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An Adaptationist Perspective on the Psychology of Intergroup Prejudice

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Humans did not evolve to be racist, and racism is not an evolved psychological adaptation. For psychological traits to be considered adaptations, the problems that they are designed to solve must have been recurrent throughout the evolutionary history of the human lineage for long enough to have been shaped by natural selection. This is not likely to have been the case with racism, since only technologies developed relatively recently (in evolutionary time scale) have allowed humans to travel the types of long distances that enable members of differing racial groups to interact (Stringer & McKie, 1997). It is thus unlikely that natural selection shaped the human mind to produce a psychological system that was designed to promote racially biased cognition, attitudes, and behaviors. More plausibly, the mind generates mental representations of the self and others that might be described as racist as an epiphenomenon, or “by-product,” of mechanisms evolved to solve other categories of adaptive challenges in our evolutionary past.

But does this mean that understanding the psychology of racism precludes an evolutionary analysis of its origins and maintenance? No, it does not, as the scope of evolutionary approaches to human psychology is not limited to investigations of features of the mind that can plausibly be described as evolved adaptations but

also includes the study of traits that might be considered mental epiphenomena of adaptive systems—or, rather, “psychological by-products” of adaptations (Tooby & Cosmides, 1992). As such, there are ways that racism may be fruitfully investigated from an evolutionary perspective. The evolutionary approach we adopt has been referred to as the “adaptationist” perspective, which can be described as one which considers the likely selection pressures that recurred over evolutionary history to frame testable hypotheses regarding human cognition, attitudes, emotion, and behavior (Andrews, Gangestad, & Matthews, 2002; Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998; Tooby & Cosmides, 1992). An adaptationist approach involves a consideration that psychological systems underlying how people think about themselves and others are “for” functional ends—that is, they exist to solve some problem inherent in the human condition. Some such problems reflect unique challenges faced by humans, such as acquiring language; other challenges apply more broadly across several species, and include selecting mates, avoiding infectious disease, managing conflict with intrasexual competitors (by defeating or avoiding them), and acquiring or maintaining access to resources. As one might imagine, functional solutions to each of these problems may require different strategies, and these strategies may be generated from different psychological systems.

With respect to postulating the existence of an evolved psychology that generates racial prejudice as a by-product of other adaptive systems, predictions derived from an adaptationist perspective are informed by a consideration of the kinds of evolved psychological machinery that may be responsible for the social construction of “race,” and what kinds of downstream psychological biases may occur as a result. Among such possibilities are psychological mechanisms evolved to identify basic social categories (Cheney & Seyfarth, 1982; Tajfel, 1981), which can then be used to denote coalitional groups (Kurzban, Tooby, & Cosmides, 2001), or norm boundaries that allow for coordination within cultural groups (Gil-White, 2001; Hirschfeld, 1996)—none of which are mutually exclusive.

Whatever combination of basic cognitive processes is responsible for how humans think about race, we believe that a research program that tests hypotheses about when and how racial prejudice is expressed can be enriched by considering the kinds of challenges people face when interacting with individuals from a social group other than their own (hereafter referred to as *outgroups*). When an individual target is categorized as a member of an outgroup, how a person responds to him or her depends on many variables. When studying individual responses to others in intergroup contexts, it is helpful to think of outgroups as posing different kinds of adaptive challenges than do ingroup members. Furthermore, in some domains, the problems posed by outgroup members differ markedly depending on whether the target or the perceiver is male or female. However, in other domains, perhaps men and women may face similar threats from outgroups, regardless of target gender. As such, one might imagine that the psychology of intergroup prejudice differs considerably between men and women in some domains and but not in others. In this chapter, we describe how an adaptationist perspective can be utilized to begin to understand these

similarities and differences, and how it can provide both a rich source of theoretical tools for framing interesting hypotheses regarding the psychology and natural history of prejudice and perhaps some insight into why it is so persistent. Across domains in which the sexes differ and converge in their interactions with outgroups, we draw attention to the fact that intergroup bias is a complex phenomenon deeply rooted in our evolutionary history and likely has served functional outcomes for the agents of group-based prejudice and discrimination. An appreciation of this history is crucial to understanding the psychological underpinnings of racism, ethnocentrism, and other forms of xenophobia.

TWO PSYCHOLOGICAL SYSTEMS FOR PREJUDICE: ONE META-THEORY

The first domain we explore is one in which the challenges and solutions reflect different strategies between men and women, and it draws on insights from parental investment and sexual selection theories (Darwin, 1871; Bateman, 1948; Trivers, 1972). Along these lines, we posit that selection has produced psychological systems managing the cognitive processing of the risks and benefits of physical and sexual aggression in intergroup contexts (Thornhill & Palmer, 2000; Tooby & Cosmides, 1988; Navarrete, McDonald, Molina, & Sidanius, 2010), the former being relevant primarily for males as both the agents and the targets, and the latter being relevant primarily for males as the agents and females as the targets.

The second domain is one that reflects greater similarity between men and women in the strategies taken to meet a challenge, and it is informed by the literature on psychological manifestations of disease-avoidance strategies (Curtis & Biran, 2001; Fessler, 2002) more recently characterized as part of an evolved “behavioral immune system” (Schaller & Duncan, 2007; Neuberg, Kenrick, & Schaller, 2011). Within this framework, we suggest that interactions with outgroups pose an adaptive problem that afflicts both sexes relatively equally: that of risking contact with foreign vectors of infectious disease.

In attempting to provide intellectually satisfying accounts of how the psychology of prejudice operates across both these domains, it is perhaps most fruitful to stay true to a broader computational approach shared by psychologists of different stripes and stay away from the language of tired and unproductive discourse such as that of the debates about *nature versus nurture*, *genes versus culture*, or even *personality versus social context*. Such language only distracts from drawing insight from the conceptual gains made across the social sciences in which broad consensus exists, such as the understanding that the workings of the mind could be better understood as the output of computational systems with working mechanisms designed “for” a purpose or goal of the system (e.g., Tooby & Cosmides, 1992). The mechanisms that compose these systems may be understood with little concern as to how much of the design of a given mechanism is owed to genetically versus socially transmitted information, since natural selection is indifferent to whether the information that builds

computational systems comes from genes or from environments (Dawkins, 1982). Rather, what matters is that the mechanisms that generate behavior operate on reliable, species-typical decision rules which the laws of selection can then shape, depending on whether the outcomes have effects on survival and reproduction in a given environment. The decision rules themselves may be affected by the experiences and “life history” of the organism, and they may differ considerably between individuals within the same species as a reflection of their adaptive strategies to their unique circumstances (Griskevicius, Tybur, Delton, & Robertson, 2011; Kaplan & Gangestad, 2005). From this broad, computational understanding of psychological systems, the utility of dichotomous thinking regarding even notions such as the relative importance of personality versus social contexts becomes ever less compelling, since one’s “personality” or “context” are more rightfully conceptualized as informational inputs into the computational systems of the mind—systems which must yield, as does all of nature, to the forces of natural selection.

EVOLVED SEX DIFFERENCES IN THE PSYCHOLOGY OF PREJUDICE: DIFFERENT ADAPTIVE PROBLEMS YIELDS DIFFERENT PSYCHOLOGIES

The Roots of a Male-Specific Psychology of Prejudice

Sexual selection is a component of natural selection that operates along two pathways (Darwin, 1871; Fisher, 1930; Andersson, 1994)—*intra-* and *inter-*sexual selection. Intrasexual selection involves competition between members of the same sex and produces traits that are useful in competition with same-sex rivals in gaining access to mating opportunities (e.g., elongated teeth and horns, large muscles). Intersexual selection involves a feedback process in which the strategies and preferences of one sex give rise to counter-strategies and preferences in the other. Rather than evolving to subdue same-sex rivals via intrasexual competition, this process typically encourages the evolution of traits that are useful in attracting members of the opposite sex (e.g. plumage, nuptial gifts, etc.).

Parental investment theory begins with the observation that, for most sexually reproducing organisms, the sexes differ in the minimum physiological effort they must exert to produce viable offspring (Clutton-Brock, 1991). Humans are no different in this respect. For example, at minimum, women must bear the costs of gamete production, fertilization, placentation, gestation, birthing, and lactation, whereas men are minimally obligated to invest solely in the energy required for gamete production and fertilization. Given this disparity, the marginal fitness gains from acquiring multiple mates are far greater for men than for women, and the costs of mating with a poor quality mate are far greater for women than for men. That is, women are physically constrained by their reproductive physiology for a relatively lower potential for quantity over their lifespan, and increasing the number of sexual partners does not increase offspring

count to the same degree as it does for men. In fact, it can place women at higher risk for harmful consequences of sex, including infection and poor genetic quality of the copulating partner, without the cost offsets of steeply increased offspring number, as is the case for men.

Taken together, insights from sexual selection and parental investment theory suggest that this fundamental difference in reproductive physiology between the sexes produces an asymmetry in the strength of intrasexual competition, with competition for mates operating more strongly on males (Trivers, 1972). For men, risky, aggressive, and dangerous tactics used to subdue, debilitate, or eliminate same-sex competitors can greatly increase reproductive output by signaling dominance and perhaps underlying genetic quality (Griskevicius et al., 2009) or by increasing sexual access to the associated opposite-sex surplus. For women, however, given the constraints of their reproductive physiology, the same risky, potentially dangerous tactics would not significantly increase reproductive output.

The above suggests that, when we apply the principles of sexual selection and parental investment to the problem of human intergroup aggression, we should expect males to be both its primary agents and its targets (Buss & Shackelford, 1997; Daly & Wilson, 1988; Sidanius & Pratto, 1999; Tooby & Cosmides, 1988). This can occur even under conditions of high risk of injury or death, since the formation of coalitions is typically characterized by mechanisms for effective risk management (such as a “veil of ignorance” of who lives or dies) and “winner take all” outcomes that create massive incentives for survivors—incentives that may increase even as casualties mount, since gains rise steeply as the number of survivors drops (Choi & Bowles, 2007; Tooby & Cosmides, 1988). In sum, the wasteful “dysfunction” of intergroup aggression among males persists because the offsetting reproductive gains are potentially immense, and this harsh state of affairs generates the incentive for men to engage in risky and aggressive strategies in order to dominate other groups, as well as to avoid being dominated. With respect to what this means for a male-specific psychology of prejudice, we suspect that it taps into a psychological system for managing intergroup relations designed ultimately to perpetrate and resist intergroup dominance and aggression among males. And, to the extent that racial categories can be mentally represented as group-like entities to the human mind (Kurzban et al., 2001), we submit that the workings of this psychological system should be detectable in empirical investigations of intergroup phenomena—including sex differences in behavior, emotional reactions, attitudes, and cognitive processing.

As expected from this basic theoretical framework, the incidence of “real-world” intergroup aggression differs markedly between the sexes. Across human societies, intergroup aggression is characterized by an asymmetry between men and women as both targets and aggressors, such that lethal aggression in domains ranging from gang fights to regional and geopolitical conflict can be described as primarily “a male affair” (for reviews, see Daly & Wilson, 1988; Keegan, 1993; Wrangham & Peterson, 1996). Archeological, primate, and genetic studies have affirmed that this is likely to have been the case throughout human evolutionary history (e.g., Keeley, 1996; Kelly,

2005; Makova & Li, 2002; Wrangham & Peterson, 1996). In modern societies, it is men that are primarily involved in most acts of group-based violence, ranging from lynchings to hate crimes, many of which are racially motivated (reviewed in Sidanius & Pratto, 1999).

Data from studies measuring racial attitudes and discrimination support this perspective. Based on the idea that racially prejudiced attitudes can be conceptualized as a type of “low-level” expression of intergroup aggression among males, Sidanius & Veniegas (2000) made two predictions: (1) that men should express greater racial prejudice and discrimination than women and (2) such prejudice should be more strident against males of the racial outgroup. Survey evidence does in fact suggest that men are, on average, more biased than women on explicit measures of race bias (e.g., Ekehammar, 1985; Ekehammar & Sidanius, 1980, 1982; Furnham, 1985; Marjoribanks, 1981; Sidanius, Cling, & Pratto, 1991; Sidanius & Ekehammar, 1980).

Archival and audit studies have provided some support for the second prediction that men are the targets of greater levels of group-based prejudice. Examples are readily found in audit studies in the educational system (Gordon, Piana, & Keleher, 2000), the labor market (Arai & Thoursie, 2009; Aria, Bursell, & Nekby, 2008; Carlsson & Rooth, 2007; Stroh, Brett, & Reilly, 1992), sales pricing of autos (Ayers & Siegelman, 1995), and criminal sentencing (Bushway & Piehl, 2001; Steffensmeier, Ulmer, & Kramer, 1998). Although such outcomes are certainly indicative of “real-world” discrimination, these studies have the limitation that, because the gender of the agent of prejudice is anonymous, it is not clear whether the male-targeted outcomes are the result of greater discrimination among men or whether women also contribute to such negative outcomes for outgroup men.

Some experimental evidence supports the notion of the greater evocative salience of male outgroup targets in engendering biased reactions, as it has been found that men of racial outgroups, relative to female outgroup targets, elicit greater bias with respect to punitive attitudes about criminal sentencing (Haley, Sidanius, Lowery, & Malamuth, 2004), resist extinction of conditioned fear (Navarrete et al., 2009), and facilitate superior detection in visual search tasks akin to the kinds of abilities typically evoked by natural hazards such as snakes or spiders (Ackerman et al., 2006).

Navarrete et al. (2010) tested a more rigorous set of predictions derived from this framework along the following lines. These predictions were informed by a consideration of the specific selection pressures postulated to have shaped the intergroup psychology of men—particularly that the mechanisms that generate racial and ethnic prejudice tap into evolved psychological systems designed to manage aggressive competition among men in high-stakes, risky intergroup contexts. They made two predictions regarding a male-specific psychology of prejudice. These were (1) that discriminatory outcomes would be most strident when men were pitted against other groups of men; and (2) that aggression and social dominance would be the motivation for prejudice more strongly and consistently for men relative to women.

In an experiment using male and female research participants who made decisions regarding fictitious zero-sum outcomes with groups composed of all males or all females, the outcomes were consistent with these predictions. Specifically, when given the option of inflicting a spiteful, costly punishment on another group at the cost of ingroup resources, men choose to punish outgroup male groups but not outgroup female groups, and women choose not to punish any groups. In another series of studies (Studies 2 and 4; Navarrete et al., 2010), men's racial prejudice was found to be related to individual differences in aggression, particularly when the men's goal of intergroup dominance was chronically salient.

In concert with the widely documented sex difference in general prejudice against outgroups, these nuanced patterns of sex-specific relationships among target gender, agent gender, aggression, and the goal of social dominance suggest a meaningful component of racial prejudice may be fundamentally related to recurring intergroup conflict among human males over evolutionary history. However, male-male competition alone does not explain another important aspect of prejudice: that exhibited by women. Although much evidence suggests that women are generally less prejudiced than men, they are clearly not free from bias. In reports where the gender of the outgroup target is manipulated, even though male targets elicit greater biased responses among research participants, levels of bias between male and female participants are sometimes similar (e.g., Haley et al., 2004; Navarrete et al., 2009); in fact women show greater bias than men in some studies (e.g. Owens, Shute, & Slee, 2000; Stets & Straus, 1990; Fisman, Iyengar, Kamenica, & Simonson, 2008). Such findings showing that women demonstrate considerable bias themselves suggest that psychological processes other than those that have evolved to manage intra-sexual competition among men may be at work in the psychologies of women.

Below, we describe a *female-specific* psychology that may have evolved in response to the unique problems that women have faced in conflicts of interest with men of other social groups.

Intersexual Selection and Intergroup Conflict

We have argued above that the evolutionary history of aggressive intergroup conflict has been largely a male affair, because the marginal increase in access to the opposite sex via the elimination or domination of same-sex competitors produces greater fitness benefits for men than for women. Of course this should not suggest that women do not have anything to gain in same-sex coalitional conflicts, but rather that the expected reproductive gains are not large enough in women to offset the considerable costs associated with aggressive tactics. Therefore, the psychological systems that potentiate hostile intergroup behavior and generate prejudiced attitudes and emotions toward same-sex outgroup competitors is likely to be muted for women relative to men.

Although women's bias and aggression toward outgroup women may be less severe than men's bias and aggression toward outgroup men, the potential for negative affective or attitudinal biases against outgroup men may be equally

possible for women, even if the psychology that generates these biases is not motivated by the same aggression-related motivations applicable to men. This potential for negativity toward outgroup men could have arisen not through the workings of intrasexual competition but, rather, through the forces of intersexual conflict operating between the sexes. Although women may have a lower probability of being the agents or victims of lethal intergroup violence, they can nevertheless be the targets of non-lethal violence with the potential for serious fitness consequences.

Across cultures and time, women have often been the victims of brutal sexual aggression in intergroup conflicts (Thornhill & Palmer, 2000; Wrangham & Peterson, 1996; Vikman, 2005). Atrocities in violent political conflicts such as those committed in Bosnia, Rwanda, Darfur, and the U.S. engagements in Vietnam and Iraq highlight the potential for sexual aggression to which women may be subjected during times of war (i.e., intergroup contexts). Acts of sexual aggression are not unique to the human species, as they are common in some animal societies, including some closely related to humans, such as chimpanzees. Indeed, sexual aggression sometimes reflects a species-typical evolved mating strategy in certain animals and a conditional mating strategy in others (see Thornhill & Palmer, 2000).

For women, two general paternal factors influence the survival prospects of offspring: the genetic quality of the biological father and the amount of investment the father makes in providing for the offspring. Women who mate with low-quality men (i.e., men with genetic predispositions impairing survival prospects or the ability to obtain mates) have a higher probability of having low-quality offspring, who themselves may not survive to reproduce or may not be able to obtain mates. Women who conceive but lack any subsequent investment from a father—biological or not—risk not having the nutritional or protective resources necessary for the survival of their offspring. Sexual aggression from strangers poses severe threats across both of these factors. When coerced into intercourse, women lose the opportunity to judge the quality of the aggressor; they essentially risk one of their limited number of lifetime reproductions on a man who may have poor genetic quality. Similarly, women who are aggressed against lose their ability to evaluate a man's investment potential. Moreover, strangers who invade and aggress sexually may be less likely to remain to assist in childcare nine months after conception and beyond.

The costs of aggressing sexually are quite high for men in most contexts (Smith, Borgerhoff Mulder, & Hill, 2001). Men risk both retaliation from the victim and the kin or romantic partner of the victim and loss of social status and alliances. Hence, it is not surprising that most men, under most circumstances, do not use sexual aggression as a reproductive strategy. Nevertheless, sexual aggression is markedly more common against outgroups during intergroup conflict than among ingroups in times of peace (Thornhill & Palmer, 2000; Wrangham & Peterson, 1996; Vikman, 2005). At a proximate level, the higher frequency may reflect the lower costs perceived by the perpetrators for harming others during times of intergroup conflict. This may be due to any combination of several social

processes, among them de-individuation in group activities, reduced accountability across group boundaries, and ethnocentric double standards in the activation of empathy or when normal rules of moral judgment apply. Regardless of the precise nature of the proximate psychological factors that lead to greater sexual aggression by men in intergroup contexts, it appears that outgroup men have historically posed greater risks of sexual assault against women than familiar men of one's own group. Although sexual aggression and coercion occurs within most societies (e.g., Broude & Greene, 1976; Levinson, 1989), wartime has traditionally provided an even greater affordance of opportunities for sexual aggression as far back as the historical record allows (reviewed in Vikman, 2005). In fact, violent intergroup conflict may have been even more common in prehistoric societies than has been the case in historical societies (Bamforth, 1994; Chagnon, 1996; Daly & Wilson, 1988; Ember, 1978; Ghiglieri, 1999; Keeley, 1996; Knauff, 1987; Krech, 1994; Wrangham & Peterson, 1996). In a recent survey of the history and prehistory of violence, Steven Pinker (2011) has provided convincing evidence that, across cultures and throughout history, physical violence is reliably correlated with other types of antisocial activity, most notably sexual aggression. Taken together, the observations that (a) sexual aggression is not uncommon among our closest primate cousins, (b) warfare and sexual aggression have been tightly linked as far back as recorded history, (c) physical and sexual aggression are reliably linked across space and time, and (d) intergroup violence was much more common in the past than in modern times mean that it is not unreasonable to suspect that women have faced recurring threats of sexual assault throughout our evolutionary history (perhaps threats higher than those encountered in modern Western societies), and that they may have been particularly at risk from men from groups other than their own. Since people are more likely to spend time with persons of their own social groups than with strangers, the threat of sexual assault per interaction with an outgroup male over the course of a lifetime was likely markedly higher than the threat of sexual assault among familiar men controlling for baseline differences in proximity. Given the importance of reproductive choice for women, intersexual selection acting on the conflict of reproductive interests between coercive men and discerning women may have favored a female-specific psychology predisposing women to be vigilant against outgroup men to avoid sexual coercion.

To be sure, by interacting with outgroups, there are potential fitness benefits to broadening the pool of mate choices to include mates of any social group. A wider pool allows for a greater raw number of men of high genetic quality, and it improves the genetic diversity of the mating pool. However, given outgroup men were more likely than ingroup men to compromise female choice via sexual aggression and coercion, selection may favor a negativity bias toward outgroup men under certain conditions.

Although invariant avoidance of outgroup men would drastically decrease the risk of sexual coercion or aggression, women should not be expected strictly to avoid outgroups. Such biases come with their own costs, including diverting attention and energy away from other important tasks and risking losing

potentially valuable interactions with outgroups (e.g., non-coercive mating opportunities, trading opportunities). Given that both biases and lack of biases toward outgroups have fitness relevant costs, women's degree of bias should be expected to vary as a function of their appraised vulnerability to lose control of the maintenance of reproductive choices. As such, women who perceive themselves to be more vulnerable to sexual coercion, or who perceive outgroup men as particularly physically formidable (and more likely to overpower them), should be more willing to pay the costs associated with bias (e.g., attention and energy) in order to minimize the probability of sexual aggression and its attendant loss of choice in reproductive partner.

Recent research suggests this may be a productive framework in which to address a female-specific psychology of prejudice. Results from several studies indicate that White women's perceived vulnerability to sexual coercion is positively correlated with negative attitudes toward African Americans (Navarrete, Fessler, Santos Fleischman, & Geyer, 2009; Navarrete et al., 2010, Study 2). One study showed that race prejudice for women was most strongly directed at Black men, not Black women, and that the relationship between perceived vulnerability to sexual coercion and fear toward Black and White men and women was strongest toward Black men (Navarrete et al., 2010, Study 3). Put simply, the degree to which White women were biased against Black men was predicted by how vulnerable White women felt to sexual coercion. Consistent with the notion that a domain-specific link may exist between the avoidance of sexual coercion and the avoidance of outgroup men, this relationship held even when the effect of general fearfulness was statistically controlled.

The relation between inter-individual variation in perceived vulnerability to sexual coercion and bias toward outgroup males suggests that outgroup prejudice may be specifically attuned to the costs of sexual aggression, which are not the same throughout the course of a woman's menstrual cycle. Because the reproductive consequences of sexual aggression are strongest during the periovulatory phase of the menstrual cycle (i.e., the window in which a woman can conceive), women should be especially biased toward outgroup males during the fertile part of their cycle. This should be particularly true for women who perceive themselves to be vulnerable to sexual coercion and who view outgroup men as physically formidable. In a test of these specific theoretically derived predictions, Navarrete, Fessler, Santos Fleischman, & Geyer (2009) report that the relationship between perceived vulnerability to sexual coercion and multiple measures of prejudice toward outgroups grew stronger as fertility increased across the menstrual cycle. These findings are not trivial, given that implicit measures of bias have been shown to correlate more strongly with "real-world" behavior than explicit measures (Greenwald et al., 2009).

McDonald, Asher, Kerr, & Navarrete (2011) replicated and extended these findings by demonstrating a link between conception risk and implicit outgroup prejudice in both racial and non-racial outgroups. In light of the conflict between the potential costs and benefits associated with intergroup interactions, in generating prejudiced evaluations, selection may have favored psychological

mechanisms that assess the extent to which outgroup men are perceived as physically formidable, as such traits would increase the effectiveness of a man's attempts physically to overpower and constrain a woman's behavior and, therefore, reproductive choice. McDonald and her colleagues hypothesized that the link between conception risk and implicit intergroup prejudice should be particularly strong for women who associate the outgroup with physical formidability.

Two studies were conducted to test this prediction using both White or Black men as targets, as well as men categorized into arbitrarily bifurcated social groups distinguishable solely by shirt colors. Research participants were assigned to groups based on largely arbitrary preferences for one primary color versus another (e.g., yellow vs. blue), after which they completed implicit association tests measuring the extent to which they readily associated (a) outgroup men as physically formidable ("physicality") relative to ingroup men with (b) the extent to which outgroup men were more negatively/less positively evaluated on affectively charged semantic terms (e.g., horrible, evil, good, etc.) relative to ingroup men. Across both studies, the results revealed that conception risk led to greater prejudice in intergroup evaluations most consistently when outgroup men were associated with physicality. These findings suggest that the psychological system by which women's evaluations of outgroup men become more negative as a function of conception risk does not depend on a specific racial context (e.g., Black vs. White). Instead, the mechanisms within the system likely rely on more basic categorization processes that respond to cues that are dependent not on the race of the target but, rather, on the target's group category—even if largely arbitrary. This is consistent with the points we made earlier that our evolved psychology is likely to have been shaped during a time in our evolutionary history when groups were defined not by race but, rather, by differences in coalitional alliances marked by non-physical traits such as linguistic accent, dialect, and social customs or norms.

Overall, these results suggest that women may be equipped with flexible psychological mechanisms designed to protect reproductive choice by avoiding outgroup men, who have historically posed the greatest reproductive threat, particularly when (a) a woman perceives herself as particularly vulnerable and (b) the targets are perceived as being most capable of effectively constraining her reproductive choice.

Sex Differences in Prejudice: Summary

We have so far argued that the adaptive problems posed by intergroup conflict have been different for men and women throughout human evolutionary history, and that the manner in which natural and sexual selection has provided ways of dealing with these problems may have set the stage for important psychological differences between the sexes. We think these differences reflect the workings of an evolved psychology designed to provide sex-specific solutions to the unique challenges that are posed by outgroup men to each sex. These problems and solutions have produced psychological sex differences in the expression of intergroup bias likely to have evolved on separate sexually selected

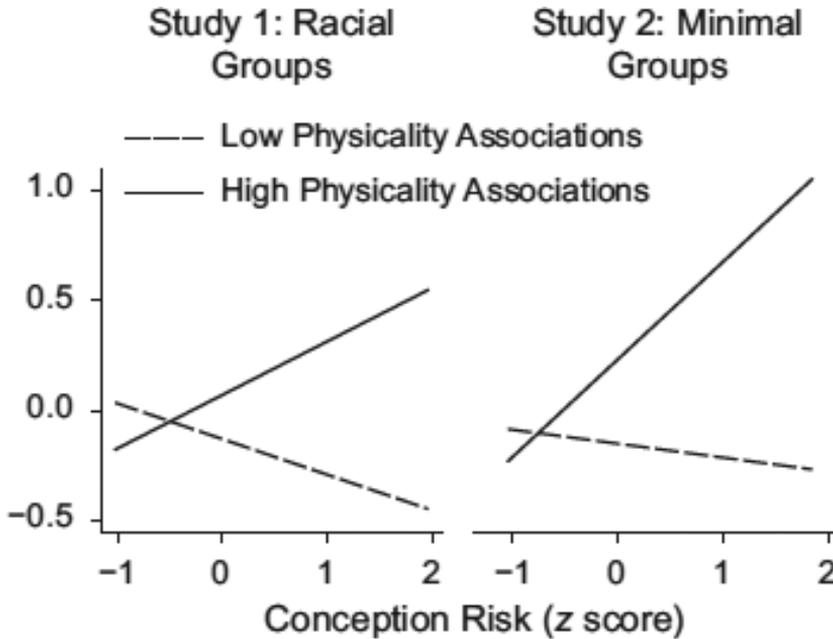


Figure 4.1 Intergroup prejudice as a function of conception risk and physicality associations (1 standard deviation above and below mean physicality) (from McDonald et al., 2011).

avenues of conflict: intrasexual conflict, in which males of separate coalitions have competed with each other for potential access to mates, and intersexual conflict, in which females have attempted to avoid sexually aggressive tactics from outgroup males. These paths to prejudice are psychologically manifested as a predisposition for *aggressive* prejudice for men and greater proneness to *fearful* prejudice for women—both paths directed most strongly toward male exemplars of the outgroup.

We now turn to a domain of prejudice in which men's and women's psychologies may be expected to be more similar than different: the intersection of prejudice and the psychology of pathogen avoidance.

OUTGROUP BIAS AND PATHOGEN AVOIDANCE

Whereas sexual selection refers specifically to the kinds of processes shaped by competition between and within the sexes for access to mating reproductive opportunities, natural selection refers more broadly to processes through which fitness-promoting traits are favored, including what is typically referred to as "survival." With respect to the more general challenge of survival, an additional threat posed by outgroups—one that may have also shaped the evolution of psychological biases—is that of infectious disease.

Humans throughout evolutionary history have consistently faced challenges posed by infectious disease. In fact, infectious parasites posed a threat to multicellular organisms well before mammals even evolved. Threats posed by parasitic micro-organisms have motivated a suite of complex adaptations, including sexual recombination, the immune system, and psychological and behavioral strategies designed to mitigate the deleterious effects of infectious disease (Curtis, de Barra, & Aunger, 2011; Hamilton, Axelrod, & Tanese, 1990; Schaller & Duncan, 2007; Tybur, Lieberman, & Griskevicius, 2009). Essentially, a competitive “arms race” occurs between pathogens and hosts, in which larger organisms adapt to counter-threats posed by constantly evolving micro-organisms (Van Valen, 1973). This is sometimes referred to as the *Red Queen Effect*, which describes an evolutionary “arms race” where constant development of counter-strategies are needed just in order to maintain the fitness of an organism relative to the systems with which it is co-evolving (Ridley, 1993). The term is taken from Lewis Carroll’s *Through the Looking Glass*, in which the Red Queen comments: “It takes all the running you can do, to keep in the same place.” The only method through which to mitigate the deleterious effects of pathogens that vary across time and space is to develop immune responses that are similarly varied across historical and geographic regions.

Like other organisms, the varied immune responses that develop among humans can be conceptualized as a composition of specialized defenses against specific parasites within the local ecology. The immune systems of individuals living in separate groups are often adapted to different parasites, such that some groups possess immunities to parasites to which other groups may be vulnerable (Black, 1975). As a result, groups of individuals can be carriers of pathogens that may produce deleterious symptoms to which they themselves are largely immune, but to which individuals from other groups are not. Thus, for any given individual, interactions with ingroup members whose immune systems are locally adapted are a much safer bet than interactions with outgroup members adapted to different parasite ecologies, and thus may carry parasite that, while relatively innocuous in them, may have debilitating fitness consequences if transmitted to members of other groups.

The lethal spread of smallpox and measles from Europeans to traditional populations possessing no immunity to these diseases provides a dramatic instance of this principle. Although pathogens as virulent as smallpox or measles typically require large population densities with substantial geographic boundaries between them to evolve such devastating effects (see Anderson & May, 1979), small-scale traditional societies nevertheless are adapted to resist local parasites that differ from those encountered by more distant groups (Black, 1975). Pathogen transmission via intergroup contact can occur along multiple routes, including pathways that involve direct personal contact (e.g., shaking hands, sharing food, sexual intercourse), or along contact pathways that may be relatively less personal but are nevertheless not uncommonly associated with intergroup encounters, such as trading pelts, blankets, or other objects,

urinating or defecating in the local water supply, and contacting local nonhuman pathogen vectors such as mosquitoes, ticks, or livestock. In sum, as is the case for sexual aggression threats to women, the average interaction with an outgroup member conceivably poses a greater pathogen transmission risk than the average interaction with an ingroup member, all else equal.

It has also been proposed that norms and traditions that vary between groups (e.g., hygiene, food selection, storage, and preparation) may develop in response to specific endemic infectious disease threats (Schaller & Murray, 2008, 2010; Sherman & Billing, 1999). Outgroups may have different cultural practices based on unique parasite threats in their own ecologies. For example, groups living in areas with climates conducive to food-borne bacterial contamination may develop cuisines with certain antimicrobial components. Spices such as garlic, cumin, oregano, and thyme inhibit bacterial growth and may be incorporated into food preparation to prevent food spoilage. Interactions with outgroups may encourage the diffusions of foreign cultural traditions that, while perfectly acceptable in one ecology, may pose disease threats in another (Nettle, 2006; Schaller & Murray, 2008). In this example, transmission of minimally spiced, minimally antimicrobial food preparation from one group with low threats of bacterial contamination to a group with high threats may pose a pathogen threat to the group living in the more microbe-friendly ecology.

If the problems of pathogen transmission across social groups posed significant fitness challenges throughout our evolutionary history, natural selection may have favored the emergence and maintenance of a psychology predisposing us to xenophobic biases in order to mitigate infectious disease threats posed by people from outgroups. Examples of similar “behavioral immune system” responses exist from the animal behavior literature, where potential disease threats are mitigated via prophylactic behavior such as mammalian mothers removing feces from their dens or bees removing decaying material from their hives. In humans, examples of behavioral prophylaxis may be instantiated as biases against ingesting particular foods or mating with certain people evincing cues of increased disease risk, such as pungent odors emanating from the potential food or mating target. Mental representations of such stimuli may be associated with negative emotions, including disgust—a powerful motivator of the avoidance and expulsion of potential sources of contagion (Tybur et al., 2009).

But, as is the case with biases that function to address the problems associated with physical and sexual aggression in intergroup contexts, such biases motivated by pathogen avoidance are not without tradeoffs. Several *benefits* of interactions with outgroups are limited by persistent biases against them, including mating and exchange opportunities, as we have mentioned above. Furthermore, the attentional and energetic resources necessary to avoid members of outgroups can have their own opportunity costs. Hence, a key test of a behavioral immune system approach to the psychology of prejudice may involve examining how bias varies across individuals differing in their vulnerability to infectious disease. Methodologically similar to the individual difference

approach to establishing the link between perceived vulnerability to sexual coercion and negativity to outgroup men, it would be expected that the case for a pathogen-avoidance function for biases against outgroups in general would be strengthened if such biases were found to be strongest among those who appraised themselves as being particularly vulnerable to disease.

Several studies have indeed established this link and suggest that outgroup bias does indeed involve a pathogen-avoidance component. Across four studies, Faulkner, Schaller, Park, and Duncan (2004) found consistent evidence that individuals who chronically perceive themselves as more vulnerable to infectious disease also have more negative attitudes toward the immigration of those of ethnically foreign origins. Another two studies showed that experimental manipulations temporarily making pathogens salient were associated with greater negativity toward ethnically foreign immigrants. Navarrete and Fessler (2006) conceptually replicated and extended these results in finding that perceived vulnerability to infectious disease relates to general ethnocentric attitudes among U.S. college students, and that reading about and rating how disgusting are various pathogen risks increased individuals' ingroup favoritism. Navarrete, Fessler, and Eng (2007) found that a bias in favor of a pro-American target vs. an anti-American target is higher among pregnant women relative to non-pregnant women, higher still in the first trimester of pregnancy—both periods of natural increased vulnerability to infectious disease. Finally, using measures similar to those employed by Navarrete et al. (2010) to demonstrate a relationship between women's vulnerability to sexual coercion and bias toward Black men, Tybur, Merriman, Caldwell, McDonald, and Navarrete (2010) found that sensitivity to disgust toward pathogen threats predicts social dominance orientation—endorsement of inequality between groups—equally for both men and women (see also Hodson & Costello, 2007).

Studies of societies' mean levels of traits predicted to buffer against infectious disease are also consistent with a behavioral immune system perspective. Group ecologies differ in their parasite variety and density. Presumably, those societies located in environments with more varied parasites must develop immunities that are specifically attuned to the parasites within their ecology. For individuals in these societies, interactions with outgroups may pose a greater infectious disease threat than would be the case in less parasite-dense and varied ecologies. Thus, groups in parasite-rich ecologies are expected to adapt to such conditions by erecting social barriers against intergroup interactions. Consistent with this perspective, societies' parasite prevalence is strongly related to mean levels of collectivism, which concentrates intragroup interactions and limits intergroup interactions (Fincher, Thornhill, Murray, & Schaller, 2008). Parasite prevalence also predicts societies' number of religions, which may encourage intragroup cohesion and interaction and discourage intergroup interactions (Fincher & Thornhill, 2008; see also Fincher & Thornhill, 2012). Taken together, these studies are not only consistent with the hypothesis that intergroup bias is related to avoiding infectious disease; they also demonstrate a nuanced psychology that adjusts bias based on the infectious disease costs associated with intergroup interactions.

Those aspects of intergroup bias brought about by intrasexual and intersexual competition are by nature gendered phenomena. They involve highly sex-specific psychologies that reflect both gender differences in the costs and benefits of sexual activity and the variances in expected and potential reproductive output. In contrast, aspects of intergroup bias related to pathogen avoidance are not expected to demonstrate clear sex differences. Both men and women must cope with threats posed by infectious disease, and pathogen avoidance may motivate intergroup bias equally for the sexes. Unlike research showing strong sex differences in relations between intergroup bias and endorsement of intergroup competition and dominance (Navarrete et al., 2010), none of the research discussed above on intergroup bias and disease avoidance has reported sex-specific effects. Further, the sex of the outgroup member should not strongly influence the threats posed by infectious disease or the amount of bias motivated by pathogen avoidance. Whereas outgroup men, but not outgroup women, pose a potential threat of sexual aggression and coercion to women specifically, both outgroup sexes presumably pose a similar pathogen-related threat to both ingroup sexes.

DIFFERENTIATING BIASES

All three evolutionary processes discussed in this chapter are posited to contribute to intergroup biases generated by an evolved psychology of prejudice. We have argued that intrasexual selection operating more strongly among men than among women may have produced psychological biases that motivate aggressive competition between males of different groups. Intersexual selection operating on the conflict of mating interests between men and women may have produced biases that motivate women's avoidance of outgroup males when perceived vulnerability to sexual coercion is high. And, lastly, we have argued that natural selection operating on the problems posed by pathogen transmission between groups has produced biases that motivate avoidance of contact with outgroups in general, particularly when appraisals of an individual's vulnerability to pathogen threats are chronically or contextually high.

Because the threats forming the selection pressure vary between all three processes, the nature of bias should also be differentiable. Although considerable evidence now exists for the notion that men of a racial outgroup evoke greater negative reactions among both men and women, the ways in which they are negatively prejudiced differ considerably. As previously noted, men's bias against outgroup males is both more punitive in nature than women's and more readily related to aggression and dominance motives (Navarrete et al., 2010). Women's bias against outgroup males is characterized more by fear and avoidance and is related to chronic concerns about sexual coercion. Both sexes' bias toward outgroups in general appears to relate to pathogen concerns, when it may be characterized by avoidance motivated by disgust, and is predicted by chronic and situational vulnerability to infection.

IMPLICATIONS AND LIMITATIONS

We have described women's bias as targeted primarily toward outgroup men rather than toward ingroup men or outgroup women, because of the costs associated with increased risk of sexual coercion by outgroup men, all else equal. We have also described men's bias as targeted primarily toward outgroup men, because of the gains to be had by eliminating or dominating other male coalitions. And we have posited that a crucial component of group-based prejudice expressed by both men and women is characterized by pathogen-avoidance motives. In marshaling empirical support for these claims, we have described work that exploits the natural variation existing between individuals on the traits relevant to the function of these biases in order to explain variance in the expression of bias. This is because we do not expect that, as a product of evolution by natural selection, the psychology of prejudice should be characterized by built-in preferences or tastes that are not sensitive to environmental input. Instead we posit the existence of dynamic, evolved psychological systems that are sensitive to the costs and benefits of any course of action in the face of uncertain outcomes and incomplete information. The costs of any course of action in response to a given threat are likely to include a *cost risk quotient* that represents one's probability of falling victim to the threat. Highly aggressive and dominant men may feel better able to engage the threat of outgroup men, and therefore express greater prejudice—a syndrome likely to be related to readying oneself for approach-related posturing or violent engagement. On the other hand, women who appraise themselves as highly vulnerable to sexual coercion and people of both sexes who appraise themselves as vulnerable to infection become more prejudiced not because such personality profiles are associated with the need to ready oneself for approach-related contact, but for precisely the opposite reason: Because prejudice is not only about approach-related aggression and dominance, it is about avoiding danger among those individuals who have appraised themselves as not up to the challenge. Thus prejudicial outcomes can arise by opposing strategies.

Although strong, potentially costly responses to threats related to coalitional aggression, sexual aggression and coercion, and infection are not universally experienced on account of their energetically expensive natures, people may nonetheless engage in other, more measured responses to these problems. For example, instead of experiencing fear and engaging in flight and concealment when presented with a threat of sexual aggression, women may avoid costly mating by experiencing disgust and engaging in more measured avoidance (Tybur et al., 2009). Disgust, though typically thought of as functioning to motivate pathogen avoidance (e.g., Curtis & Biran, 2001), is elicited by a number of sexual behaviors that connote costs, including incest, sexual coercion, and behaviors that do not increase reproductive success but do involve potential disease costs (e.g., anal sex). Effectively, the underlying reasons for avoiding such maladaptive sexual interactions are similar to those motivating women's intergroup bias discussed earlier in the chapter. Some women are less biased against

outgroups than others, and these individual differences appear to relate to the degree to which women feel vulnerable to sexual coercion. For the same reason that women are not universally biased toward outgroup men (e.g., the attentional and energetic costs of bias and avoidance), they should also not be expected universally to use the same strategies to avoid males who may present threats of coercion. Fear, flight, and concealment are costly strategies of avoidance, and they may not be necessary to avoid suboptimal mates. Instead, disgust, rejection, and mild avoidance (e.g., walking away) may be less costly alternative responses to suboptimal mates who are unlikely successfully to aggress or coerce. Women who perceive relatively low—but still a degree of—vulnerability to sexual coercion may still be biased against outgroup males, but their bias may be qualitatively different from that of women with greater perceived vulnerability. Rather than avoiding outgroup male sexual partner via *fear*, they may engage in avoidance by being *disgusted*. Disgust may motivate general proximal avoidance and distancing from men perceived as potentially sexually aggressive or coercive, but in a less extreme manner than fear. Indeed, we find that sensitivity to *sexual* disgust consistently relates to variables relevant to outgroup bias more strongly than sensitivity to pathogen or moral disgust (Tybur et al., 2010).

Emotional and behavioral responses subtyped between and within biases functioning to neutralize different threats are heterogeneous, but at the same time they should be flexible and responsive to fluctuating threats from a dynamic environment. Although some women may tend to respond to outgroup males with fear, and others with disgust, these responses should vary between contexts with differing probabilities of sexual coercion. A woman faced with a rapidly approaching outgroup male may experience fear and flight regardless of chronic perceptions of vulnerability to sexual coercion, because the situational sexual aggression threat is high and the costs associated with fear and flight are necessary to neutralize the threat. On the other hand, women who feel highly vulnerable to sexual coercion may feel disgust rather than fear toward outgroup males when the probability of coercion is relatively low (e.g., when they are protected by an imposing group of ingroup males). Such questions have yet to be empirically examined.

Although we have focused initially on differentiation within responses to sexual coercion and aggression threats, the emotional and behavioral responses to infection threats posed by outgroups perhaps exhibit the greatest degree of heterogeneities. The pathogen-avoidance hypothesis of intergroup bias was initially motivated partially by observations that outgroups are often compared to disgusting, disease-ridden animals (e.g., cockroaches). Although disgust certainly motivates avoidance of infectious materials and outgroups often elicit disgust (Cottrell & Neuberg, 2005), intergroup conflict is often characterized by interactions that are high pathogen risks. Violent confrontation between groups risks physical contact and inadvertent exchanges of infectious bodily fluids, including blood and saliva. This apparent contradiction between the goal of avoiding pathogens and actions that risk infection could develop under two

conditions. First, goals related to avoiding pathogens and dominating other groups may be in competition, and so cross-group domination may win out. In refraining from combat to avoid pathogens, individuals within groups may risk extreme social status costs that are ultimately more harmful to lifetime reproductive output than infection itself (Matthew & Boyd, 2011). Second, violent confrontation could ultimately serve the goal of pathogen avoidance despite short-term increases in infection risk. By dominating, intimidating, and even eliminating potentially infectious outgroup members, male coalitions may dissuade other groups from future interactions that may pose greater disease risks than those involved in conflict.

Although it is perhaps useful for reducing our nuanced approach to the evolutionary psychology of prejudice to a few memorable heuristics, one may be tempted to make the following characterizations of our theoretical and empirical claims: Male prejudice is about aggression and dominance, female prejudice is about fear of rape, and general biases among both men and women are about disgust. Such characterizations would not be unfair given the three evolutionary processes we described as important historical forces likely to have shaped the psychology of modern humans. To be sure, we think that sexual selection is extremely important, to the extent that intergroup bias is a gendered phenomenon, and that disease-avoidance concerns, as a fundamental problem for all life forms on the planet, form the root of a whole host of human biases and preferences, not only those related to group-based prejudice. However, we have been careful to avoid claims that all features of the prejudiced mind are reducible to sexual selection and disease avoidance. There are other problems related to group-based prejudice that have not been treated here, some of which are related fundamentally to gender—such as female coalitional alliances and intra-sexual aggression. A growing body of work suggests that aggression may not be less common among women than among men, only that it may be less explicit and physically violent in nature. As is the case with females of many primate species, coalitions among women and girls against same-sex competitors may be fundamental to the human condition. An evolutionary analysis of such dynamics is waiting to be done and represents a limitation in current theory and research in evolutionary approaches to social psychology, as it is in this present chapter.

Likewise, our current analysis has left out a major thread within the evolutionary literature, and one which surely must be a key component of the psychological architecture shared by both men and women with respect to thinking about groups: that of the problem of cooperation within groups and how to coordinate collective action. How the problem of cooperation is relevant to the emergence and maintenance of intergroup biases is an under-explored area of inquiry among evolutionary and social psychological researchers (for exceptions, see Brewer, 1999; Gil-White, 2001). Perhaps humankind's most noble social instincts can also lead to between-group preferences—our capacity for compassion for others like ourselves, our willingness to sacrifice our own comfort and safety for the benefit of others, our desire to conform in order to

not offend others may all have a dark side to them if their expression is contingent on anything other than unconditional love. The frontiers of the psychological science are ripe for bold perspectives that seek to explain difficult topics— perspectives that cut across disciplinary lines in the search for ever more accurate narratives of topics such as how and why we are so damned tribal.

REFERENCES

- Anderson, R. M., & May, R. M. (1979). Population biology of infectious diseases. *Nature*, 280, 361–367.
- Andersson, M. (1994). *Sexual selection*. Princeton, NJ: Princeton University Press.
- Andrews, Gangestad, & Matthews (2002). To be added on proof.
- Arai, M., Bursell, M., & Nekby, L. (2008). *Between meritocracy and ethnic discrimination: The gender difference*. SULCIS Working Papers 2008:2. Stockholm University, Linnaeus Center for Integration Studies.
- Arai, M., & Thoursie, P. S. (2009). Renouncing personal names: An empirical examination of surname change and earnings. *Journal of Labor Economics*, 27, 127–147.
- Ayres, I., & Siegelman, P. (1995). Race and gender discrimination in bargaining for a new car. *American Economic Review*, 85, 304–321.
- Bamforth, D. B. (1994). Indigenous people, indigenous violence: Precontact warfare on the North American Great Plains. *Man*, 29, 95–115.
- Bateman, A. J. (1948). Intra-sexual selection in *Drosophila*. *Heredity*, 2, 349–368.
- Black, F. L. (1975). Infectious diseases in primitive societies. *Science*, 187, 515–518.
- Brewer, M. B. (1999). The psychology of prejudice: Ingroup love or outgroup hate? *Journal of Social Issues. Special Issue: Prejudice and intergroup relations: Papers in honor of Gordon W. Allport's centennial*, 55, 429–444.
- Broude, G. J., & Greene, J. (1976). Cross-cultural codes on twenty sexual attitudes and practices. *Ethnology*, 15, 409–430.
- Bushway, S. D., & Piehl, A. M. (2001). Judging judicial discretion: Legal factors and racial discrimination in sentencing. *Law & Society Review*, 35, 733–764.
- Buss, D. M., Haselton, M. G., Shackelford, T. K., Bleske, A., & Wakefield, J. C. (1998). Adaptations, exaptations, and spandrels. *American Psychologist*, 53, 533–548.
- Buss, D. M., & Shackelford, T. K. (1997). Human aggression in evolutionary psychological perspective. *Clinical Psychology Review*, 17, 605–619.
- Carlsson, M., & Rooth, D. O. (2007). Evidence of ethnic discrimination in the Swedish labor market using experimental data. *Labour Economics*, 14, 716–729.
- Chagnon, N. A. (1996). Chronic problems in understanding tribal violence and warfare. In G. Bock & J. Goode (Eds.), *The genetics of criminal and antisocial behavior*. New York: Wiley.
- Cheney, D., and Seyfarth, R. (1982). Recognition of individuals within and between groups of free-ranging vervet monkeys. *American Zoologist*, 22, 519–529.
- Choi, J., & Bowles, S. (2007). The coevolution of parochial altruism and war. *Science*, 318, 636–640.
- Clutton-Brock, T. (1991). *The evolution of parental care*. Princeton, NJ: Princeton University Press.
- Cottrell, C. A., & Neuberg, S. L. (2005). Different emotional reactions to different groups: A sociofunctional threat-based approach to prejudice. *Journal of Personality & Social Psychology*, 88, 770–778.

- Curtis, V., & Biran, A. (2001). Dirt, disgust, and disease: Is hygiene in our genes? *Perspectives in Biology and Medicine*, 44, 17–31.
- Curtis, V., de Barra, M., & Aunger, R. (2011). Disgust as an adaptive system for disease avoidance behavior. *Philosophical Transactions of the Royal Society B*, 366, 389–401.
- Daly, M., & Wilson, M. (1988). *Homicide*. Hawthorne, NY: Aldine de Gruyter.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Dawkins, R. (1982). *The extended phenotype*. Oxford, UK: W. H. Freeman.
- Ekehammar, B. (1985). Sex differences in socio-political attitudes revisited. *Educational Studies*, 11, 3–9.
- Ekehammar, B., & Sidanius, J. (1980). Negative similarities versus correlational similarities. *Multivariate Behavioral Research*, 15, 95–98.
- Ekehammar, B., & Sidanius, J. (1982). Sex differences in socio-political attitudes: A replication and extension. *British Journal of Social Psychology*, 21, 249–257.
- Ember, C. (1978). Myths about hunter-gatherers. *Ethnology*, 27, 239–248.
- Faulkner, J., Schaller, M., Park, J. H., & Duncan, L. A. (2004). Evolved disease-avoidance mechanisms and contemporary xenophobic attitudes. *Group Processes & Intergroup Relations*, 7, 333–353.
- Fessler, D. M. T. (2002). Reproductive immunosuppression and diet: An evolutionary perspective on pregnancy sickness and meat consumption. *Current Anthropology*, 43, 19–39, 48–61.
- Fincher, C. L., & Thornhill, R. (2008). Assortative sociality, limited dispersal, infectious disease and the genesis of the global pattern of religion diversity. *Proceedings of the Royal Society B: Biological Sciences*, 275, 2587–2594.
- Fincher, C. L., & Thornhill, R. (2012). Parasite-stress promotes in-group assortative sociality: The cases of strong family ties and heightened religiosity. *Behavioral and Brain Sciences*, 35, 61–119.
- Fincher, C. L., Thornhill, R., Murray, D. R., & Schaller, S. (2008). Pathogen prevalence predicts human cross-cultural variability in individualism/collectivism. *Proceedings of the Royal Society B: Biological Sciences*, 275, 1279–1285.
- Fisher, R. A. (1930). *The genetical theory of natural selection*. Oxford, UK: Oxford University Press.
- Fisman, R., Iyengar, S. S., Kamenica, E., & Simonson, I. (2008). Racial preferences in dating. *Review of Economic Studies*, 75, 117–132.
- Furnham, A. (1985). Adolescents' sociopolitical attitudes: A study of sex and national differences. *Political Psychology*, 6, 621–636.
- Ghiglieri, M. P. (1999). *The dark side of man: Tracing the origins of male violence*. Reading, MA: Perseus Books.
- Gil-White, F. J. (2001). Are ethnic groups biological "species" to the human brain? Essentialism in our cognition of some social categories. *Current Anthropology*, 42, 515–554.
- Gordon, R., Piana, L. D., & Keleher, T. (2000). *Facing the consequences: An examination of racial discrimination in U.S. public schools*. Oakland, CA: ERASE Initiative, Applied Research Center.
- Greenwald, A. G., Poehlman, T. A., Uhlmann, E., & Banaji, M. R. (2009). Understanding and using the Implicit Association Test, III: Meta-analysis of predictive validity. *Journal of Personality and Social Psychology*, 97, 17–41.
- Griskevicius, V., Tybur, J. M., Gangestad, S. W., Perea, E. F., Shapiro, J. R., & Kenrick, D. T. (2009). Aggress to impress: Hostility as an evolved context-dependent strategy. *Journal of Personality and Social Psychology*, 96, 980–994.

- Griskevicius, V., Tybur, J. M., Delton, A. W., & Robertson, T. E. (2011). The influence of mortality and socioeconomic status on risk and delayed rewards: A life history theory approach. *Journal of Personality and Social Psychology*, *100*, 1015–1026.
- Haley, H., Sidanius, J., Lowery, B., & Malamuth, N. (2004). The interactive nature of sex and race discrimination: A social dominance perspective. In G. Philogene (Ed.), *Racial identity in context: The legacy of Kenneth B. Clark* (pp. 149–160). Washington, DC: American Psychological Association.
- Hamilton, W. D., Axelrod, R., & Tanese, R. (1990). Sexual reproduction as an adaptation to resist parasites. *Proceedings of the National Academy of Sciences of the USA*, *87*, 3566–3573.
- Hirschfeld, L. A. (1996). *Race in the making: Cognition, culture and the child's construction of human kinds*. Cambridge, MA: MIT Press.
- Hodson, G., & Costello, K. (2007). Interpersonal disgust, ideological orientations, and dehumanization as predictors of intergroup attitudes. *Psychological Science*, *18*, 691–698.
- Kaplan, H. S., & Gangestad, S. W. (2005). Life history theory and evolutionary psychology. In D. M. Buss (Ed.), *Handbook of evolutionary psychology* (pp. 68–95). New York: Wiley.
- Keegan, J. (1993). *The history of warfare*. New York: Alfred A. Knopf.
- Keeley, L. H. (1996). *War before civilization: The myth of the peaceful savage*. New York: Oxford University Press.
- Kelly, R. C. (2005). The evolution of lethal intergroup violence. *Proceedings of the National Academy of Sciences*, *102*, 15294–15298.
- Knauff, B. (1987). Reconsidering violence in simple human societies. *Current Anthropology*, *28*, 457–500.
- Krech, S. (1994). Genocide in tribal society. *Nature*, *371*, 14–15.
- Kurzban, R., Tooby, J., & Cosmides, L. (2001). Can race be erased? Coalitional computation and social categorization. *Proceedings of the National Academy of Sciences*, *98*, 15387–15392.
- Levinson, D. (1989). *Family violence in cross-cultural perspective*. Newbury Park, CA: Sage.
- Makova, K. D., & Li, W.-H. (2002). Strong male-driven evolution of DNA sequences in humans and apes. *Nature*, *416*, 624–626.
- Marjoribanks, K. (1981). Sex-related differences in socio-political attitudes: A replication. *Educational Studies*, *7*, 1–6.
- Matthew, S., & Boyd, R. (2011). Punishment sustains large-scale cooperation in prestate warfare. *Proceedings of the National Academy of Sciences of the USA*, *108*, 11375–11380.
- McDonald, M., Asher, B., Kerr, N., & Navarrete, C. D. (2011). Fertility and intergroup bias in racial and in minimal group contexts: Evidence for shared architecture. *Psychological Science*, *22*, 860–865.
- Navarrete, C. D., & Fessler, D. M. T. (2006). Disease avoidance and ethnocentrism: The effects of disease vulnerability and disgust sensitivity on intergroup attitudes. *Evolution and Human Behavior*, *27*, 270–282.
- Navarrete, C. D., Fessler, D. M. T., & Eng, S. J. (2007). Elevated ethnocentrism in the first trimester of pregnancy. *Evolution and Human Behavior*, *28*, 60–65.
- Navarrete, C. D., Fessler, D. M. T., Santos Fleischman, D., & Geyer, J. (2009). Race bias tracks conception risk across the menstrual cycle. *Psychological Science*, *20*, 661–665.

- Navarrete, C. D., McDonald, M., Molina, L., & Sidanius, J. (2010). Prejudice at the nexus of race and gender: An out-group male target hypothesis. *Journal of Personality & Social Psychology*, *98*, 933–945.
- Navarrete, C. D., Olsson, A., Ho, A. K., Mendes, W., Thomsen, L., & Sidanius, J. (2009). Fear extinction to an outgroup face: The role of target gender. *Psychological Science*, *20*, 155–158.
- Nettle, D. (2006). The evolution of personality variation in humans and other animals. *American Psychologist*, *61*, 622–631.
- Neuberg, S. L., Kenrick, D. T., & Schaller, M. (2011). Human threat management systems: Self-protection and disease-avoidance. *Neuroscience & Biobehavioral Reviews*, *35*, 1042–1051.
- Owens, L., Shute, R., & Slee, P. (2000). “Guess what I just heard!”: Indirect aggression among teenage girls in Australia. *Aggressive Behavior*, *26*, 67–83.
- Pinker, S. (2011). *The better angels of our nature: Why violence has declined*. New York: Viking.
- Ridley, M. (1993). *The red queen: Sex and the evolution of human nature*. London: Viking.
- Schaller, M., & Duncan, L. A. (2007). The behavioral immune system: Its evolution and social psychological implications. In J. P. Forgas, M. G. Haselton, & W. von Hippel (Eds.), *Evolution and the social mind: Evolutionary psychology and social cognition* (pp. 293–307). New York: Psychology Press.
- Schaller, M., & Murray, D. R. (2008). Pathogens, personality and culture: Disease prevalence predicts worldwide variability in sociosexuality, extraversion, and openness to experience. *Journal of Personality and Social Psychology*, *95*, 212–221.
- Schaller, M., and Murray, D. R. (2010). Infectious diseases and the evolution of cross-cultural differences. In M. Schaller, A. Norenzayan, S. J. Heine, T. Yamagishi, and T. Kameda (Eds.), *Evolution, culture, and the human mind* (pp. 243–256). New York: Psychology Press.
- Sherman, P. W., & Billing, J. (1999). Darwinian gastronomy: Why we use spices. *BioScience*, *49*, 453–463.
- Sidanius, J., Cling, B. J., & Pratto, F. (1991). Ranking and linking as a function of sex and gender role attitudes. *Journal of Social Issues*, *47*, 131–149.
- Sidanius, J., & Ekehammar, B. (1980). Sex-related differences in socio-political ideology. *Scandinavian Journal of Psychology*, *21*, 17–26.
- Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. New York: Cambridge University Press.
- Sidanius, J., & Veniegas, R. C. (2000). Gender and race discrimination: The interactive nature of disadvantage. In S. Oskamp (Ed.), *Reducing prejudice and discrimination: The Claremont symposium on applied social psychology* (pp. 47–69). Mahwah, NJ: Erlbaum.
- Smith, E. A., Borgerhoff Mulder, M., & Hill, K. (2001). Controversies in the evolutionary social sciences: A guide to the perplexed. *Trends in Ecology and Evolution*, *16*, 128–135.
- Steffensmeier, D., Ulmer, J., & Kramer, J. (1998). The interaction of race, gender, and age in criminal sentencing: The punishment cost of being young, Black, and male. *Criminology*, *36*, 763–797.
- Stets, J. E., & Straus, M. A. (1990). Gender differences in reporting of marital violence and its medical and psychological consequences. In M. A. Straus & R. J. Gelles (Eds.), *Physical violence in American families* (pp. 151–165). New Brunswick, NJ: Transaction Books.

- Stringer, C., & McKie, R. (1997). *African exodus: The origins of modern humanity*. London: Jonathan Cape.
- Stroh, L. K., Brett, J. M., & Reilly, A. H. (1992). All the right stuff: A comparison of female and male managers' career progression. *Journal of Applied Psychology*, 77, 251–260. Personal author, compiler, or editor name(s); click on any author to run a new search on that name.
- Tajfel, H. (1981). *Human groups and social categories*. Cambridge, UK: Cambridge University Press.
- Thornhill, R., & Palmer, C. (2000). *A natural history of rape: Biological bases of sexual coercion*. Cambridge, MA: MIT Press.
- Tooby, J., & Cosmides, L. (1988). *The evolution of war and its cognitive foundations*. Institute for Evolutionary Studies Technical Report 88(1).
- Tooby, J., & Cosmides, L. (1992). The psychological foundations of culture. In J. Barkow, L. Cosmides, & J. Tooby (Eds.), *The adapted mind: Evolutionary psychology and the generation of culture* (pp. 19–136). New York: Oxford University Press.
- Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual selection and the descent of man* (pp. 136–179). Chicago: Aldine-Atherton.
- Tybur, J. M., Lieberman, D., & Griskevicius, V. (2009). Microbes, mating, and morality: Individual differences in three functional domains of disgust. *Journal of Personality and Social Psychology*, 97, 103–122.
- Tybur, J. M., Merriman, L. A., Caldwell, A. E., McDonald, M. M., & Navarrete, C. D. (2010). Extending the behavioral immune system to political psychology: Are political conservatism and disgust sensitivity really related? *Evolutionary Psychology*, 8, 599–616.
- Van Valen, L. (1973). A new evolutionary law. *Evolutionary Theory*, 1, 1–30.
- Vikman, E. (2005). Ancient origins: Sexual violence in warfare, part I. *Anthropology & Medicine*, 12, 21–31.
- Wrangham, R. W., & Peterson, D. (1996). *Demonic males: Apes and the origins of human violence*. Boston: Houghton Mifflin.