

An evolutionary threat-management approach to prejudices

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The article provides an overview of key insights that have emerged from an evolutionary approach to the psychology of prejudice. Within this framework, prejudices and related phenomena are viewed as products of adaptations designed by natural selection to manage fitness-relevant threats and opportunities faced by ancestral populations. This framework has generated many novel, nuanced, and empirically supported predictions regarding (1) the specific contents of prejudices, (2) the specific categories of people who are likely to elicit these prejudices, and (3) the specific contexts within which these prejudices are either more, or less, likely to be evoked.

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Psychological research on prejudice has traditionally investigated how proximal mechanisms — individuals' goals, emotions and knowledge structures — shape the attitudes and actions directed at different categories of people. In recent years, researchers have coupled this study of proximal explanations to a careful consideration of *ultimate* explanations, which focus on evolutionary processes operating on ancestral populations. From this perspective, contemporary prejudices are typically viewed as outcomes of psychological adaptations 'designed' by natural selection to manage threats and opportunities that had implications for reproductive fitness within the ecologies that characterized much of human (and pre-human) evolutionary history. This threat-management and opportunity-management approach reveals important nuances in previously accepted findings and generates a host of novel predictions, many of which have been empirically supported [1,2].

Prejudices as products of threat-management mechanisms

For our ancestors, defense against predators and attainment of valued resources posed recurrent problems. Cooperating with others helped solve those problems, and individuals inclined toward cooperation gained tangible benefits (e.g., nutrition, longevity) that translated into reproductive advantages relative to those inclined toward solitary, independent action. Across many generations of differential reproductive success, humans came to be characterized by an inclination toward sociality [3–5]. Sociality comes with costs, however. Proximity to others increases one's vulnerability to interpersonal violence, theft, and infectious disease. Interdependence makes cooperators susceptible to free-riding and other forms of cheating. These threats imposed selection pressures that shaped the evolution of social cognition. Individuals who more successfully identified those who posed fitness-relevant threats, and responded in ways that minimized those threats, were more likely to survive and reproduce. Therefore, as a companion to evolved mechanisms for sociality, there would also have evolved affordance-management systems [6–9] comprising psychological mechanisms that facilitated learning of cues connoting specific forms of threat, use of these cues to identify conspecifics who potentially posed specific forms of threat, and cue-based affective, cognitive and behavioral responses that — within ancestral ecologies — mitigated specific forms of threat. Contemporary prejudices, stereotypes, and acts of behavioral discrimination are consequences of these mechanisms.

Functionally different threats imply psychologically different prejudices

Whereas prejudice is often defined simply in terms of its generally negative evaluative flavor, the threat-management approach implies that different prejudices come in different affective flavors. This is because different psychological responses would have been required to successfully mitigate different threats.

Escape may be useful for managing the threat posed by the rapid approach of an angry man, but is unlikely to be an effective response to someone cheating in an exchange of resources. That threat might be more effectively mitigated by approach and confrontation. And neither of these responses is likely to completely mitigate the threat of pathogen infection posed by people already infected. Indeed, different threats evoke different behavioral reactions, and the emotional responses facilitating these behaviors show a similar functional specificity: fear facilitates escape, anger facilitates approach and

confrontation, and disgust facilitates not only avoidance but often also moral condemnation and the enduring exclusion of offending individuals from group activities. Thus, to the extent that different groups of people are perceived to pose different kinds of threats, they might be expected to elicit different prejudices and distinct discriminatory responses. They do [10,11]. More broadly, this body of research suggests that the psychology of prejudice might best be understood as the psychology of prejudices, plural.

Threat-detection mechanisms produce prejudices against people who pose no actual threat

People rarely have direct perceptual access to others' aggressive, deceptive, or free-riding intentions, or to the pathogens lurking within their bodies. Consequently, perceivers use cues (e.g., physical appearance, behavior) to infer the threats potentially afforded by others. Cues that were diagnostic of threat in ancestral ecologies may be less diagnostic in contemporary contexts, however, and even the most diagnostic cues are fallible [2,8,12]. Social perceivers thus inevitably make inference errors. The inference process is calibrated to minimize the likelihood of making errors associated with high fitness costs, with the consequence that it produces many other errors instead [13,14]. Just as smoke detectors are designed to be highly sensitive to any hint of smoke particles (so as to avoid missing actual fires), human threat detection mechanisms are designed to be highly sensitive to even imperfect cues to threat (so as to avoid missing evidence of actual threat).

This means that, like smoke detectors, people generate many false alarms, responding to many benign individuals as though they posed actual threats. Outgroup men are intuitively perceived to be dangerous and so are often targets of a fear-based prejudice [8,15–18]. Objectively healthy individuals with anomalous appearances are intuitively appraised as potentially contagious and so often elicit a disgust-based prejudice [19]. Because threat-management systems operate on the heuristic of 'better safe than sorry,' people discriminate against those who may, in fact, pose no threat at all.

Prejudices are elicited especially when contextual cues connote vulnerability to threat

Threat-management responses are costly, both in terms of energy expended and opportunities missed. In ancestral populations, the fitness benefits of threat-mitigating responses were most likely to outweigh these costs when perceivers were most vulnerable to the threat. Threat-management systems thus evolved to be functionally flexible, producing prejudicial responses most strongly in the context of additional information connoting to perceivers that they are vulnerable to the relevant threat [2,20**].

When cues connote vulnerability to physical harm, people show stronger tendencies to assume ambiguous

individuals are members of potentially dangerous outgroups [21], to misperceive their own proximity to potentially dangerous outgroups [15], and to misperceive outgroup members as angry [16,17]. Vulnerability-connoting cues also increase the activation of threat-specific stereotypes into working memory. For example, non-Black North Americans in a dark (rather than well-lit) room showed especially strong activation of stereotypes linking Black men to specific traits such as 'hostile' and 'criminal' [18].

A conceptually analogous functional flexibility is evident in prejudicial responses to individuals possessing features that cue the threat of infection (e.g., individuals with blemished or asymmetrical faces, who are obese, or who belong to subjectively foreign outgroups [19]). These prejudices are exaggerated when contextual cues connote that perceivers are themselves more vulnerable to infection [22–29]. This functional flexibility is also observed in prejudices predicated upon the threat of resource scarcity. Under conditions connoting economic vulnerability, people are more likely to perceive racially ambiguous persons as outgroup members and show heightened prejudices against groups stereotypically viewed as strong economic competitors [30*,31,32].

Prejudices differ depending on sex of targets and sex of perceivers

Because coalitional group memberships were so essential to threat-management in ancestral ecologies, people continue to be extraordinarily sensitive to coalitional boundaries. Indeed, unambiguous information about coalitional memberships tends to psychologically trump more indirect cues to group membership, including race [33,34]. Because men were historically more likely than women to participate in violent conflicts between coalitional groups, two implications follow: First, people are likely to be especially sensitive to the threat afforded by outgroup men (compared to outgroup women). Support for this implication is found in evidence that fearful responses to outgroup men (relative to outgroup women) are especially difficult to unlearn [35], and that vulnerability-connoting contexts lead non-Black people to erroneously perceive anger in the faces of Black men but not in the faces of Black women [17]. Second, the prejudices expressed by men (compared to women) may be especially sensitive to contextual cues connoting vulnerability to physical attack. Some evidence supports this hypothesis, too [36,37]. Moreover, men who are especially focused on coalitional issues are also especially prejudiced against outgroup men [37].

This does not mean that women are not prejudiced against outgroup men. They are, but their prejudices seem to be based somewhat less on perceived threat of coalitional violence and more on the need to manage threats to mating autonomy [38*].

Threats to mating autonomy may also help explain prejudices against non-heterosexuals. These prejudices vary according to the extent to which non-heterosexuals are perceived by heterosexual men and women to pose threats of unwanted sexual interest — a finding that helps explain why young heterosexual women are less prejudiced than heterosexual men against gay men, and why straight men are less prejudiced against bisexual women than against bisexual men [39].

New directions and emerging topics of inquiry Prejudices associated with prosociality

We have focused primarily on prejudices linked to threats posed by aggression, infection, and economic exploitation. As illustrated by findings linking mating autonomy to prejudice, new programs of research focus on other fitness-relevant threats and opportunities, and their implications for prejudice. Some of this research reveals that psychological mechanisms that serve a predominantly prosocial function also have the potential to produce prejudice.

One example is offered by recent research linking the evolved psychology of offspring care to intergroup prejudice. Given the many years it takes human offspring to mature to reproductive age, reproductive fitness is indirectly influenced by parents' capacity to nurture their offspring and protect them against various threats. One implication is that under circumstances in which a caregiver role is made salient to individuals — even if those individuals are not actually parents — they express greater prejudice against potentially threatening ethnic outgroups [40*].

Another example pertains to the many fitness benefits associated with sociality and within-group cooperation more generally. These benefits are less likely to accrue in the presence of individuals who threaten a group's operational integrity by failing to conform to norms underlying cooperative behavior [41]. In many human societies, cooperative behavior and normative conformity are encouraged by religious beliefs. One implication of this is the common presence of prejudices against those with different religious beliefs. Another implication is the strong prejudice against atheists seen in much of the world. This prejudice is predicated upon moral distrust and perceived incompatibility of values, is expressed even by people who are themselves not strongly religious, and is expressed especially strongly when perceivers are concerned with their group's operational integrity [42,43*].

Life history theory and the content of stereotypes

Within ancestral ecologies, age, sex, and ethnicity were likely to have been readily identifiable, difficult to fake, and — importantly — somewhat diagnostic of several important fitness-relevant threats and opportunities. Life history theory provides a theoretical framework for un-

derstanding why this may be the case, and thus for what the contents of contemporary stereotypes about age, sex, and ethnicity/race are likely to be.

Life history theory was developed within the biological sciences to explain how organisms, including humans, strategically allocate finite resources to different tasks (e.g., growth, mating, parenting) across the life span [44–46]. Allocation strategies vary across maturation stage and sex. Therefore, age and sex, working together, shape individuals' goal priorities and the behavioral strategies used to achieve those goals. Because social perceivers have a powerful interest in anticipating others' goals and behaviors — so as to effectively manage their own fitness outcomes — they are likely to possess stereotypes about sex and age calibrated to nuances in how sex and age actually interact to shape people's behavior [47*].

Life history theory also describes how individual organisms' ecological circumstances shape their enduring goals and behavioral strategies. Harsh, unpredictable ecologies lead toward 'fast' strategies that are relatively present-focused, impulsive, and sexually unrestrained, whereas resource-sufficient and predictable ecologies lead toward 'slow' strategies that are more future-oriented, planful, and sexually restrained [48–50]. People may thus develop different stereotypes about categories of people associated with these different ecologies, and may use these stereotypes when making inferences about individuals. Moreover, because in many contemporary contexts members of different groups live in different locales, information about ethnicity or race may serve as a crude cue for an individual's ecological home. One applied implication of this is that the effects of ethnic and racial stereotypes on impression formation may be reduced when perceivers have available relevant information about others' ecological circumstances [47*].

Conclusions

Humans are *social* animals, a characteristic that has motivated decades of research on the psychological underpinnings of prejudice. Only more recently have psychological scientists attended more closely to the fact that humans are *evolved* social animals. Research that has taken this fact seriously — and pursued its logical implications rigorously — has generated many novel hypotheses, empirical discoveries, and useful new conceptual insights about the psychology of prejudice(s).

Conflict of interest statement

Nothing declared.

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References and recommended reading

Papers of particular interest, published within the period of review, have been highlighted as:

- of special interest
 - of outstanding interest
1. Neuberg SL, DeScioli P: Prejudices: managing threats to group life. To appear in *Handbook of Evolutionary Psychology* (2nd ed.). Edited by Buss D John Wiley & Sons; in press.
 2. Schaller M, Neuberg SL: **Danger, disease, and the nature of prejudice(s)**. In *Advances in Experimental Social Psychology*, vol. 46. Edited by Olson J, Zanna MP. Academic Press; 2012:1-55.
 3. Brewer MB, Caporael L: **An evolutionary perspective on social identity: revisiting groups**. In *Evolution and Social Psychology*. Edited by Schaller M, Simpson JA, Kenrick DT. Psychology Press; 2006:143-161.
 4. Campbell DT: **Legal and primary-group social controls**. *J Soc Biol Struct* 1982, **5**:431-438.
 5. Richerson P, Boyd R: **The evolution of human hypersociality**. *Ringberg Castle Symposium on Ideology, Warfare and Indoctrinability*. 1995.
 6. McArthur LZ, Baron RM: **Toward an ecological theory of social perception**. *Psychol Rev* 1983, **90**:215-238.
 7. Neuberg SL, Kenrick DT, Schaller M: **Evolutionary social psychology**. In *Handbook of Social Psychology*. Edited by Fiske ST, Gilbert D, Lindzey G. John Wiley & Sons; 2010:761-796.
 8. Neuberg SL, Kenrick DT, Schaller M: **Human threat management systems: self-protection and disease avoidance**. *Neurosci Biobehav Rev* 2011, **35**:1042-1051.
 9. Zebrowitz LA, Montepare J: **The ecological approach to person perception: evolutionary roots and contemporary offshoots**. In *Evolution and Social Psychology*. Edited by Schaller M, Simpson JA, Kenrick DT. Psychology Press; 2006:81-113.
 10. Cottrell CA, Neuberg SL: **Different emotional reactions to different groups: a sociofunctional threat-based approach to 'prejudice'**. *J Pers Soc Psychol* 2005, **88**:770-789.
 11. Cottrell CA, Richards DAR, Nichols AL: **Predicting policy attitudes from general prejudice versus specific intergroup emotions**. *J Exp Soc Psychol* 2010, **46**:247-254.
 12. Kurzban R, Leary MR: **Evolutionary origins of stigmatization: the functions of social exclusion**. *Psychol Bull* 2001, **127**:187-208.
 13. Haselton MG, Nettle D: **The paranoid optimist: an integrative evolutionary model of cognitive biases**. *Pers Soc Psychol Rev* 2006, **10**:47-66.
 14. Nesse RM: **Natural selection and the regulation of defenses: a signal detection analysis of the smoke detector principle**. *Evol Hum Behav* 2005, **26**:88-105.
 15. Cesario J, Navarrete CD: **Perceptual bias in threat distance: the critical roles of ingroup support and target evaluations in defensive threat regulation**. *Soc Psychol Pers Sci* 2014, **5**:12-17.
 16. Becker DV, Neel R, Anderson U: **Illusory conjunctions of angry facial expressions follow intergroup biases**. *Psychol Sci* 2010, **21**:938-940.
 17. Maner JK, Kenrick DT, Becker DV, Robertson T, Hofer B, Delton AW, Neuberg SL, Butner J, Schaller M: **Functional projection: how fundamental social motives can bias interpersonal perception**. *J Pers Soc Psychol* 2005, **88**:63-78.
 18. Schaller M, Park JH, Mueller A: **Fear of the dark: interactive effects of beliefs about danger and ambient darkness on ethnic stereotypes**. *Pers Soc Psychol Bull* 2003, **29**:637-649.
 19. Schaller M, Park JH: **The behavioral immune system (and why it matters)**. *Curr Dir Psychol Sci* 2011, **20**:99-103.
 20. Neuberg SL, Schaller M: Evolutionary social cognition. In *APA Handbook of Personality and Social Psychology* (Vol. 1, Attitudes and Social Cognition). Edited by Mikulincer M, Shaver PR (Borgida E, Bargh JA [Assoc. Eds.]). American Psychological Association; 2014:3-45.
 - How people think about others reflects motivated, strategic responses to the fundamental challenges our ancestors long faced as highly interdependent social animals. This chapter presents the logical foundations underlying evolved social-cognitive processes and reviews research demonstrating a wide range of adaptation-based, functional social-cognitive processes (e.g., related to perception, attention, categorization, memory, and decision making) designed to managing challenges related to self-protection, disease-avoidance, resource acquisition, social affiliation, status acquisition, mate seeking, mate retention, and kin care.
 21. Miller SL, Maner JK, Becker DV: **Self-protective biases in group categorization: threat cues shape the psychological boundary between "us" and "them"**. *J Pers Soc Psychol* 2010, **99**:62-77.
 22. Ackerman JM, Becker DV, Mortensen CR, Sasaki T, Neuberg SL, Kenrick DT: **A pox on the mind: disjunction of attention and memory in processing physical disfigurement**. *J Exper Soc Psychol* 2009, **45**:478-485.
 23. Huang JY, Sedlovskaya A, Ackerman JM, Bargh JA: **Immunizing against prejudice: effects of disease protection on outgroup attitudes**. *Psychol Sci* 2011, **22**:1550-1556.
 24. Miller SL, Maner JK: **Overperceiving disease cues: the basic cognition of the behavioral immune system**. *J Pers Soc Psychol* 2012, **102**:1198-1213.
 25. Park JH, Schaller M, Crandall CS: **Pathogen-avoidance mechanisms and the stigmatization of obese people**. *Evol Hum Behav* 2007, **28**:410-414.
 26. Young SG, Sacco DF, Hugenberg K: **Vulnerability to disease is associated with a domain-specific preference for symmetrical faces relative to symmetrical non-face stimuli**. *Euro J Soc Psychol* 2011, **41**:558-563.
 27. Kenrick AC, Shapiro JR, Neuberg SL: **Do parental bonds break anti-fat stereotyping? Parental work-ethic ideology and disease concerns predict bias against heavy-weight children**. *Soc Psychol Pers Sci* 2013, **4**:723-731.
 28. Faulkner J, Schaller M, Park JH, Duncan LA: **Evolved disease-avoidance mechanisms and contemporary xenophobic attitudes**. *Group Proc Intergroup Relat* 2004, **7**:333-353.
 29. Navarrete CD, Fessler DMT, Eng SJ: **Elevated ethnocentrism in the first trimester of pregnancy**. *Evol Hum Behav* 2007, **28**:60-65.
 30. Krosch AR, Amodio DM: **Economic scarcity alters the perception of race**. *Proc Nat Acad Sci* 2014, **111**:9079-9084.
 - Within-group cooperation evolved to enhance predictable access to crucial resources. When resources are scarce, people may thus be motivated to limit their sharing to clear members of their ingroups, and this behavioral preference may be supported by functionally biased perceptual and cognitive mechanisms. In a series of studies, White perceivers primed with resource scarcity were especially likely to categorize mixed-race targets as Black (rather than White), to 'see' African Americans as more 'stereotypically Black,' and to allocate fewer resources to them.
 31. Rodeheffer CD, Hill SE, Lord CG: **Does this recession make me look Black? The effect of resource scarcity on categorization of biracial faces**. *Psychol Sci* 2012, **23**:1476-1478.
 32. Butz DA, Yogeewaran K: **A new threat in the air: macroeconomic threat increases prejudice against Asian Americans**. *J Exp Soc Psychol* 2011, **47**:22-27.
 33. Kurzban R, Tooby J, Cosmides L: **Can race be erased? Coalitional computation and social categorization**. *Proc Nat Acad Sci* 2001, **98**:15387-15392.
 34. Pietraszewski D, Cosmides L, Tooby J: **The content of our cooperation, not the color of our skin: an alliance detection system regulates categorization by coalition and race, but not sex**. *PLOS ONE* 2014, **9**:e88534 <http://dx.doi.org/10.1371/journal.pone.0088534>.
 35. Navarrete CD, Olsson A, Ho AK, Mendes WB, Thomsen L, Sidanius J: **Fear extinction to an outgroup face: the role of target gender**. *Psychol Sci* 2009, **20**:155-158.
 36. Schaller M, Neuberg SL: **Intergroup prejudices and intergroup conflicts**. In *Foundations of Evolutionary Psychology*. Edited by

- Crawford , Krebs DL. Lawrence Erlbaum Associates; 2008: 399-412.
37. McDonald MM, Navarrete CD, Van Vugt M: **Evolution and the psychology of intergroup conflict: the male warrior hypothesis.** *Phil Trans Roy Soc B: Bio Sci* 2012, **367**:670-679.
 38. McDonald MM, Donnellan MB, Cesario J, Navarrete CD: **Mate choice preferences in an intergroup context: Evidence for a sexual coercion threat-management system among women.** *Evol Hum Behav* (in press).
Both men and women tend to be biased against outgroup men, but perhaps for different reasons. There are reasons to believe that sexual assault of women was a common feature of intergroup conflict throughout our long evolutionary history. The authors thus argue that those women who view themselves as especially vulnerable to sexual coercion, and for whom the costs of sexual coercion are especially great, are likely to be particularly wary of potential sexual contact with outgroup men. Extending past research and employing a minimal groups paradigm, the authors found that women who received an unsolicited dating request from an outgroup man were especially likely to refuse that request to the extent they (1) dispositionally felt vulnerable to sexual coercion and (2) were in the fertile phase of their menstrual cycle.
 39. Pirlott AG, Neuberg SL: **Sexual prejudice: avoiding unwanted sexual interest?** *Soc Psychol Pers Sci* 2014, **5**:92-101.
 40. Gilead M, Liberman N: **We take care of our own: caregiving salience increases out-group bias in response to out-group threat.** *Psychol Sci* 2014, **25**:1380-1387.
Care-giving is a fundamental human activity often characterized as prosocial. Effective care-giving also requires, however, that we protect those in our care from external threats. In a series of studies, the authors found that, in the presence of an experimentally manipulated outgroup threat (but not a natural threat), enhanced salience of care-giving led to increased amounts of outgroup derogation.
 41. Neuberg SL, Smith DM, Asher T: **Why people stigmatize: toward a biocultural framework.** In *The Social Psychology of Stigma*. Edited by Heatherton TF, Kleck RE, Hebl MR, Hull JG. Guilford; 2000:31-61.
 42. Cook CL, Cottrell CA, Webster GD: **No good without god: antiatheist prejudice as a function of threats to morals and values.** *Psychol Relig Spirit* 2014. Advance online publication.
 43. Gervais WM: **In godlessness we distrust: using social psychology to solve the puzzle of anti-atheist prejudice.** *Soc Pers Psychol Compass* 2013, **7**:366-377.
Atheists confront considerable prejudice and discrimination. Why? The author reviews evidence suggesting that part of the answer rests on atheists' lack of belief in monitoring and punishing gods. Without such beliefs, others may view atheists as 'moral wildcards' — as individuals who may succumb to selfish urges and who thus cannot be trusted to behave prosocially.
 44. Hill K, Kaplan H: **Life history traits in humans: theory and empirical studies.** *Ann Rev Anthro* 1999, **28**:397-430.
 45. Kaplan HS, Gangestad SW: **Life history theory and evolutionary psychology.** In *The Handbook of Evolutionary Psychology*. Edited by Buss DM. JohnWiley & Sons; 2015:68-95.
 46. Stearns SC: **Life-history tactics: a review of the ideas.** *Quart Rev Bio* 1976, **51**:3-47.
 47. Neuberg SL, Sng O: **A life history theory of social perception: stereotyping at the intersections of age, sex, and ecology (and race).** *Soc Cog* 2013, **31**:696-711.
Why are the features of age, sex, and ethnicity/race so ubiquitously used to understand others? Integrating life history theory with an affordance-management view of social perception, the authors derive a series of hypotheses, including about how these features interact to create the particular stereotypes people have about others; how the ecologies in which different groups live shape the stereotypes people have them; and how this integrative framework suggests possibilities for reducing misguided applications of race stereotypes to individuals.
 48. Ellis BJ, Figueredo AJ, Brumbach BH, Schlomer GL: **Fundamental dimensions of environmental risk.** *Hum Nat* 2009, **20**:204-268.
 49. Griskevicius V, Tybur JM, Delton AW, Robertson TE: **The influence of mortality and socioeconomic status on risk and delayed rewards: a life history theory approach.** *J Pers Soc Psychol* 2011, **100**:1015-1026.
 50. Simpson JA, Griskevicius V, Kuo SI-C, Sung S, Collins WA: **Evolution, stress, and sensitive periods: the influence of unpredictability in early versus late childhood on sex and risky behavior.** *Dev Psychol* 2012, **48**:674-686.