



# Guns, Germs, and Sex: How Evolution Shaped Our Intergroup Psychology

Mark Van Vugt<sup>1\*</sup> and Justin H. Park<sup>2</sup>

<sup>1</sup> VU University Amsterdam

<sup>2</sup> University of Bristol

## Abstract

A phenomenon of perennial interest to social psychologists is people's tendency to categorize others on the basis of group membership and to exhibit a preference for members of the ingroup relative to the outgroup. Recent work emphasizing the evolutionary functions of outgroup aggression, exploitation, and avoidance have shed new light on previously observed intergroup phenomena and generated many new empirical findings. We delineate two distinct evolved psychologies of intergroup relations and review recent research pertaining to each. One research line (on the psychology of warfare) focuses on the intergroup competition for resources; as we describe below, such competition – and the associated exploitative psychology – is more amplified among men. The other research line (on the psychology of disease avoidance) focuses on the need to avoid contagious disease. Because the threats posed by competitive versus disease-carrying outgroups are qualitatively distinct, the psychological reactions may also be qualitatively distinct.

Although it may not be obvious to modern-day city dwellers, humans are a tribal species. Our tribal psychology shows up in many familiar guises. First, people make spontaneous ingroup–outgroup categorizations and favor ingroup over outgroup members in a wide variety of situations (e.g. Brewer, 1979; Tajfel & Turner, 1979). Second, even when ingroups are large, symbolic, and composed of mostly unfamiliar individuals, people readily identify with them and display ingroup loyalty, sometimes at great personal cost (e.g. Abrams, Ando, & Hinkle, 1998; De Cremer & Van Vugt, 1999; Van Vugt & Hart, 2004; Zdaniuk & Levine, 2001); furthermore, people despise selfish and disloyal ingroup members, and they readily punish defectors (e.g. Fehr & Gächter, 2002; Marques, Yzerbyt, & Leyens, 1988). Third, and perhaps most relevant to our present thesis, people have a specific stance with respect to outgroups and intergroup situations. When intergroup relations are salient, people readily show prejudice against members of outgroups and find it easy to morally justify intergroup aggression and violence (Brewer & Brown, 1998; Fiske, 2002; Leach, Spears, Branscombe, & Doosje, 2003). Indeed, intergroup contexts are often spontaneously perceived as competitive and hostile (Johnson et al., 2006; Wildschut, Pinter, Vevea, Insko, & Schopler, 2003).

Perhaps not surprisingly, these phenomena have occupied social psychologists for a long time, and there is no shortage of explanations for them. Broadly speaking, there are two classes of explanations, which are not necessarily mutually exclusive (Kurzban & Neuberg, 2005). The first class focuses on people's ingroup psychology. Being a highly social and cooperative species, humans likely possess tendencies to exalt the ingroup (Brewer, 1979; Brewer & Caporael, 2006; Tajfel & Turner, 1979). As a byproduct of favoring ingroups, people will show indifference toward, or worse, a dislike for outgroups. The second class of explanations – the one that we concentrate on here – focuses

explicitly on people's psychological dispositions with respect to outgroups. The argument is that humans likely evolved specific adaptations for managing intergroup relations because such situations provided important reproductive challenges for ancestral humans.

As our objective is to describe and review the second class of explanations, we should clarify what it has to offer, above and beyond what is offered by the ingroup bias-hypothesis of outgroup hostility. First, explanations that focus exclusively on the positive aspects – the benefits of sociality – and treat negative aspects as a byproduct are missing something fundamental about how people's minds work. Human social life is full of threats as well as opportunities (Schaller, Park, & Kenrick, 2007), and it is improbable that humans have evolved tendencies to extract benefits but not tendencies to avoid costs. Indeed, looking across the spectrum of human experience, it is clear that people do possess specific reactions to negative things, which are often more powerful than reactions to positive things (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Haselton & Nettle, 2006). There are good evolutionary reasons for this: "Organisms that were better attuned to bad things would have been more likely to survive threats and, consequently, would have increased probability of passing along their genes" (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001, 325).

Second, and perhaps more important, explanations that treat negativity toward outgroups as a byproduct cannot account for the highly textured psychological and behavioral reactions to outgroups. People do not have some hazy negative feelings toward outgroups. In some instances, outgroups motivate desires to dominate and exploit; in other instances, they inspire desires to exclude and avoid. Recent work on prejudice, stereotyping, and intergroup processes that recognizes this textured nature of intergroup psychology has generated many new insights and empirical findings (e.g. Cottrell & Neuberg, 2005; Kurzban & Leary, 2001; Schaller, Park, & Faulkner, 2003; Sidanius & Pratto, 1999; Van Vugt, De Cremer, & Janssen, 2007). We provide more specific examples below.

Given the complexity of sociality and intergroup relations, there are probably many different psychological tendencies pertaining to interactions with different kinds of outgroups depending upon the specific challenges in a given interaction. In this study, we focus on two domains of intergroup contact – warfare and disease avoidance – and describe recent research pertaining to these two domains.

## The Psychology of Warfare

Intergroup conflict is ancient. Not only was intergroup conflict common in human ancestral environments (Alexander, 1987; Tooby & Cosmides, 1988), there is evidence that chimpanzees – our closest genetic relative and also a group-living species – are highly territorial and that their intergroup encounters are often hostile (Dugatkin, 1997; Goodall, 1986a; Wrangham & Peterson, 1996). Fossil evidence of human warfare dates back at least 200,000 years, and it is estimated that as much as 20–30% of ancestral men died from intergroup violence (Keeley, 1996). Many present-day hunter-gatherer groups are just as territorial and violent (e.g. Chagnon, 1988; Eibl-Eibesfeldt, 1974; Kelly, 1995). Alexander (1987) argued that the biggest threat for early humans came from other groups, which instigated an evolutionary arms race to form ever larger coalitions. As Kurzban and Leary (2001, 195) noted, "membership in a potentially cooperative group should activate a psychology of conflict and exploitation of out-group members – a feature that distinguishes adaptations for coalitional psychology from other cognitive systems".

From the perspective of coalitional psychology, it becomes clear that not all intergroup situations are equal; indeed, not all categories of people are members of coalitions that

engage in coordinated action – consider, for example, the homeless, the elderly, or people with blue eyes. Humans are likely to have evolved coalition-detection mechanisms that are responsive to various indicators of tribal alliances: “patterns of coordinated action, cooperation, and competition” (Kurzban, Tooby, & Cosmides, 2001). In modern environments, heuristic cues such as skin color, speech patterns, and linguistic labels – regardless of whether they actually signal tribal alliances – may engage these mechanisms (Kurzban, Tooby, & Cosmides, 2001; Schaller, Park, & Faulkner, 2003). Perhaps equally important, many other salient cues – gender, age, eye color – may be far less likely to engage the coalitional psychology. We should note that although this coalitional psychology evolved in the evolutionary context of competition for resources (such as territories, food, and mates), this does not imply that it is contemporarily activated only within contexts involving actual intergroup conflict, as proposed, for instance, by realistic conflict theory (Campbell, 1965).

### *The male warrior hypothesis*

An important implication of the warfare hypothesis is that intergroup conflict may have affected the evolved psychologies of men and women differently. Intergroup aggression has historically involved rival coalitions of males fighting over scarce reproductive resources (Keegan, 1994); this is true for early humans as well as chimpanzees (Chagnon, 1988; De Waal, 2006; Goodall, 1986a). As a consequence, this aspect of human coalitional psychology may be more pronounced among men, an idea we refer to as the *male warrior hypothesis* (Van Vugt, De Cremer, & Janssen, 2007; Van Vugt & Park, in press).

This hypothesis integrates many previously unconnected findings and generates many novel predictions concerning sex differences in specific cognitive and behavioral reactions to outgroups that can be tested using the social psychological literature. Men are expected to be more belligerent than women – and they usually are. Men are generally more supportive of warfare than women in opinion polls and have a stronger aesthetic preference for stimuli involving intergroup conflict such as war and western movies (Van Vugt et al., 2008). When playing war-games in the laboratory men are more likely to attack another country without provocation, and warfare is most intense when men are playing other men despite not knowing the sex of their rivals (Van Vugt et al., 2008). Men also have more positive illusions about winning these simulated intergroup conflicts, which tends to perpetuate conflict (Johnson et al., 2006). These sex differences also emerge when individuals play economic games between groups: all male groups tend to be more competitive than all female groups or mixed-sex groups (Wildschut, Pinter, Vevea, Insko, & Schopler, 2003).

Critics could argue that these are manifestations of a greater tendency of men to be aggressive and competitive in general – between groups and between individuals alike. However, men and women are quite similar in levels of interpersonal aggression, although they clearly differ in tactics with men being more physically aggressive and women more verbally aggressive (Archer, 2000; Simpson & Van Vugt, 2009). Furthermore, intergroup aggression actually involves high levels of collaboration among ingroup members, and, following the logic underlying the male warrior hypothesis, men are expected to cooperate more with each other if there is intergroup competition. This exact pattern was found in a recent set of studies (Van Vugt, De Cremer, & Janssen, 2007). University students played public good games in small groups in the laboratory either under conditions of interpersonal competition or intergroup competition (an induced prestige competition between rival universities). Whereas women contributed

more overall to their group, men contributed significantly more when their groups was competing with other groups.

We further predict sex differences in cognitive manifestations of this intergroup conflict psychology. Although the evidence is preliminary, a number of recent studies show that men are more likely to inhumanize members of outgroups, particularly when these outgroups constitute a coalitional threat. Inhumanization is the tendency to deny outgroup members' typical human qualities such as politeness and civility (Leyens et al., 2001). In a recent study (Van Vugt et al., 2008), men and women, all Christians, were asked to describe a Christian or Muslim target using either human (e.g. civil) or animal-typical (e.g. feral) words. Interestingly, Christian men were more likely to describe the Muslim target in animal-typical ways, thus showing some evidence of inhumanization. We hypothesize that inhumanization is a functional response in aggressive intergroup encounters, as it is much easier to maltreat outgroup members when they are considered less than human (cf. Haslam, 2006). It remains to be seen whether inhumanization strategies are particularly likely when outgroup targets are male, as the male warrior hypothesis would predict.

There is some evidence that outgroup males are considered more threatening. A different functional response in dealing with outgroup members is to (mis)perceive aggressive intention in such people. Maner et al. (2005) termed this tendency *functional projection*, and they proposed that people are more likely to perceive anger in the faces of outgroup members, especially males, even if they are holding neutral expressions. In two studies, Maner et al. (2005) found that an experimentally heightened self-protective motive (which involved showing participants scenes from the movie *Silence of the Lambs*) increased the tendency among White Americans to perceive anger in the faces of Black men and Arab men but not in the faces of White men.

Finally, men and women differ in their tribal social identities. Men have a more collective sense of self that is more strongly derived from their group memberships and affiliations (Baumeister & Sommer, 1997). Gabriel and Gardner (1999) asked students to describe themselves by completing the statement "I am ...". They found that male students were twice as likely to make statements referring to a tribal association (e.g. "I am a member of a fraternity"). In a recent study (Van Vugt et al., 2008), 100 people around the University of Kent campus were asked to indicate their favorite color and to explain why they picked this particular color. Among men, almost 30% mentioned a tribal association (e.g. their favorite football team, the colors of the flag of their country of origin); none of the women did so.

Tribal social identity formation probably kicks in at an early age. From an early age, boys prefer group interactions over dyadic interactions whereas girls prefer dyadic interactions. Benenson (1993) compared young children's responses to a single puppeteer (dyad) versus three puppeteers (group). Across two studies, the boys preferred the group interaction whereas the girls preferred the dyadic interaction. Benenson also surveyed social networks among children and found that boys tend to have larger social networks with more interaction partners. Studies of social play in children show that boys are more likely to participate in competitive games involving multiple groups such as soccer (Geary, 1998), and they are less tolerant of individuals who do not adhere to the rules of the game (Sherif, Harvey, White, Hood, & Sherif, 1961). The relationships also tend to be more hierarchical in boys' groups than in girls' groups, and the boy leader is often the one who is most verbally and physically assertive (Fabes & Eisenberg, 1992). Finally, boys are much more likely than girls to test their fighting ability and physical strength by, for instance, arm wrestling or stone throwing.

Parents tend to reinforce these sex differences in social play. For instance, fathers actively encourage their sons to engage in rough-and-tumble play and discourage them to play with dolls. Boys also receive more physical discipline than girls from both parents (Geary, 1998). Finally, it appears that boys selectively attend to adult models displaying masculine behavior such as play fighting. We speculate that such 'warrior' tendencies follow a stable developmental trajectory in boys with the aim of preparing them for competition with other males within groups as well as between groups when they are older (Geary, 1998).

Taken together, the male warrior hypothesis links many previously unconnected findings in the literature on sex differences in intergroup cognition and behavior. A cursory review of the literature shows that men show higher levels of intergroup aggression and hostility and cooperate more with their group under conditions of intergroup threat. Furthermore, men are more likely to identify themselves spontaneously with tribal groups and they have a more pronounced tribal social development. Further research could help to illuminate the role of sex hormones such as testosterone and other neurobiological processes in modulating these sex differences in tribal social behavior.

### The Psychology of Disease Avoidance

In addition to intentionally harming one another, people may inadvertently harm others via communicable pathogens. Communicable pathogens are particularly harmful for group-living species, especially as populations become denser (e.g. Nunn, Altizer, Jones, & Sechrest, 2003). For humans, evolutionarily unprecedented levels of population density have exacerbated the problem significantly. For urban-dwelling humans, the destruction caused by pathogens is staggering. Most notably, the 'Black Death' in the 1300s killed 20 million people, and the 'Spanish Flu' in the 1900s killed over 25 million people. And because affected groups of humans quickly acquire heritable immunity to highly potent pathogens (so that they may harbor the pathogens without dying), contact between previously divided populations has been disastrous for many groups, such as the indigenous peoples of the American continents (Diamond, 1997).

In response to the selection pressure imposed by pathogens, host organisms have evolved several defenses; one example is the physiological immune system. But the immune system is not a final solution, because pathogens themselves evolve – at much faster rates than their hosts – the ability to penetrate their hosts' immune systems. A more reliable defense would involve prevention of infection in the first place, via behavioral avoidance. Given that not all social interactions are likely to transmit pathogens, it would have been adaptive for animals to evolve the capacity to detect pathogen-carrying individuals and selectively avoid them (Kurzban & Leary, 2001; Loehle, 1995). Indeed, aversion toward and avoidance of infected conspecifics has been observed in many human and nonhuman animals (e.g. Crandall & Moriarty, 1995; Goodall, 1986b; Kavaliers & Colwell, 1995; Kiesecker, Skelly, Beard, & Preisser, 1999). This form of defense has been labeled the behavioral immune system (Schaller & Duncan, 2007).

How do we know whom to avoid? Pathogens, after all, are invisible. Research indicates that people respond to various bodily cues (e.g. lesions, rashes) that are correlated with the presence of pathogens (Kurzban & Leary, 2001; Schaller, Park, & Faulkner, 2003). The perception of such cues may then trigger specific emotional responses such as disgust (e.g. Curtis, Aunger, & Rabie, 2004; Oaten, Stevenson, & Case, 2009) and disease-relevant cognitions such as appraisals of contagion and contamination (e.g. Rozin, Millman, & Nemeroff, 1986). Developmental psychologists have found that the notion of



contagion is something that children learn very quickly (Kalish, 1996; Solomon & Cassimatis, 1999); among adults, the desire to avoid diseased others is correlated with the perceived contagiousness of the disease (Bishop, 1991; Crandall & Moriarty, 1995). Nearly universal aversion toward people with visually conspicuous diseases such as leprosy is a good illustration of the disease-avoidance process in operation.

Cues are helpful, but they are not always accurate. Some conspicuous bodily cues (e.g. burn scars) do not signal the presence of pathogens, and some pathogens leave no mark. A functional approach to such signal-detection problems (Haselton & Nettle, 2006) suggests that it would have been more adaptive to be biased toward falsely inferring the presence of pathogens when they are absent (rather than failing to infer their actual presence). As a result, people may be biased toward inferring that healthy people are diseased, rather than the reverse. An important implication is that any deviation from what is considered 'normal' appearance in a given society (even in the absence of contagious disease) may be interpreted as evidence of infection, automatically triggering an aversive response (Kurzban & Leary, 2001; Schaller & Duncan, 2007).

Importantly, people's aversive response is likely to be functionally flexible. Like physiological immune responses, behavioral responses entail costs as well as benefits. They should thus be activated especially strongly when the benefits of avoiding disease are high (and are likely to exceed the costs). Information concerning the benefits of avoidance behavior may be present in the environment (e.g. outbreak of disease in the local area) or within individuals (e.g. suppressed immune system). Simply put, the motivation to avoid individuals bearing disease-connoting cues is expected to be particularly powerful among people with heightened (perceived) susceptibility to pathogens (Schaller & Duncan, 2007).

These implications have led to several lines of inquiry and interesting discoveries. Several studies have investigated whether various physical 'abnormalities' (disability, obesity, facial birthmark, facial features associated with old age) may serve as pathogen-connoting cues (Duncan, 2005; Duncan & Schaller, 2008; Klaczynski, 2008; Park, Faulkner, & Schaller, 2003; Park, Schaller, & Crandall, 2007). Most relevant for the present study, heuristic cues of disease come not only in the form of morphological deviation, but also in the form of cultural 'outgroupness'. As noted above, contact with members of other groups often introduced diseases to which individuals had no immunity (Diamond, 1997). For people within any given culture, certain outgroups may appear especially foreign with respect to disease-relevant domains, such as food preparation and hygiene practices. Because each culture has developed (via cultural evolution) its own set of practices for preventing infection, cultures with different practices – especially in the domains of food preparation and hygiene – may be perceived as posing disease threats. Thus, the perception of outgroups, particularly those that are subjectively foreign, may activate disease-avoidance responses.

Some evidence for this hypothesis emerges from a series of studies by Faulkner, Schaller, Park, and Duncan (2004). They found that Canadian students with chronically heightened concerns about disease tend to harbor more strongly negative attitudes toward cultural outgroup members, but only those outgroup members perceived to be subjectively foreign in the disease-relevant domains (e.g. Africans, Sri Lankans); such effects were not found for outgroup members perceived to be subjectively familiar (e.g. East Asians, Europeans). Faulkner, Schaller, Park, and Duncan (2004) also found parallel effects in studies in which concerns about disease were experimentally manipulated.

Other studies, employing somewhat different methodologies, have replicated and extended these findings. One study found that chronically heightened concerns about

disease are associated with both outgroup negativity and ingroup positivity, even after controlling for concerns about death (Navarrete & Fessler, 2006). Another study found that individual differences in disgust sensitivity are associated with both negativity toward outgroups and positivity toward the ingroup (Navarrete & Fessler, 2006). Yet another study examined reactions of pregnant women. In the first trimester of pregnancy, both the fetus and mother are more susceptible to infection (due to suppressed immune responses), leading to the hypothesis that women in this period may exhibit stronger disease-avoidance responses. In a cross-sectional study of pregnant women, Navarrete, Fessler, and Eng (2007) found that women in the first trimester of their pregnancy were more ethnocentric and xenophobic.

Interestingly, patterns of ethnocentrism and xenophobia may vary systematically across cultures as a result of long-term regional differences in pathogen prevalence. Following the logic of functional flexibility, people in pathogen-prevalent regions are expected to have amplified behavioral immune system responses. One possible consequence is that they may be more likely to develop and transmit cultural norms that more strongly discourage potentially harmful intergroup contact. This line of reasoning may offer one explanation for the widely studied cultural variation in individualism–collectivism. Collectivism is characterized in part by sharper ingroup–outgroup boundaries. Thus, collectivistic value systems may be especially likely to emerge and persist in regions characterized by higher pathogen prevalence. Evidence supports this prediction (Fincher, Thornhill, Murray, & Schaller, 2008).

The hypothesis that humans may possess a behavioral immune system not only explains many forms of aversive reactions but also generates new predictions regarding intergroup psychology. Indeed, within this domain, there have been several examples of new and non-obvious predictions (e.g. effect of pregnancy on intergroup attitudes, association between pathogen prevalence and collectivism) that were generated uniquely by evolutionary reasoning.

## Implications for the Social Psychology of Intergroup Relations

We have presented a framework for studying the psychology of intergroup relations from an evolutionary perspective. Our analysis suggests that not all intergroup relations are alike because not all outgroups are alike. How people interact with members of outgroups is determined in part by the specific challenges these groups pose to the welfare of the ingroup and its members. When these challenges correspond to evolutionarily relevant threats – threats that were significant enough in ancestral social environments that humans have evolved to deal with them – they elicit a specific intergroup psychology. We discussed two such challenges – warfare and disease avoidance – and hypothesized that they likely contributed to a distinct evolved ingroup–outgroup psychology, consisting of an interrelated set of functional cognitive and behavioral responses to neutralize these threats. In the case of warfare, the primary elicited emotional responses would be anger or fear, and the primary behavioral responses would be aggression, dominance, or, in the case of formidable opposition, submission. In the case of disease avoidance, the primary emotion would be disgust and the primary behavioral response would be avoidance (cf. Schaller & Neuberg, 2008).

We tested these evolutionarily informed hypotheses by examining the impact of various moderator variables – such as biological sex and vulnerability to disease – that according to theory should produce reliable differences in intergroup affect, cognition, and behavior. The data obtained from various research programs in North America and

Europe support our main hypotheses so far, but further tests are needed. For instance, when a warfare psychology is salient, some outgroups are *infrahumanized* (they are considered animal-like) whereas others are *dehumanized* (they are considered robot-like; Haslam, 2006). It would be interesting to know which strategy is likely to emerge and whether it depends upon the size, strength, and perceived competence of the outgroup (Fiske, 2002). Another issue is whether there is a spillover between different threats. Some outgroups may activate both a warfare and disease psychology, and rather than simply inspiring avoidance, they may be attacked to be eliminated (think of war propaganda in which enemies are depicted as vectors of disease – rats, lice, parasites – which must be destroyed).

In addition to warfare and disease avoidance, there might be a host of other significant ancestral intergroup challenges that created their own unique intergroup psychology. Groups could potentially suffer from *cheaters* and *free-riders* – individuals who would use up group resources such as food without contributing to their provision. Sharing food with members of outgroups might be especially risky because these individuals could more easily defect (the cultural tradition of sharing with food with strangers suggests that there are also benefits). When such free-rider threats are salient, we should expect an intergroup psychology that is characterized by anger and stereotypic beliefs of outgroup members pertaining to dishonesty and untrustworthiness. The primary behavioral reactions for dealing with freeloaders would be punishment and social exclusion (Kurzban & Leary, 2001).

The evolutionary framework also makes various suggestions for interventions to improve intergroup relations. When outgroups pose coalitional threats, interventions might be targeted specifically at male-to-male interactions because they are the most likely perpetrators and victims of intergroup aggression. When outgroup members activate a disease psychology, there is some reason to believe that interventions focusing on prejudice in reproductive females might work best (Navarrete, Fessler, & Eng, 2007).

In terms of their objectives, interventions will be particularly successful when they eliminate the sense of threat associated with particular groups altogether. An example of a group likely to activate a disease psychology is the *homeless*. We suspect that providing homeless people with clean clothes and washing facilities might reduce some of the prejudices that such people encounter. Similarly, when members of groups activate a warfare psychology, attempts must be made to individuate members of such groups, for instance, by accentuating their personal achievements as students rather than the achievements of their group.

A second aim of interventions is to alter the perceptual cues that elicit threat responses toward particular outgroups such as new immigrant groups. For instance, language, dress code, and particular rituals or customs serve as tribal markers, and the less noticeable they are the more these outgroups will receive positive treatment. Thus, for the sake of attenuating the effects of coalitional psychology, it is important for societies to make it easier for new immigrant groups to adopt the language and customs of the ingroup.

Third, interventions might be focused on changing the specific cognitive and affective responses toward outgroups. However, if it is true that these responses are evolved, then the link between threat and response might be difficult to inhibit or extinguish (cf. fear of snakes and spiders; Öhman & Mineka, 2001). Indeed, research has found that a learned fear response to an outgroup face (but not an ingroup face) is resistant to extinction (Olsson, Ebert, Banaji, & Phelps, 2005); furthermore, a recent study found that the resistance effect is limited to *male* outgroup faces (Navarrete et al., 2009). Nevertheless, frequent positive interactions with members of outgroups are likely to reduce initial aversion or hostility. For instance, the learning bias documented by Olsson, Ebert, Banaji, and Phelps



(2005) was weaker among individuals who reported a higher number of intergroup dating experiences. Similarly, the Jigsaw class-room experiments (Aronson & Bridgeman, 1979) demonstrate that cooperative relations between members of different ethnic groups are a good means of reducing prejudice, possibly because this intervention redraws the coalitional boundaries into a more inclusive one (cf. Kurzban, Tooby, & Cosmides, 2001). Finally, contact between members of different groups will be more effective to the extent that the nature of that contact explicitly pre-empts fears of aggression or disease transmission. Thus, initial negotiations between representatives of previously hostile groups should preferably take place on neutral territory.

## Conclusion

The social psychological literature on intergroup relations is rich and diverse. It is relatively mute about the origins of tribal tendencies in humans and therefore lacks a coherent framework for understanding why different outgroups elicit vastly different responses. We presented here a preliminary framework, inspired by insights from evolutionary psychology and biology, that links particular intergroup challenges, notably warfare and disease avoidance, to particular functional responses. Although such responses may have emerged because they were adaptive in ancestral times, they might not necessarily be functional in modern times. Nevertheless, understanding why particular outgroups elicit particular emotions, cognitions, and behaviors is the first step toward a sensible policy to improve intergroup relations in our society.

## Short Biographies

Mark Van Vugt conducts research on group processes and intergroup relations. His research focuses on both the psychological and evolutionary mechanisms underlying a wide range of group and intergroup phenomena such as status, leadership, cooperation, and intergroup conflict and applies insights from his research to help solve real-world social issues. His work has been published in all the leading journals in psychology such as the *American Psychologist*, *Psychological Science*, *Personality and Psychology Review*, and *Journal of Personality and Social Psychology* (he currently serves as associate editor for the latter journal). His research has been supported by grants from the British Academy ("the social brain" project), the Economic and Social Research Council, Leverhulme, and the Netherlands Scientific Association. He is author and editor of several books including an edited volume on cooperation (*Cooperation in Modern Society*; Routledge, 2000) a textbook on applying social psychology (Sage, 2008) and a popular science book on the evolution of leadership (Profile 2010). Mark's work features regularly in the popular science media on TV and radio, and in science magazines such as the *New Scientist*. Mark has recently moved to the VU University Amsterdam.

Justin Park conducts research on social cognitive processes from a functional perspective. His research focuses on psychological mechanisms with possible evolutionary origins and on interpersonal and intergroup phenomena associated with those mechanisms. For example, in one line of research, he has investigated the extent to which psychological disease-avoidance mechanisms may underlie some instances of prejudice and stigmatization. He has published in *Personality and Social Psychology Bulletin*, *European Journal of Social Psychology*, *Evolution and Human Behavior*, *Personality and Individual Differences*, and *Review of General Psychology*. He received his PhD from the University of British Columbia in 2005 and is currently at the University of Bristol.

## Endnote

\* Correspondence address: Mark Van Vugt, VU University Amsterdam, 1081 BT Amsterdam, the Netherlands. Email: m.van.vugt@psy.vu.nl

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