



# Third-Party Perceptions of Male and Female Status: Male Physical Strength and Female Physical Attractiveness Cue High Status

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Status is a universal feature of human sociality. A lesser-studied adaptive problem surrounding status is assessing who has which levels of status in a given group (e.g., identifying which people possess high status). Here, we integrate theory and methods from evolutionary social science, animal behavior, and social psychology, and we use an emotion inference paradigm to investigate what cues render people high status in the eyes of social perceivers. This paradigm relies on robust associations between status and emotion display—particularly the anger display. If a target is expected to enact (but not necessarily feel) anger, this would suggest that social perceivers view that target as higher status. By varying target attributes, we test whether those attributes are considered status cues in the eyes of social perceivers. In two well-powered, pre-registered experiments in the United States ( $N = 451$ ) and India ( $N = 378$ ), participants read one of eight vignettes about a male or female target—described as high or low in either physical strength or physical attractiveness (possible status cues)—who is thwarted by another person, and then reported expectations of the target's felt and enacted anger. We find that people expected physically stronger (versus less strong) men and more (versus less) physically attractive women to enact greater anger when thwarted by a same-sex other. Strength had no significant effect on estimations of female status and attractiveness had no significant effect on estimations of male status. There were no differences in expectations of felt anger. Results suggest that people use men's strength and women's attractiveness as status cues. Moreover, results underscore the notion that focusing on male-typical cues of status might obscure our understanding of the female status landscape. We discuss how this paradigm might be fruitfully employed to examine and discover other unexplored cues of male and female status.

**Keywords:** status, evolutionary social science, sex/gender differences, social perception, emotion

## INTRODUCTION

Status confers fitness benefits because group members allow high-status individuals to receive relatively unchallenged or preferential access to contested resources (e.g., Anderson et al., 2001; von Rueden et al., 2011; Majolo et al., 2012; Cowlshaw and Dunbar, 2021). Such status exists in the eyes of beholders. The central, related question we explore here—one considered relatively overlooked

in this area of research (Buss et al., 2020)—focuses on the adaptive problem that beholders face in identifying who has high status. Specifically, at zero acquaintance, what cues lead us to infer that a target is high status?

The first features that might come to mind are likely a target's significant physical strength, great riches, or political positions. The perceptually salient instantiations of these features (e.g., big muscles, expensive watches) are indeed thought to be associated with status (von Rueden et al., 2008, 2014; Blaker and van Vugt, 2014; Lukaszewski et al., 2016; Buss et al., 2020; Durkee et al., 2020). Here we suggest that, although correct, the primacy of these features might suggest an implicit bias in some social science work whereby researchers have privileged male-typical defaults for cognition and behavior. Put differently, when people—researchers and laypeople alike—think about status features, we often think first about features that reliably augment men's status. Nevertheless, some features that render men high status are likely distinct from some of those that render women high status (e.g., Rucas, 2015; Buss et al., 2020).<sup>1</sup> Thus, the cues that evoke perceptions of male high status might not “work” for women. Likewise, those cues that evoke perceptions of female high status might not “work” for men.

Here, we explore which target features cause social perceivers to view men and women as possessing high status. To this end, we leverage robust associations observed in previous research between anger and status—that relatively higher status people display anger more often, and that social perceivers expect relatively higher status people to display anger more often (Tiedens et al., 2000; Hess et al., 2005; Hareli et al., 2009; Sell et al., 2009, 2017). Concretely, we explore whether United States and Indian social perceivers infer more (versus less) physically strong men and physically attractive women to be more likely to display anger when thwarted by a same-sex/gender other. If so, these anger expectations would imply that United States and Indian social perceivers use men's physical strength and women's physical attractiveness as cues to those targets' high status. This work thus integrates prior research on status, sex/gender, and emotion stereotyping to test basic predictions about which features influence status perceptions. Additionally, it introduces a useful experimental paradigm for the further investigation of additional and perhaps understudied status features.

## STATUS

Hierarchies are common across the animal kingdom. So, too, are instances of some animals being closer to the top of those hierarchies and thus enjoying preferential access to contested resources and the fitness benefits this generates (e.g., Noë et al., 1980; Wasser and Barash, 1983; Sapolsky, 2004; Smith and van Vugt, 2020). Such status hierarchies also exist across human cultures, from industrialized to small-scale societies (e.g., Brown, 1991; Boehm, 1993; von Rueden et al., 2008, 2011; Anderson et al., 2015). Therein, higher relative status position seems to reliably foster improved fitness outcomes, although this seems to be

most well-studied and clear among males. For example, in small-scale societies, men's high status is associated with better health outcomes and privileged access to resources; and in data from 33 non-industrial societies, male status (as indexed by wealth and political influence) positively predicts the number of men's surviving children (e.g., Berger et al., 1980; Patton, 2000; von Rueden et al., 2011, 2019; von Rueden and Jaeggi, 2016<sup>2</sup> (for some status-fitness links among females, see Bowser and Patton, 2010; Rucas, 2015; Alami et al., 2020). This link between one's own high status and increased fitness underscores a prominent adaptive problem surrounding status: How does one attain it?

Another important challenge is discerning who has higher (and lower) status. Indeed, consider the useful things you can do if you know the relative status of each fellow group member: demanding deference from lower-status individuals (or coalitions), punishing non-deference by lower-status individuals, deferring to higher-status individuals, taking courses of actions aimed at enhancing the status of self and associates (e.g., offspring; Scelza, 2010), and so on. A basic requirement to do these things is the ability to estimate, or compute, the social status of a given individual relative to that of self (and specific others) (e.g., Henrich and Gil-White, 2001; Buss et al., 2020).

But discerning someone's status is no easy task. The status of an unacquainted individual is neither necessarily known nor immediately accessible. People do not walk around with their status levels emblazoned on their chests (e.g., “I am a 10/10 on status in this group”). Rather, someone's status must be inferred from perceivable cues and lower-level inferences (e.g., association with someone already known to have high status, ownership of a Ferrari).

To make this discernment, people should track cues that are reliably linked to being valued because they generate benefits and/or inflict costs in a given environment (Foulsham et al., 2010; Blaker and van Vugt, 2014; Durkee et al., 2020)<sup>3</sup>. For example, ancestrally, objects (e.g., food), personal characteristics (e.g., ambitiousness), physical characteristics (e.g., size), relational characteristics (e.g., having allies), emotional expressions (e.g., the anger expression), and so on may have had characteristic associations and effects on people's status, on average. If so, the mind may be designed to estimate a target's status by tracking a wide array of potentially status-relevant features (e.g., the value of the objects owned by the target, the kinds of emotions expressed by the target in a given context). To illustrate, the modern mind might use Tom's frequent driving of a Ferrari to produce the inference that Tom *owns* the Ferrari and the additional inference that Tom has overall high status in his community.<sup>4</sup>

<sup>2</sup>Jaeggi, A. V., Blackwell, A. D., von Rueden, C., Trumble, B., Stieglitz, J., Garcia, A., et al. (under review). Relative wealth and inequality associate with health in a small-scale subsistence society. *medRxiv* [Preprint]. doi: 10.1101/2020.06.11.20121889

<sup>3</sup>Szycer, D. (under review). Human values: a cognitive perspective. *PsyArxiv* [Preprint].

<sup>4</sup>Further, status is necessarily relative; the status level of any one target critically depends on which other individual(s) the target is compared against (e.g., I might view Tom as having higher status than Ben because Ben drives a Toyota, but as having lower status than Joel because Joel drives a custom Bugatti). Moreover, status is an n-person-coordinated social construct (e.g., I may be under the impression that Tom has high status because of his Ferrari, but everyone else in the

<sup>1</sup>This same logic also necessarily implies that some of the features that render people high status in the eyes of others are the same for male and female targets.

So, what are the cues that people attend to in attempting to discern if an unknown man or woman is high status?

## Status Features

“[R]elatively little is known about the precise criteria by which humans assess and allocate status” (Buss et al., 2020, p. 980). Indeed, conceivably, there could be myriad features that render a target high status. If status cues were arbitrary, anything could be or become one. From an adaptationist view, however, features that contribute to perceptions of high status will often be non-arbitrary; they will often be features that would have rendered a target better able to generate benefits for and/or inflict costs on other group members (e.g., features that render a target a better ally, leader, mate, friend, advisor, hunter, caretaker, and a more formidable rival). But consider that what makes a person a good ally or a dangerous rival might differ depending on that person’s sex/gender, one’s own sex/gender, one’s culture, and so on. Indeed, the expectation is that status cues will often vary with respect to various perceiver and target identities and relationships, as well as across cultures, subcultures, and so on. Here, we focus on the influence of target sex/gender on status cues and on two of the most likely sex/gender-differentiated status features: male physical strength and female physical attractiveness.

## Male Physical Strength

For researchers and laypeople alike, many of the features that immediately come to mind as cueing status might be especially reflective of men’s abilities to garner access to contested resources. One reason for this is because status and resource access among non-human animals is often determined by success in agonistic conflicts, which itself is often determined by an individual’s size and strength (e.g., Chase and Seitz, 2011; Bush et al., 2016; Holekamp and Strauss, 2016). Among humans, however, there are multiple routes to status (e.g., Cheng et al., 2013; Redhead et al., 2019).

This is not to suggest that features boosting a *person’s* likelihood of success in agonistic physical conflicts are ignored in status estimations (see, e.g., Buss et al., 2020; Durkee et al., 2020; Chen Zeng et al., 2022). In fact, given the long history of male coalitional hunting and raiding—in which success would have been enhanced by physical formidability (among other features)—one might expect the social mind to use men’s physical strength as a status cue (e.g., Sell et al., 2009; Buss et al., 2020). In fact, social perceivers are known to use a man’s size and strength as cues to his status (e.g., Blaker and van Vugt, 2014; Lukaszewski et al., 2016; Durkee et al., 2018; Buss et al., 2020; von Rueden, 2014; von Rueden et al., 2008, 2014). Moreover, more physically formidable men are expected—by themselves and by others—to receive greater deference and consideration from others (e.g., Sell et al., 2012; Lukaszewski, 2013; Delton and Sell, 2014; Pietraszewski and Shaw, 2015). Note that this need not be solely because stronger men can more effectively take contested resources or inflict costs on those who obstruct access to them (e.g., Sell et al., 2009, 2012, 2016). This same status conferral can also owe to strong men’s abilities

community sees his new Ferrari as parvenu, deeming him low status and treating him accordingly.

to generate benefits to their allies and other group members (e.g., Eisenbruch et al., 2016; Lukaszewski et al., 2016; Stavans and Baillargeon, 2019; Durkee et al., 2020).

To the extent that men’s physical strength contributes to estimations of their physical attractiveness, it is possible that more attractive men might be inferred to have higher status (e.g., Lukaszewski et al., 2016; Sell et al., 2017). These men are at least inferred to have greater access to desirable mates (Brown et al., 2021). However, male attractiveness also does not predict allocations of status when controlling for male strength (Lukaszewski et al., 2016).

## Female Physical Attractiveness

Women’s size and strength may not be straightforwardly linked with expectations of their greater consideration (in their own or in others’ eyes). Given both the relative lack of female coalitional warfare and also women’s comparatively lower preferences of using physical aggression (e.g., Burbank, 1987; Campbell, 1999; Vaillancourt, 2013), female physical size and strength may not have been hugely beneficial. Indeed, some have asserted that physical aggression could threaten a woman’s ability to bear or care for offspring, hence women’s lesser use of it (Campbell, 1999; see also Griskevicius et al., 2009). Further, given the size asymmetries imposed by sexual dimorphism, even great sex-typical strength would leave most females unable to win physical contests against most males (e.g., Puts, 2010).

Rather, some have reasoned that physical attractiveness should be one cue of women’s status (e.g., Buss et al., 2020; see also Sell et al., 2009). This view is premised on the long evolutionary history of physical attractiveness being (a) central to female mate value and (b) reflective of the fertility benefits women could confer (or withhold). Others have also extended this notion, suggesting that physical attractiveness can render women desirable social partners for relationships beyond (heterosexual) mating ones (e.g., Eisenbruch and Roney, 2020). And still others have noted that some of the benefits girls and women glean if they are considered physically attractive—access to higher quality social and romantic partners, greater access to resources, more social attention and influence—help females attain other aspects of status that might then lead people to defer to those women and also associate women’s physical attractiveness with the presence of additional status features (e.g., attention, popularity) (e.g., Vaillancourt and Krems, 2018; Fisher and Krems, in press; Bradshaw and DelPriore, 2021)<sup>5</sup>.

## EMOTION AND STATUS: THE CASE OF ANGER

Emotions and status are tightly intertwined (see, e.g., Tiedens, 2001; Shariff and Tracy, 2009; van Kleef and Lange, 2020; Durkee, 2021). For example, adaptationist views suggest that pride tracks status gains and motivates individuals to garner greater valuation and respect from others (e.g., Sznycer et al., 2017, 2018b; Durkee et al., 2019; Cohen et al., 2020; Sznycer and Cohen, 2021).

<sup>5</sup>Krems, J., Hahnel, R., Merrie, L. A., and Williams, K. (under review). Sometimes we want vicious friends: friend preferences are target-specific. *PsyArXiv* [Preprint]. doi: 10.31234/osf.io/4fjx8

Likewise, shame tracks status losses and motivates individuals to mitigate their status losses (e.g., Sznycer et al., 2012, 2016, 2018a; Durkee et al., 2019; Cohen et al., 2020). Here, we focus on the emotion of anger and its links to a target's status.

An adaptationist view of anger sees it as a recalibrational emotion designed to motivate a person to bargain for better treatment from others (e.g., Sell et al., 2009, 2017). On this view, my anger is evoked when another person places insufficient weight on my welfare relative to what I feel entitled to (based on our relative bargaining power). I should feel angry when I feel undervalued (Sznycer and Lukaszewski, 2019). Of course, anger is not the only emotional display that might be plausibly recruited in this situation; less explored is the notion that people might enact crying, whining, and other need-signaling tactics to bargain for better treatment (in the context of communal relationships). But anger, specifically, is theorized to be implemented when individuals with greater ability to inflict costs on or to withhold benefits from others feel undervalued (Sell et al., 2009, 2017; Sznycer and Lukaszewski, 2019).

A definitional component of having high status is that others acquiesce to one's will; one also has greater influence over others and priority access to contested resources. Thus, relative to lower status people, a higher status individual should have greater ability, for example, to inflict reputational costs on someone who undervalues them (e.g., influencing others to think negatively about the undervaluing target), and/or to withhold benefits from someone who undervalues them (e.g., forestalling the undervaluing target's ability to access food or desirable partners). The recalibrational view thus predicts that people with greater ability to inflict costs on or withhold benefits from others (i.e., higher status people) should be more anger prone, have a greater sense of entitlement, and perhaps report a richer history of using anger-based aggression to get their way.

Importantly, evidence suggests that these predictions are correct (e.g., Sell et al., 2009, 2016, 2017; van Kleef and Lange, 2020; Durkee, 2021)<sup>6</sup>. For example, Sell et al. (2009) found that physically stronger men (presumed to have greater ability to inflict physical costs on others) and physically attractive women (presumed to have greater reproductive potential that they can withhold) reported greater anger proneness.<sup>7</sup> Moreover,

<sup>6</sup>Tiedens, L. Z., Ellsworth, P. C., and Moskowitz, D. S. (1998). *Feeling Your Place: Emotional Consequences of Social Status Positions*. Unpublished manuscript.

<sup>7</sup>Note that higher-status people might not always display anger in the ways that first come to mind. For example, a strong man might get in the face of a weaker man who undervalues him, a more traditional conceptualization of anger, and perhaps one especially linked to status based on dominance or cost-infliction. Such strong men might also be more likely to have outbursts of anger unpredictably (i.e., not only in reaction to being undervalued; Cheng et al., 2010). The same behavior would be taboo in a faculty meeting, however, even if an ostensibly lower-status adjunct undervalued a seeming higher-status full professor; and the same behavior is less likely to be observed among women, who might be more likely to hide their anger and later engage in forms of indirect aggression that allow the aggressor to remain anonymous (see Krems et al., 2015; see also Brescoll and Uhlmann, 2008). These brief examples suggest that anger displays from those who derive status from prestige or benefit generation (and withholding; for reviews see, e.g., Maner, 2017; Cheng, 2020; see also Case et al., 2021) might be less likely to engage in overt and perhaps male-typical anger displays (i.e., anger displays as traditionally conceptualized). If this is the case (e.g., Henrich and Gil-White, 2001; Case et al., 2021), it suggests that we first need to better understand what features are linked to perceptions of cost infliction and benefit generation, for

anger displays may also be more effective for such individuals (Sell et al., 2009). This is not to say that higher-status people necessarily feel greater anger. Higher-status people might have lower thresholds for anger feelings and be quicker to feel anger—or not. Regardless, many higher-status people often seem to be less likely to inhibit their overt displays of anger and are more likely to enjoy greater freedom to express that anger (e.g., Sell et al., 2016; van Kleef and Lange, 2020; Durkee, 2021). So it is possible, for example, that both higher- and lower- status people experience similar levels of anger at being thwarted, but higher-status people are simply more likely to overtly display that anger (and achieve its recalibrational ends).

Moreover, not only are higher-status people perhaps more likely to display their anger when undervalued, but social perceivers have picked up on this relationship between anger display and status. For example, some work in social psychology has explored emotion stereotypes—social inferences about who is likely to show what emotions (e.g., Tiedens et al., 2000; Tiedens, 2001). One line of this work has shown that social perceivers use emotional displays to make inferences about displayer status (e.g., Hareli et al., 2011; Mast and Palese, 2019). In particular, social perceivers reliably and bidirectionally associate a man's or woman's high status with their likelihood of displaying anger (e.g., Knutson, 1996; Tiedens et al., 2000; Tiedens, 2001; Hess et al., 2005; Hareli et al., 2009). Somewhat similar to the recalibrational theory (for actors), some social psychological work based in appraisal theory holds that, in the eyes of perceivers, anger is associated with social power because it leads to appraisals that anger-expressing actors are able to control and influence their social environment (Keltner et al., 2003; Lerner and Tiedens, 2006). Indeed, people are often perceived to be of higher status when they display anger (versus other emotional expressions) (Aguinis et al., 1998; Tiedens, 2001), and higher-status people are expected to display more anger when their goals are thwarted (Tiedens et al., 2000; Hess et al., 2005; Hareli et al., 2009).

One might wonder, however, how such a relationship—whether genuine or perceived—between anger display and status could exist. For example, if social perceivers can easily infer someone's status from perceptually salient cues, one might wonder why perceivers would ever treat a high status person in a way that undervalues them and evokes their anger (and thus there should be no relationship between status and anger but rather only a relationship between status and appeasement).<sup>8</sup> There are several possible reasons that people might undervalue, in the target's eyes, high-status targets. First, one might not realize that their actions communicate undervaluation, perhaps because the consequences of those actions are opaque. Second, the target of

which perceivers, and in which situations; from there, we might derive better informed predictions about the efficacy of using different modes of anger-based aggression (e.g., direct, indirect) toward recalibrational ends.

<sup>8</sup>One could easily ask a seeming inverse of this question as well: What is to stop a person from making an anger expression and/or enacting anger all of the time to reap the benefits of being perceived as higher status? One reason people might not do this is because interpersonal anger might be ineffectual, if not exceedingly costly, for actors who are unable to back their anger up with the ability to inflict costs or withhold benefits.

one's actions might be unknown. To illustrate, I might buy the café's last almond croissant without realizing that a higher-status person was maneuvering for it. Third, there could be situations in which the norms are *not* based around highest bargaining power leading to greatest influence—for example, norms wherein each person gets an equal vote, regardless of bargaining power. Enforcement of such a norm would comparatively disadvantage those with higher status and potentially anger them.

## THE PRESENT WORK

Here, we leverage these robust associations between anger and status—that social perceivers expect higher-status people to display more anger when thwarted—to explore what some status-cueing features might be. And we use a potentially effective new paradigm for identifying which features social perceivers use to infer target status. Specifically, we ask if United States (Experiment 1) and Indian (Experiment 2) social perceivers infer: (1) physically stronger (versus weaker) men to display greater anger when thwarted by another man; and (2) more (versus less) physically attractive women to display greater anger when thwarted by another woman. If so, these anger expectations would imply that social perceivers use male physical strength and female physical attractiveness as cues to those respective targets' high status. In other words, by experimentally manipulating the types and levels of two plausibly status-connoting attributes, and then asking social perceivers to infer the level of anger displayed when people possessing these attributes are thwarted, we aim to gain insight into how the mind determines the status of unknown men and women.

Experiments 1 and 2 test these predictions in the United States and in India, respectively. Preregistrations, data, and syntax are available on Open Science Framework: <https://osf.io/u4rcj/>.

## EXPERIMENT 1 (UNITED STATES) AND EXPERIMENT 2 (INDIA)

### Methods

#### Participants

##### Experiment 1

We aimed to collect usable data from 450 United States adult community participants. Of 563 who at least began our short survey on CloudResearch, 451 (263 female;  $M_{age} = 41.45$ ,  $SD_{age} = 13.18$ ) passed a bot (having Qualtrics' reCAPTCHA score  $\geq 0.4$ ) and two attention checks (e.g., "Please set the bar to 100 if you are paying attention") and reported their sex. This yielded 0.80 power to detect small effects ( $f \sim 0.13$ ).

##### Experiment 2

We aimed to collect usable data from 450 Indian adult community participants. Of 557 who at least began our short survey on CloudResearch, 378 (116 female, 2 other;  $M_{age} = 31.08$ ,  $SD_{age} = 8.33$ ) passed a bot (having Qualtrics' reCAPTCHA score  $\geq 0.4$ ) and two attention checks (e.g., "Please set the bar to 100 if you are paying attention") and reported their sex. This yielded 0.80 power to detect small effects ( $f \sim 0.14$ ). We

had previously planned to additionally exclude those participants failing a fill-in-the-blank, open-ended English comprehension check ("Eagles, hawks, sparrows, and robins are all examples of what kind of animal?"); given that excluding those failing that check would restrict our sample size to 314 (96 female, 2 other) but would not change the patterns of results, we chose to include those participants failing this check in the results reported below.

### Design and Procedure

Both experiments shared a 2 (Target gender)  $\times$  2 (Attribute)  $\times$  2 (Level of Attribute) between-subjects design. Participants were thus randomly assigned to read one of eight short scenarios about a man or woman on their way home from a long day at their office, heading to the bus stop. They have not eaten all day and stop to buy food near the bus stop. But while waiting to check out, a same-gender stranger cuts in front of them in line (see Sell et al., 2017); this stranger thus causes the target to miss the bus and wait in an undesirable area of town for an hour until the next bus arrives.

In the start of each vignette, the target was described as being high or low in physical strength or physical attractiveness compared to same-gender others. See **Appendix A** for vignettes.

Participants were then asked to report their inferences about how the target would feel ("Based on the scenario you just read, to what extent do you think that Alex would FEEL on the INSIDE...") and act ("...ACT on the OUTSIDE") toward the person who thwarted their plans (i.e., cut in front of them in line, forcing them to wait for the next bus) using two 100-point sliders (0 = *not at all*, 100 = *very much*). Embedded among seven total items were two focal items assessing our focal dependent variable of anger ["angry at the (man/woman) in line", "annoyed...";  $\alpha_{feelings} = 0.73\text{--}0.85$ ;  $\alpha_{actions} = 0.84\text{--}0.88$ ]; other items were grateful ("grateful to..."), appreciative of ("..."), sad ("sad..."), and surprised ("surprised..."), and were not included in analyses. Items appeared in randomized order, as did blocks assessing inferences of feelings and displays.

## RESULTS

### Experiment 1

In the United States sample, we conducted a 2 (Reaction: Feelings, Actions)  $\times$  2 (Target sex/gender)  $\times$  2 (Attribute: Physical Strength/Attractiveness)  $\times$  2 (Level: High/Low) mixed-factors Analysis of Variance (ANOVA) to explore people's expectations of targets' angry feelings and actions in response to being thwarted by a same-sex/gender stranger.<sup>9</sup> In light of a significant four-way interaction,  $F(1,443) = 9.48$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.021$ , we first examined our *a priori* predictions.

<sup>9</sup>For transparency, we also report the full findings from this omnibus test here. We find main effects of (a) Reaction,  $F(1, 443) = 448.40$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.503$ , such that people expected targets would feel greater anger ( $M = 89.14$ ,  $SE = 0.82$ ) than they would display ( $M = 62.07$ ,  $SE = 1.36$ ), and (b) Attribute,  $F(1, 443) = 9.92$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.022$ , such that people expected targets described in terms of physical strength would feel/display greater anger ( $M = 78.52$ ,  $SE = 1.29$ ) than targets described in terms of physical attractiveness ( $M = 62.07$ ,  $SE = 1.36$ ). These were qualified by interactions of Reaction and Attribute Level,  $F(1, 443) = 5.95$ ,  $p = 0.015$ ,  $\eta_p^2 = 0.013$ , of Reaction, Target sex/gender and Attribute,  $F(1, 443) = 4.02$ ,  $p = 0.046$ ,  $\eta_p^2 = 0.009$ , as well as the four-way interaction reported above.

Do people infer that stronger men and more physically attractive women will display greater anger? Yes. As predicted, we find that people (a) expect physically stronger (versus weaker) men to enact significantly greater anger at the man thwarting them,  $F(1,443) = 4.55, p = 0.033, \eta_p^2 = 0.010, 95\% \text{ CI} = (0.91, 22.08)$  and (b) also expect more (versus less) physically attractive women to enact significantly greater anger at the woman thwarting them,  $F(1,443) = 8.21, p = 0.004, \eta_p^2 = 0.018, 95\% \text{ CI} = (5.03, 27.00)$ . See **Figure 1A**, and see **Table 1** for means (SEs).

People did not expect these same patterns for feelings of anger ( $ps > 0.650$ ). Additionally, there were no significant differences in expected acts or feelings of anger as a function of men's varying physical attractiveness ( $ps > 0.060$ ) or women's varying physical strength ( $ps > 0.685$ ).

We also explored other, not-predicted possible differences.

Comparing target attributes (strength versus attractiveness), people expect physically stronger (versus more attractive) men to enact significantly greater anger toward thwarters,  $F(1,443) = 7.94, p = 0.005, \eta_p^2 = 0.018, 95\% \text{ CI} = (4.70, 26.35)$ , and also to feel significantly greater anger toward thwarters,  $F(1,443) = 4.52, p = 0.034, \eta_p^2 = 0.010, 95\% \text{ CI} = (0.53, 13.58)$ . There were no significant differences for men low in strength versus men low in attractiveness ( $ps \geq 0.068$ ). People also expected physically weaker (versus less attractive) women to enact significantly greater anger,  $F(1,443) = 10.17, p = 0.002, \eta_p^2 = 0.022, 95\% \text{ CI} = (6.62, 27.89)$ . There were no significant differences for women high in strength versus women high in attractiveness ( $ps \geq 0.540$ ).

Comparing target sex/gender, we find that people expected more physically attractive men (versus women) to enact significantly more anger toward thwarters,  $F(1,443) = 5.70, p = 0.017, \eta_p^2 = 0.022, 95\% \text{ CI} = (1.43, 14.79)$ . People also reported expecting less attractive men (versus women) to enact greater anger,  $F(1,443) = 10.00, p = 0.002, \eta_p^2 = 0.022, 95\%$

**TABLE 1** | Means (SEs) of expected levels of anger display from different targets.

	Male target		Female target	
	High	Low	High	Low
<b>Physical strength</b>				
Feel	89.59(2.33)	92.83(2.27)	91.07(2.31)	91.35(2.29)
Act	70.69(3.86)	59.20(3.75)	67.80(3.83)	65.63(3.79)
<b>Physical attractiveness</b>				
Feel	82.54(2.37)	87.00(2.25)	90.65(2.44)	88.11(2.33)
Act	55.17(3.93)	65.34(3.73)	64.39(4.04)	48.38(3.86)

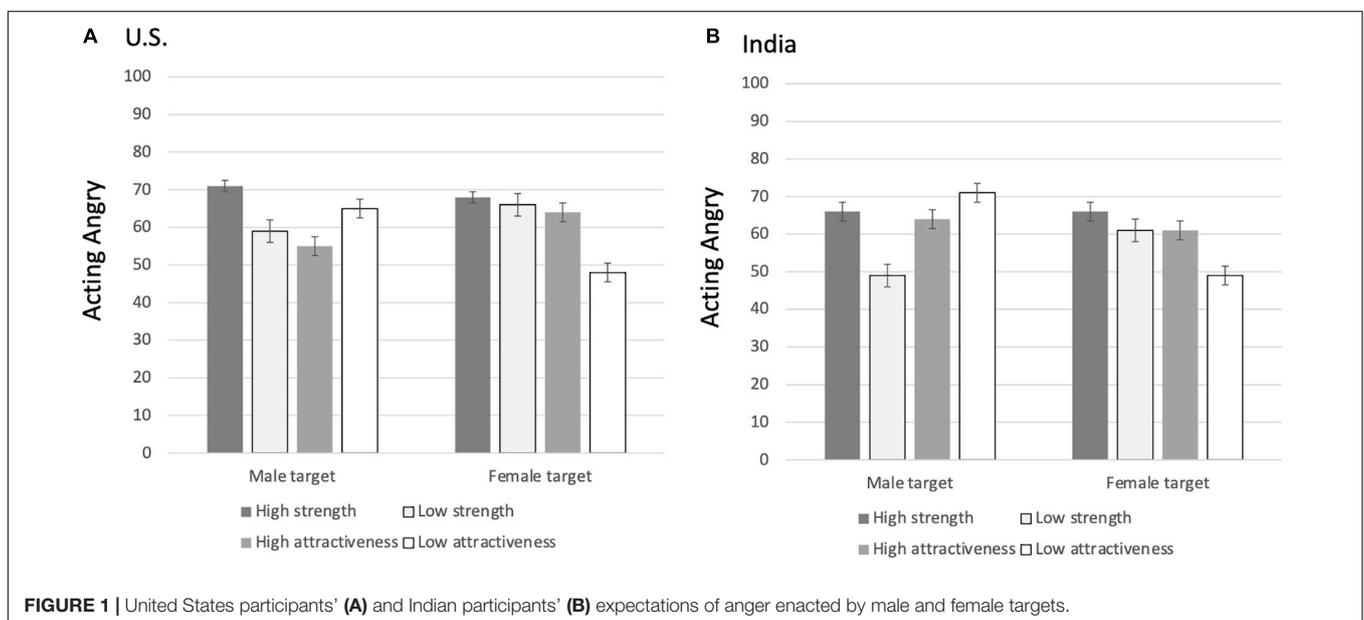
CI = (6.42, 27.51). No other significant target sex/gender differences emerged ( $ps > 0.300$ ).

In every case, targets were also expected to feel more anger than they were expected to display ( $ps < 0.001$ ).

### Experiment 2

In the sample from India, we again conducted the same 2 (Reaction: Feelings, Actions) x 2 (Target sex/gender) x 2 (Attribute) x 2 (Level: High/Low) mixed-factors ANOVA to explore people's expectations of targets' angry feelings and actions in response to being thwarted. In light of a (barely) significant four-way interaction,  $F(1, 370) = 3.88, p = 0.050, \eta_p^2 = 0.010$ , we examined our *a priori* predictions.<sup>10</sup>

<sup>10</sup>For transparency, we also report the full findings from this omnibus test. We find main effects of (a) Reaction,  $F(1, 370) = 45.69, p < 0.001, \eta_p^2 = 0.110$ , such that people expected targets would feel greater anger ( $M = 70.16, SE = 1.17$ ) than they would display ( $M = 60.98, SE = 1.34$ ), and (b) Target sex/gender,  $F(1, 370) = 3.92, p = 0.048, \eta_p^2 = 0.010$ , such that people expected male targets would feel/display greater anger ( $M = 67.66, SE = 1.50$ ) than female targets ( $M = 63.48, SE = 1.48$ ). These were qualified by interactions of Reaction and Attribute level,  $F(1, 370) = 6.43, p = 0.012, \eta_p^2 = 0.017$ , and Reactions, Target sex/gender and Attribute,  $F(1, 370) = 8.24, p = 0.004, \eta_p^2 = 0.022$ , as well as the four-way interaction reported above.



Do people infer that stronger men and more physically attractive women will display greater anger? Yes. Replicating the pattern of findings from Experiment 1’s United States sample, we again find that people (a) expect physically stronger (versus weaker) men to enact significantly greater anger,  $F(1, 370) = 9.49$ ,  $p = 0.002$ ,  $\eta_p^2 = 0.025$ , 95% CI = (6.08, 27.53) and (b) also expect more (versus less) physically attractive females to enact significantly greater anger,  $F(1, 370) = 4.59$ ,  $p = 0.033$ ,  $\eta_p^2 = 0.012$ , 95% CI = (0.95, 22.29). See **Table 2** for means (SEs) and see **Figure 1B** (above).

People did not expect these same patterns for feelings of anger ( $ps > 0.650$ ). Additionally, there were no significant differences in expected enactment or feelings of anger as a function of men’s physical attractiveness ( $ps > 0.200$ ) or women’s physical strength ( $ps > 0.300$ ).

We also explored other, not-predicted possible differences.

Comparing target attributes (strength versus attractiveness), we find that people expect less attractive men to enact more anger than weaker men,  $F(1,370) = 16.30$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.042$ , 95% CI = (10.50, 32.34). People also expected weaker women to enact significantly greater anger than less attractive women,  $F(1,370) = 4.97$ ,  $p = 0.026$ ,  $\eta_p^2 = 0.013$ , 95% CI = (1.41, 22.48). There were no other significant differences comparisons here ( $ps \geq 0.300$ ).

Comparing target sex/gender, people expected weaker men (versus women) to enact significantly less anger toward thwarters,  $F(1, 370) = 5.70$ ,  $p = 0.017$ ,  $\eta_p^2 = 0.015$ , 95% CI = (2.22, 22.88). People also expected less attractive men (versus women) to feel marginally more anger,  $F(1, 370) = 3.711$ ,  $p = 0.055$ ,  $\eta_p^2 = 0.010$ , 95% CI = (0.20, 18.95), and to enact significantly more anger,  $F(1, 370) = 14.87$ ,  $p < 0.001$ ,  $\eta_p^2 = 0.039$ , 95% CI = (10.50, 32.34). No other significant target sex/gender differences emerged ( $ps > 0.200$ ).

Unlike in the United States data, people expected most—but not all—targets to feel significantly greater anger than they would display ( $ps < 0.050$ ). The exceptions were for men low in physical attractiveness ( $p = 0.301$ ), women high in physical strength ( $p = 0.718$ ), and women high in physical attractiveness ( $p = 0.091$ ).

## DISCUSSION

What cues do people use to infer a stranger’s status? The present data suggest that the cues people use to infer a target’s status

depends on the target’s gender. Specifically, people use men’s physical strength and women’s physical attractiveness as cues of their high status.

Here, we predicted and found that social perceivers—both in the United States and in India—inferred that men who were physically stronger (versus weaker) and women who were more (versus less) physically attractive would enact more anger at same-sex/gender others who thwarted them (i.e., cut in front of them in a line). These expectations were nuanced and specific. People did not expect women’s physical strength or men’s physical attractiveness to significantly influence anger displays. People also did not expect such differences in people’s feelings of anger at being thwarted. Again, this pattern of results implies that, at least across these two nations, physical strength and physical attractiveness render men and women, respectively, higher status in the eyes of social perceivers.

These findings are consistent with literature suggesting that physical formidability is a cue of male status, and they also add to the growing body of work suggesting that physical attractiveness is a cue of female status (e.g., Sell et al., 2009; Buss et al., 2020). These findings also provide some support for the utility of the emotion expectation paradigm used here. This paradigm might be an effective tool for examining (other) cues of status in third-party perception, and thus helping to answer the broad, understudied question of how status, which exists in the eyes of others, is perceived and allocated. Indeed, myriad possible status features can be inserted into this paradigm—as in vignettes describing men and women with great riches (versus poverty), great notoriety (versus none), and so on—to test which other cues are used to infer people’s status.

## IMPLICATIONS FOR MALE AND FEMALE STATUS

We focused here on straightforward predictions about features highly likely to be linked to estimations of men’s and women’s status. The link between men’s physical strength and inferences of their higher status may be especially unsurprising, as larger and stronger males are known to receive and effectively command priority access to contested resources (e.g., De Waal and Waal, 2007; Cheng et al., 2013; Franz et al., 2015; Durkee et al., 2018, 2020). However, this finding may also underscore the evolved nature of the status features that the mind is attuned to. Physical strength may have been highly predictive of an animal’s success in ancestral environments but is less reliably predictive of people’s success in modern settings (e.g., universities, workplaces). Nevertheless, in line with other work (Buss et al., 2020), the present findings suggest that social perceivers still use men’s physical strength as a status cue.

As we argued above, default conceptualizations of status may often privilege historically male-typical instantiations of status (e.g., success in physical conflicts) and concomitant cues (see also Benenson, 1999; Lukaszewski et al., 2016; von Rueden et al., 2018; Garfield et al., 2019; Hagen and Garfield, 2019). These cues may or may not lead people to deem the women possessing them as high status. Thus, we examined whether women were inferred

**TABLE 2** | Means (SEs) of expected levels of anger display from different targets.

	Male Target		Female Target	
	High	Low	High	Low
<b>Physical strength</b>				
Feel	73.33(3.34)	71.18(3.42)	67.50(3.34)	69.48(3.09)
Act	65.65(3.81)	48.85(3.90)	66.10(3.81)	61.40(3.52)
<b>Physical attractiveness</b>				
Feel	72.06(3.31)	74.89(3.34)	67.31(3.17)	65.51(3.54)
Act	64.44(3.66)	70.87(3.81)	61.07(3.62)	49.45(4.04)

to have higher status as a function of their physical strength but also of their physical attractiveness (see Sell et al., 2009; Buss et al., 2020). Indeed, robust evidence suggests that more attractive women have more, easier access to contested resources (e.g., help from strangers, money, social support, attention; Benson et al., 1976; Mulford et al., 1998; Solnick and Schweitzer, 1999; Rosenblat, 2008; Rosen and Underwood, 2010; Parrett, 2015; Bhogal et al., 2016; Eisenbruch and Roney, 2020).

Yet whereas much related work focuses on attractiveness as a cue of female fertility, and thus women's ability to confer (or withhold) reproductive benefits, the benefits of female beauty need not be so limited. First, what connotes female beauty will vary across cultures and eras. As such, not all aspects of physical attractiveness are necessarily going to be linked to fertility.

Second, more physically attractive people might also be preferred as social partners for a range of reasons over and above those linked to furthering one's own reproductive access or that of one's kin (e.g., Eisenbruch and Roney, 2020). Third, female beauty might also reliably covary with other features that enhance women's ability to inflict costs on or generate benefits for others. For example, some work suggests that girls' earlier life physical attractiveness can be leveraged into popularity and other possible forms of status that provide priority access to contested resources (Elder, 1969; Krendl et al., 2011; Lee et al., 2018; Vaillancourt and Krems, 2018). Such attractiveness might garner women "notoriety or prominence within the cultural consciousness," aspects of social status that, in turn can improve women's abilities to produce high-quality offspring (Rucas, 2015, p. 117). Indeed, this link between female beauty and attainment of other status features may be exacerbated by modern technologies in the economy of human attention. Status features garner attention across a range of social species (e.g., Vaughn and Waters, 1981; LaFreniere and Charlesworth, 1983; McNelis and Boatright-Horowitz, 1998; Maner et al., 2008; Foulsham et al., 2010). Notably, modern technological applications (e.g., Instagram) might accelerate the translation of human attention—which can be captured *via* displaying status cues (e.g., female beauty, great riches)—into social influence, income, and other facets of status.

This implies a possible reframing for some explanations of women's appearance enhancement, whereby motivations and tendencies to enhance appearance can and perhaps should be viewed as a competitive strategy to access more than (male) mates—i.e., to compete for status (Blake and Brooks, 2019; Davis and Arnocky, 2020; Eisenbruch and Roney, 2020; Fisher and Krems, in press; Bradshaw and DelPriore, 2021; see text footnote 5). For example, Blake and Brooks (2019) found that women's intended self-sexualization (i.e., wearing revealing clothing) is partly driven by status-related goals. To the extent that beauty can garner status, and such status can benefit women (by, e.g., conferring preferential access to survival- and reproduction-limiting resources), then perhaps we should expect women to compete for status (and not only mates) *via* appearance enhancement (and/or the derogation of rivals' beauty).

We also suggest that there are many possible cues/features of female status that remain unexplored. To identify these, at one level of abstraction, one might start by asking in which ways girls and women generate benefits for others (Durkee et al.,

2020)—such as by being apt (allo)mothers, friends, and advisors, desirable romantic partners, and so on—and then ask which cues might reflect those aptitudes. A similar way to attack this problem might be to examine females' ability to generate those benefits perhaps historically more often associated with males, such as political leadership (e.g., Price and van Vugt, 2014; von Rueden et al., 2014). Might there be features that contribute more strongly to perceptions of a woman's leadership ability, and are cues of these glossed as status cues?

We might similarly ask what features render a woman better able to inflict costs on people. For example, females prefer indirect tactics of aggression to direct ones (e.g., gossip over physical violence) (e.g., Campbell, 1999; Vaillancourt, 2013; Benenson, 2014). Perhaps greater popularity or network centrality, for example, could help derogatory gossip spread more effectively (e.g., Hess and Hagen, 2006, 2019), making popular and/or network-central women more formidable among other women. If so, cues of these could be used to infer female status.

An additional, related tack generates still more overlooked status cues *via* acknowledging females' use of social partners as tools for inflicting costs on others (i.e., in enacting social or relational aggression; Campbell, 1999; Hess and Hagen, 2006, 2019; Vaillancourt, 2013; Benenson, 2014). Consider a woman who can successfully inflict costs on others by inciting her male kin to physically harm those others, or a woman who can withhold benefits from others by asking her high-value male partner or her group of female friends to refrain from allying with those others. Such indirect routes to status may have long been used by women—not unlike one child demanding better treatment from another because "my dad can beat up your dad," or one man receiving preferential treatment from another because the former is the son of someone important. Thus, it may be time to examine the possibility that perhaps women might especially (but certainly not exclusively) enjoy *indirect status*—and perhaps particularly from their associations with strong, rich, or otherwise powerful males. To be exceedingly clear, this does not discount females' ability to gain indirect status *via* other females or to gain direct status in their own rights. Rather, on this view, 'possession' of such associates—or of cues connoting the presence of such associates—might lead social perceivers to infer such female possessors as having high status. This might work similarly as for better-studied male targets, who can gain indirect status from coalitional partners, for one example (e.g., von Rueden et al., 2008, 2019).

One might also wonder why physically stronger (versus weaker) women or more (versus less) physically attractive men were not deemed higher status. As to why female strength did not influence third-party perceptions, it is possible that our sample sizes were insufficient to allow us to detect genuine but small effects (e.g., Sell et al., 2016). It is also possible that, as discussed above, women's increased physical size or strength would not have historically helped women in agonistic conflicts. Moreover, that weaker women were expected to display more anger than less attractive women might even suggest that greater physical strength is viewed as masculine and perhaps even undesirable in women; by the same token, weaker women might be deemed more feminine and attractive, and thus expected to display

greater anger. For men, there are several possibilities, including that male attractiveness is indeed a status cue, but the size of that effect was smaller than what we were able to detect (e.g., Sell et al., 2016). Alternatively, perhaps descriptions of physical attractiveness feminized targets in social perceivers' views, thus making those targets less high status in third-party perception (see Buss, 1990; Buss et al., 2020).

## LIMITATIONS AND FUTURE DIRECTIONS

As noted above, we hardly exhausted the possible cues of status. Future work might use this same paradigm to explore third-party perception of other, additional features. Future work might also explore whether the same features that rendered people higher status here act similarly when thwarters are other-sex/gender. For example, on average, even a weaker man could inflict catastrophic physical damage on a stronger woman. Yet threatening or enacting such harm is now highly taboo in most societies. Would people still expect this man to display anger at a thwarting woman? Additionally, whereas we manipulated the strength and attractiveness of targets, we gave no information about *thwarter* strength or attractiveness. Our same logic would predict that third-party perceivers should expect less anger displayed when thwarters possess relatively greater status cues (e.g., greater physical strength). Moreover, it is possible that some status cues are more or less effective as a function of the target and thwarter sex/gender. For example, perhaps male (versus female) prospective thwarters would be deemed especially likely to defer to physically attractive female targets. Indeed, such expectations of deference may be another front for exploration in a similar paradigm as we used here.

Are these features—physical strength and physical attractiveness—really cues of *status* (rather than something else)? This is a fair question, especially given that there exist various conceptualizations of status (e.g., rank, reputational regard, power, dominance- and prestige-based status; Cheng et al., 2013, 2021; Galinsky et al., 2015; Buss et al., 2020; Durkee et al., 2020). Moreover, disagreements persist over the extent to which humans have dominance-based status, and thus the extent to which humans confer status upon conspecifics able to inflict costs on others, or instead emphasize status conferral upon those able to generate benefits (e.g., Cheng et al., 2021, Durkee et al., 2020; Chen Zeng et al., 2022). It is possible, for example, that male anger displays are linked primarily to dominance-based status, which would be consistent with the functions of anger expressions for expressors (essentially making expressors look more aggressively formidable). At the same time, other work suggests that male physical strength is also associated with the ability to generate benefits (Lukaszewski et al., 2016; Durkee et al., 2020), suggesting that this cue might also be linked to other forms of status associated with prestige and reputation (see, e.g., Buss et al., 2020). This same question should be asked with respect to women: Is physical attractiveness primarily related to dominance-based

status? It might not seem so at first, but to the extent that more physically attractive women are able to inflict greater costs on rivals (Fisher and Cox, 2009) or are able to translate their appearance into other forms of status (e.g., popularity) that, in turn, are linked to the perpetration of hierarchy-maintaining aggression (see Vaillancourt and Krems, 2018), it is certainly possible.

Moreover, this is a fair question given that we have not directly measured status perception. We are explicit in our logic that greater inferences of target anger display should track—and would, in fact, seem to track—cues associated with status in third-party perception. We underscore the soundness of this logic, but also acknowledge that our paradigm is not as straightforward as asking whether participants deem stronger versus weaker targets high status. Such a face-valid method might be an apt, complementary means for assessing which features render targets high status in social perception. A broader multi-method approach might also use non-survey social, cognitive, and behavioral methods. For example, higher status individuals capture greater attention (e.g., Chance, 1967; Vaughn and Waters, 1981; LaFreniere and Charlesworth, 1983; McNelis and Boatright-Horowitz, 1998; Maner et al., 2008; Foulsham et al., 2010). Thus, examining attentional adhesion to targets varying in strength or attractiveness could allow for inferences of whether these features render targets high status in third-party perception.

We tested and found support for predictions in two cultures. Future work would ideally examine these and additional status features across a range of cultures, including small-scale societies. One issue to anticipate in doing so is that there can be different norms for emotion display (including anger; Park et al., 2013; see also Rychlowska et al., 2015). All else equal with respect to emotion display norms, a fruitful area of cross-cultural examination might be in identifying specific features linked to status in various cultures and examining them within and across cultures using this paradigm (see, e.g., Sznycer et al., 2016).

Finally, we point out the possibility that some people might not readily deem female physical attractiveness a cue of *genuine* status—at least not as readily as they might otherwise deem male physical strength, wealth, leadership positions, and the like. Women themselves acknowledge beauty as bringing power, at least over men; for example, in 2020 the novel by Chelsea G. Summers, the female protagonist thinks, “. . . I wanted these men to lust for me because. . . I knew that lust was power.” Yet we also acknowledge that some people might be offended that female beauty “counts” as a status cue in third-party perception, including for well-meaning reasons related to gender equality. It is an empirical question as to whether this form of status is truly given short shrift in people's social judgments—or if honoring female attractiveness as a cue of status in any way disadvantages women, as some might expect it to. But ultimately, this meta-question of the impact of people's association between female physical attractiveness and status is distinct from the findings here, which suggest that people in the United States and India use both men's physical

strength and women's physical attractiveness as cues of those targets' high status.

## CONCLUSION

People face an adaptive challenge in inferring other people's status levels. This raises an important but relatively understudied question about what cues people use to make these status inferences. Here, we leverage robust associations between anger and status—that social perceivers expect higher-status people to display more anger (Tiedens et al., 2000; Tiedens, 2001; Hess et al., 2005; Hareli et al., 2009; Sell et al., 2009, 2017)—to explore what some of those status-cueing features might be. In line with past work (e.g., Buss et al., 2020), we also examined whether the features that cue men's high status might be distinct from those that cue women's high status. We find that United States and Indian social perceivers expect men with more (versus less) physical strength and women with more (versus less) physical attractiveness to display greater anger when thwarted by another person. This pattern of anger expectations implies that United States and Indian social perceivers use men's physical strength and women's physical attractiveness as cues to those targets' high status.

## REFERENCES

- Aguinis, H., Simonsen, M. M., and Pierce, C. A. (1998). Effects of nonverbal behavior on perceptions of power bases. *J. Soc. Psychol.* 138, 455–469. doi: 10.1080/00224549809600400
- Alami, S., Von Rueden, C., Seabright, E., Kraft, T. S., Blackwell, A. D., Stieglitz, J., et al. (2020). Mother's social status is associated with child health in a horticulturalist population. *Proc. R. Soc. B* 287:20192783. doi: 10.1098/rspb.2019.2783
- Anderson, C., Hildreth, J. A. D., and Howland, L. (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychol. Bull.* 141, 574–601. doi: 10.1037/a0038781
- Anderson, C., John, O. P., Keltner, D., and Kring, A. M. (2001). Who attains social status? Effects of personality and physical attractiveness in social groups. *J. Pers. Soc. Psychol.* 81, 116–132. doi: 10.1037/0022-3514.81.1.116
- Benenson, J. F. (1999). Females' desire for status cannot be measured using male definitions. *Behav. Brain Sci.* 22, 216–217. doi: 10.1017/s0140525x99241817
- Benenson, J. F. (2014). *Warriors and Worriers: The Survival of the Sexes*. New York, NY: Oxford University Press.
- Benson, P. L., Karabenick, S. A., and Lerner, R. M. (1976). Pretty pleases: the effects of physical attractiveness, race, and sex on receiving help. *J. Exp. Soc. Psychol.* 12, 409–415. doi: 10.1016/0022-1031(76)90073-1
- Berger, J., Rosenholtz, S. J., and Zelditch, M. Jr. (1980). Status organizing processes. *Annu. Rev. Sociol.* 6, 479–508. doi: 10.1146/annurev.so.06.080180.002403
- Bhagal, M. S., Galbraith, N., and Manktelow, K. (2016). Sexual selection and the evolution of altruism: males are more altruistic and cooperative towards attractive females. *Lett. Evol. Behav. Sci.* 7, 10–13. doi: 10.5178/lebs.2016.42
- Blake, K., and Brooks, R. C. (2019). "Income inequality and reproductive competition: implications for consumption, status-seeking, and women's self-sexualization," in *The Social Psychology of Inequality*, eds J. Jetten and K. Peters (Cham: Springer), 173–185. doi: 10.1007/978-3-030-28856-3\_11
- Blaker, N. M., and van Vugt, M. (2014). "The status-size hypothesis: how cues of physical size and social status influence each other," in *The Psychology of Social Status*, eds J. T. Cheng, J. L. Tracy, and C. Anderson (New York, NY: Springer), 119–137. doi: 10.1007/978-1-4939-0867-7\_6
- Boehm, C. (1993). Egalitarian behavior and reverse dominance hierarchy. *Curr. Anthropol.* 34, 227–254. doi: 10.1086/204166

## DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

## ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Oklahoma State IRB. The patients/participants provided their written informed consent to participate in this study.

## AUTHOR CONTRIBUTIONS

JK developed hypotheses with critical feedback from LM, DS, JB-C. LM, VS, KD, and NR drafted materials with critical feedback from JK and DS. JK, LM, and VS worked on data analysis. JK drafted the manuscript with critical feedback from DS, JF, NR, and JB-C. All authors contributed to the article and approved the submitted version.

- Bowser, B., and Patton, J. (2010). "Women's leadership: political alliance, economic resources, and reproductive success in the Ecuadorian Amazon," in *The Evolution of Leadership: Transitions in Decision Making from Small-Scale to Middle-Range Societies*, eds K. J. V. Vaughn, J. W. Eerkens, and J. Kantner (Santa Fe: School for Advanced Research Press), 51–71.
- Bradshaw, H. K., and DelPriore, D. J. (2021). Beautification is more than mere mate attraction: extending evolutionary perspectives on female appearance enhancement. *Arch. Sex. Behav.* 51, 43–47. doi: 10.1007/s10508-021-01952-7
- Brescoll, V. L., and Uhlmann, E. L. (2008). Can an angry woman get ahead? Status conferral, gender, and expression of emotion in the workplace. *Psychol. Sci.* 19, 268–275. doi: 10.1111/j.1467-9280.2008.02079.x
- Brown, D. E. (1991). *Human Universals*. New York, NY: McGraw-Hill.
- Brown, M., Boykin, K., and Sacco, D. (2021). Inferring preferred mating strategies through body fat and sex-typical body features. *PsyArXiv* [Preprint].
- Burbank, V. K. (1987). Female aggression in cross-cultural perspective. *Behav. Sci. Res.* 21, 70–100. doi: 10.1177/106939718702100103
- Bush, J. M., Quinn, M. M., Balreira, E. C., and Johnson, M. A. (2016). How do lizards determine dominance? Applying ranking algorithms to animal social behaviour. *Anim. Behav.* 118, 65–74. doi: 10.1016/j.anbehav.2016.04.026
- Buss, D. M. (1990). Unmitigated agency and unmitigated communion: an analysis of the negative components of masculinity and femininity. *Sex Roles* 22, 555–568. doi: 10.1007/bf00288234
- Buss, D. M., Durkee, P. K., Shackelford, T. K., Bowdle, B. F., Schmitt, D. P., Brase, G. L., et al. (2020). Human status criteria: sex differences and similarities across 14 nations. *J. Pers. Soc. Psychol.* 119, 979–998. doi: 10.1037/pspa0000206
- Campbell, A. (1999). Staying alive: evolution, culture, and women's intrasexual aggression. *Behav. Brain Sci.* 22, 203–214. doi: 10.1017/s0140525x99001818
- Case, C. R., Bae, K. K., Larsen, K. T., and Maner, J. K. (2021). The precautionary nature of prestige: when leaders are hypervigilant to subtle signs of social disapproval. *J. Pers. Soc. Psychol.* 120, 694–715. doi: 10.1037/pspi0000284
- Chance, M. R. (1967). Attention structure as the basis of primate rank orders. *Man* 2, 503–518. doi: 10.2307/2799336
- Chase, I. D., and Seitz, K. (2011). Self-structuring properties of dominance hierarchies: a new perspective. *Adv. Genet.* 75, 51–81. doi: 10.1016/B978-0-12-380858-5.00001-0
- Chen Zeng, T., Cheng, J. T., and Henrich, J. (2022). Dominance in humans. *Philos. Trans. R. Soc. B* 377:20200451.

- Cheng, J. T. (2020). Dominance, prestige, and the role of leveling in human social hierarchy and equality. *Curr. Opin. Psychol.* 33, 238–244. doi: 10.1016/j.copsyc.2019.10.004
- Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., and Henrich, J. (2013). Two ways to the top: evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *J. Pers. Soc. Psychol.* 104, 103–125. doi: 10.1037/a0030398
- Cheng, J. T., Tracy, J. L., and Henrich, J. (2010). Pride, personality, and the evolutionary foundations of human social status. *Evol. Hum. Behav.* 31, 334–347. doi: 10.1016/j.evolhumbehav.2010.02.004
- Cheng, J. T., Tracy, J. L., and Henrich, J. (2021). Dominance is necessary to explain human status hierarchies. *Proc. Natl. Acad. Sci. U.S.A.* 10:e2103870118. doi: 10.1073/pnas.2103870118
- Cohen, A. S., Chun, R., and Sznycer, D. (2020). Do pride and shame track the evaluative psychology of audiences? Preregistered replications of Sznycer et al. (2016; 2017). *R. Soc. Open Sci.* 7:191922. doi: 10.1098/rsos.191922
- Cowlishaw, G., and Dunbar, R. I. M. (2021). *Primate Conservation Biology*. Chicago, IL: Chicago University Press.
- Davis, A. C., and Arnocky, S. (2020). An evolutionary perspective on appearance enhancement behavior. *Arch. Sex. Behav.* 51, 3–37. doi: 10.1007/s10508-020-01745-4
- De Waal, F., and Waal, F. B. (2007). *Chimpanzee Politics: Power and Sex Among Apes*. Baltimore, MD: JHU Press.
- Delton, A. W., and Sell, A. (2014). The co-evolution of concepts and motivation. *Curr. Dir. Psychol. Sci.* 23, 115–120. doi: 10.1177/0963721414521631
- Durkee, P. (2021). “Emotions and status hierarchies in L,” in *The Oxford Handbook of Evolution and the Emotions*, eds L. Al-Shawaf and T. Shackelford (Oxford: Oxford University Press).
- Durkee, P. K., Goetz, A. T., and Lukaszewski, A. W. (2018). Formidability assessment mechanisms: examining their speed and automaticity. *Evol. Hum. Behav.* 39, 170–178. doi: 10.1016/j.evolhumbehav.2017.12.006
- Durkee, P. K., Lukaszewski, A. W., and Buss, D. M. (2019). Pride and shame: key components of a culturally universal status management system. *Evol. Hum. Behav.* 40, 470–478. doi: 10.1016/j.evolhumbehav.2019.06.004
- Durkee, P. K., Lukaszewski, A. W., and Buss, D. M. (2020). Psychological foundations of human status allocation. *Proc. Natl. Acad. Sci. U.S.A.* 117, 21235–21241. doi: 10.1073/pnas.2006148117
- Eisenbruch, A., and Roney, J. (2020). Social taste buds: evidence of evolved same-sex friend preferences from a policy-capturing study. *Evol. Psychol. Sci.* 6, 195–206. doi: 10.1007/s40806-019-00218-9
- Eisenbruch, A. B., Grillot, R. L., Maestriperi, D., and Roney, J. R. (2016). Evidence of partner choice heuristics in a one-shot bargaining game. *Evol. Hum. Behav.* 37, 429–439. doi: 10.1016/j.evolhumbehav.2016.04.002
- Elder, G. H. Jr. (1969). Appearance and education in marriage mobility. *Am. Sociol. Rev.* 34, 519–533. doi: 10.2307/2091961
- Fisher, M., and Cox, A. (2009). The influence of female attractiveness on competitor derogation. *J. Evol. Psychol.* 7, 141–155. doi: 10.1556/jep.7.2009.2.3
- Fisher, M., and Krems, J. A. (in press). “An evolutionary review of female intrasexual competition,” in *The Handbook of Evolutionary Psychology*, ed. D. Buss (Hoboken, NJ: Wiley & Sons).
- Foulsham, T., Cheng, J. T., Tracy, J. L., Henrich, J., and Kingstone, A. (2010). Gaze allocation in a dynamic situation: effects of social status and speaking. *Cognition* 117, 319–331. doi: 10.1016/j.cognition.2010.09.003
- Franz, M., McLean, E., Tung, J., Altmann, J., and Alberts, S. C. (2015). Self-organizing dominance hierarchies in a wild primate population. *Proc. R. Soc. B Biol. Sci.* 282:20151512. doi: 10.1098/rspb.2015.1512
- Galinsky, A. D., Rucker, D. D., and Magee, J. C. (2015). “Power: past findings, present considerations, and future directions,” in *APA Handbook of Personality and Social Psychology, Interpersonal Relations*, Vol. 3, eds M. Mikulincer, P. R. Shaver, J. A. Simpson, and J. F. Dovidio (Washington, DC: American Psychological Association), 421–460. doi: 10.1037/14344-016
- Garfield, Z. H., Hubbard, R. L., and Hagen, E. H. (2019). Evolutionary models of leadership. *Hum. Nat.* 30, 23–58. doi: 10.1007/s12110-019-09338-4
- Griskevicius, V., Tybur, J. M., Gangestad, S. W., Perea, E. F., Shapiro, J. R., and Kenrick, D. T. (2009). Aggress to impress: hostility as an evolved context-dependent strategy. *J. Pers. Soc. Psychol.* 96, 980–994. doi: 10.1037/a0013907
- Hagen, E., and Garfield, Z. H. (2019). Leadership and prestige, mothering, sexual selection, and encephalization: the computational services model. *OSF [Preprints]*. doi: 10.31219/osf.io/9bckd
- Hareli, S., Harush, R., Suleiman, R., Cossette, M., Bergeron, S., Lavoie, V., et al. (2009). When scowling may be a good thing: the influence of anger expressions on credibility. *Eur. J. Soc. Psychol.* 39, 631–638. doi: 10.1002/ejsp.573
- Hareli, S., Sharabi, M., Cossette, M., and Hess, U. (2011). Observers’ expectations regarding the emotional reactions of others in a failure context: the role of status and perceived dominance. *Motiv. Emot.* 35, 52–62. doi: 10.1007/s11031-010-9199-0
- Henrich, J., and Gil-White, F. J. (2001). The evolution of prestige: freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evol. Hum. Behav.* 22, 165–196. doi: 10.1016/s1090-5138(00)00071-4
- Hess, N. H., and Hagen, E. H. (2006). Psychological adaptations for assessing gossip veracity. *Hum. Nat.* 17, 337–354. doi: 10.1007/s12110-006-1013-z
- Hess, N. H., and Hagen, E. H. (2019). “Gossip, reputation, and friendship in within-group competition,” in *The Oxford Handbook of Gossip and Reputation*, eds F. Giardini and R. Wittek (Oxford: Oxford University Press), 275–302.
- Hess, U., Adams, R. Jr., and Kleck, R. (2005). Who may frown and who should smile? Dominance, affiliation, and the display of happiness and anger. *Cogn. Emot.* 19, 515–536. doi: 10.1080/02699930441000364
- Holekamp, K. E., and Strauss, E. D. (2016). Aggression and dominance: an interdisciplinary overview. *Curr. Opin. Behav. Sci.* 12, 44–51. doi: 10.1016/j.cobeha.2016.08.005
- Keltner, D., Gruenfeld, D. H., and Anderson, C. (2003). Power, approach, and inhibition. *Psychol. Rev.* 110, 265–284. doi: 10.1037/0033-295x.110.2.265
- Knutson, B. (1996). Facial expressions of emotion influence interpersonal trait inferences. *J. Nonverbal Behav.* 20, 165–182. doi: 10.1037/a0016551
- Krems, J. A., Bradshaw, H., and Merrie, L. A. (2021). “Intrasexual aggression,” in *The Oxford Handbook of Evolutionary Psychology and Romantic Relationships*, eds J. Mogilski and T. Shackelford (Oxford: Oxford University Press).
- Krems, J. A., Neuberger, S. L., Filip-Crawford, G., and Kenrick, D. T. (2015). Is she angry? (Sexually desirable) women “see” anger on female faces. *Psychol. Sci.* 26, 1655–1663. doi: 10.1177/0956797615603705
- Krendl, A. C., Magoon, N. S., Hull, J. G., and Heatherton, T. F. (2011). Judging a book by its cover: the differential impact of attractiveness on predicting one’s acceptance to high-or low-status social groups. *J. Appl. Soc. Psychol.* 41, 2538–2550. doi: 10.1111/j.1559-1816.2011.00824.x
- LaFreniere, P. J., and Charlesworth, W. R. (1983). Dominance, attention, and affiliation in a preschool group: a 9-month longitudinal study. *Ethol. Sociobiol.* 4, 55–67. doi: 10.1016/0162-3095(83)90030-4
- Lee, K. S., Brittain, H., and Vaillancourt, T. (2018). Predicting dating behavior from aggression and self-perceived social status in adolescence. *Aggress. Behav.* 44, 372–381. doi: 10.1002/ab.21758
- Lerner, J. S., and Tiedens, L. Z. (2006). Portrait of the angry decision maker: how appraisal tendencies shape anger’s influence on cognition. *J. Behav. Decis. Making* 19, 115–137. doi: 10.1002/bdm.515
- Lukaszewski, A. W. (2013). Testing an adaptationist theory of trait covariation: relative bargaining power as a common calibrator of an interpersonal syndrome. *Eur. J. Pers.* 27, 328–345. doi: 10.1002/per.1908
- Lukaszewski, A. W., Simmons, Z. L., Anderson, C., and Roney, J. R. (2016). The role of physical formidability in human social status allocation. *J. Pers. Soc. Psychol.* 110, 385–406. doi: 10.1037/pspi0000042
- Majolo, B., Lehmann, J., de Bortoli Vizioli, A., and Schino, G. (2012). Fitness-related benefits of dominance in primates. *Am. J. Phys. Anthropol.* 147, 652–660. doi: 10.1002/ajpa.22031
- Maner, J. K. (2017). Dominance and prestige: a tale of two hierarchies. *Curr. Dir. Psychol. Sci.* 26, 526–531. doi: 10.1177/096372141714323
- Maner, J. K., DeWall, C. N., and Gailliot, M. T. (2008). Selective attention to signs of success: social dominance and early stage interpersonal perception. *Pers. Soc. Psychol. Bull.* 34, 488–501. doi: 10.1177/0146167207311910
- Mast, M. S., and Palese, T. (2019). “What can we learn about others’ power from their emotional expressions?,” in *The Social Nature of Emotion Expression*, eds U. Hess and S. Hareli (Cham: Springer), 179–197. doi: 10.1007/978-3-030-32968-6\_10

- McNelis, N. L., and Boatright-Horowitz, S. L. (1998). Social monitoring in a primate group: the relationship between visual attention and hierarchical ranks. *Anim. Cogn.* 1, 65–69. doi: 10.1007/s100710050008
- Mulford, M., Orbell, J., Shatto, C., and Stockard, J. (1998). Physical attractiveness, opportunity, and success in everyday exchange. *Am. J. Sociol.* 103, 1565–1592. doi: 10.1086/231401
- Noë, R., de Waal, F. B., and van Hooff, J. A. (1980). Types of dominance in a chimpanzee colony. *Folia Primatol.* 34, 90–110. doi: 10.1159/000155949
- Park, J., Kitayama, S., Markus, H. R., Coe, C. L., Miyamoto, Y., Karasawa, M., et al. (2013). Social status and anger expression: the cultural moderation hypothesis. *Emotion* 13, 1122–1131. doi: 10.1037/a0034273
- Parrett, M. (2015). Beauty and the feast: examining the effect of beauty on earnings using restaurant tipping data. *J. Econ. Psychol.* 49, 34–46. doi: 10.1016/j.joep.2015.04.002
- Patton, J. (2000). “Reciprocal altruism and warfare,” in *Adaptation and Human Behavior: An Anthropological Perspective*, eds L. Cronk, W. Irons, and N. Chagnon (Hawthorne, NY: Aldine de Gruyter), 417–436. doi: 10.4324/9781351329200-24
- Pietraszewski, D., and Shaw, A. (2015). Not by strength alone. *Hum. Nat.* 26, 44–72. doi: 10.1007/s12110-015-9220-0
- Price, M. E., and van Vugt, M. (2014). The evolution of leader–follower reciprocity: the theory of service-for-prestige. *Front. Hum. Neurosci.* 8:363. doi: 10.3389/fnhum.2014.00363
- Puts, D. A. (2010). Beauty and the beast: mechanisms of sexual selection in humans. *Evol. Hum. Behav.* 31, 157–175. doi: 10.1016/j.evolhumbehav.2010.02.005
- Redhead, D. J., Cheng, J. T., Driver, C., Foulsham, T., and O’Gorman, R. (2019). On the dynamics of social hierarchy: a longitudinal investigation of the rise and fall of prestige, dominance, and social rank in naturalistic task groups. *Evol. Hum. Behav.* 40, 222–234. doi: 10.1016/j.evolhumbehav.2018.1.2.001
- Rosen, L. H., and Underwood, M. K. (2010). Facial attractiveness as a moderator of the association between social and physical aggression and popularity in adolescents. *J. Sch. Psychol.* 48, 313–333. doi: 10.1016/j.jsp.2010.03.001
- Rosenblat, T. S. (2008). The beauty premium: physical attractiveness and gender in dictator games. *Negot. J.* 24, 465–481. doi: 10.1111/j.1571-9979.2008.00198.x
- Rucas, S. (2015). “Cooperation drives competition among Tsimane women in the Bolivian Amazon,” in *The Oxford Handbook of Women and Competition*, ed. M. Fisher (Oxford: Oxford University Press).
- Rychlowska, M., Miyamoto, Y., Matsumoto, D., Hess, U., Gilboa-Schechtman, E., Kambale, S., et al. (2015). Heterogeneity of long-history migration explains cultural differences in reports of emotional expressivity and the functions of smiles. *Proc. Natl. Acad. Sci. U.S.A.* 112, E2429–E2436. doi: 10.1073/pnas.1413661112
- Sapolsky, R. M. (2004). Social status and health in humans and other animals. *Annu. Rev. Anthropol.* 33, 393–418. doi: 10.1146/annurev.anthropol.33.070203.144000
- Scelza, B. A. (2010). Fathers’ presence speeds the social and reproductive careers of sons. *Curr. Anthropol.* 51, 295–303. doi: 10.1086/651051
- Sell, A., Eisner, M., and Ribeaud, D. (2016). Bargaining power and adolescent aggression: the role of fighting ability, coalitional strength, and mate value. *Evol. Hum. Behav.* 37, 105–116. doi: 10.1016/j.evolhumbehav.2015.09.003
- Sell, A., Hone, L. S., and Pound, N. (2012). The importance of physical strength to human males. *Hum. Nat.* 23, 30–44. doi: 10.1007/s12110-012-9131-2
- Sell, A., Sznycer, D., Al-Shawaf, L., Lim, J., Krauss, A., Feldman, A., et al. (2017). The grammar of anger: mapping the computational architecture of a recalibrational emotion. *Cognition* 168, 110–128. doi: 10.1016/j.cognition.2017.06.002
- Sell, A., Tooby, J., and Cosmides, L. (2009). Formidability and the logic of human anger. *Proc. Natl. Acad. Sci. U.S.A.* 106, 15073–15078. doi: 10.1073/pnas.0904312106
- Shariff, A. F., and Tracy, J. L. (2009). Knowing who’s boss: implicit perceptions of status from the nonverbal expression of pride. *Emotion* 9, 631–639. doi: 10.1037/a0017089
- Smith, J. E., and van Vugt, M. (2020). Leadership and status in mammalian societies: context matters. *Trends Cogn. Sci.* 24, 263–264. doi: 10.1016/j.tics.2020.01.003
- Solnick, S. J., and Schweitzer, M. E. (1999). The influence of physical attractiveness and gender on ultimatum game decisions. *Organ. Behav. Hum. Decis. Process.* 79, 199–215. doi: 10.1006/obhd.1999.2843
- Stavans, M., and Baillargeon, R. (2019). Infants expect leaders to right wrongs. *Proc. Natl. Acad. Sci. U.S.A.* 116, 16292–16301. doi: 10.1073/pnas.1820091116
- Sznycer, D., Al-Shawaf, L., Bereby-Meyer, Y., Curry, O. S., De Smet, D., Ermer, E., et al. (2017). Cross-cultural regularities in the cognitive architecture of pride. *Proc. Natl. Acad. Sci. U.S.A.* 114, 1874–1879. doi: 10.1073/pnas.1614389114
- Sznycer, D., and Cohen, A. S. (2021). How pride works. *Evol. Hum. Sci.* 3:e10. doi: 10.1017/ehs.2021.6
- Sznycer, D., and Lukaszewski, A. W. (2019). The emotion–valuation constellation: multiple emotions are governed by a common grammar of social valuation. *Evol. Hum. Behav.* 40, 395–404. doi: 10.1016/j.evolhumbehav.2019.05.002
- Sznycer, D., Takemura, K., Delton, A. W., Sato, K., Robertson, T., Cosmides, L., et al. (2012). Cross-cultural differences and similarities in proneness to shame: an adaptationist and ecological approach. *Evol. Psychol.* 10, 352–370.
- Sznycer, D., Tooby, J., Cosmides, L., Porat, R., Shalvi, S., and Halperin, E. (2016). Shame closely tracks the threat of devaluation by others, even across cultures. *Proc. Natl. Acad. Sci. U.S.A.* 113, 2625–2630. doi: 10.1073/pnas.1514699113
- Sznycer, D., Xygalatas, D., Alami, S., An, X. F., Ananyeva, K. I., Fukushima, S., et al. (2018b). Invariances in the architecture of pride across small-scale societies. *Proc. Natl. Acad. Sci. U.S.A.* 115, 8322–8327. doi: 10.1073/pnas.1808418115
- Sznycer, D., Xygalatas, D., Agey, E., Alami, S., An, X. F., Ananyeva, K. I., et al. (2018a). Cross-cultural invariances in the architecture of shame. *Proc. Natl. Acad. Sci. U.S.A.* 115, 9702–9707. doi: 10.1073/pnas.1805016115
- Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: the effect of negative emotion expressions on social status conferral. *J. Pers. Soc. Psychol.* 80, 86–94. doi: 10.1037/0022-3514.80.1.86
- Tiedens, L. Z., Ellsworth, P. C., and Mesquita, B. (2000). Sentimental stereotypes: emotional expectations for high- and low-status group members. *Pers. Soc. Psychol. Bull.* 26, 560–575. doi: 10.1177/0146167200267004
- Vaillancourt, T. (2013). Do human females use indirect aggression as an intrasexual competition strategy? *Philos. Trans. R. Soc. B Biol. Sci.* 368:20130080. doi: 10.1098/rstb.2013.0080
- Vaillancourt, T., and Krems, J. A. (2018). “An evolutionary psychological perspective of indirect aggression in girls and women,” in *The Development of Relational Aggression*, eds S. Coyne and J. Ostrov (Oxford: Oxford University Press), 111–126.
- van Kleef, G. A., and Lange, J. (2020). How hierarchy shapes our emotional lives: effects of power and status on emotional experience, expression, and responsiveness. *Curr. Opin. Psychol.* 33, 148–153. doi: 10.1016/j.copsyc.2019.07.009
- Vaughn, B. E., and Waters, E. (1981). Attention structure, sociometric status, and dominance: interrelations, behavioral correlates, and relationships to social competence. *Dev. Psychol.* 17, 275–288. doi: 10.1037/0012-1649.17.3.275
- von Rueden, C. (2014). “The roots and fruits of social status in small-scale human societies,” in *The Psychology of Social Status*, eds J. T. Cheng, J. L. Tracy, and C. Anderson (New York, NY: Springer), 179–200. doi: 10.1007/978-1-4939-0867-7\_9
- von Rueden, C., Alami, S., Kaplan, H., and Gurven, M. (2018). Sex differences in political leadership in an egalitarian society. *Evol. Hum. Behav.* 39, 402–411. doi: 10.1016/j.evolhumbehav.2018.03.005
- von Rueden, C., Gurven, M., and Kaplan, H. (2008). The multiple dimensions of male social status in an Amazonian society. *Evol. Hum. Behav.* 29, 402–415. doi: 10.1016/j.evolhumbehav.2008.05.001
- von Rueden, C., Gurven, M., and Kaplan, H. (2011). Why do men seek status? Fitness payoffs to dominance and prestige. *Proc. R. Soc. B Biol. Sci.* 278, 2223–2232. doi: 10.1098/rspb.2010.2145
- von Rueden, C., Gurven, M., Kaplan, H., and Stieglitz, J. (2014). Leadership in an egalitarian society. *Hum. Nat.* 25, 538–566. doi: 10.1007/s12110-014-9213-4
- von Rueden, C. R., and Jaeggi, A. V. (2016). Men’s status and reproductive success in 33 nonindustrial societies: effects of subsistence, marriage system, and reproductive strategy. *Proc. Natl. Acad. Sci. U.S.A.* 113, 10824–10829. doi: 10.1073/pnas.1606800113
- von Rueden, C. R., Redhead, D., O’Gorman, R., Kaplan, H., and Gurven, M. (2019). The dynamics of men’s cooperation and social status in a

small-scale society. *Proc. R. Soc. B* 286:20191367. doi: 10.1098/rspb.2019.1367

Wasser, S. K., and Barash, D. P. (1983). Reproductive suppression among female mammals: implications for biomedicine and sexual selection theory. *Q. Rev. Biol.* 58, 513–538. doi: 10.1086/413545

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## APPENDIX A: VIGNETTE EXAMPLES

### Target descriptions

Alex is taller than most other men (women). In fact, Alex often towers over them. Alex is also much stronger than most men (women); even from far away, Alex looks very muscular and imposing compared to most other men (women).

Alex is shorter than most men (women). In fact, other men (women) often tower over Alex. Alex is also much smaller than most men (women); even from far away, Alex looks much slighter compared to most other men (women).

Alex is a very attractive man (woman). People definitely take notice of Alex when he (she) walks into a room because he (she) is so good-looking compared to most other men (women).

Alex is a very unattractive man (woman). People rarely take notice of Alex when he (she) walks into a room because he (she) is so unattractive compared to most other men (women).

### Action

Today, Alex is on his (her) way home. He (She) spent the entire day doing annoying and tedious paperwork at the office. His (Her) phone died, so he couldn't listen to music. He (She) also forgot his lunch, so on his way home, Alex stops in to grab something quick to eat near his (her) bus stop. Busses run every hour, so he (she) should make the next bus as long as he (she) is quick. He (She) can't wait to get home!

Right then, another man (woman) *deliberately* cuts in line in front of Alex, and places a big, complicated order. Now Alex will miss the bus, meaning spending another hour in this dirty, boring part of the city.