Ecology-driven stereotypes override race stereotypes

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Why do race stereotypes take the forms they do? Life history theory posits that features of the ecology shape individuals' behavior. Harsh and unpredictable ("desperate") ecologies induce fast strategy behaviors such as impulsivity, whereas resource-sufficient and predictable ("hopeful") ecologies induce slow strategy behaviors such as future focus. We suggest that individuals possess a lay understanding of ecology's influence on behavior, resulting in ecology-driven stereotypes. Importantly, because race is confounded with ecology in the United States, we propose that Americans' stereotypes about racial groups actually reflect stereotypes about these groups' presumed home ecologies. Study 1 demonstrates that individuals hold ecology stereotypes, stereotyping people from desperate ecologies as possessing faster life history strategies than people from hopeful ecologies. Studies 2–4 rule out alternative explanations for those findings. Study 5, which independently manipulates race and ecology information, demonstrates that when provided with information about a person's race (but not ecology), individuals' inferences about blacks track stereotypes of people from desperate ecologies, and individuals' inferences about whites track stereotypes of people from hopeful ecologies. However, when provided with information about both the race and ecology of others, individuals' inferences reflect the targets' ecology rather than their race: black and white targets from desperate ecologies are stereotyped as equally fast life history strategists, whereas black and white targets from hopeful ecologies are stereotyped as equally slow life history strategists. These findings suggest that the content of several predominant race stereotypes may not reflect race, per se, but rather inferences about how one's ecology influences behavior.

race stereotypes | life history theory | stereotype content | ecology | affordance management

Morally lax. Criminal. Adulterous. Irresponsible. Unemployed. Traits such as these have long characterized white Americans' stereotypes of black Americans (1–3). Why do race stereotypes in the United States take these particular forms?

Stereotypes are useful to the extent they can rapidly provide perceivers with information about the affordances—threats and opportunities—posed by others (4). Indeed, a major function of the mind is to identify and anticipate affordances and to respond to them in ways that are threat reducing and opportunity enhancing so that we may more successfully achieve our goals (5–10). However, because we cannot directly see others' behavioral intentions, strategies, or capacities, we must infer them (imperfectly) from cues we can perceive. Here, we argue that one such cue is an individual's home ecology, because ecologies shape the behavior of those within them. Thus, by knowing another's home ecology, people possess useful information (in the form of stereotypes) about others' behavioral intentions, strategies, and capacities. To the extent that different races are associated with different home ecologies, an individual's race becomes a secondary cue to his or her ecology, with the implication that race may evoke ecology-driven stereotypes.

Evolutionary biology's life history theory provides a framework for understanding how and why ecologies influence behavior and thereby people's stereotypes of others. Premised on the assumption that energetic resources are finite, life history theory posits that all organisms must make trade-offs in how they allocate their energy across different fundamental tasks (broadly grouped into the categories of growth, maintenance, and reproduction) in an effort to maximize reproductive fitness (11–13). Devoting energetic resources to any one task necessarily means devoting fewer energetic resources toward alternative tasks (14); one cannot spend the same calorie twice. The pattern of an organism's trade-offs reflects its life history strategy. Life history strategies represent integrated, interdependent traits and behaviors, broadly placed along a continuum from fast to slow (15). In general, fast life history strategies are exemplified by lower investment in embodied capital, earlier sexual maturation and reproduction, higher numbers of offspring, and lower parental investment; slow life history strategies are exemplified by higher investment in embodied capital, later maturation and reproduction, lower numbers of offspring, and higher parental investment (14).

Relative to other organisms, humans exhibit investment patterns consistent with a slow life history strategy (16). However, there is considerable variation in life history strategy among individuals (17). For example, people differ with respect to reproductive timing, sexual promiscuity, investment in children, investment in education, and inclinations toward risk-taking and opportunistic criminality—all behavioral indicators of life history strategy (18, 19).

Whether an organism adopts a fast or slow life history strategy partly depends on features of the environment, because an organism's ecology critically alters the costs and benefits of different resource allocation strategies. For example, in ecologies in which a long life is unlikely (e.g., because of insufficient resources or high predation risks), organisms that invest energy in reaching sexual maturity quickly and reproducing early decrease the likelihood they will die without reproducing (12). Two attributes of human ecologies prominently shape trade-offs in resource allocation: harshness and unpredictability. Harshness refers to the (un)availability of resources in an environment,

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Significance

Ecological features shape people's goals, strategies, and behaviors. Our research suggests that social perceivers possess a lay understanding of ecology's influence on behavior, resulting in ecology-driven stereotypes. Moreover, because race is confounded with ecology in the United States, Americans' stereotypes about racial groups may actually reflect their stereotypes about these groups' presumed home ecologies. In a series of studies, we demonstrate that (*i*) individuals possess ecology-driven stereotypes; (*ii*) these stereotypes are not derivative of race stereotypes; and (*iii*) the application of race stereotypes to targets is greatly diminished when more immediate cues to home ecology are present. These findings have important implications for the conceptualization of race stereotypes, as well as for reducing the application of pernicious stereotypes to individuals.

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whereas unpredictability refers to unpredictable variation in environmental conditions (15). Here, we label environments that are both harsh and unpredictable as desperate ecologies, and ecologies that are resource-sufficient and stable as hopeful ecologies. Desperate and hopeful ecologies—like fast and slow strategies—are envisioned as anchoring two ends of a continuum, with considerable variation across the range (17).

Desperate and hopeful ecologies engage different behavioral and psychological tendencies, associated with fast and slow life history strategies, respectively (14). Therefore, ecology may be a highly useful cue for social perceivers to use in predicting the behavior of others (20). That is, if perceivers wish to manage others' goals, strategies, and capacities to enhance their own outcomes, and if ecology shapes others' goals, strategies, and capacities, then person perception should be attuned to cues of ecology. Moreover, given that different ecologies affect behaviors in specific ways, social perceivers should have similarly specific beliefs—that is, stereotypes—about how people from different ecologies think and behave. Social perceivers may thus be characterized as lay life historians—using cues to another's ecology to make predictions about their likely life history strategies. Individuals from desperate ecologies should be stereotyped as possessing fast life history strategies (i.e., as more likely to be sexually unrestricted, impulsive, and engage in socially opportunistic behaviors such as physical aggression and violence), whereas individuals from hopeful ecologies should be stereotyped as possessing slow life history strategies (i.e., as more likely to be sexually restricted, planful, and invested in their own education and the education of their children).

These ecology stereotypes have important implications for race stereotypes in America. In the United States, races are differentially distributed across ecologies. Specifically, whites are more likely to live in relatively resource-sufficient and stable ecologies, whereas blacks are more likely to live in relatively resource-poor and unpredictable ecologies (21, 22). As a result, American perceivers may associate desperate and hopeful ecologies with different racial groups and stereotype individuals from those groups as possessing the specific traits and behavioral inclinations associated with those ecologies. If social perceivers use cues to ecology to infer others' behavioral strategies and capacities, and race in the United States is associated with residential ecology, race may serve as a cue to ecology and thus American racial stereotypes may actually reflect ecology stereotypes. Indeed, arguably the most prominent stereotypes about American blacks are that they are physically threatening, criminally inclined, sexually promiscuous, and disinclined to delay gratification (3)—all of which track the stereotypes proposed to characterize those from desperate ecologies, as derived from life history theory.

Moreover, if race serves as a secondary heuristic cue to predict others' life history strategies and behaviors, the impact of race on social inferences may be greatly reduced in the presence of more immediate cues to the desperation vs. hopefulness of a target's home ecology. We test this hypothesis by independently manipulating information about the home ecology and race of targets, predicting that perceivers decrease their application of race stereotypes in favor of applying more affordance-relevant ecology stereotypes.

Thus, in the current research, we explore three broad hypotheses: (*i*) social perceivers understand to some extent the ways in which desperate and hopeful ecologies shape behavior, and mentally represent this knowledge as ecology stereotypes; (*ii*) because race and ecology are confounded in the United States, race stereotypes in the United States should track ecology stereotypes; and (*iii*) given that ecology—not race, per se—shapes life history strategy, the application of life history-relevant race stereotypes to individuals should be altered by the presence of ecology information. We do not suggest that all race stereotypes reflect ecology stereotypes or that ecology stereotypes always override racial prejudices. We do propose, however, that many predominant racial stereotypes in the United States reflect stereotypes about the different ecologies in which racial groups are presumed to live. Such findings would have important implications for understanding the content and application of race stereotypes.

Our initial test examined the existence of ecology stereotypes. Fifty-one American subjects were recruited for a study about "impressions of individuals who live in different environments" (*Methods*). Participants in the desperate ecology condition were asked to "imagine an individual who's lived since birth in a poor, economically underdeveloped community where money and jobs are scarce and unpredictable, and opportunities are limited." Participants in the hopeful ecology condition were asked to "imagine an individual who's lived since birth in a wealthy, economically developed community where money and jobs are plentiful and expected to be available well into the future." After reading the written ecology descriptions, participants were asked to rate the individual on a series of traits, "How likely is this individual to [trait]?" Traits were grouped into five categories, representing life history strategy-relevant suites: sexual unrestrictedness, impulsivity, opportunistic behavior, investment in own education, and investment in children (*Methods*). We predicted that individuals ostensibly from desperate ecologies would be stereotyped as more likely to exhibit fast life history strategies than individuals from hopeful ecologies.

Across all five behavioral domains, we see the predicted effects (Fig. 1). Individuals from the desperate ecology were stereotyped to be more impulsive than individuals from a hopeful ecology [$t(49) = 4.15$, $P < 0.001$, $d = 1.19$], more likely to engage in opportunistic behavior [$t(49) = 3.65$, $P = 0.001$, $d = 1.04$], less invested in education [$t(49) = 3.96$, $P < 0.001$, $d = 1.13$], and less invested in their children [$t(49) = 3.11$, $P = 0.003$, $d = 0.89$]. Individuals from the desperate ecology were also stereotyped to be more sexually unrestricted than individuals from a hopeful ecology; this effect approached statistical significance [$t(49) = 1.71$, $P = 0.09$; $d = 0.49$].

Although study 1 provides clear initial support for our hypothesis that individuals possess ecology-driven stereotypes, we considered three potential alternative explanations for our findings.

First, one might argue that presenting participants with the written ecology descriptions may have led participants to simply imagine individuals of a particular race; therefore, our ecology stereotypes might actually reflect stereotypes of whites and blacks rather than stereotypes about individuals from hopeful and desperate ecologies. However, our framework suggests that ecology stereotypes should hold within race—such that targets, regardless of race, should be viewed as having fast life history characteristics when coming from desperate ecologies and slow life history characteristics when coming from hopeful ecologies. To test this prediction, in study 2, we gathered photographic stimuli depicting both desperate and hopeful ecologies in the United States and assessed individuals' perceptions of the racial compositions within each ecology by asking participants to report the percentage of individuals of different races (white, black, or other) living in the ecology depicted by the photographs (*SI Text*). Analyses revealed different perceived racial compositions within the two desperate ecology photographs; one ecology was perceived as primarily inhabited by white residents and the other inhabited primarily by black residents (*SI Text*). Both hopeful ecologies were perceived as primarily inhabited by white residents (*SI Text*). A separate group of participants was then shown two photographs (depicting either desperate or hopeful ecologies), asked to imagine an individual who's lived in that environment since birth, and then rate the individual on a series of traits identical to those used in study 1 (*Methods*). We predicted that targets from both desperate ecologies would be stereotyped as possessing fast life history strategies compared with targets from both hopeful ecology photographs. Across all life history behavioral domains, we found the predicted effects: critically,

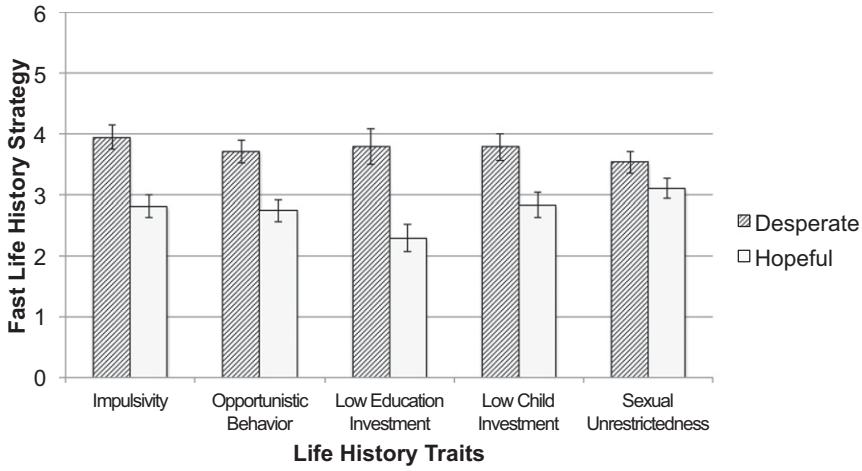

Fig. 1. Life history strategy stereotypes as a function of manipulated ecology (study 1). Error bars represent ±SE.

targets in both the predominantly "black" desperate ecology and the predominantly "white" desperate ecology were stereotyped as possessing faster life history strategies than targets in the hopeful ecologies (all $P < 0.001$; d ranging from 1.51 to 4.20; Fig. S1 and *SI Text*). If stereotypes about desperate ecologies were merely stereotypes about blacks, participants' stereotypes of individuals in the predominantly white desperate ecology should have been similar to stereotypes of individuals in the predominantly white hopeful ecologies. These stereotypes, however, were not similar. Ecology stereotypes are not derivative of race stereotypes; ecology stereotypes are applied to both white and black individuals.

Second, we examined whether ecology stereotypes simply reflect wealth stereotypes. A person's wealth is a potentially useful cue to his or her life history strategy (by implying information about the resource carrying capacity of that ecology or as a cue that the individual operates via a specific life history strategy). However, from a life history perspective, wealth—a feature of the individuals living within the ecology—is not redundant with information about the ecology itself, and ecology stereotypes are unlikely to be derivative of wealth stereotypes. We tested this prediction in study 3 by independently providing information about the personal wealth of the individual and the ecology in which he lives (*SI Text*). We find that participants readily apply ecology stereotypes to persons even within levels of personal wealth: for each of the five life history strategy constructs, individuals from desperate ecologies were stereotyped as possessing faster life history strategies than individuals from hopeful ecologies, regardless of whether they were relatively rich or poor (all $P < 0.05$; d ranging from 0.42 to 2.58; Fig. S2 and Table S1). Hence, ecology stereotypes are not derivative of wealth stereotypes; they are applied to both wealthy and poor individuals. These findings also suggest that ecology stereotypes are not simply stereotypes about the socioeconomic status or social classes of individuals (23). Indeed, unlike approaches focusing on specific historical and sociological conditions that shape stereotypes of the economically disadvantaged (24), our approach suggests that similar ecology-driven stereotypes are likely to exist across societies, a point we address in *Discussion*.

Third, in study 4, we examined whether the identified ecology stereotypes are simply the result of participants assigning positive traits to targets from hopeful ecologies and negative traits to targets from desperate ecologies. Our framework suggests that ecology stereotypes reflect beliefs about very specific characteristics—those that reflect the life history strategies likely to be used in different ecologies. Whether these characteristics are viewed favorably or not should be irrelevant. Thus, we predicted no sweeping positivity bias toward those from hopeful (vs. desperate) ecologies. Moreover, because our framework only makes predictions about characteristics related to life history strategy, we do not expect ecology stereotypes for characteristics not directly relevant to life history strategy. To test these assertions, participants assigned to either a hopeful or desperate ecology condition rated the individual on a number of attributes, including items capturing the five life history strategy-relevant domains and items assessing characteristics not closely linked to life history strategy (e.g., "enjoy spending time with friends"; *SI Text*). In the latter category, we included items that were clearly positively or negatively valenced (e.g., "be hard-working," "be materialistic"). We predicted that, as before, participants would stereotype targets from a desperate ecology as possessing faster life history strategies compared with targets from a hopeful ecology. However, we predicted that participants would not hold different ecology stereotypes for traits irrelevant to life history strategy, and that participants would not exhibit a general positivity bias toward targets from a hopeful ecology.

Our findings largely support these predictions (*SI Text*). For the life history strategy-relevant traits, individuals from desperate ecologies were stereotyped as possessing faster life history strategies than individuals from hopeful ecologies (all $P < 0.05$; d ranging from 0.39 to 1.55). Importantly, for life history strategy-irrelevant traits, no ecology differences emerged (all $P > 0.20$). Finally, participants' responses to valenced, but life history strategy-irrelevant, traits also revealed no ecology difference. These traits included targets' likeliness to be loyal, athletic, sympathetic (all positively valenced) or quarrelsome, reserved, conventional (all negatively valenced) (all $P > 0.12$). Ecology stereotypes were specific to the life history strategy-relevant items and do not reflect a mere positivity bias toward individuals from hopeful ecologies.

Studies 2–4 not only provided consistent replications of the ecology stereotype findings of study 1, but also effectively countered alternative explanations for those findings. We thus return to our central argument in study 5. By independently manipulating race and ecology information, we sought to test three predictions. First, we examined the similarity of basic race and basic ecology stereotypes to test whether race stereotypes track ecology stereotypes. Second, we examined whether ecology stereotypes held within race, predicting that black (and white) targets from desperate ecologies would be stereotyped as possessing faster life history strategies compared with black (and white) targets from hopeful ecologies. Third, and most critically, we tested whether the application of basic race stereotypes to targets is overridden by the presentation of ecology information. Specifically, we predicted no differences in stereotypes of black and white targets from

desperate ecologies and no differences in stereotypes of black and white targets from hopeful ecologies.

Three hundred and two participants were randomly assigned to imagine either an individual from a desperate or hopeful ecology (with no race information provided); a white or black individual (with no ecology information provided); or a white or black individual from a desperate or hopeful ecology (both race and ecology information provided; *Methods*). Participants then rated the target on a number of attributes, again capturing the five life history strategy suites of sexual unrestrictedness, impulsivity, opportunistic behavior, investment in own education, and investment in children.

We examined each life history strategy component independently and find similar results across components (see *SI Text, Study 5: Ecology-Driven Stereotypes Override Race Stereotypes* analyses and Figs. S3–S7). These results mirror those reported below. For simplicity of presentation, we present our findings here after averaging the five life history components into a single composite ($\alpha = 0.89$).

We first assessed whether our basic ecology stereotype findings emerged in the absence of race information. As expected, we again find that individuals from desperate ecologies are stereotyped as possessing faster life history strategies than individuals from hopeful ecologies ($P < 0.001$, $d = 1.10$; Fig. 2).

Our prediction is that race stereotypes track ecology stereotypes. We find first that, in the absence of ecology information, black individuals are stereotyped as possessing faster life history strategies than white individuals ($P < 0.001$, $d = 0.63$). Critically, we then compared participants' stereotypes of targets from desperate ecologies (with no race information provided) with their stereotypes of black targets (with no ecology information provided), expecting that these two targets would be viewed similarly. We also compared participants' stereotypes of targets from hopeful ecologies (with no race information provided) with their stereotypes of white targets (with no ecology information provided), expecting that these two targets would also be viewed similarly.

Our predictions were largely supported. Participants' stereotypes of targets from hopeful ecologies and white targets were the same ($P = 0.12$). Comparisons between participant views of targets from a desperate ecology and black targets revealed a significant overall difference in life history strategy stereotypes ($P = 0.012$, $d = 0.30$); targets from a desperate ecology were perceived as possessing somewhat faster life history strategies than were black targets. However, focused analyses revealed that this was the case for only two of the five components. Whereas perceiver inferences of sexual unrestrictedness, opportunistic behavior, and investment in children did not differ for black targets and targets from desperate ecologies (P ranging from 0.14 to 0.59), black targets were viewed as somewhat less impulsive ($P = 0.017$, $d = 0.28$) and as more likely to invest in their own education ($P < 0.001$, $d = 0.48$) than were targets from desperate ecologies.

Our second prediction is that ecology stereotypes hold within race. Indeed, we find strong evidence that ecology stereotypes are applied to both white and black targets: participants stereotyped white targets from desperate ecologies as possessing faster life history strategies than white targets from hopeful ecologies ($P < 0.001$, $d = 0.95$). Similarly, participants stereotyped black targets from desperate ecologies as possessing faster life history strategies than black targets from hopeful ecologies ($P < 0.001$, $d = 0.96$).

The core argument advanced by our framework is that, because ecology shapes individuals' life history strategies, knowing a person's home ecology provides perceivers with useful information for inferring the affordances potentially posed by that person. Because race and ecology are confounded in the United States—members of different racial groups are disproportionally distributed into different ecologies (21, 22)—American perceivers may use race as a heuristic cue to ecology. However, from our framework, it is a target's ecology, and not his or her race, that carries causal information about behavior and is thus likely to be privileged by the social perception process. Our final prediction is therefore that ecology information should trump race information. Specifically, we predicted that there would be few or no differences in how our participants viewed black and white targets from desperate ecologies; targets of both races should be viewed as similarly engaging in fast life history strategies. Likewise, we expected few or no differences in how our participants viewed black and white targets from hopeful ecologies; targets of both races should be viewed as similarly engaging in slow life history strategies. Indeed, stereotypes of white and black individuals from desperate ecologies did not differ ($P = 0.59$), nor did stereotypes of white and black individuals from hopeful ecologies ($P = 0.69$).

Discussion

Taken together, our findings provide strong evidence for the importance of ecology as a cue used by social perceivers in anticipating the affordances of others. Study 1 demonstrated that individuals hold ecology stereotypes, stereotyping individuals from desperate ecologies as possessing faster life history strategies than individuals from hopeful ecologies. In testing alternative explanations, studies 2–4 find that these ecology stereotypes are applied within race to both blacks and whites, within wealth to both rich and poor individuals, and that ecology stereotypes are not just the result of a positivity bias toward individuals from hopeful ecologies. Returning to our core premise, study 5 demonstrated that—in the absence of ecology information—race

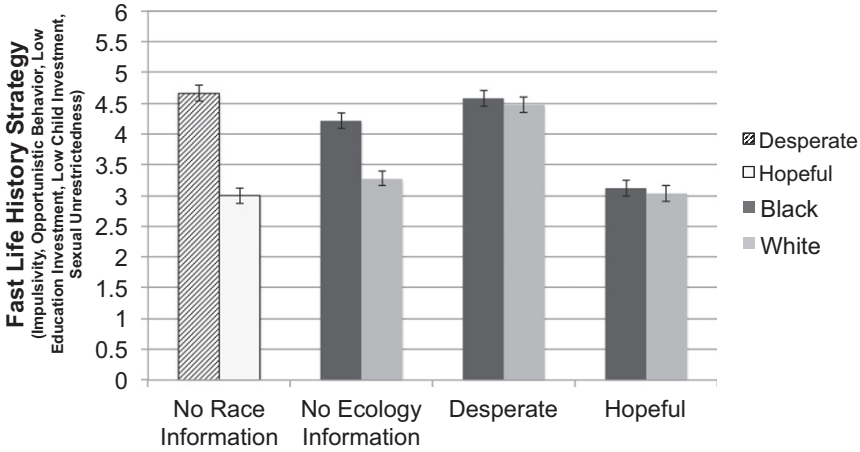

Fig. 2. Life history strategy stereotypes as a function of manipulated ecology and race (study 5). Error bars represent ±SE.

stereotypes track basic ecology stereotypes; however, when provided with information about both the race and ecology of others, individuals' inferences reflect the targets' ecology rather than the targets' race. In the social inference process, ecology information trumps race.

The diminished use of race as a cue in the face of ecology information has important implications for person perception and social inferences. Although we do not claim that all race stereotypes derive from ecology stereotypes, our findings suggest that many prominent race stereotypes of black Americans (e.g., promiscuity, criminality) might not reflect beliefs about race at all. Race is, instead, a heuristic cue used by social perceivers to infer life history strategies—and resulting behavioral inclinations—of targets. When more proximate cues to life history strategy (e.g., home ecology) are presented, the application of these race stereotypes to individual blacks and whites disappears.

That we suggest the content of many prominent race stereotypes reflects not race, per se, but rather the ecologies in which members of different races are presumed to live, should not be interpreted to also suggest that race is an unimportant psychological construct. Race has important implications for individuals' social identities, shapes societal institutions, and likely drives prejudices not directly linked to stereotypes about life history strategies. However, as previous research on coalitional psychology has noted (25, 26), the lack of exposure to individuals of different races over human evolutionary history suggests that the social mind should not have evolved to encode race as a fundamental category. Rather, race in modern societies often functions as a secondary cue—to home ecologies, as evidenced by our findings, and to coalitional membership, as evidenced by existing work (25, 26).

Here, we argued that ecology shapes behavior, which in turn shapes perceivers' stereotypes about the likely affordances posed by others. Although this assumes some degree of accuracy in perceiver stereotypes (27, 28), this is far from claiming that stereotypes are perfectly accurate. Cues to threat are imperfectly diagnostic (4). Moreover, from an affordance management perspective, stereotype inaccuracies are likely to be biased in the direction of exaggerating threats (29, 30). For example, because the costs of physical injury are typically greater than the costs of a missed acquaintanceship, we might expect stereotypes about individuals from desperate ecologies to exaggerate their physical aggressiveness (4).

We defined desperate ecologies as harsh and unpredictable. However, certain ecologies within the United States may be resource poor but predictable and thereby afford social stability—as seen, for example, in family-centered immigrant communities. These ecologies may induce a slower life history strategy compared with ecologies that are both harsh and unpredictable—which stereotypes of such groups might then track.

In the current research, we focused on stereotypes of white and black Americans, given that, in the United States, race is somewhat diagnostic of ecology (21, 22). In societies where race or ethnicity is not confounded with ecology, however, we would not expect race or ethnicity to be used as a heuristic cue to ecology. However, ecology stereotypes should still exist and substantially shape people's perceptions of others. Across societies, individuals from desperate ecologies should be stereotyped to possess faster life history strategies than individuals from hopeful ecologies.

Additionally, because ecologies shape behaviors and social perceivers have an interest in anticipating those behaviors, similar ecology stereotypes should be held by those living both within and outside these ecologies. That is, individuals living in desperate ecologies and individuals living in hopeful ecologies should hold similar stereotypes about targets from desperate and hopeful ecologies. However, these stereotypes may not similarly translate into prejudices, as the evaluation of the affordances ostensibly posed by these targets may differ. For example, whereas a perceiver from either ecology may stereotype a target as sexually unrestricted, this trait may be viewed as an opportunity or threat depending on the perceiver's own ecology-driven life history strategy.

Race stereotypes have far-reaching consequences. Stereotypes about groups can lead to negative prejudices and discrimination directed toward members of those groups, with associated financial, health, and societal implications. We proposed and provided initial evidence for why American race stereotypes take the particular forms they do: race acts as a cue to a person's ecology, and home ecology provides important information about the potential threats and opportunities posed by others. If ecology information can reduce the application of race stereotypes, this may shed new light on ways of reducing racial prejudices and discrimination.

Methods

Participants gave written consent before participating in each experiment. All study protocols were approved by the Institutional Review Board at Arizona State University.

Study 1. Fifty-one individuals (28 females; mean age, 18.75 y; SD, 1.38; 68% white, 12% Hispanic, and 8% Asian American) participated as part of introductory psychology course requirements. Participants were randomly assigned to provide their beliefs about an individual from either a desperate ecology or a hopeful ecology. Participants in the desperate ecology condition were asked to "imagine an individual who's lived since birth in a poor, economically underdeveloped community where money and jobs are scarce and unpredictable, and opportunities are limited." Participants in the hopeful ecology condition were asked to "imagine an individual who's lived since birth in a wealthy, economically developed community where money and jobs are plentiful and expected to be available well into the future." After reading the written ecology descriptions, participants were asked to rate the individual on a series of traits, "How likely is this individual to [trait]?" For example, "How likely is this individual to plan for the future?" Responses were reported on six-point scales (1 = very unlikely; 6 = very likely). The order of traits presented within each ecology condition was randomized. Traits were grouped into five categories, representing life history strategy-relevant suites: sexual unrestrictedness, impulsivity, opportunistic behavior, investment in own education, and investment in children. Items were coded such that higher values correspond to a fast life history strategy. Multiple items within attribute were averaged to form composites.

Sexual unrestrictedness stereotypes were assessed by the attributes "be sexually promiscuous," "have multiple sex partners," "have sex at a young age," "cheat on their partner or spouse," "be monogamous," "wear a wedding ring if married," and "be committed to their partner or spouse" (last three traits reverse-coded; $\alpha = 0.80$). Impulsivity stereotypes were assessed by the attributes "make plans well in advance," "make financial investments for the future," "put off now for what can be gained in the future," "plan for the future," "have a retirement fund," "exhibit self-control," and "act impulsively" (all but the last trait reverse-coded; $\alpha = 0.84$). Opportunistic behavior stereotypes were assessed by the attributes "engage in criminal behavior," "engage in drug use," "be physically aggressive," "be physically dominating," and "resort quickly to violence" ($\alpha = 0.80$). Investment in own education stereotypes were assessed by the attribute "be invested in their education." Investment in children stereotypes were assessed by the attributes "have more children than can be supported without financial hardship," "be invested in the education of their children," and "have only as many children as can be afforded" (last two traits reverse-coded; $\alpha = 0.56$). Filler traits were also included (e.g., musical, athletic, intelligent, religious).

Study 2. Forty-eight individuals (23 females; mean age, 18.71 y; SD, 1.38; 70% white, 13% Hispanic, 6% Asian American, 4% African American) participated as part of introductory psychology course requirements. Participants were randomly assigned to view two of four photographs and asked to provide their stereotypes of an individual from the neighborhood depicted in the photographs. The photographs were taken from pilot testing (*SI Text*). Participants in the desperate ecology condition were shown two photographs depicting a desperate ecology neighborhood and asked to imagine an individual who's lived in that environment since birth. Participants in the hopeful ecology condition were shown two photographs depicting a hopeful ecology neighborhood and asked to imagine an individual who's lived in that environment since birth. Participants were asked to rate the individual on a series of traits, identical to those used in study 1. Cronbach's α for sexual unrestrictedness items was 0.73, impulsivity was 0.88, opportunistic behavior was 0.85, and investment in children was 0.68.

Study 3. Two hundred and ninety-one individuals (138 females; mean age, 35.82 y; SD, 13.37; 73% white, 5% Hispanic, 13% Asian American, 8% African American) participated in a social perceptions survey advertised through Amazon's Mechanical Turk and were compensated $0.50 for their participation.

Participants were randomly assigned to one condition within a 3 (wealth: high, low, no information) × 2 (ecology: desperate, hopeful) between-subjects design. Participants in the ecology conditions were asked to think about a 24-y-old man "who has lived since birth in the neighborhood pictured below and still lives there." Participants in the desperate ecology condition were randomly shown one of two desperate ecology photographs used in study 2; participants in the hopeful ecology condition were shown one of the two hopeful ecology photographs. Participants in the high wealth condition were informed that the target made $150,000 last year; participants in the low wealth condition were informed that the target made $15,000 last year. Participants were then asked to rate the individual on a series of traits capturing five life history strategy-relevant suites of behavior: sexual unrestrictedness, impulsivity, opportunistic behavior, investment in own education, and investment in children (see *SI Text* for list of items). Cronbach's α for sexual unrestrictedness items was 0.83, impulsivity was 0.85, and opportunistic behavior was 0.94. The items assessing investment in own education were correlated at $r = 0.82$ ($P < 0.001$), and the items assessing investment in children were correlated at $r = 0.68$ ($P < 0.001$).

Study 4. The sample consisted of 106 participants (59 females; mean age, 39.50 y; SD, 15.40; 79% white, 5% Hispanic, 5% Asian American, 9% African American), recruited through Amazon's Mechanical Turk for a survey about perceptions of individuals from different environments. Participants were compensated $0.50. Participants were randomly assigned to either the desperate or hopeful ecology conditions, as manipulated in study 1. As before, participants rated the target on a number of attributes. Representative items capturing the five life history strategy-relevant domains were again included: "have sex at a young age" (sexual unrestrictedness), "plan in advance" (impulsivity), "be physically aggressive" (opportunistic behavior), "invest in their education" (investment in education), and "invest in the education of their children" (investment in children). However, items assessing characteristics not closely linked to life history strategy were also included, such as "enjoy spending time with friends" and "enjoy dancing;" some of these items were clearly valenced, either positively or negatively, such as "be loyal," "be materialistic," "be quarrelsome," "be sympathetic," and "be hardworking."

Study 5. Three hundred and two (134 females; mean age, 19.58 y; SD, 1.70; 55% white, 17% Asian American, 16% Hispanic, 5% African American) participants signed up for a study on person perception as part of introductory psychology course requirements. To test our predictions, we orthogonally manipulated ecology and race—asking participants to imagine either an individual from a desperate or hopeful ecology (with no race information provided); a white or black individual (with no ecology information provided); or a white or black individual from a desperate or hopeful ecology (both race and ecology information provided). Participants were thus randomly assigned to one of eight experimental conditions.* Ecology and race information were manipulated using variations of the written descriptions used in study 1. Participants in the No-Race conditions read the written ecology descriptions from the previous studies, but were provided with no race information about the target. Participants in the No-Ecology conditions were asked to imagine a target of a particular race (e.g., "imagine a black individual") but were provided with no ecology information. Participants in the ecology × race conditions received information about both the race and ecology of the target (e.g., "imagine a black individual who's lived since birth in a wealthy, economically developed community where money and jobs are plentiful and expected to be available well into the future").

Participants then rated the target on a number of attributes, capturing the five life history strategy suites of sexual unrestrictedness, impulsivity, opportunistic behavior, investment in own education, and investment in children. Throughout our studies, these constructs were somewhat modified as we continued to hone them based on theory and psychometric analyses. The sexual unrestrictedness subscale was measured by the items "prefer long-term relationships," "wear a ring if married," "have sex at a young age," "have children at a young age," "lose virginity at a young age," "be sexually promiscuous," "have multiple sexual partners," "advertise themselves as sexually available," "change sexual partners often," and "have many children" (first two traits reverse-coded; $\alpha = 0.86$). Impulsivity was assessed by the attributes "act impulsively," "plan in advance," and "make plans for the future" (last two traits reverse-coded; $\alpha = 0.71$). Opportunistic behavior stereotypes were assessed by the attributes "engage in criminal behavior," "be physically aggressive," "get angry quickly," and "resort quickly to violence" ($\alpha = 0.85$). Investment in education was assessed by the attributes "be educated" and "invest in their education" (both traits reverse-coded; $r = 0.78$, $P < 0.001$). Investment in children was assessed by the attributes "have more children than can be financially supported" and "invest in the education of their children" (last trait reverse-coded; $r = 0.34$, $P < 0.001$).

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*We did not run a full Ecology X Race 9-cell design because a No-Ecology/No-Race condition—asking participants to simply "imagine an individual"—would both appear odd to participants and provide no information useful for testing our hypotheses.

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