. A psychological mechanism using this simple decision rule might have been selected because the losses of one's competitors or combatants often may be considered gains for the aggressor. When rapid responding was favored by selection pressures, it may have been more advantageous to be primed to cause harm to any perceived adversaries (i.e., as in hostile or emotional aggression) than to more deliberately evaluate the actual gains or losses from an aggressive action. Under some conditions, natural selection may have favored the efficiency of building in a simple "satisficing algorithm" which could often perform as well as more complex evaluating procedures (Gigerenzer & Goldstein, 1996; Ketelaar & Goddie, 1998).

Proximate and ultimate causes

A comprehensive understanding of any behavior requires attention to both proximate causes (in the person's lifetime) and ultimate functions (i.e., what the mechanism was designed to do, based on the consequences on survival and reproductive success in ancestral environments). Daly and Wilson (1994) nicely illustrate this distinction with feeding behavior. The proximal "goal" may be described as the inhibition of a central motivational mechanism, such as gut-load messages and blood sugar cues. But it is also essential to understand that the "ultimate" function of this system is to extract utilizable energy from food and to maintain energy balance.

While the mind was designed by natural selection processes operating in ancestral envi-

ronments as a function of fitness, people are not presumed to strive consciously to achieve the goal of fitness (Alcock, 1984). Rather, the types of mind mechanisms which evolved in ancestral environments and which can be "activated" in current environments were naturally selected because in those earlier environments they had fitness-favoring consequences.

The architecture of the mind

The evolutionary approach can be particularly helpful by focusing researchers' attention on the evolved architecture of the mind.³ It is composed of many information processing psychological mechanisms or algorithms. These were designed by selection processes largely as evolved "solutions" to adaptive problems recurrently faced by our ancestors.⁴ There is often confusion in equating evolutionary psychology with some form of genetic determinism. Although genes obviously play a role in enabling and limiting the range of all human behaviors, the algorithms underlying human development in different domains differ in the extent to which they are open to influence by environmental conditions. A *facultative developmental* algorithm is a relatively open mental program that directs development via interaction with particular features of the environment, whereas an *obligative developmental* algorithm is a mental program that is minimally affected by variations in environmental conditions (Alcock, 1984). The degree of genetic contribution to individual differences in various domains is a function of the extent to which the mental programs are facultative or obligative. Geary (1998) has described the former (which he labels open genetic systems as contrasted with closed genetic systems) as representing "skeletal knowledge" wherein domain-relevant experiences during development are essential for full adult competence. The underlying evolved "programs" include what may be described as "subroutines" that motivate children to seek out domain-relevant experiences encountered in emotionally stimulating environments (e.g., rough and tumble play) and to rehearse social scripts (e.g., playing "cops and robbers," engaging in relevant fantasy). Although understanding the evolved structure of the cognitive modules underlying behavior is essential, Geary rejects the idea suggested by some early ethologists that human behavior is reflexively driven by such modules in response to their eliciting environments. Instead, Geary and other evolutionary models (e.g., see Malamuth, 1998) have emphasized the calibrating or modulating effects of various other psychological mechanisms and experiences.

Facultative (or open) developmental programs may also differ. Geary distinguishes between two types of open genetic programs. One is where the genetic program codes for a finite list of possibilities, while experience during a sensitive period activates or deactivates subsets of the possibilities. It is exemplified by language learning. The other type of program is even more open. Although it biases the processing of domain-relevant information and influences the categorization processes, extensive experience is required. The latter type of cognitive model is quite common, and Geary suggests that an important function of relatively long pre-adult stages in our species is to enable the development of adult competencies adapted to local conditions based on the set of skeletal open genetic programs.

Evolution typically is a very slow process that requires many generations to modify the psychological architecture of the mind. Compared to our ancestral environments, current environments may share some features, but may also radically differ in others. It is therefore

important to recognize that the complex psychological adaptations developed in ancestral environments are likely to have undergone only minor transformations despite the changes that have occurred in the environments (Cosmides & Tooby, 1987). Evolutionary forces operate "indirectly" on current behavior by having forged the architecture of the mind which interacts with proximate factors, including socialization and situational contingencies (Fletcher et al., 1999). While in some areas the computational problems underlying the evolution of psychological mechanisms may not be very different from those faced by our ancestors (e.g., some perceptual tasks), in areas such as aggression, there are enormous differences. For example, the aggression our ancient ancestors commonly viewed in their everyday experiences provided them with veridical information regarding the frequency and consequences of such behavior in their environments. By contrast, the technologically produced environments people occupy today (e.g., where television violence is common fare) frequently provide highly skewed information. This conceptualization helps to explain why media violence and other forms of conflict viewed through mass media have become such common fare. They "parasitize" evolved attention mechanisms of psychological programs evolved in ancestral environments to be particularly alert to signals of threatening events, imminent danger, and violence or conflict (Posner & DiGirolamo, 1998).⁵

Understanding aggressive responses therefore requires them to be embedded within a model of the psychological architecture of the human mind that underlies decision making, which is based on both conscious and subconscious processes. As noted earlier, this architecture of the mind is composed of many psychological mechanisms. These need to be considered as interrelated "packages" of information processing devices designed to process certain types of inputs, using particular decision rules, and to emit certain types of outputs. Psychological mechanisms and the type of environmental input (e.g., features of situations) they can process, and are responsive to, are not two separable causal processes, but rather elements of the same evolved package (Tooby & Cosmides, 1990). The fact that aggression is often associated with particular situational inputs (e.g., goal blocking, threats, etc.), and internal emotions and cognitions (anger, negative affect, hostility, etc.) is because aggressive tactics evolved as one of a delimited set of optional behaviors within the context of an evolved "package" of psychological mechanisms.

Yet social psychologists have often stressed the relative independence of aggression as a behavior distinct from the various "emotions (e.g., anger) and cognitions (e.g., hostility) that happen to be associated with harmful actions" (Richardson & Green, 1997, p. 172). Such distinctions do enable important differentiation between the activation of psychological mechanisms that may lead to aggression as contrasted with the behavior itself (which is clearly not an inevitable consequence of the activation of these mechanisms). However, conceiving of aggression as an "evolved package" that allows for consideration of ultimate functions points to a rather different conclusion. From an evolutionary perspective, characteristics such as emotions are adaptations⁶ which function to alert the person to threats and opportunities and to prepare the organism for strategic behaviors (Nesse, 1990; Tooby & Cosmides, 1990). Without requiring relatively slower conscious processing, emotions may relatively quickly prime action tendencies: the emotion's hedonic component may prime approach or avoidance while the intensity may serve as an indication of the relative significance of the eliciting stimulus.

Emotions are not organized into one general emotional system but each type of emotion

(e.g., anger, affection, etc.) is designed as part of a response to a particular set of delimited conditions (or adaptive problems) as input, and transform that input into physiological and behavioral output specifically addressing that type of condition (Ellis & Malamuth, 2000; LeDoux, 1996). For example, inputs perceived as strategic interference elicit anger. Anger produces output changes in information processing (e.g., increased sensitivity to cost-inflicting behaviors), the release of certain hormones, and increased arousal (heightened autonomic activity). These outputs prepare the organism to potentially respond with rapid “fight or flight” actions that reduce interference (Buss, 1989; Malamuth, 1998). Anger is not only an energizer of behavior but it can also serve as an organizer of behavior and as a social signal (e.g., communicating threat) to others. Evolutionary-based theories regarding the motivational functions of affect systems can also be well integrated with the role of cultural expectations and the impact of social, cognitive, and moral motives (e.g., Buck, 1999). Similarly, an evolutionary perspective also incorporates the idea that the experience, display, and consequences of emotions such as anger are strongly affected by socialization by caregivers and the larger social context (Lemerise & Dodge, 1993). Finally, learning experiences may also reverse the causal sequence so that individuals come to seek out experiences that lead to positive emotions and avoid those that have become associated with negative emotions (Nesse, 1990).

The “deep structure” underlying aggression

Consideration of the human mind as shaped by evolutionary mechanisms suggests that social psychologists have overemphasized the extent to which people function as rational decision makers who consciously weigh the various costs and benefits of possible actions (for examples, see Raven, 1965; Tedeschi & Felson, 1994). Aggressive behavior should not be understood as the result of decision rules that are always accessible to conscious processing. Rather, aggression can more generally be conceptualized as a behavior whose most central function is coercive influence. It is one of several individual tactics of influence (for addressing problems of social conflict) that evolved as part of evolutionary stable strategies (Dawkins, 1986; Maynard Smith, 1982).

Applying such an analysis reveals the functional “deep structure” underlying aggressive tactics:

The relationship-specificity of human violence bespeaks its functionality: circumstances eliciting it are threats to fitness, and the targets of violence are generally not merely those available but those with whom assailants have substantive conflict . . . and hence have something to gain by subduing them. Threats to fitness as a result of others’ actions depend not only on the nature of the threats but also on the relationship and the reproductive value of the parties, and on the alternative avenues to fitness of each. The utility of using violence to protect, defend or promote fitness in past environments can be discerned by an analysis of the complex functionality of morphology and psychology . . . (Daly & Wilson, 1994, pp. 260–261)

Consider, for example, the fact that in several North American cities the most frequently occurring motive for homicide is labeled in police reports as “trivial altercations,” which

often amount to “face” and “status” disputes (Wilson & Daly, 1985, 1993). Moreover, this finding is not confined to North American cities but has been shown to be true elsewhere, including Israel (Landu & Drapkin, 1968) and Japan (Hiraiwa-Hasegawa, 1998).

Relying only on a proximate analysis, it is difficult to conceptualize such aggression as anything but pathological, largely because the eliciting events appear so trivial. However, Daly and Wilson (1988) argue that within the evolutionary framework, these events may actually have considerable importance due to their potential influence on a person’s reputation as someone “not to be messed with.” They note that “conflicts of interest are endemic to society, and one’s interests are likely to be violated by competitors unless those competitors are *deterred*” (p. 128). One effective means of deterring competitors in ancestral environments was to maintain a credible threat of violence but its utility in modern societies has been mitigated because the government has assumed the exclusive legitimate right to use force (although they may allow it in some special circumstances, such as in immediate self-defense). Daly and Wilson note that “wherever that monopoly is relaxed – whether in an entire society or in a neglected underclass – then the utility of that credible threat becomes apparent” (p. 28).

Humans, particularly young males, may therefore have evolved psychological mechanisms attuned to “face saving” and reputation maintenance. Therefore, what may be perceived by an observer as a trivial offense may be experienced by both perpetrator and target as a major affront. In the evolutionary environment where interactions with strangers were relatively rare, the willingness to fight may indeed have been important as a means of maintaining one’s reputation with significant others. In current environments where interactions often take place among strangers, there may be less discernible consequences, with no visible lessening on the agent’s ability to maintain a reputation and deter potential competitors. But protective mechanisms evolved to particularly function in small social groups may be activated currently even in stranger interactions using ancestrally evolved decision rules. Therefore, in examining the functionality of mechanisms that may increase the likelihood of aggressive responding (e.g., anger and shame) in current environments, it is not sufficient to examine the underlying logic in proximate terms only. It is also necessary to understand the development of these mechanisms (and the information they are designed to process) in terms of ultimate functions.

Frank (1988) presents a model of emotions that advances such understanding. He suggests that the function of emotion is to recalibrate assessments of self-interest to take future costs (or benefits) into account. Emotional predispositions evolved partly because, on average, they resulted in behaviors that appeared irrational in terms of short-term cost and benefit consequences but actually had beneficial consequences on fitness in the long term (on average, in the ancestral environments that shaped the mind’s evolution).

Let us consider how Frank’s commitment model might relate to our example of face and status disputes. One of two young men in a conflict situation aggressively pushes the other. What are the victim’s alternative courses of action? He might walk away. Logically this often seems the best course of action. The damage or cost of being pushed has already been incurred. The benefit of walking away is that no further bodily harm is likely. A second option would be to act aggressively. As this is likely to cause more bodily harm (an obvious cost to fitness which should be avoided), and because there appear to be no immediate benefits in such an action, it seems irrational. However, as we discussed above,

one effective means of deterring competitors is to maintain a "credible threat of violence."

The emotion of anger not only makes aggression more likely but also has characteristic facial expressions, changes in voice and posture. Thus anger initially may serve to signal a "threat of danger" to the competitor and may effectively deter the violator. However, if the threat does not act as a deterrent there must be a subsequent aggressive act or the credibility of the threat is eliminated (Daly & Wilson, 1988). After a reputation has been established, there may be little need for aggression, but until this occurs or in situations where the reputation is tested, aggression may maintain the credibility of this threat.

To reiterate, anger, which typically communicates threat and makes aggressive behavior more likely, may be the result of evolutionary-based "computation" which can serve "long-term interests" (at least within some ancestral environments) that the individual is not consciously aware of (Frank, 1988). This, of course, presents a somewhat different perspective than suggested by the quote presented earlier from Berkowitz (1993) regarding anger not having "a particular goal." However, it is more in keeping with Berkowitz's (1998) more recent description of the "automaticity" of some aggressive responses. The evolutionary framework also helps explain why certain mechanisms have "automatic" features. These developed for situations wherein quick and relatively fixed actions would have been advantageous. Some neural pathways mediating the "computation" by the relevant psychological mechanisms at subconscious levels have been described by LeDoux (1996). This work indicates that certain stimuli trigger information processing in two directions: one path activates behavior without conscious processing, while the other simultaneously sends information to "higher centers" that enable conscious analysis.

Aggression Research in Humans and Other Animals

Cross-species comparisons

Some social psychologists have emphasized the limitations of "biological" approaches and cross-species comparisons because of the unique aspects of human aggression (e.g., see Baron, 1977; Baron & Richardson, 1994; Tedeschi & Felson, 1994). We share the view that there are some evolved psychological mechanisms in humans which cannot be understood by simplistic inferences from other species. At the same time, we are convinced that some of the mechanisms often thought by social psychologists to be unique to humans exist in varying degrees in some other species and can be better understood within the framework of evolved mind mechanisms. For instance, Baron (1977), Baron and Richardson (1994), and Tedeschi and Felson (1994) repeatedly illustrate the uniqueness of human motives by pointing to retribution or revenge motives and emotions. Recent research actually demonstrates close parallels in other species. For example, in studying captive bonnet macaques, Silk (1992) found that males, in particular, join aggressive coalitions against specific individuals who had in the past been part of coalitions against them. Smuts and Smuts (1993) similarly concluded that male baboons engage in vicious punishing acts against females who have not associated or mated with them. The evolutionary logic under-

lying such acts has been explicated by Clutton-Brock and Parker (1995), who note that although positive reciprocity (reciprocal altruism) has been focused on extensively in evolutionary biology, negative reciprocity (retaliatory infliction of fitness reduction) has been largely ignored: "In social animals, retaliatory aggression is common, individuals often punish other group members that infringe their interests, and punishments can cause subordinates to desist from behavior likely to reduce the fitness of dominant animals. Punishing strategies are used to establish and maintain dominance relationships, to discourage parasites and cheats, to discipline offspring or prospective sexual partners and to maintain cooperative behavior" (p. 209). Clutton-Brock and Parker (1995) note the similarity of such punishing acts to human revenge motives. Indeed, such punishing strategies are often directed not only at the principal protagonists but also at their kin and they often appear "spiteful" – they appear to result in considerable cost to the punisher, at least in the more immediate context (Clutton-Brock & Parker, 1995). This result is similar to the costly outcome (in the short run) of reciprocal altruism (Trivers, 1971), although in negative retribution in the long run, there may be clearer evidence of reciprocity (Trivers, 1971). In the long run and in terms of ultimate, evolutionary-stable strategies, some game-theory modeling studies analyzing the logic of retributive behavior in many social species (Clutton-Brock and Parker, 1995) suggest the evolution of specific psychological algorithms underlying such behavior. Other modeling studies point to the evolution of psychological algorithms favoring cooperating, punishing non-cooperators, and punishing those who do not punish non-cooperators (Boyd & Richerson, 1992).

Human uniqueness

We believe that cross-species comparisons may be useful not only because they help shed light on evolved mechanisms and associated decision rules, but also because currently, our ethical system allows the study of other species in ways not permitted with humans, e.g., experimentally manipulating the effects of early deprivation on later aggression. While appreciating the benefits of examining other species, we also hold that certain features of our human psychological mechanisms are importantly unique, particularly those underlying the development of complex cultures and of social learning. As evolutionary anthropologists Boyd and Silk (1998, p. 633) note:

The idea that culture is separate from biology is a popular misconception that cannot withstand scrutiny. Culture cannot transcend biology because it is as much a part of human biology as bipedal locomotion. Culture is generated from organic structures in the brain that were produced by the processes of organic evolution. However, cultural transmission leads to novel evolutionary processes. Thus, to understand the whole of human behavior, evolutionary theory must be modified to account for the complexities introduced by these, as yet poorly understood processes.

It appears that more than any other species, humans have evolved specialized psychological mechanisms that are particularly adapted to enhance observational learning from other humans. As Henrich and Boyd (1998) suggest, "cultural transmission mechanisms

represent a kind of special purpose adaptations constructed to selectively acquire information and behavior by observing other humans and inferring the mental states that give rise to their behavior" (p. 217). This tendency may be easily observed in infants, who typically imitate spontaneously much of what they observe in other humans. Modeling others creates what has been termed a "second system of inheritance," whereby in addition to inheriting genes, humans "inherit" values and norms from others around them via processes that may even share some elements with genetic transmission (Dawkins, 1986). Such "conformist" mechanisms enable the development of gradual, cumulative knowledge transmitted culturally (e.g., strategies that evolve across generations and are adopted via observational learning of others rather than through direct individual experience). The role of media violence and other potential modeling influences in calibrating humans' evolved "aggression-relevant mechanisms" (see discussion below) can be better understood by looking more closely at "conformist" mechanisms.

Calibration/Modulation of Psychological Mechanisms

A primary emphasis of social psychological research on aggression can be described as focusing on how such "conformist" or social learning mechanisms affect various aspects of the development, alteration, maintenance, and activation of evolved modules pertaining to aggressive tactics. As discussed earlier, the underlying programs that potentiate the use of various cooperative, manipulative, and/or aggressive influence tactics are relatively open modules calibrated by relevant environmental experiences. We consider below examples of how these mechanisms are calibrated through social learning. First, we will discuss the social learning processes underlying the modulation of aggressive behavior (observational learning and enactive learning). Second, we will consider some of the known sources of social learning. Third, we will describe how individuals' cognitions and cultural norms moderate the impact of social learning.

Social learning and coercive tactics

The success of influence tactics is expected to vary from person to person in connection with environmental contingencies. One relevant piece of information in deciding which strategy to use is the potential consequences of behavior. According to the social learning paradigm, children acquire knowledge about behaviors and their consequences through two learning processes: (1) through the observation of others, and (2) through enactive learning (instrumental and classical conditioning) (Bandura, 1986).

Observational learning. From various sources, the child will observe numerous instances of aggressive behavior (as well as other influence tactics) and their consequences. Through observation the child gradually builds a repertoire of knowledge or mental models of different types of social situations, possible behavioral responses to those situations and possible outcomes resulting from the behavior. Thus, the form of the behavior, the situations

in which the behavior occurs, its appropriateness for these situations, and the probabilities of various consequences can be learned by the child. The organized mental representations of this learned information are called scripts (Huesmann, 1988).

Observation enables one to learn the consequences of behaviors without taking personal risks. This type of learning has obvious benefits in situations where there is a high probability that enacting behavior will produce severe and irreversible consequences. The observer also benefits from knowledge already acquired by others. Such learning, though, may be guided by evolved modules that "prepare" the organism for particular information (see Gallistel, 1995, for a general discussion of evolutionary-based models of learning). For example, in a series of well-known studies, Susan Mineka and her associates (Mineka, Davidson, Cook, & Keir, 1984; Mineka & Cook, 1993) showed that laboratory-reared monkeys having no experiences with or initial fear of snakes would quickly learn to fear this stimulus after watching a videotape of another member of their species reacting with fear to a snake. However, there was no evidence of similar observational learning when the monkeys saw the same fear response to a flower.

However, simply observing behavioral consequences for others does not ensure equal success when the observer employs the same tactics. The decision-making mechanisms need to be calibrated to relevant information for that individual (e.g., social status, physical size). In situations where the actor and the observer have relevant attributes in common there may be more utility in observational learning. Indeed research indicates that when the actor and observer share more in common, the information is encoded faster (Huesmann, 1986).

A recent series of studies have provided some intriguing early glimpses into possible neurological mechanisms, sometimes referred to as "mirror neurons," underlying observational learning in monkeys and humans (e.g., Rizzolatti & Arbib, 1998; Fadiga, Buccino, Craighero, & Fogassi, 1999). These researchers described certain parts of the brain where neurons are activated in very similar ways when an individual observes the actions of someone with whom they identify or when they engage in the same actions, or even when they simply imagine the same actions. Other associated neurons are activated only when the actor himself/herself engages in the behavior. Although clearly in its early stages, this work may help explain why observing others can be such a powerful influence, since some of the same mind "rehearsal" seems to occur during observation as in actual behavior enactment.

Enactive learning. Although observing others contributes in important ways to the calibration of psychological mechanisms, critical learning occurs when a child actually enacts and rehearses scripts. Depending upon how the child's own actions are reinforced, the probability that he will engage in similar actions increases or decreases. According to Bandura (1986) rewards and punishments for aggression are represented by anticipated consequences of the aggressive act for the individual and the utility or value that the potential outcome has for that individual. The positive consequences can include tangible rewards such as obtaining desired objects, positive self-evaluations, and favorable social reactions from others (e.g., increased status among peers, control or dominance over others, etc.). Similarly, if a child anticipates that negative consequences are likely to result from his or her aggressive behaviors, they are less likely to behave aggressively. Negative consequences might include physical punishment, social disapproval, harm or injury to another person, and disruption of social relationships.

Thus, according to the social learning paradigm, the child will initially learn aggressive behavior through observation of others. (Our evolutionary-based framework, however, conceptualizes such early experiences in terms of the calibration or modulation of already evolved psychological mechanisms.) Depending on what consequences are perceived for his/her own behaviors, the script may become more or less easily activated in subsequent similar situations. Studies supporting this model do indicate that aggressive children are more likely to predict that aggressive acts will result in tangible rewards and increased status among their peers and that such acts are more likely to stop others from behaving aversively towards them (Perry, Perry, & Rasmussen, 1986; Guerra & Slaby, 1990). In addition, Guerra and colleagues (Guerra, 1989; Slaby & Guerra, 1988) have shown that recurrent aggressive behavior during adolescence correlates with lower expectations of negative consequences for aggressive behavior.

Sources of social learning

There are various sources for observational learning. In addition to observing the behaviors of parents, siblings, teachers, and peers, the child receives information about the social environment from books, television, the internet, and films.

Media violence. Investigators have consistently documented that viewing violence in the media can influence viewers' aggressive tendencies (e.g., the number of aggressive behaviors committed by the viewer) and shape their perceptions and attitudes toward violence in the real world (Smith & Donnerstein, 1998). Some evolutionary theorists have criticized social learning theories for placing too much emphasis on observational learning from television and media sources. They note that violence and aggressive tendencies are prevalent in societies in which such media violence is not available (i.e., Chagnon, 1990). While it is true that in tribal societies, such as the Yanomamo, violence is pervasive without media sources for observational learning, there are certainly many other sources for observational learning in such societies (e.g., from witnessing violence and hearing stories about war raids).

We believe that the media is simply one of many sources from which information about the social environment can be gathered (consciously and unconsciously), but is one that is becoming an increasingly frequent source in modern societies. For example, studies have shown that 57 percent of television programs contain some violence (Kunkel et al., 1996) and that by the age of 13, children will have viewed 100,000 violent scenes on television (Huston et al., 1992). Importantly, however, not all portrayals pose the same risk to viewers. The context in which the violence is portrayed may increase or decrease the risk of increased aggressive tendencies in viewers (Kunkel et al., 1996).

Smith and Donnerstein (1998) reviewed nine different contextual cues that influence learning of aggression, fear, and emotional desensitization. Several of these contexts suggest that the more that this violence is judged "real" and relevant to the individual the more likely it is to affect future aggressive tendencies. For example, several studies have found that increasing the degree of realism raised aggressive responding in children and adults (Atkin, 1983; Berkowitz & Alioto, 1973; Geen, 1975; Thomas & Tell, 1974). The

degree of perceived similarity between the perpetrator and viewer also influences the degree of impact on aggression (Berkowitz & Geen, 1966, 1967; Hicks, 1965; Huesmann, 1986; Josephson, 1987). In addition, people are more likely to attend to, identify with, and learn from attractive role models than from unattractive ones (Bandura, 1986, 1994). Aggression research shows that exposure to violent perpetrators with good or heroic natures increases the risk of aggressive behaviors from both child and adult viewers (Leyens & Picus, 1973; Liss, Reinhardt, & Fredrikson, 1983; Perry & Perry, 1976; Turner & Berkowitz, 1972). Viewers become emotionally and physiologically desensitized when the duration of a violent act or its graphic portrayal are increased (Cline, Croft, & Courier, 1973; Lazarus & Alfert, 1964, Mullin & Linz, 1995). Perhaps more graphic acts appear to be more realistic. Studies also indicate that portrayed justification or social acceptance of violence increases viewers' aggressive tendencies (Berkowitz & Geen, 1967; Paik & Comstock, 1994). In contrast, viewing socially unjustified violence may cause a decrease in viewers' aggressive responding (Geen, 1981).

Interestingly, media research has documented reliable effects even when subjects are clearly aware that they are reading fictional portrayals. For instance, in a recent study by Strange and Leung (1999), it was found that both true and fictional news stories had similar influences in changing participants' judgments about the causes and solutions for societal problems (education and health care). In addition, the authors found that the greater the extent to which the stories (news or fictional) evoked participants' memories of related experiences, the more likely they were to influence the participants' subsequent judgments.

These and similar data fit in well with recent theorizing and integration of the available scientific literature regarding how people comprehend and validate social information. For example, Wyer and Radvansky (1999) describe a model that views comprehension as a process of constructing "situation models." They note that in modern societies, a major source of the models people construct is the mass media, particularly television. They further note that an important feature of human information processing is the ability to add "tags" to representations (such as situation models) to denote their falsity (e.g., no matter how many times you see Santa Claus on television, you still perceive him as a fictitious character). However, they argue that because information acquired from television is typically not extensively thought about, situation models constructed about fictitious people and events via the mass media are unlikely to be tagged as such. These models may therefore be stored in similar ways as models of events that have occurred in real life and not be often subject to source monitoring (Johnson, Hashtroudi, & Lindsay, 1993). Consequently, the models of fictitious events may be used as a basis for inference without discounting based on the context in which they were formed.

The extent of fictional influence via experiencing an event in the mass media may be related to the fact that although humans have some ability to "decouple" fiction and reality, our evolutionary environments did not have selection pressure to develop highly attuned mechanisms for such distinctions. For instance, even though in some ancestral environments storytellers may have told fictional tales, it was much easier to discriminate between such narrative and the "real world" than to distinguish real events from those depicted via the sophisticated technology of current times. Therefore, we did not

evolve strong mechanisms to be immune from fictional portrayals in the media and those motivated to minimize potential impact (e.g., parents) may have to stimulate "extra" cognitive effort by adding "tags" of falsity when observing television and other media.

Direct exposure to family violence. A variety of studies indicate that there is a positive relationship between direct exposure to familial violence in childhood and aggressive behavior in adulthood. For example, recurrently witnessing parental aggression as a child and/or being the victim of parental abuse is positively correlated with use of violence in dating (Foshee, Bauman, & Fletcher, 1999; Malamuth, Sockloskie, Koss, & Tanaka, 1991). Childhood victims of aggression also committed greater amounts of spouse abuse in adulthood (Hotaling & Sugarman, 1990) and inflicted more physical abuse on their own children (Zaidi, Knutson, & Mehm, 1989). Widom (1989) compared a group of children who were physically or sexually abused to another group that was matched on age, sex, race, and social class but who had not experienced child abuse. The author found that both physical abuse and neglect were strong predictors of adult criminal violence.

Studies also indicate that direct exposure to familial conflict is related to differences in children's aggressive tendencies toward their peers. For example, in several studies Cummings and his colleagues have shown that witnessing angry interactions between parents may contribute to aggression against other children (Cummings, Ianotti, & Zahn-Waxler, 1985; Cummings, Hennessy, Rabideau, & Cichetti, 1994; Davies & Cummings, 1994). In a study by Zaidi, Knutson, and Mehm (1989) subjects read hypothetical vignettes in which a child misbehaved. Those subjects who experienced severe physical punishment as children were more likely to recommend physical punishment for the transgressing child than those who had experienced little or no physical punishment.

Clearly, many studies support the hypothesis that witnessing and experiencing familial violence is related to aggressive tendencies but fewer studies have attempted to identify the mechanisms that may underlie this relationship. According to social learning theory, witnessing familial violence could lead to increased use of aggression in at least two ways. First, because aggression is more likely to be used when positive outcome expectancies are formed for using the behavior, children of violent parents may be more likely to use aggression when they have observed that parental use of aggression leads to more positive outcomes for the aggressive parent than negative outcomes. And second, there may be a lack of opportunities for the child to observe constructive strategies for conflict resolution. A recent study by Foshee et al. (1999) serves to illustrate the type of data gathered in this area. The researchers examined the mediators of the relationship between exposure to family violence in childhood and later dating violence using retrospective assessment of a large number of adolescents. The authors compared variables expected to mediate aggression according to social learning models as compared with social control theories. The social learning mediators are exemplified by variables such as acceptance of dating violence and an aggressive conflict style. The social control variables included parental attachment as well as commitment and belief in conventional rules of society. Support for some, but not all, of the social learning mediating variables was found for both males and females. For the social control variables, support for mediation was only found with male adolescents.

Directly experiencing violence as a child may cause the formation of hostile attribution biases (the tendency to "over attribute" to others hostile intentions). Several studies indicate that aggressive boys are more likely to attribute aggressive intent to others even when intentions are benign or ambiguous (Dodge, 1980; Nasby, Hayden, & DePaulo, 1979). Why should aggressive boys be more likely to infer harmful intent from others? Dodge and Coie (1987) suggest that a history of having to defend oneself against others might increase the probability that one will attribute hostile attributions to the actions of others. Thus, repeatedly experiencing aggression early in life (as is often true in cases of familial violence) may calibrate decision-making mechanisms in such a way that one is more likely to attribute hostile intention to others in social interactions. Perceptions of hostile intentions may then increase the likelihood that aggressive tactics are used in the social interaction. Gouldner (1960) suggests that if someone thinks that they are the victim of aggression, they are more likely to feel justified in retaliating aggressively. Supporting this view, Brown and Tedeschi (1976) found that the initiator of a hostile action is perceived as behaving unfairly, but that an aggressive response to such provocation is judged to be fair. Gouldner proposes that the justification of retaliatory aggression is a norm present in many societies. As noted earlier, retaliatory aggression is also common in various other social species.

Growing up in families with high levels of aggression may also result in the lack of opportunities to learn how to understand and regulate various emotions, such as anger (Dunn & Brown, 1994). For example, exposure to violence in childhood is correlated with heightened emotional reactivity (Davies & Cummings, 1998) and more anxiety, distraction, and withdrawal (Gordis, Margolin, & John, 1997) to staged and naturally-occurring anger episodes. It should be noted that although these types of findings support social learning formulations, it is difficult to disentangle the possible contributions to such individual differences of shared genetic factors underlying both parental violence and children's emotional and behavioral responses from the influences of being in such family environments. Research also indicates both the independent and mutually exacerbating influences of genetic vulnerabilities and risky family environments on the genesis of children's aggressivity and conduct disorders (Cadoret et al., 1995; Repetti, Taylor, & Seeman, 1999).

Moderators of aggression

Individuals' cognitions and perceived norms. According to the social learning model, children learn aggressive behaviors through observation of aggressive acts and through reinforcement of their own aggressive behaviors. The social scripts, which guide behavior, are modified during the learning process and become less flexible in adulthood. However, even after scripts or decision rules underlying the increased potential for aggression have been activated, the actual implementation of aggression may be moderated by other factors, particularly certain cognitions and beliefs. It has been suggested that normative beliefs, which are those held about what constitutes acceptable and unacceptable behavior (Guerra, Huesmann, & Hanish, 1994), act as filters influencing the likelihood that an activated script will be enacted in aggressive responses. Researchers have shown that the

normative beliefs of children and adults who are more aggressive are more accepting of aggression (Guerra, Huesmann, & Hanish, 1994; Huesmann & Guerra, 1997). However, these are correlative data and it remains to be convincingly shown that such beliefs actually have a causal role in the use of coercive tactics.

Bandura (1986) suggests that normative beliefs that do not condone violence can be disengaged in three ways: (1) by altering perceptions of the behavior itself, (2) through misrepresenting the effects that the harmful act has on others, or (3) by altering perceptions of the victim of the act. Moreover, Bandura, Barbaranelli, Caprara, and Pastorelli (1996) contend that "people do not ordinarily engage in reprehensible conduct until they have justified to themselves the rightness of their actions" (p. 365). These investigators examined the causal pathway by which a tendency for moral disengagement affects aggressive and antisocial behavior. The authors measured subjects' inclination to resort to various cognitions related to the three ways described by Bandura (1986). Their findings suggested that moral disengagement mechanisms act upon aggressive tendencies directly and also indirectly by influencing guilt, prosocial behavior, and cognitive reactions conducive to aggression.

Cultural norms. The transformation of harmful conduct through moral justifications may be a particularly effective means of eliminating self-deterrents if it is supported by significant others in one's group, thereby promoting self-approval (Bandura et al., 1996). Under these conditions aggression may be seen as an acceptable and even socially desirable behavior and may become a part of social norms. Such norms do not typically condone the indiscriminate use of aggression (which may threaten group cohesion) but may have certain identifiable decision rules regarding when aggression is or is not appropriate to use (e.g., against out-group but not in-group members).

Nisbett and Cohen (1996) suggest that cross-cultural consistency and variability in the shaping of evolved mechanisms of the mind can be conceptualized in the context of distinctions between adaptive problems that humans have had to solve in all environments (e.g., rearing offspring that are relatively helpless for long periods of time) and those that differ in varied ecologies and social environments (e.g., variations in availability of food or parasites). Such commonalities and differences in environments interact with the underlying evolved psychological mechanisms shared by members of our species to produce cross-cultural universality in certain phenotypic characteristics and cross-cultural variability in others. Once certain norms and values have emerged and are supported by various cultural institutions, they may be transmitted and maintained across generations even if the environments that originally led to their development have changed considerably.

The American South has long been regarded as more violent than the North (Fischer, 1989). Nisbett and colleagues (Nisbett, 1993; Cohen & Nisbett, 1994; Nisbett & Cohen, 1996) have shown that it is not violence in general that is more common in the South, but more specifically violence relating to self-protection, punishment of disobedient children and in response to insults. For example, Cohen, Nisbett, Bowdle, and Schwartz (1996) investigated differences in aggressive tendencies between Northern and Southern men in the laboratory. In order to invoke possible aggressive tendencies, a confederate of the experimenter bumped into each unsuspecting participant and then continued walking

down the hall, verbally insulting the research participant. Whereas Northerners were affected little by these insulting actions, Southerners showed behavioral, physiological, emotional, and cognitive signs of aggressivity. In comparison to the insulted Northerners, insulted Southerners had higher levels of cortisol, increased testosterone levels, were more likely to believe that the insult damaged their masculine status and reputation, were more likely to behave aggressively in a subsequent “chicken” game, were more likely to behave in a domineering fashion with the experimenter, and were more likely to complete an ambiguous story plot with themes of violence. In contrast, there were no differences in the attributions, behaviors, and physiology of those Northern and Southern participants who were not insulted.

The authors (Cohen & Nisbett, 1994) suggested that acceptance of violence, particularly in response to insult, arose as a form of self-defense of property and person. They postulate that a “culture of honor” has arisen in the Southern US because this area has historically been composed of herding communities in which there was inadequate or unjust law-enforcement. They further state that “such conditions perpetuated the culture of honor in the South, as it became important to establish one’s reputation for toughness – even on matters that might seem trivial on the surface. If one had been crossed, trifled with, or affronted, retribution had to follow as a warning to the community” (Cohen et al., 1996, p. 946). This analysis is reminiscent of Daly and Wilson’s (1994) point, noted earlier in this chapter, that whenever the State’s monopoly on the use of violence is relaxed, then the credible threat of aggression as a deterrent is likely to become more important.

Cultural norms may increase or restrain various forms of violence, depending on whether the particular types of aggressive acts are condoned or disapproved of by the particular culture. Moreover, the degree to which the norms supporting or condemning violence influence members of the culture may vary as a function of such factors as the cohesiveness of the family, community, and religious institutions. Support for this type of model was reported by Cohen (1998) who examined various indices of violence as a function of different norms and community cohesiveness in various regions of the United States.

Situational Activation of Psychological Mechanisms

Social psychologists have provided a rich literature on a variety of situational variables that interact with people’s psychological mechanisms to affect the probability of aggressive behavior. We will illustrate here the role of such situational factors by considering both (a) situational inputs that activate psychological mechanisms because their content is part of the “package” of those mechanisms, and (b) environmental stimuli that prime the psychological mechanisms because of their learned associations with particular aggression-related concepts. Due to space constraints, we will not consider other research, such as on the effects of alcohol consumption (e.g., Bushman, 1993, 1997; Lipsey, Wilson, Cohen, & Derzon, 1997) or heat (Anderson & Anderson, 1998) that concern situational variables modifying the functioning of psychological mechanisms.

Content situations likely to elicit aggressive tactics

As Buss (1999) has emphasized, evolutionary psychological models propose “. . . a specific interactional model – aggression as evoked by particular adaptive problems confronted in particular cost-benefit contexts. In principle, the mechanisms producing aggression could remain dormant for the entire life of an individual, if the relevant contexts are not encountered” (p. 285). Buss and Shackelford (1997) describe several of the recurrent “adaptive problems” to which aggression is likely to be an evolved “solution.” These include the following: (1) to co-opt resources from others, (2) to defend against assault, (3) to inflict costs on competitors, (4) to gain status and power, (5) to discourage competitors from using aggressive tactics, (6) to deter long-term mates from sexual infidelity, and (7) to reduce the amount of resources expended on unrelated offspring. Knowing some of the interpersonal conflicts that our ancestors would have recurrently faced over evolutionary history is valuable information because the evolved mental mechanisms are expected to be activated in current environments by contextual cues inherent to these types of interpersonal conflicts. In these situations, the mechanisms underlying various types of influence tactics are activated, making the use of aggression more likely. It is important to stress that the psychological mechanisms or “decision rules” are not static programs, but instead are designed by evolutionary processes to be “open” and flexible to relevant environmental stimuli. For example, decision-making processes are expected to be flexible to life history variables (e.g. previous success or failures using such tactics), and situational variables (e.g., a novel stimuli that become associated with certain concepts).

Priming of mechanisms

The evolutionary-based framework suggests that aggression may be triggered (i.e., activation of the relevant modules) by specific contextual stimuli, particularly those that “. . . resemble those in which our ancestors confronted certain adaptive problems and reaped particular benefits” (Buss, 1999, p. 284). In keeping with the computational theory of the mind, modern environments may present novel stimuli that also activate aggression-relevant psychological mechanisms. They do so because they are coded in the mind as part of “aggression-related” concepts, even though they do not correspond to a stimulus which appeared in ancestral environments. This is well demonstrated by research on the “weapons effect” using stimuli such as guns, which obviously did not exist in ancestral environments, but can become embedded in our evolved modules pertaining to aggression because the mind’s programs have the flexibility to integrate novel stimuli and images within a conceptual framework (Pinker, 1997).

Social psychological research indicates that the presence of common weapons, such as guns or knives, significantly increases aggressive responding both in the laboratory (Berkowitz & LePage, 1967) and in the real world (Turner, Layton, & Simons, 1975). It has been suggested that the presence of weapons or pictures of weapons may prime aggression-related thoughts and may increase the probability of aggressive behaviors (Berkowitz, 1990;

Carlson, Marcus-Newhall, & Miller, 1990). Direct support for the hypothesis in terms of thought has been recently provided by Anderson, Anderson, and Deuser (1996) and by Anderson, Benjamin, and Bartholow (1998). In the latter experiment, for example, subjects were presented (using words or pictures) with a prime stimulus (weapon or nonweapon) followed by a target word (aggressive or nonaggressive) that was to be read as quickly as possible. The findings clearly showed that the mere identification of a weapon primes aggression-related thoughts. Although such effects on cognitive processes have been demonstrated with both unprovoked and provoked individuals, studies focusing on actual aggressive behavior generally indicate that provocation is a necessary precursor of the weapons priming effect (e.g., Turner et al., 1975).

Concluding Remarks

Recent research by Tremblay et al. (1999) and other studies (e.g., Nagin & Tremblay, 1999) indicate that physical aggression is actually a normative behavior in young infants. The majority of children have learned to inhibit their physical aggression by the time they enter kindergarten and to use alternative tactics of influence. Such research supports the existence of a common decision rule to use oppositional and/or aggressive response to blocked goals (what Buss, 1994, has labeled strategic interference). Perhaps in some respects this decision rule may even function as an evolved "default" response, unless learning experiences foster and shape the "preferred" use of alternative tactics (potentiated by aspects of our evolved social modules). Learning experiences may be essential to countermand this "default" response and to encourage the use of other influence tactics potentiated by our evolved psychology. Research suggests that such learning is particularly critical in the early period of life (Tremblay et al., 1999). This finding is consistent with other recent studies (e.g., Pakaslahti, Spoof, Asplund-Peltola, & Keltikangas-Jaevinen, 1998). They indicate that parents of nonaggressive children are more likely to actively teach their offspring problem-solving strategies. By contrast, parents of aggressive children are not only more likely to avoid discussing problems with them but they are also more likely to divert them to other sources for solutions and to generally show indifference to helping them develop problem-solving strategies. In keeping with these findings, the integrative, evolutionary-based framework we have presented in this chapter suggests that if we want to minimize the use of coercive tactics by individuals, groups, and nations (Hall & Whitaker, 1999), then we must actively anticipate the potential use of aggression and promote early behavioral experiences as well as environmental conditions throughout life that inhibit aggression and encourage the use of other influence strategies.

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Notes

1. There is often confusion in equating an evolutionary approach with genetic contribution to behavior. Evolutionary psychologists generally study species-typical psychological mechanisms, whereas genetic behavioral researchers focus on the extent to which individual differences in genetic makeup contribute to various behaviors.
2. The concept of calibration is used here to refer to relatively long-term alteration in various information processing elements, such as the encoding and decoding of stimuli.
3. Some might argue that this type of theorizing is not amenable to systematic testing. Ketelaar and Ellis (2000) present an excellent discussion and defense of the testability of evolutionary psychological concepts.
4. Note that this does not mean that even for our ancestors, these adaptations had beneficial consequences in all or even most circumstances, but that everything else being equal, on average those of our ancestors who had this characteristic survived and reproduced more successfully than those who did not.
5. Consider the commonly used example of taste buds for sweetness, which evolved in ancestral environments as a way to increase the likelihood that we would jump at the opportunity to eat scarce substances that provided nutritional value (e.g., the sweetness in ripe fruit). In today's environments, these taste buds have been capitalized on to develop substances such as processed sugar, which also activates our sweetness mechanisms, but which may actually be harmful rather than beneficial to our health. In a modern environment with an overabundance of artificial sweets, the craving stimulated by the sight of candies may create difficulties in maintaining good health. This is an example of using our knowledge to create products that in the long run make our environments more difficult. But it can work the opposite way – just as we have created buildings, warm coats, and nutritional guidelines to enable our bodies to live comfortably in environments that they were not designed for (as were species with deep furs for living in cold environments), knowledge of our mind mechanisms can help us function more effectively in our social lives.
6. The wide consensus among scholars that the basic or simple emotions (such as anger, disgust, sadness, and fear) are universal is supportive of this perspective (Ekman & Davidson, 1994).

References

- Alcock, J. (1984). *Animal Behavior: An evolutionary approach*. Sunderland, MA: Sinauer.
- Alexander, R. D. (1979). *Darwinism and human affairs*. Seattle, WA: University of Washington Press.
- Anderson, C. A., & Anderson, K. B. (1998). Temperature and aggression: Paradox, controversy, and a (fairly) clear picture. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy* (pp. 248–298). San Deigo, CA: Academic Press.
- Anderson, C. A., Anderson, K. B., & Deuser, W. E. (1996). Examining an affective aggression framework: Weapon and temperature effects on aggressive thoughts, affect, and attitudes. *Personality and Social Psychology Bulletin*, *22*, 366–376.
- Anderson, C. A., Benjamin, A. J. Jr., & Bartholow, B. D. (1998) Does the gun pull the trigger? Automatic priming effects of weapon pictures and weapon names. *Psychological Science*, *9*, 308–314.
- Atkin, C. (1983). Effects of realistic TV violence vs. fictional violence on aggression. *Journalism Quarterly*, *60*, 615–621.
- Bandura, A. (1973). *Aggression: A social learning analysis*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1983). Psychological mechanisms of aggression. In R. G. Geen & E. I. Donnerstein

- (Eds.), *Aggression: Theoretical and empirical reviews* (Vol. 1, pp. 1–40). New York: Academic Press.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Bandura, A. (1991). Social cognitive theory of moral thought and action. In W. M. Kurtines & J. L. Gewirtz (Eds.), *Handbook of moral behavior and development: Theory, research, and applications* (Vol. 1, pp. 71–129). Hillsdale, NJ: Erlbaum.
- Bandura, A. (1994). Social cognitive theory of mass communication. In J. Bryant & D. Zillmann (Eds.), *Media effects* (pp. 61–90). Hillsdale, NJ: Erlbaum.
- Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology*, 71, 364–374.
- Barkow, J. H. (1989). *Darwin, sex, and status: Biological approaches to mind and culture*. Toronto: University of Toronto Press.
- Barnett, O. W., Fagan, R. W., & Booker, J. M. (1991). Hostility and stress as mediators of aggression in violent men. *Journal of Family Violence*, 6, 217–241.
- Baron, R. A. (1977). *Human aggression*. New York: Plenum.
- Baron, R. A., & Richardson, D. (1994). *Human Aggression*. New York: Plenum.
- Berkowitz, L. (1970). Aggressive humor as a stimulus to aggressive responses. *Journal of Personality and Social Psychology*, 16, 710–717.
- Berkowitz, L. (1990). On the formation and regulation of anger and aggression: A cognitive neo-associationistic analysis. *American Psychologist*, 45, 494–503.
- Berkowitz, L. (1993). Towards a general theory of anger and emotional aggression: Implications of the cognitive-neo-associationistic perspective for the analysis of anger and other emotions. In Wyer, R. S. & Srull, T. K. (Eds.), *Perspectives on anger and emotion: Advances in social cognition*, (Vol. 6, pp. 1–46). Hillsdale, NJ: Erlbaum.
- Berkowitz, L. (1994). On the escalation of aggression. In M. Portegal & J. F. Knutson (Eds.), *The dynamics of aggression: Biological and social processes in dyads and groups* (pp. 33–41). Hillsdale, NJ: Erlbaum.
- Berkowitz, L. (1998). Affective aggression: The role of stress, pain, and negative affect. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy*. San Diego, CA: Academic Press.
- Berkowitz, L., & Alioto, J. T. (1973). The meaning of an observed event as a determinant of its aggressive consequences. *Journal of Personality and Social Psychology*, 28, 206–217.
- Berkowitz, L., & Geen, R. G. (1966). Film violence and the cue properties of available targets. *Journal of Personality and Social Psychology*, 3(5), 525–530.
- Berkowitz, L., & Geen, R. G. (1967). Stimulus qualities of the target of aggression: A further study. *Journal of Personality and Social Psychology*, 5, 364–368.
- Berkowitz, L., & LePage, A. (1967). Weapons as aggression eliciting stimuli. *Journal of Personality and Social Psychology*, 7, 202–207.
- Boyd, R., & Richerson, P. (1992). Punishment allows the evolution of cooperation (or anything else) in sizable groups. *Ethology and Sociobiology*, 13, 171–195.
- Boyd, R., & Silk, J. B. (1998). *How humans evolved*. New York: Norton.
- Brock, T. C., & Buss, A. H. (1962). Dissonance, aggression and evaluation of pain. *Journal of Abnormal Social Psychology*, 65, 197–202.
- Brown, R. C., & Tedeschi, J. T. (1976) Determinants of perceived aggression. *Journal of Social Psychology*, 100, 77–87.
- Bryant, J., Carveth, R. A., & Brown, D. (1981). Television viewing and anxiety: An experimental examination. *Journal of Communication*, 31, 106–119.
- Buck, R. (1999). The biological effects: a typology. *Psychological Review*, 106, 301–336.
- Buck, R., & Ginsburg, B. (1997). Communicative genes and the evolution of empathy. In W. J. Ickes (Ed.), *Empathic accuracy* (pp. 17–43). New York: Guilford Press.
- Bushman, B. J. (1993). Human aggression while under the influence of alcohol and other drugs: An integrative research review. *Current Directions in Psychological Science*, 2, 950–960.

- Bushman, B. J. (1997). Effects of alcohol on human aggression: Validity of proposed explanations. In D. Fuller, R. Dietrich, & E. Gottheil (Eds.), *Recent developments in alcoholism: Alcohol and violence* (Vol. 13, pp. 227–243). New York: Plenum.
- Buss, D. M. (1988). The evolution of human intrasexual competition: Tactics of mate attraction. *Journal of Personality and Social Psychology*, *54*, 616–628.
- Buss, D. M. (1989). Conflict between the sexes: Strategic interference and the evocation of anger and upset. *Journal of Personality and Social Psychology*, *56*, 735–747.
- Buss, D. M. (1994). Personality evoked: The evolutionary psychology of stability and change. In T. F. Heatherton, & J. L. Weinberger (Eds.), *Can personality change?* Washington, DC: American Psychological Association.
- Buss, D. M. (1995). Evolutionary psychology. *Psychological Inquiry*, *6*, 1–30.
- Buss, D. M. (1999). *Evolutionary psychology: The new science of the mind*. Boston, MA: Allyn & Bacon.
- Buss, D. M., & Shackelford, T. K. (1997). Human aggression in evolutionary perspective. *Clinical Psychology Review*, *17*, 605–619.
- Cadore, R. J., Yates, W. R., Troughton, E., Woodworth, G., & Stewart, M. A. (1995). Genetic-environmental interaction in the genesis of aggressivity and conduct disorders. *Archives of General Psychiatry*, *52*, 916–924.
- Carlson, M., Marcus-Newhall, A., & Miller, N. (1990). Effects of situational aggression cues: A quantitative review. *Journal of Personality and Social Psychology*, *58*, 622–633.
- Carmelli, D., Rosenman, R. H., & Swan, G. E. (1988). The Cook and Medley Hostility Scale: A heritability analysis in adult male twins. *Psychosomatic Medicine*, *50*, 165–174.
- Carmelli, D., Swan, G. E., & Rosenman, R. H. (1990). The heritability of the Cook and Medley Hostility Scale revisited. *Journal of Social Behavior and Personality*, *5*, 107–116.
- Chagnon, N. A. (1990). Reproductive and somatic conflicts of interest in the genesis of violence and warfare among tribesmen. In J. Haas (Ed.), *The anthropology of war* (pp. 77–104). Cambridge, England: Cambridge University Press.
- Cline, V. B., Croft, R. G., & Courier, S. (1973). Desensitization of children to television violence. *Journal of Personality and Social Psychology*, *27*, 360–365.
- Clutton-Brock, T. H., and Parker, G. A. (1995). Punishment in animal societies. *Nature*, *373*, 209–216.
- Cohen, D. (1998). Culture, social organization, and patterns of violence. *Journal of Personality and Social Psychology*, *75*, 408–419.
- Cohen, D., & Nisbett, R. E. (1994). Self-protection and the culture of honor: Explaining southern violence. *Personality and Social Psychology Bulletin*, *20*, 551–567.
- Cohen, D., Nisbett, R. E., Bowdle, B. F., & Schwartz, N. (1996). Insult, aggression, and the Southern culture of honor: An “experimental ethnography.” *Journal of Personality and Social Psychology*, *70*, 945–960.
- Cosmides, L., & Tooby, J. (1987). From evolution to behavior: Evolutionary psychology as the missing link. In J. Dupre (Ed.), *The latest on the best: Essays on evolution and optimality* (pp. 277–306). Cambridge, MA: MIT Press.
- Cosmides, L., & Tooby, J. (1995). From function to structure: The role of evolutionary biology and computational theories in cognitive neuroscience. In M. S. Gazzaniga (Ed.), *The cognitive neurosciences* (pp. 1199–1210). Cambridge, MA: MIT Press.
- Cummings, E. M., Hennessy, K. D., Rabideau, G. J., & Cichetti, D. (1994). Coping with anger involving a family member in physically abused and non-abused boys. *Development and Psychopathology*, *6*, 31–41.
- Cummings, E. M., Ianotti, R. J., & Zahn-Waxler, C. (1985). Influence of conflict between adults on the emotions and aggression of young children. *Developmental Psychology*, *21*, 495–507.
- Daly, M., & Wilson, M. (1988). *Homicide*. Hawthorne, NY: Aldine de Gruyter.
- Daly, M. & Wilson, M. (1990). Killing the competition: Female/female and male/male homicide. *Human Nature*, *1*, 81–107.
- Daly, M., & Wilson, M. (1994). Evolutionary psychology of male violence. In J. Archer (Ed.), *Male violence* (pp. 253–288). London: Routledge.

- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Davies, P. T., & Cummings, E. M. (1994). Marital conflict and child adjustment: An emotional security hypothesis. *Psychological Bulletin*, 116, 389–411.
- Davies, P. T., & Cummings, E. M. (1998). Exploring children's emotional security as a mediator of the link between marital relations and child adjustment. *Child Development*, 69, 124–139.
- Dawkins, R. (1986). *The blind watchmaker: Why the evidence of evolution reveals a universe without design*. New York: Norton.
- DeWaal, F. B. M. (1992). Aggression as a well-integrated part of primate social relationships: A critique of the Seville Statement on Violence. In J. Silverberg and J. P. Gray (Eds.), *Aggression and peacefulness in humans and other primates* (pp. 37–56). New York: Oxford.
- DeWaal, F. B. M. (1996). *Good natured: The origins of right and wrong in humans and other animals*. Cambridge, MA: Harvard University Press.
- Diener, E., Dineen, J., Endresen, K., Beaman, A. L., & Fraser, S. C. (1975). Effects of altered responsibility, cognitive set, and modeling on physical aggression and deindividuation. *Journal of Personality and Social Psychology*, 31, 328–337.
- Dodge, K. A. (1980). Social cognition and children's aggressive behavior. *Child Development*, 51, 162–170.
- Dodge, K. A., & Coie, J. D. (1987). Social information processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, 53, 1146–1158.
- Dodge, K. A., & Newman, J. P. (1981). Biased decision making processes in aggressive boys. *Journal of Abnormal Psychology*, 90, 375–379.
- Dunn, J., & Brown, J. (1994). Affect expression in the family, children's understanding of emotions, and their interactions with others. *Merrill-Palmer Quarterly*, 40, 120–137.
- Ekman, P., & Davidson, R. J. (1994). Afterword: How is evidence of universals in antecedents of emotion explained? In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion: Fundamental questions* (pp. 176–179). New York: Oxford.
- Eley, T. C. (1997). General genes: A new theme in developmental psychopathology. *Current directions in psychological science*, 6, 90–95.
- Ellis, B., & Malamuth, N. M. (2000). Love and anger in romantic relationships: An independence model. *Journal of Personality*, 68, 525–556.
- Fadiga, L., Buccino, G., Craighero, L., & Fogassi, L. (1999). Corticospinal excitability is specifically modulated by motor imagery: A magnetic stimulation study. *Neuropsychologia*, 37, 147–158.
- Ferguson, T. J., & Rule, B. G. (1983). An attributional perspective on anger and aggression. In R. G. Geen, & E. I. Donnerstein (Eds.), *Aggression: Theoretical and empirical reviews* (Vol. 1, pp. 41–74). New York: Academic Press.
- Fischer, D. H. (1989). *Albion's seed: Four British folkways in America*. New York: Oxford University Press.
- Fletcher, G. J. O., Simpson, J. A., Thomas, G., & Giles, L. (1999). Ideals in intimate relationships. *Journal of Personality and Social Psychology*, 76, 72–89.
- Foshee, V. A., Bauman, K. E., & Fletcher, L. (1999). Family violence and the perpetration of adolescent dating violence: Examining social learning and social control processes. *Journal of Marriage and the Family*, 61, 331–342.
- Frank, R. H. (1988). *Passions within reason: The strategic role of the emotions*. New York: W. W. Norton.
- Gallistel, C. R. (1995). The replacement of general-purpose theories with adaptive specializations. In M. Gazzaniga (Ed.), *The cognitive neurosciences* (pp. 1255–1267). Cambridge, MA: MIT Press.
- Geary, D. C. (1998). *Male and female: Evolution of human sex differences*. Washington, DC: American Psychological Association.
- Geen, R. G. (1975). The meaning of observed violence: Real vs. fictional violence and consequent effects on aggression and emotional arousal. *Journal of Research in Personality*, 9, 270–281.
- Geen, R. G. (1981). Behavioral and physiological reactions to observed violence: Effects of prior exposure to aggressive stimuli. *Journal of Personality and Social Psychology*, 40, 868–875.
- Geen, R. G. (1994). Social psychological. In M. Hersen, R. T. Ammerman, & L. Sisson (Eds.), *Hand-*

- book of aggressive and destructive behavior in psychiatric patients* (pp. 51–64). New York: Plenum.
- Geen, R. G. (1998a). Aggression and antisocial behavior. In D. T. Gilbert, S. T. Fiske, and G. Lindzey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 317–356). Boston, MA: McGraw-Hill.
- Geen, R. G. (1998b). Processes and personal variables in affective aggression. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy* (pp. 1–48). San Deigo, CA: Academic Press.
- Geen, R. G., & Stonner, D. (1973). Context effects in observed violence. *Journal of Personality and Social Psychology*, 25, 145–150.
- Gigerenzer, G., & Goldstein, D. G. (1996). Reasoning the fast and frugal way: Models of bounded rationality. *Psychological Review*, 103, 650–669.
- Gordis, E. B., Margolin, G., & John, R. S. (1997). Marital aggression, observed parental hostility, and child behavior during triadic family interaction. *Journal of Family Psychology*, 11, 76–89.
- Gouldner, A. (1960). The norm of reciprocity: a preliminary statement. *American Sociological Review*, 47, 73–80.
- Gouze, K. R. (1987). Attention and social problem solving as correlates of aggression in preschool males. *Journal of Abnormal Child Psychology*, 15, 181–197.
- Guerra, N. G. (1989). Evaluative factors in social problem solving by aggressive boys. *Journal of Abnormal Child Psychology*, 17, 277–289.
- Guerra, N. G., Huesmann, L. R., & Hanish, L. (1994). The role of normative beliefs in children's social behavior. In N. Eisenberg (Ed.), *Social Development* (pp. 140–158). Newbury Park, CA: Sage.
- Guerra, N. G., & Slaby, R. G. (1990). Cognitive mediators of aggression in adolescent offenders: II. Intervention. *Developmental Psychology*, 26, 269–277.
- Gustafson, R. (1994). Alcohol and aggression. *Journal of Offender Rehabilitation*, 21, 41–80.
- Hall, H. V., & Whitaker, L. C. (1999). *Collective violence: Effective strategies for assessing and interviewing in fatal group and institutional aggression*. New York: CRC Press.
- Henrich, J., & Boyd, R. (1998). The evolution of conformist transmission and the emergence of between-group differences. *Evolution and Human Behavior*, 19, 215–241.
- Hicks, D. J. (1965). Imitation and retention of film-mediated aggressive peer and adult models. *Journal of Personality and Social Psychology*, 2, 97–100.
- Hiraiwa-Hasegawa, M. (1998). An evolutionary study of homicide: Universal patterns and cultural differences. Plenary address presented at the 10th annual meeting of the Human Behavior and Evolution Society, University of California Davis, Davis, California.
- Hotaling, G. T., & Sugarman, D. B. (1990). A risk marker analysis of assaulted wives. *Journal of Family Violence*, 5, 1–13.
- Huesmann, L. R. (1986). Psychological processes promoting the relation between exposure to media violence and aggressive behavior by the viewer. *Journal of Social Issues*, 42, 125–139.
- Huesmann, L. R. (1988). An information processing model for the development of aggression. *Aggressive Behavior*, 14, 13–24.
- Huesmann, L. R. (1998). The role of social information processing and cognitive schema in the acquisition and maintenance of habitual aggressive behavior. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy* (pp. 73–109). San Diego, CA: Academic Press.
- Huesmann, L. R., & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology*, 72, 408–419.
- Humphrey, N. K. (1976). The social function of intellect. In P. P. G. Bateson and R. A. Hinde (Eds.), *Growing points in ethology* (pp. 303–317). Cambridge, England: Cambridge University Press.
- Huston, A. C., Donnerstein, E., Fairchild, H., Feshbach, N. D., Katz, P. A., Murray, J. P., Rubinstein, E. A., Wilcox, B. L., & Zuckermann, D. (1992). *Big world, small screen: The role of television in American Society*. Lincoln, NE: University of Nebraska Press.
- Johnson, M. K., Hashtroudi, S., & Lindsay, D. S. (1993). Source monitoring. *Psychological Bulletin*, 114, 3–28.

- Josephson, W. L. (1987). Television violence and children's aggression: Testing and priming, social script, and disinhibition predictions. *Journal of Personality and Social Psychology*, *53*, 882–890.
- Kaufman, J., & Zigler, E. (1987). Do abused children become abusive parents? *American Journal of Orthopsychiatry*, *57*, 186–192.
- Ketelaar, T., & Ellis, B. J. (2000). Are evolutionary explanations unfalsifiable? Evolutionary psychology and the Lakatosian philosophy of science. *Psychological Inquiry*, *11*, 1–21.
- Ketelaar, T., & Goddie, A. S. (1998). The satisficing role of emotions in decision-making. *Psyche*, *7*, 63–77.
- Kunkel, D., Wilson, B. J., Linz, D., Potter, W. J., Donnerstein, E., Smith, S. L., Blumenthal, E., & Gray, T. (1996). *Violence in television programming overall*. University of California, Santa Barbara, Scientific Papers, National Television Violence Study. Studio City, CA: Mediascope.
- Landau, S. F., and Drapkin, I. (1968). Ethnic patterns of criminal homicide in Israel. Unpublished paper, Hebrew University of Jerusalem, Jerusalem, Israel.
- Lazaraus, R. S., & Alfert, E. (1964). Short-circuiting of threat by experimentally altering cognitive appraisal. *Journal of Abnormal and Social Psychology*, *69*, 195–205.
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Simon & Schuster.
- Lemerise, E. A., & Dodge, K. A. (1993). The development of anger and hostile reactions. In M. Lewis and J. M. Haviland (Eds.), *Handbook of emotions*. New York: Guilford.
- Leyens, J. P., & Picus, S. (1973). Identification with the winner of a fight and name mediation: Their differential effects upon subsequent aggressive behavior. *British Journal of Social and Clinical Psychology*, *12*, 374–377.
- Lipsey, M. W., Wilson, D. B., Cohen, M. A., & Derzon, J. H. (1997). Is there a causal relationship between alcohol use and violence? In D. Fuller, R. Dietrich, & E. Gottheil (Eds.), *Recent developments in Alcoholism: Alcohol and violence* (Vol. 13, pp. 245–282). New York: Plenum.
- Liss, M. B., Reinhardt, L. C., & Fredriksen, S. (1983). TV heroes: The impact of rhetoric and deeds. *Journal of Applied Developmental Psychology*, *4*, 175–187.
- Lore, R. S., & Schultz, L. (1993). Control of human aggression: A comparative perspective. *American Psychologist*, *48*, 16–25.
- Malamuth, N. M. (1998). An evolutionary-based model integrating research on the characteristics of sexually coercive men. In J. Adair, K. Dion, & D. Belanger (Eds.), *Advances in psychological science* (Vol. 2): *Personal, social, and developmental aspects* (pp. 151–184). Hove, UK: Psychology Press.
- Malamuth, N. M. & Malamuth, E. (1999). Integrating multiple levels of scientific analysis and the confluence model of sexual coercers. *Jurimetrics: Journal of Law, Science and Technology*, *39*, 157–179.
- Malamuth, N. M., Sockloskie, R. J., Koss, M. P., & Tanaka, J. S. (1991). Characteristics of aggressors against women: Testing a model using a national sample of college students. *Journal of Consulting and Clinical Psychology*, *59*, 670–681.
- McGue, M., Bacon, S., & Lykken, D. T. (1993). Personality stability and change in early adulthood: a behavioral genetic analysis. *Developmental Psychology*, *29*, 96–109.
- Maynard Smith, J. (1982). *Evolution of the theory of games*. Cambridge, England: Cambridge University Press.
- Mednick, S. A., Gabrielli, W. F., & Hutchings, B. (1984). Genetic influences in criminal convictions: Evidence from an adoption cohort. *Science*, *224*, 891–894.
- Milgram, S. (1974). *Obedience to authority: An experimental view*. New York: Harper & Row.
- Mineka, S., & Cook, M. (1993). Mechanisms involved in the observational conditioning of fear. *Journal of Experimental Psychology: General*, *122*, 23–38.
- Mineka, S., Davidson, M., Cook, M., & Keir, R. (1984). Observational conditioning of snake fear in rhesus monkeys. *Journal of Abnormal Psychology*, *93*, 355–372.
- Molm, L. D. (1997). Risk and power use: Constraints on the use of coercion in exchange. *American Sociological Review*, *62*, 113–133.
- Mullin, C. R., & Linz, D. (1995). Desensitization and resensitization of violence against women: Effects of exposure to sexually violent films on judgements of domestic violence victims. *Journal*

- of *Personality and Social Psychology*, 69, 449–459.
- Nagin, D., & Tremblay, R. E. (1999). Trajectories of boys' physical aggression, opposition, and hyperactivity on the path to physically violent and non-violent juvenile delinquency. *Child Development*, 70, 1181–1196.
- Nasby, W., Hayden, B., & DePaulo, B. M. (1979). Attributional bias among aggressive boys to interpret unambiguous social stimuli as displays of hostility. *Journal of Abnormal Psychology*, 89, 459–468.
- Nesse, R. M. (1990). Evolutionary explanations of emotions. *Human Nature*, 1, 261–289.
- Nisbett, R. E. (1993). Violence and US regional culture. *American Psychologist*, 48, 441–449.
- Nisbett, R. E., & Cohen, D. (1996). *Culture of honor: The psychology of violence in the South*. Boulder, CO: Westview Press.
- Paik, H., & Comstock, G. (1994). The effects of television violence on antisocial behavior: A meta-analysis. *Communications Research*, 21, 516–546.
- Pakaslahti, L., Spoof, I., Asplund-Peltola, R., & Keltikangas-Jaevinen, L. (1998). Parents' social problem-solving strategies in families with aggressive and non-aggressive girls. *Aggressive Behavior*, 24, 37–51.
- Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. New York: Oxford University Press.
- Perry, D. G., & Perry, L. C. (1976). Identification with film characters, covert aggressive verbalization, and reactions to film violence. *Journal of Research in Personality*, 10, 399–409.
- Perry, D. G., Perry, L. C., & Rasmussen, P. (1986). Cognitive social learning mediators of aggression. *Child Development*, 57, 700–711.
- Pinker, S. (1997). *How the mind works*. New York: Norton.
- Posner, M. I., & DiGirolamo, G. J. (1998). Executive attention: Conflict, target detection, and cognitive control. In R. Parasuraman (Ed.), *The attentive brain* (pp. 401–423). Cambridge, MA: MIT Press.
- Quigley, B. M., & Tedeschi, J. T. (1996). Mediating effects of blame attributions on feelings of anger. *Personality and Social Psychology Bulletin*, 22, 1280–1288.
- Raven, B. H. (1965). Social influence and power. In I. D. Steiner and M. Fishbein (Eds.), *Current studies in social psychology* (pp. 371–382). New York: Holt.
- Raven, B. H. (1999). Reflections on interpersonal influence and social power in experimental social psychology. In A. Rodrigues and R. V. Levine (Eds.), *Reflections on 100 years of experimental social psychology* (pp. 114–134). New York: Basic Books.
- Repetti, R. L., Taylor, S. E., & Seeman, T. E. (1999). Risky families: Family social environments and the mental and physical health of offspring. Unpublished manuscript, University of California, Los Angeles.
- Richardson, D. R., & Green, L. R. (1997). Circuitous harm: Determinants and consequences of nondirect aggression. In R. Kowalski (Ed.), *Aversive interpersonal behaviors* (pp. 171–188). New York: Plenum.
- Rizzolatti, G., & Arbib, M.A. (1998). Language within our grasp. *Trends in Neurosciences*, 21, 188–194.
- Rousseau, J. J. (1911). *Emile*. London: J. M. Dent (original work published 1762).
- Rushton, J. P., Fulker, D. W., Neale, M. C., Nias, D. K. B., & Eysenck, H. J. (1986). Altruism and aggression: The heritability of individual differences. *Journal of Personality and Social Psychology*, 50, 1192–1198.
- Sanders, G. S., & Baron, R. S. (1975). Pain cues and uncertainty as determinants of aggression in a situation involving repeated instigation. *Journal of Personality and Social Psychology*, 32, 495–502.
- Sanford, N., & Comstock, C. (1971). *Sanctions for evil*. San Francisco, CA: Jossey-Bass.
- Segall, M. H., Ember, C. R., & Ember, M. (1997). Aggression, crime and warfare. In J. W. Berry, M. H. Segall, & C. Kagitçibasi (Eds.), *Handbook of cross-cultural psychology: vol. 3: Social behavior and applications* (pp. 213–254). New York: Allyn-Bacon.
- Silk, J. B. (1992). The patterning of intervention among male bonnet macaques: Reciprocity, revenge and loyalty. *Current Anthropology*, 33, 218–225.
- Silverberg, J., & Gray, J. P. (Eds.) (1992). *Aggression and peacefulness in humans and other primates*.

New York: Oxford.

- Slaby, R. G., & Guerra, N. G. (1988). Cognitive mediators of aggression in adolescent offenders: 1. Assessment. *Developmental Psychology*, 24, 580–588.
- Smith, L., & Donnerstien, E. (1998). Harmful effects of exposure to media violence: Learning of aggression, emotional desensitization and fear. In R. G. Geen & E. Donnerstein (Eds.), *Human aggression: Theories, research, and implications for social policy* (pp. 167–202). San Diego, CA: Academic Press.
- Smuts, B., & Smuts, R. (1993). Male aggression and sexual coercion. *Advances in the Study of Behavior*, 22, 1–63.
- Sternberg, C. R. & Campos, J. (1990). The development of anger expressions in infancy. In N. L. Stein & B. Leventhal (Eds.), *Psychological and biological approaches to emotion* (pp. 247–282). Hillsdale, NJ: Erlbaum.
- Strange, J. J., & Leung, C. C. (1999). How anecdotal accounts in news and in fiction can influence judgments of a social problem's urgency, causes and cures. *Personality and Social Psychology Bulletin*, 25, 436–449.
- Tedeschi, J. T., & Felson, R. B. (1994). *Violence, aggression, & coercive actions*. Washington, DC: American Psychological Association.
- Thomas, M. H., & Tell, P. M. (1974). Effects of viewing real versus fantasy violence upon interpersonal aggression. *Journal of Research in Personality*, 8, 153–160.
- Thornhill, R., & Thornhill, N. W. (1992). The evolutionary psychology of men's coercive sexuality. *Behavioral and Brain Sciences*, 15, 363–421.
- Tinbergen, N. (1951). *The study of instinct*. London: Oxford University Press.
- Tooby, J. & Cosmides, L. (1990). On the universality of human nature and the uniqueness of the individual: The role of genetics and adaptation. *Journal of Personality*, 58, 17–68.
- Tooby, J., & Cosmides, L. (1992). The past explains the present: Emotional adaptations and the structure of ancestral environments. *Ethology and Sociobiology*, 11, 375–424.
- Tremblay, R. E., Christa, J., Perusse, D., McDuff, P., Boivin, M., Zoccolillo, M., and Montplaisir, J. (1999). The search for the age of "onset" of physical aggression: Rousseau and Bandura revisited. *Criminal Behaviour and Mental Health*, 9, 8–23.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology*, 36, 35–36.
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 1871–1971). Chicago, IL: Aldine.
- Turner, C. W., & Berkowitz, L. (1972). Identification with film aggressor (covert role taking) and reactions to film violence. *Journal of Personality and Social Psychology*, 21, 256–264.
- Turner, C. W., Layton, J. P., & Simons, L. S. (1975). Naturalistic studies of aggressive behavior: Aggressive stimuli, victim visibility, and horn honking. *Journal of Personality and Social Psychology*, 31, 1098–1107.
- Wash, G., & Knudson-Martin, C. (1994). Gender identity and family relationships: Perspectives from incestuous fathers. *Contemporary Family Therapy: An International Journal*, 16, 393–410.
- Widom, C. S. (1989). Does violence beget violence? A critical examination of literature. *Psychological Bulletin*, 106, 3–28.
- Wilson, M. I. (1989). Marital conflict and homicide in evolutionary perspective. In R. W. Bell & N. J. Bell (Eds.), *Sociobiology and the Social Sciences* (pp. 45–62). Lubbock, TX: Texas Tech University Press.
- Wilson, M., & Daly, M. (1985). Competitiveness, risk taking, and violence: The young male syndrome. *Ethology and Sociobiology*, 6, 59–73.
- Wilson, M., & Daly, M. (1993). Lethal confrontational violence among young men. In N. J. Bell & R. W. Bell (Eds.), *Adolescent risk taking* (pp. 84–106). Newbury Park, CA: Sage.
- Wyer, R. S. & Radvansky, G. A. (1999). The comprehension and validation of social information. *Psychological Review*, 106, 89–118.
- Zaidi, L. Y., Knutson, J. F., & Mehm, J. G. (1989). Transgenerational patterns of abusive parenting. *Aggressive Behavior*, 15, 137–152.
- Zimbardo, P. G. (1995). The psychology of evil: A situationist perspective on recruiting good people to engage in anti-social acts. *Research in Social Psychology*, 11, 125–133.

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