

# The evolution of pride and social hierarchy

Jessica L. Tracy<sup>a,\*</sup>, Eric Mercadante<sup>a</sup>, Zachary Witkower<sup>a</sup>,  
Joey T. Cheng<sup>b</sup>

<sup>a</sup>University of British Columbia, Vancouver, BC, Canada

<sup>b</sup>York University, Toronto, ON, Canada

\*Corresponding author: e-mail address: jltracy@psych.ubc.ca

## Contents

1. What is pride? Real-time operation, development, and neuroscience	55
1.1 The pride nonverbal expression	55
1.2 The psychological structure of pride	58
1.3 The development and neuroscience of pride	65
2. The evolution of pride and social hierarchy	68
2.1 From pride to social rank: Experiential, motivational, and informational effects	68
2.2 Evolutionary history	70
2.3 The psychology of dominance versus prestige	73
2.4 Two routes to high rank and the selection of two facets of pride	77
2.5 From pride to social rank: Nonverbal signaling	83
2.6 Which kind of status does pride signal	86
2.7 Is pride a uniquely human emotion?	91
3. Does pride serve a secondary function, beyond rank attainment?	92
3.1 Cultural evolution and the emergence of human nature	92
3.2 Pride and the emergence of cultural evolution	94
4. Conclusions and future directions	101
References	104

## Abstract

A large body of research has emerged to suggest that the self-conscious emotion of pride is a universal and evolved part of human nature, which functions to help individuals navigate their social hierarchies, motivating them to engage in behaviors that allow them to attain and maintain social rank, and communicating to others which group members are deserving of rank attainment and should be targets of social learning. Studies also suggest that there are two distinct facets of pride: authentic and hubristic, associated with distinct forms of self-favorability—self-esteem and narcissism, respectively. Furthermore, each pride facet may function to facilitate the attainment of a distinct form of social rank: prestige versus dominance. We review findings supporting

this account, as well as evidence for the prestige and dominance model of social rank, and for a novel account of pride as the critical affective mechanism underlying cumulative cultural evolution.

The world-record-breaking cyclist Lance Armstrong might be considered a case study in the complex nature of pride: its unique combination of intrapsychic and interpersonal benefits, but also pitfalls. Lance's story is a familiar one; at the age of 13, when all the other Texan kids were playing football in the sun or swimming at the local country club, Lance was riding his bike. As he later told an interviewer, "I had started with nothing ... but on my bike, I had become something ... I was biking for miles after school, because it was my chance" (Armstrong & Jenkins, 2000). By the age of 16, he was earning \$20,000 a year in prize money, contributing significantly to his family's income. A desire to "become something"—to feel pride in himself and what he could accomplish—motivated Lance to put in the uncountable hours of hard work needed to become a champion. Pride helped him attain a kind of status that few people, and even fewer teenagers, ever acquire. Eventually, Lance became the second American ever to win the *Tour de France*—which he ultimately won seven times. In 2005 he was widely considered the fastest long-distance cyclist in the world, and had become much more than an enormously talented athlete; he was a major philanthropist, widely respected for the money and awareness he had raised for millions suffering from cancer, through Live Strong, the multimillion-dollar charitable organization he founded.

However, Lance's desire to feel proud of himself did not result only in prosocial and achievement-oriented behaviors like nonstop training and altruistic fundraising. At some point in his career, Armstrong's pride took a dramatic turn; he seems to have stopped wanting to feel good about who he was and who he could become, and started caring more about how other people saw him. Whether he was deemed the winner became more important than whether he actually won, and Armstrong found a way to attain others' adoration that was not dependent on working as hard as he possibly could, and that, in fact, separated the act of winning from doing his best. By "doping" to boost his blood oxygen levels, Armstrong managed to win races without actually being the fastest cyclist. This antisocial behavior, much like his prosocial hard work and altruism, was driven by pride, but by its more arrogant and hubristic form, a kind of pride that motivates people to impress others, show off, and take control (Burgo, 2013). Both kinds of pride help people climb the social ladder and reap

the rewards of social rank, but they do so in very different ways; one by fomenting hard work and persistence, and the other by fostering aggression, manipulation, and domination by any means (Tracy, 2016).

As we will argue, pride is one of the most central emotions shaping human social behavior and group dynamics because it is *the* emotion that motivates people to do what it takes to get ahead, to attain social status. Higher social rank tends to promote greater fitness than low rank, and a large body of evidence attests to a strong relation between social rank and fitness or well-being across species (e.g., Barkow, 1975; Hill & Hurtado, 1989; von Rueden, Gurven, & Kaplan, 2011). By facilitating the attainment of social rank, pride thus serves a critical adaptive function. Indeed, a large body of evidence suggests that humans evolved to experience pride, and that pride is an adaptive part of our affective and behavioral repertoire (Tracy, 2016; Tracy, Shariff, & Cheng, 2010).

Yet pride is different from many other adaptive emotions, like anger, fear, and happiness—the small set of emotions known as “basic” (Ekman, 1992a; Tracy & Robins, 2004a). In contrast to those emotions, pride is a “self-conscious” emotion (Tangney & Fischer, 1995), meaning that its experience requires the activation of self-awareness, and using that self-awareness to reflexively focus on one’s self-representations. To experience a self-conscious emotion—be it pride, shame, guilt, or embarrassment—a person must use their self-conscious “I”-self to focus on their self-concept or identity—the “me” self, according to James’ (1890) distinction. They must then make a self-evaluation—an appraisal of whether their self-concept is currently meeting, exceeding, or failing to meet their goals for their identity, or the kind of person they want to be. This evaluation determines whether a self-conscious emotion is experienced, and if so which one (Buss, 2001; Tangney & Dearing, 2002; Tracy & Robins, 2004a). For pride, the self-evaluation needs to be in the affirmative; pride occurs when people appraise themselves as meeting or exceeding important identity goals.

Pride can thus be understood, to some extent, as an emotional tracking device—an internal cybernetic mechanism that tells the self when its current behaviors, or external events, put the individual on track toward becoming the kind of person he or she wants to be. Correspondingly, an absence of pride tells the self that something is missing, and action must be taken to attain pride and restore self-esteem (Weidman, Tracy, & Elliot, 2016). The person who we want to be—our identity—is in turn shaped in large part by cultural and societal rules and norms; we typically want to become the kind of people who are highly valued by our societies

(Robins, Tracy, & Trzesniewski, 2010; Tracy, 2016; Tracy & Robins, 2004a). These people are the ones who hold social status, meaning that they are admired and receive deference, and have power and influence over others. Pride is therefore the emotion that tells us when our behaviors, actions, and even our global self are as we most want them to be—on track toward helping us attain social status. A desire for pride, in turn, prompts us to engage in those behaviors that will earn us status. For this reason, pride is functional.

Yet to compellingly support this account of pride as an evolved part of human nature, it is not enough to highlight how pride might be functional in human lives. Instead, ethologist Nico Tinbergen proposed five levels of analysis for understanding (and evaluating) an evolved faculty of the mind: (1) “its real-time operation (how it works proximately, from moment to moment)”; (2) “how it is implemented in neural tissue”; (3) “how it develops in the individual”; (4) “its function (what it accomplishes in an ultimate, evolutionary sense)”; and (5) “how it evolved in the species” (Pinker, 2002, p. 70; Tinbergen, 1963).<sup>1</sup>

Over the past two decades, a large body of research has accumulated on pride and its association with rank attainment. This literature allows us to examine pride at each of these levels of analysis, and determine whether it meets the criteria, at each level, that we would expect of an evolved psychological phenomenon. In this article, we begin by tackling the first three of those levels, reviewing research on: (1) what pride is and how it works proximately in human lives, (2) how it might be explained from a neuroscientific perspective, and (3) how it develops in early childhood and over the lifespan. Next, we turn to (4) the ultimate function and (5) evolutionary history of pride (its phylogeny), and in doing so, address the question of how humans attain social rank and why they evolved to do so in the ways they do. We argue that pride plays a central role in this process, motivating people to engage in the behaviors necessary to attain rank and, through pride’s recognizable nonverbal display, communicate their deservedness of high rank to other group members.

Finally, we will move beyond genetic evolution to examine pride’s role in cumulative cultural evolution, the process through which cultural knowledge progresses and advances over time, largely as a result of

---

<sup>1</sup> Of note, Tinbergen listed four levels of analysis, categorized the first two listed here together, but Pinker (2002) further distinguished them as we do here. We have adopted Pinker’s differentiation because the proximate function level of analysis is typically studied and conceptualized separately from the neuroscientific level.

knowledge transmission and social learning. We propose a novel hypothesis about the importance of pride in this domain: that this unique emotion may have come to serve a secondary function in humans, beyond rank attainment. Specifically, pride may promote the transmission of cultural knowledge, and thus contribute in an essential way to cultural evolutionary processes. In total, we will demonstrate that pride is not only a basic and adaptive part of human nature, but that it may be the emotion that makes us most human, by fostering the drive to develop and maintain a socially approved identity, which, in turn, enables humans' unique approach to attaining social rank.



## 1. What is pride? Real-time operation, development, and neuroscience

### 1.1 The pride nonverbal expression

One of the most prominent gold-standard criteria used to determine whether a particular emotion is likely to be evolved traditionally has been whether it has a distinct, cross-culturally recognized nonverbal expression (e.g., Ekman, 1992b; Tracy & Randles, 2011). Although pride was not included in the pantheon of emotions originally thought to meet this criterion (e.g., Ekman et al., 1987; Ekman, Sorenson, & Friesen, 1969; Izard, 1971), studies conducted over the past 15 years have provided strong evidence for a cross-cultural, reliably recognized pride expression (see Fig. 1; also Tracy & Robins, 2007a for a review).



**Fig. 1** Prototypical pride expressions, with arms raised (left), and arms akimbo and hands on hips (right). Both displays are reliably recognized at high rates in educated Western samples and by members of isolated small-scale traditional societies.

We began this line of work by testing whether there is a nonverbal display, which we asked people to pose, that would generate high levels of recognition as pride—meaning that observers viewing the expression would tend to agree that it conveyed pride and not some other emotion. Using a combination of forced-choice and open-ended response methods, we compared pride recognition rates for over a dozen potential pride expressions (Tracy & Robins, 2004b, 2007b). Across studies and methods, we found that the best recognized, or most prototypical, pride expression includes the body (i.e., expanded posture, head tilted slightly back, arms akimbo with hands on hips or raised above the head with hands in fists) as well as the face (i.e., small smile), and is reliably distinguished from similar emotions (e.g., happiness, excitement). We also found that recognition rates for this expression tend to be high—around 80–90% for North American samples using a forced-choice response method—and comparable to rates typically found for the best recognized basic emotion expressions (Tracy & Robins, 2007b; Tracy, Robins, & Schriber, 2009). Importantly, this finding of high levels of recognition for the pride expression has been replicated by several other labs (Beck, Cañamero, & Bard, 2010; Brosi, Spörrle, Welpel, & Heilman, 2016; Cordaro et al., n.d.; see Witkower & Tracy, 2019a, for a review).

Furthermore, like the basic emotion expressions, the pride expression can be recognized quickly and efficiently from a snapshot image, and recognition is not impaired by the addition of a cognitive load (Tracy & Robins, 2008a). These findings suggest that recognizing pride is an automatic cognitive process. It also seems to be a process that generalizes to individuals with certain social deficits; children and adolescents with autism spectrum disorders can reliably recognize pride expressions, as accurately and quickly as typically developing individuals of the same age (Tracy, Robins, Schriber, & Solomon, 2011).

In subsequent studies, we found that the pride expression is also reliably recognized by individuals across a range of cultures (Tracy & Robins, 2008b). We first found evidence for pride recognition among native Italians living in Bologna, Italy, suggesting that the pride expression we had identified in the U.S. was not merely an artifact of American culture. Next, we sought stronger evidence for universality, by examining whether recognition generalizes beyond individuals living in Western educated, industrialized, rich and democratic (WEIRD; Henrich, Heine, & Norenzayan, 2010) societies. Specifically, we tested whether individuals living in a highly isolated, largely preliterate small-scale traditional society

in Burkina Faso could recognize pride. Pride recognition rates were significantly greater than chance and higher than recognition rates for every other emotion expression examined (including anger, disgust, fear, and sadness), with the exception of happiness (Tracy & Robins, 2008b). Pride recognition thus passes the “maximally divergent populations” test of universality (Norenzayan & Heine, 2005), in that it is reliably recognized by individuals who hail from highly divergent cultural backgrounds and are geographically separated, such that our Burkinabe participants are unlikely to have learned about the pride expression through cross-cultural transmission (i.e., American media). Further supporting this account, subsequent studies found reliable recognition of the expression among villagers living in another small-scale traditional society, in Fiji (Tracy, Shariff, Zhao, & Henrich, 2013).

In perhaps the strongest evidence for pride’s universality, a study measuring nonverbal expressions spontaneously displayed by athletes immediately after winning or losing a match in the Olympic and Paralympic judo competition found that individuals from over 30 different nations, as well as congenitally blind athletes participating in the Paralympics, displayed behaviors associated with the prototypical pride expression in response to success (Tracy & Matsumoto, 2008). Given that congenitally blind individuals could not have learned to show pride through visual modeling, these findings suggest that the behavioral expression associated with pride is likely to be innate. Furthermore, these findings indicate that the same posed expression that is cross-culturally recognized as pride is spontaneously displayed when people actually feel pride. This is important, because it confirms that the pride expression is not merely a stereotyped idea of which people are aware but do not actually use; instead, the expression is a set of behaviors that reliably cooccur in predicted situations. Further supporting this conclusion, other studies have found that young children spontaneously display components of the pride expression in response to success (Belsky & Domitrovich, 1997; Lewis, Alessandri, & Sullivan, 1992; Stipek, Recchia, & McClintic, 1992) and high-school students who have performed well on a class exam subsequently walk with an erect posture—a core component of the pride expression (Weisfeld & Beresford, 1982).

Together, these findings provide strong support for the conclusion that the pride expression is a universal and innate behavioral response to success. It is unlikely that the expression would (a) be recognized so consistently, robustly, and quickly (b) by individuals who could not have learned it strictly through cross-cultural transmission (i.e., films, television,

magazines), or (c) be reliably and spontaneously displayed in pride-eliciting situations by individuals who have never seen others display it, if it were not an innate human universal.

However, the pride expression differs from other highly recognizable and universal emotion expressions, in that accurate recognition of pride requires bodily and head components as well as facial muscle movements (Tracy & Robins, 2004b). This distinction, which also characterizes the shame expression (Izard, 1971; Keltner, 1995; Tracy, Cheng, Robins, & Trzesniewski, 2009; Tracy, Robins, & Schriber, 2009), may be indicative of the unique early evolutionary origins of these two self-conscious emotion expressions; they may be homologous with nonhuman dominance and submission displays, which involve similar bodily and head movements and less facial behavior (see Tracy & Randles, 2011). Although pride can be recognized at fairly high rates of accuracy from the face and head alone, accurate recognition still requires the presence of an upwards head tilt (e.g., Cordaro et al., n.d.)—a behavior that commonly co-occurs with bodily expansiveness (Witkower, Tracy, Cheng, & Henrich, 2020).

In related research, studies of vocal displays of emotion have sought to identify a distinct pride vocal expression, but have produced somewhat mixed results. One set of studies failed to find a recognizable vocal burst associated with pride (Simon-Thomas, Keltner, Sauter, Sinicropi-Yao, & Abramson, 2009), and another found recognition rates for nonlinguistic vocalizations of pride to be only slightly above chance in several cultures (Laukka et al., 2013). However, several studies have found that certain vocal bursts are reliably identified as conveying “achievement,” and recognition rates for these displays tend to be as high as those for vocal bursts intended to convey other emotions, including fear, contentment, relief, and pleasure (Lima, Alves, Scott, & Castro, 2014; Lima, Castro, & Scott, 2013; Sauter & Scott, 2007).

## 1.2 The psychological structure of pride

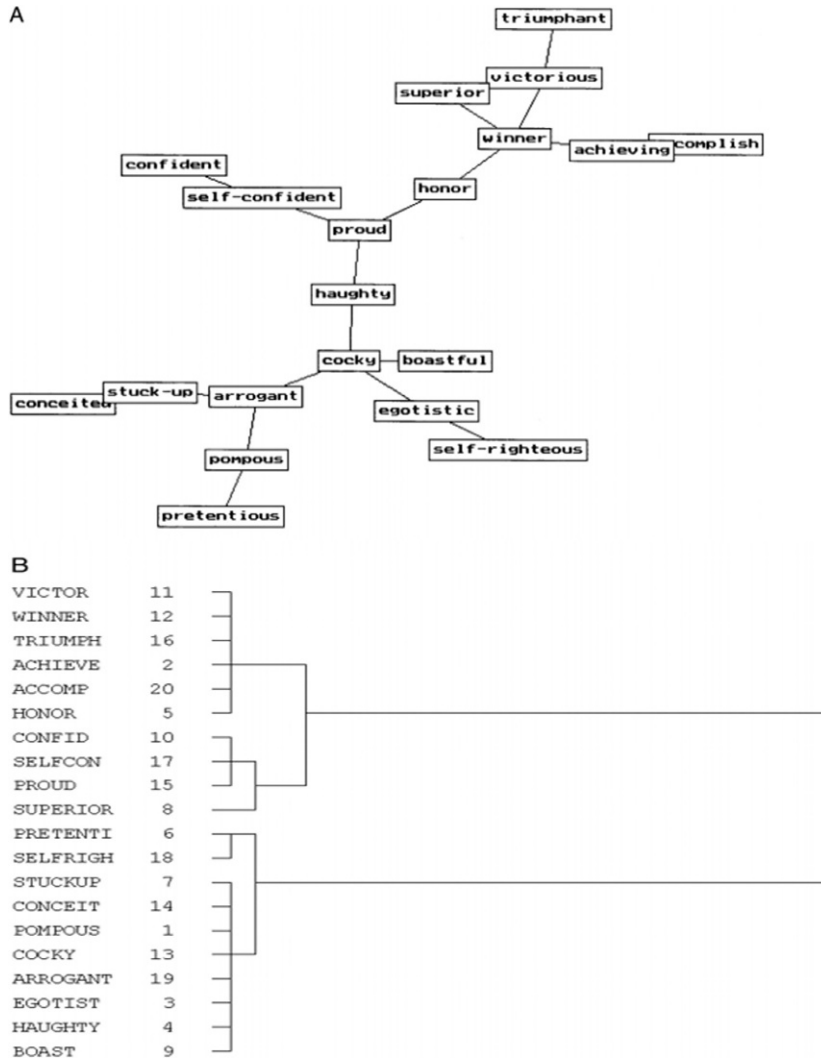
For over a millennium, scholars have noted that pride is unusual both in the way that it is experienced and the way it is conceptualized: it appears to be *not just one thing*. While most contemporary psychological scientists have considered pride to be a positive and socially useful emotion that underlies self-esteem and achievement motivation, religious scholars and philosophers—ranging from Aristotle and Lao Tzu to Thomas Aquinas and the Dalai Lama—have long cautioned against pride’s dark or “sinful”



side (see Tracy, 2016; Tracy et al., 2010). Partly on the basis of these accounts, researchers have postulated distinct “authentic” and “hubristic” components of the emotion (Lewis, 2000; Tangney, Wagner, & Gramzow, 1989; Tracy & Robins, 2004a, 2007c), and several lines of research support this account.

First, when asked to think about and list words relevant to pride, research participants consistently generate two very different categories of concepts, which empirically form two separate clusters of semantic meaning, based on similarity ratings; see Fig. 2. The first cluster (labeled “authentic pride”) includes words such as “accomplished” and “confident,” and fits with a prosocial, achievement-oriented conceptualization of pride. The second cluster (labeled “hubristic pride”) includes words such as “arrogant” and “conceited,” and fits with a more self-aggrandizing, egotistical conceptualization (Tracy & Robins, 2007c). A very similar two-cluster pattern also emerged in a study examining semantic conceptualizations of pride in Mainland China, among university students who generated pride words indigenously in Chinese (Shi et al., 2015). This cross-cultural replication suggests that the tendency to make conceptual distinctions between authentic and hubristic pride is unlikely to be an artifact of Western culture, but rather may reflect pride’s universal structure.

The second piece of evidence supporting the dual-faceted structure of pride comes from studies asking participants to rate their subjective feelings during an actual pride experience, or the feelings that describe their general dispositional tendency to feel pride (i.e., trait pride). Factor analyses of these ratings consistently reveal two relatively independent factors, which closely parallel the two semantic clusters. Subsequent analyses demonstrated that the two pride factors are not artifacts of a tendency to group together positive versus negative, activated versus deactivated, or trait versus state words (Tracy & Robins, 2007c). These factor analytic findings also have been replicated in Mainland China and South Korea, using both indigenously derived pride-related words (in Chinese and Korean) and translated versions of the English words found to represent authentic and hubristic pride in the U.S. (Shi et al., 2015). Chinese and Korean cultures tend to emphasize collectivistic, interdependent self-construals, and to downplay self-enhancing emotions in favor of those that are more self-derogating (Heine, Lehman, Markus, & Kitayama, 1999; Markus & Kitayama, 1991), so one might expect conceptualizations or experiences of pride among these individuals to vary somewhat from those found in Western cultural contexts. The finding that Chinese and Korean individuals in fact



**Fig. 2** (A) Visual map of links among pride-related constructs produced by pathfinder analysis. (B) Dendrogram of hierarchical structure of the same pride-related constructs, produced by cluster analysis.

experience and conceive of the same two pride facets as Americans do therefore provides support for the universality of both facets.

What is the difference between these two facets of pride? The factor analytic findings mentioned above led to the development of brief 7-item self-report scales that can be used to reliably measure each facet

(see Tracy & Robins, 2007c). Studies using these scales to examine the facets' personality correlates have demonstrated that they diverge in numerous ways (see Table 1 for a full list of empirical findings on the differences between the two facets). At both the trait and state level, authentic pride is positively related to the socially desirable and generally adaptive Big Five traits of Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness to Experience, whereas hubristic pride is consistently negatively related to the two pro-social traits of Agreeableness and Conscientiousness (Tracy & Robins, 2007a). These distinct personality profiles have also been replicated in a Chinese sample (Shi et al., 2015). People high in authentic pride also tend to have high explicit and implicit self-esteem, whereas those high in hubristic pride tend to have low implicit and explicit self-esteem, yet be high in narcissism and shame-proneness (Tracy, Cheng, et al., 2009), consistent with a theoretical distinction between the two prides as correspondent to the distinction between genuine self-esteem and narcissism (Tracy, Cheng, Martens, & Robins, 2011).

The facets also differ in their associations with a range of social behaviors and mental health outcomes; essentially, each facet of pride seems to underlie a different way of engaging with the social world and approaching one's goals, and, perhaps as a result, is linked to divergent mental health outcomes. Individuals high in dispositional authentic pride tend to be low in depression, trait anxiety, social phobia, aggression, hostility, and rejection sensitivity; and high in life satisfaction, relationship satisfaction, dyadic adjustment, and social support; and they report being securely attached to their relationship partners. In addition, lab experiments manipulating authentic pride—typically by asking participants to recall a time when they felt the emotion—have found that such experiences increase prosocial and empathic behaviors toward others, as well as delay of gratification (Ashton-James & Tracy, 2012; Ho, Tong, & Jia, 2016). In contrast, individuals high in dispositional hubristic pride are more likely to experience chronic anxiety; engage in aggression, hostility, and a range of other antisocial misbehaviors (e.g., drug use, petty crimes); and report lower dyadic adjustment and social support (Orth, Robins, & Soto, 2010; Tracy, Cheng, et al., 2009; Tracy, Robins, & Schriber, 2009). Lab experiments manipulating hubristic pride, also using a relived emotion task, found that these experiences led to anti-social and prejudiced behaviors against outgroup members and a weakened delay of gratification (Ashton-James & Tracy, 2012; Ho et al., 2016).

**Table 1** Correlations of authentic and hubristic pride with theoretically related traits and behaviors.

<b>Domain</b>	<b>Authentic pride</b>	<b>Hubristic pride</b>
<i>Self-evaluation</i>		
Explicit self-esteem <sup>f</sup>	0.50*	-0.14*
Implicit self-attractiveness <sup>g</sup>	0.26*	-0.10
Self-efficacy <sup>e</sup>	0.62***	-0.06
Narcissism <sup>f</sup>	0.32*	0.22*
Shame-proneness <sup>f</sup>	-0.28*	0.09*
<i>Big five personality factors</i>		
Extraversion <sup>f</sup>	0.39*	0.11
Agreeableness <sup>f</sup>	0.19*	-0.26*
Conscientiousness <sup>f</sup>	0.38*	-0.25*
Emotional stability <sup>f</sup>	0.28*	-0.05
Openness <sup>f</sup>	0.29*	0.01
<i>Attributions for success</i>		
Effort attributions <sup>f</sup>	0.17*	-0.10*
Ability attributions <sup>f</sup>	0.02	0.09*
<i>Interpersonal emotions and functioning</i>		
Authenticity <sup>g</sup>	0.46*	-0.11*
Envy <sup>e</sup>	0.05	0.27***
Fear of negative evaluation <sup>e</sup>	-0.33***	0.17***
Petty crimes and misbehaviors <sup>g</sup>	-0.05	0.20*
Aggression <sup>g</sup>	-0.20*	0.26*
Dyadic adjustment <sup>g</sup>	0.24*	-0.11*
Prejudice <sup>a</sup>	-0.12***	0.29***
Peer-rated dominance <sup>c</sup>	0.01	0.36**
Peer-rated prestige <sup>c</sup>	0.33*	-0.01
<i>Goal pursuit</i>		
Reward sensitivity <sup>b</sup>	0.27***	0.21***

**Table 1** Correlations of authentic and hubristic pride with theoretically related traits and behaviors.—cont'd

Domain	Authentic pride	Hubristic pride
Punishment sensitivity <sup>b</sup>	−0.15***	−0.14***
Self-control <sup>b</sup>	0.31***	−0.24***
Perseverance <sup>b</sup>	0.41***	−0.18***
Intrinsic motivation <sup>d</sup>	0.37**	−0.11*
Extrinsic motivation <sup>d</sup>	0.05	0.10*

<sup>a</sup>Ashton-James and Tracy (2012).<sup>b</sup>Carver, Sinclair, and Johnson (2010).<sup>c</sup>Cheng, Tracy, and Henrich (2010).<sup>d</sup>Damian and Robins (2013).<sup>e</sup>Dickins and Robins (n.d.).<sup>f</sup>Tracy and Robins (2007c).<sup>g</sup>Tracy, Cheng, et al. (2009); Tracy, Robins, and Schriber (2009).

Note. \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ . References for each effect are indicated with superscripts, as follows:

Given these divergent personality profiles, it is not surprising that the pride facets are located in different quadrants of the Interpersonal Circumplex (i.e., the independent dimensions of agency and communion; [Kiesler, 1983](#)). Although agency is positively linked to both facets, individuals high in communion are prone to authentic pride only; hubristic pride shows a negative relationship with communal traits ([Cheng et al., 2010](#)). This distinction plays out in goal striving as well; both facets are positively related to an approach orientation, evidenced by high scores on measures of the Behavioral Activation System and low scores on the Behavioral Inhibition System ([Carver et al., 2010](#)). However, individuals high in dispositional authentic pride seem to vigorously engage in their major life goals and are able to put failures in perspective, whereas those high in dispositional hubristic pride tend to set unrealistically high goals for fame and success, and interpret any positive event as indicative of their own greatness ([Carver et al., 2010](#)).

Consistent with these distinct approaches to interpreting one's achievements, several studies suggest that the two pride facets are elicited by distinct cognitive appraisals. Pride occurs when individuals appraise a positive event as relevant to their identity and their goals for their identity, and as internally caused (i.e., due to the self; [Ellsworth & Smith, 1988](#); [Roseman, 1991](#); [Tracy & Robins, 2004a](#); [Weiner, 1985](#)); the finding that

success elicits self-reported pride experiences has been replicated across American and Japanese samples (Imada & Ellsworth, 2011; Tracy & Robins, 2007c). Yet studies suggest that authentic and hubristic pride are further distinguished by subsequent attributions; authentic pride may result from attributions to internal but unstable, specific, and controllable causes, such as effort (e.g., “I won because I practiced”), whereas hubristic pride is more likely to occur from attributions to internal but stable, global, and uncontrollable causes, such as ability (e.g., “I won because I’m great”; Tracy & Robins, 2007c). Studies in China produced findings that largely replicate these patterns. Based on content coding of Chinese participants’ pride descriptions, those who experienced hubristic pride tended to attribute their successes to internal and stable abilities, but *not* to unstable behaviors. This distinction may be one reason why children benefit more from being told, after a success, that they “must have worked hard” than that they “are smart” (Mueller & Dweck, 1998); the former is likely to elicit authentic pride and the latter hubristic pride, and other studies have demonstrated that authentic pride is the stronger predictor of future achievements (Weidman et al., 2016). Nonetheless, although the effort/ability attribution distinction may be a key factor in determining whether an individual experiences authentic or hubristic pride in response to a given success, other factors such as personality and social comparisons are likely to play a role as well, and future research is needed to further address this issue—to disentangle the precise cognitive, emotional, and dispositional processes that determine which facet of pride a given individual will experience in response to the same success event.

In this vein, one set of studies examining judgments of pride displayed by others found that although perceptions of a proud target’s attributions influenced whether the target was judged as feeling authentic versus hubristic pride, perceptions of the target’s arrogance were also relevant (Tracy & Prehn, 2012). Arrogance was inferred both from the kinds of attributions targets made (i.e., attributions to ability were perceived as more arrogant than attributions to effort) and from the way in which the targets made them (i.e., whether he or she was perceived to be bragging). This finding suggests that, at least in determining which facet of pride *others* are experiencing, perceived arrogance (versus modesty) may be as important as presumed cognitive appraisal elicitors.

In more recent work, we found that the two facets of pride show divergent relations with another of Dante’s “deadly sins”: greed. Individuals high in dispositional greed were found to experience elevated levels of both

authentic and hubristic pride in response to new acquisitions but, very shortly after making these purchases, their feelings of authentic pride faded (Mercadante & Tracy, n.d.-a). This pattern emerged across several studies, including longitudinal research using a weekly diary approach to assess participants' feelings about new acquisitions at the time they were purchased then track these feelings over subsequent weeks. The sharp rise and subsequent decline in pride observed among greedy individuals following acquisitions was unique to authentic pride, and held controlling for shared variance with generalized positive affect. Although one might expect the more anti-social, hubristic pride to be the facet underlying the constant acquisitiveness seen among those high in greed, these results suggest that greedy individuals may use acquisitions as a way of regulating their self-esteem. In fact, this pattern was particularly pronounced among greedy individuals with low self-esteem, suggesting that these individuals may be dependent on the bursts of authentic pride new acquisitions bring. Further supporting this notion, another study demonstrated that when individuals were experimentally manipulated to feel low authentic pride, those high in greed and low in self-esteem reported greater interest in making acquisitions (Mercadante & Tracy, n.d.-a)

For all of these studies, it is important to note that because authentic pride is strongly positively correlated with self-esteem and positive affect, and hubristic pride is strongly positively correlated with narcissism, some of the reported relationships with external correlates are likely due at least in part to shared variance with these broader dispositions. However, for many of these effects, partialling out variance due to generalized positive affect or self-esteem would, for authentic pride at least, be akin to “throwing the baby out with the bathwater”; what authentic pride is, in large part, is a positively valenced emotion that contributes importantly to feelings of self-worth. That said, for studies that manipulate pride, we view it as essential to include a positive emotion control condition (rather than simply comparing pride to a neutral state) or control for shared variance with positive affect; only by doing so can conclusions be drawn regarding any distinctive effects of pride.

### 1.3 The development and neuroscience of pride

A number of studies have assessed the display, recognition, and understanding of pride in children, resulting in an emerging portrait of the emotion's early developmental trajectory. Like other self-conscious emotions, pride

is first experienced later in the course of development than more basic emotions like fear and joy (which emerge in infancy): around 3 years of age (e.g., Campos, Barrett, Lamb, Goldsmith, & Stenberg, 1983; Garcia, Janis, & Flom, 2015; Lewis et al., 1992; Stipek et al., 1992). This conclusion is based on studies that present young children with a challenging task and compare their behavioral and verbal responses after successful completion versus failure, or after successful completion under easy versus difficult conditions. Behavioral components of the pride expression and verbal indicators of pride tend to be displayed by children who have reached 2.5–3 years, but not by younger children, and not in shame-inducing (i.e., failure) situations or when success is easy.

The capacity to understand pride emerges somewhat later than its (assumed) experience; children are unable to accurately label their own feelings of pride after a success until about age 5 (Garcia et al., 2015). The earliest-emerging form of understanding is the ability to recognize the pride nonverbal expression, which first appears around age 4 (Tracy, Robins, & Lagattuta, 2005)—the same age at which children begin to show accurate recognition of most other emotion expressions. In contrast, the ability to understand the situations and contexts in which pride is elicited seems to develop considerably later. Several studies found that 7-year-olds have difficulty understanding that pride should be attributed to individuals whose success is due to internal (e.g., effort/ability) but not external (e.g., luck) factors (e.g., Graham & Weiner, 1986; Harris, Olthof, Terwogt, & Hardman, 1987). However, by age 9 or 10, children can make the appropriate attributional distinctions, and grant pride only to individuals who are the cause of their own success (Kornilaki & Chloverakis, 2004).

This developmental trajectory is consistent with the assumption that certain cognitive capacities are pre-requisites for the experience of self-conscious emotions: self-awareness, stable self-representations, comparisons between one's own behavior and external standards, and internal attributions (Lagattuta & Thompson, 2007; Lewis, 2000; Tracy & Robins, 2004a). By the age of 3, children demonstrate early-emerging components of self-awareness (i.e., mirror self-recognition, self-referencing, imitation; Hart & Karmel, 1996) and begin to display pride behavioral responses to success, but cannot yet identify pride in others. The development of a full understanding of the situations and attributions that elicit pride and distinguish it from happiness seems to coincide with the achievement of a global sense of self and self-esteem (Harter, 1983).

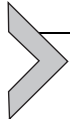


One study used a cross-sectional approach to delineate a portrait of normative developmental shifts in experiences of authentic and hubristic pride across the lifespan (Orth et al., 2010). Authentic pride increased fairly continuously from adolescence to old age, in a trend that paralleled overall well-being. In contrast, hubristic pride peaked in adolescence and young adulthood, declined throughout adulthood until about age 65, and was stable in old age. These findings suggest that pride follows the maturity principle of personality development (e.g., Roberts, Wood, & Caspi, 2008), wherein maturing social roles are thought to facilitate the experience and expression of socially and intrapsychically adaptive emotions and traits.

Turning to neuroscience, research on pride remains fairly limited, but several studies have begun to examine the brain structures that may be involved in pride experiences. In general, these experiences are associated with activation of reward centers in the striatum (Müller-Pinzler et al., 2015; Zahn et al., 2009). One fMRI study also found greater activation in the posterior superior temporal sulcus and left temporal lobe—two brain regions thought to be involved in theory of mind—when participants imagined themselves in pride-eliciting scenarios, compared to neutral scenarios (Takahashi et al., 2008). Although theory of mind may be an important cognitive pre-requisite for pride (self-evaluations require the understanding that others can evaluate the self), these researchers had expected to find greater medial prefrontal cortex (mPFC) activation, given previous findings of mPFC activity during negative self-conscious emotional experiences, as well as research linking the mPFC to self-referential thought (e.g., Fossati et al., 2003; Kircher et al., 2002; Yahata, Koeda, Matsuda, Asai, & Okubo, 2004). However, a separate study comparing brain activation after a pride versus compassion induction found that pride experiences were associated with activation of the posterior medial cortex, another region linked with self-referential thinking. In contrast, compassion activated the midbrain periaqueductal gray (PAG), a region associated with parental nurturing behaviors. Nevertheless, these researchers had expected yet failed to find activation of the mPFC in conjunction with pride experiences. One possible explanation for these unexpected results, as well as those from Takahashi et al. (2008), is that in both studies participants engaged in self-relevant processing, via imagining oneself in different situations or self-reporting psychological experiences, in all conditions.

Other studies have examined the physiological correlates of pride, and have identified an apparently distinct pattern of cardiac activity. Positive feedback on a lab task (assumed to induce pride) led to moderate increases

in skin conductance and heart rate and shifts in heart rate variability, indicative of the sympathetic nervous system preparing for controlled action (Fourie et al., 2011). However, another study comparing cardiac arousal levels following pride, anger, and shame inductions found lower arousal for pride compared to the negative emotions (Herrald & Tomaka, 2002). Together, these findings suggest that pride promotes moderate, rather than large, physiological changes, which may help prepare the body for action.



## 2. The evolution of pride and social hierarchy

We now turn to Tinbergen's fourth and fifth levels of analysis, the ultimate function of the trait and how it evolved in the species. Although these are two distinct considerations—the first addressing what purpose the trait likely served in our ancient human ancestors and the second why genes for the trait might have been selected and retained over the course of human evolutionary history (Caporael, 2001)—in practice it is difficult to consider them entirely separately. We therefore discuss here both the function that pride likely served in humans' environment of evolutionary adaptiveness (Cosmides & Tooby, 2000) as well as the factors that might have selected for genes encoding for a pride-like emotion and evidence that those genes have been retained. While this kind of theorizing necessarily requires some speculation, Conway and Schaller (2002) noted that such evolutionary arguments are strengthened to the extent that they directly consider the ways in which a particular environmental pressure might have led to the selection of genes that promote psychological processes which facilitate maximally adaptive responses to that pressure. Specificity regarding both the original selection pressure and the retained psychological process, as well as logical coherence between the psychological process and an adaptive solution to the environmental pressure, is important for increasing the robustness of such theories. With these structural features in mind, we propose that pride evolved to serve the distal function of enhancing social rank—an outcome with clear adaptive benefits.

### 2.1 From pride to social rank: Experiential, motivational, and informational effects

Pride facilitates the attainment of higher rank through several distinct paths (see also Tracy et al., 2010). First, the pride experience motivates individuals to strive for achievements in socially valued domains. Pride feelings are

pleasurable and thus reinforcing; there is no other emotion that not only makes individuals feel good, but makes them feel good about themselves. Through socialization, children come to experience pride in response to praise for socially valued achievements, first by their parents and later by teachers and peers. Eventually, individuals experience pride in response to these accomplishments even without others' evaluations (although positive feedback from others can enhance a pride experience, by making the social value of a given achievement more salient). The reinforcing properties of pride then motivate individuals to seek future achievements; so, without any need for external evaluations or rewards, individuals strive to develop an identity that coheres with social norms. Individuals who are successful in this pursuit are, in turn, rewarded with social approval, acceptance, and increased social status, all of which promote adaptive fitness.

Supporting this account, studies have found that high levels of generalized pride (i.e., not specifically assessed as authentic or hubristic) cause individuals to demonstrate increased effort and persistence at challenging activities (Sigall & Gould, 1977), and the effects of pride on increased effort cannot be explained by general positive mood (Williams & DeSteno, 2008). Similarly, pride experienced after successfully exercising self-control by avoiding temptation predicts viewing self-control goals as more important, and resisting future temptations (Hofmann & Fisher, 2012). Pride also promotes prosocial behaviors toward others. In social dilemmas, individuals who were asked to think about pride-eliciting events reported that cooperation was more important, and in fact cooperated more, compared to those thinking about enjoyment-eliciting events (Dorfman, Eyal, & Bereby-Meyer, 2014). Moreover, when people anticipate feeling proud after making fair decisions about resource allocation in an economic decision-making game, they become more likely to make fair decisions when subsequently interacting with an anonymous stranger (van der Schalk, Bruder, & Manstead, 2012). Pride thus seems to motivate a range of behaviors important for becoming a valued group member who abides by social norms and is successful at his or her most important pursuits: self-regulation, hard work and persistence, cooperation, and an orientation toward fairness and generosity.

In addition to *motivating* socially valued achievements and behaviors, pride also promotes high rank through its intrapsychic *informational* properties. According to the “affect as information” hypothesis (Schwarz & Clore, 1983), emotional feelings function, in part, to inform individuals of changes in their environment, and thereby allow them to respond

knowingly and flexibly to significant events. Building on this account, pride may inform individuals that they merit increased status and group acceptance, thus allowing them to respond accordingly. In fact, given that trait pride (along with shame) is the emotional disposition most strongly related to self-esteem (Brown & Marshall, 2001), pride may serve this informational function in part through its influence on self-esteem. Researchers have suggested that self-esteem functions as a social barometer, or “sociometer,” informing individuals of their social status and thereby ensuring that they behave in ways that maintain their status and others’ acceptance, and avoid rejection (Leary, Tambor, Terdal, & Downs, 1995). Pride may be the affective mechanism that leads to increases in self-esteem, which feed into the sociometer.

## 2.2 Evolutionary history

In our account, the human genes for pride may have been selected for because the traits that facilitate rank acquisition, including experiencing and displaying pride, can have positive fitness consequences. Indeed, hierarchical differences among individuals is a universal feature of social groups (Brown, 1991; Mazur, 1985). In all human societies, hierarchical differences influence patterns of conflict, resource allocation, and mating, and often facilitate coordination on group tasks (Berger, Rosenholtz, & Zelditch, 1980; de Kwaadsteniet & van Dijk, 2010; Ronay, Greenaway, Anicich, & Galinsky, 2012). Even the most egalitarian of foragers reveal such rank differences, despite the frequent presence of social norms that partially suppress them (Boehm, 1993; see Henrich & Gil-White, 2001). High-ranking individuals tend to have disproportionate influence within a group, such that social rank can be defined as the degree of influence one possesses over resource allocation, conflicts, and group decisions (Berger et al., 1980). In contrast, low-ranking individuals must give up these benefits, deferring to higher ranking group members. As a result, higher social rank tends to promote greater fitness than low rank (e.g., Barkow, 1975; Hill & Hurtado, 1989; von Rueden et al., 2011), making it adaptive for humans (and other social species) to strive to attain high rank (Anderson, Hildreth, & Howland, 2015), and therefore increasing the likelihood that genes encoding for rank-attaining processes would be selected.

Furthermore, despite the disproportionate benefits that hierarchy bestows upon high ranking individuals, mutually accepted hierarchical relationships in fact benefit all group members, by minimizing costly

agonistic conflicts, establishing order, and facilitating coordination and cooperation among individuals (Berger et al., 1980). Indeed, a substantial body of evidence indicates that stable social hierarchies, in which subordinates defer to rather than dispute or contest their high-ranking counterparts, generally result in better group coordination and performance and more satisfying relationships (e.g., de Kwaadsteniet & van Dijk, 2010; Halevy, Chou, & Galinsky, 2011; Ronay et al., 2012; see also Anderson & Willer, 2014).

How do humans attain high rank in their societies? A growing body of research has emerged to suggest that humans reliably use two different suites of behaviors to attain rank, and these are underpinned by distinct psychological systems, each of which evolved to sub-serve a different selection pressure. This two-strategy account of social rank was initially proposed by Henrich and Gil-White (2001), who offered an evolutionary model to explain why humans across societies appear to effectively earn status through two highly divergent means, which these authors referred as *dominance* and *prestige* (see also Cheng & Tracy, 2014; Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013; Cheng et al., 2010).

Dominance refers to the use of intimidation and coercion to attain a form of status that is based largely on the effective induction of fear. In the dominance hierarchies that characterize many nonhuman species, social rank is determined on the basis of agonistic encounters (Trivers, 1985). In humans, dominance is thought to have evolved from this history of agonistic rank competitions but differs in that it is not limited to physical conflict, and instead can be wielded by aggressively controlling costs and benefits in many domains, and is therefore typically seen in individuals who control access to resources, mates, and well-being. Dominant individuals create fear in subordinates by taking or threatening to withhold resources. In turn, subordinates submit by complying with demands or providing material or social resources to safeguard other more valuable resources, such as their physical welfare, children, or livelihoods. Consequently, dominance begets substantial social influence, rooted in coercive compliance. By regulating patterns of domination–deference, dominance hierarchies facilitate coordination and minimize the frequency of agonistic encounters and associated costs, and, as a result, enhance the fitness of all parties involved (Cheng & Tracy, 2014).

Prestige, in contrast, refers to status granted to individuals who are recognized and respected for their skills, success or knowledge. According to Henrich and Gil-White (2001), prestige arose uniquely in humans'

evolutionary history when our species acquired the ability to obtain cultural information from other group members, because natural selection favored genes that promoted selectively attending to and learning from the most knowledgeable or skilled others. As a result, subordinate group members would be motivated to provide deference (e.g., mates, food, coalitional support) to prestigious individuals, who in turn permit followers access to copying their skills, strategies, and know-how. Consistent with this expectation, anthropological evidence from small-scale societies indicates that prestigious individuals are typically preferred as collaborative partners and mates (von Rueden & Jaeggi, 2016; von Rueden, Redhead, O’Gorman, Kaplan, & Gurven, 2019). This increased ability to access and acquire knowledge from highly skilled or successful others would favor the development of a psychological machinery capable of differentiating and ranking individuals along the dimension of skill (and, thus, prestige), such that the highest quality cultural models with the greatest expertise are elevated to the top of the hierarchy. Prestige-based rank is thus thought to be unique to humans because it relies on cultural learning, a capacity that is considered much less developed in other animals (Boyd & Richerson, 1985; Laland & Galef, 2009).

In humans, dominance and prestige can be thought of as coexisting avenues to attaining rank and influence, despite being underpinned by distinct motivations and behavioral patterns, and resulting in distinct patterns of imitation and deference from subordinates. By using prestige strategies, individuals possessing high-quality information or skills can be elevated to the top of the hierarchy. Meanwhile, other individuals may reach the highest ranks of their group’s hierarchy by being manipulative and wielding threat of force, regardless of the quality of their knowledge or skills. Nonetheless, although both dominance and prestige are, in theory, viable strategies for acquiring high status, the effectiveness of each is likely to vary depending on individual attributes (e.g., physical size, wealth, skills, intelligence) and the situation in which it is used. Dominance-oriented behaviors (e.g., aggression, manipulateness) can impose greater costs than benefits when individuals lack the capacity to intimidate others or enforce threats, or in social groups with norms or social structures that suppress coercive influence. Prestige, too, can be futile, if individuals are not perceived as possessors of valued cultural information, or in social groups structured largely around dominance hierarchies.

### 2.3 The psychology of dominance versus prestige

Given their theoretically divergent underpinnings, one clear prediction that emerges from this evolutionary account is that we should expect to see different psychological signatures—emotions, cognitions, and behaviors—manifested in those who wield a dominance versus a prestige strategy. In fact, extant research provides strong support for this expectation. Individuals who regularly use a dominance strategy tend to be aggressive, narcissistic, and Machiavellian, whereas those who use a prestige strategy tend to be socially accepted, agreeable, and conscientious, and have high self-esteem (Buttermore, 2006; Cheng et al., 2010; Johnson, Burk, & Kirkpatrick, 2007). These findings emerge from studies assessing dominance and prestige using both self- and peer ratings (see Tables 2 and 3).

This pattern of associations and our theoretical account of dominance suggest that direct or indirect displays of physical, psychological, or verbal aggression are the primary routes through which dominant individuals

**Table 2** Correlations of dominance and prestige with theoretically related traits and attributes, found by Cheng et al. (2010).

	Self-rated dominance	Self-rated prestige
Genuine self-esteem <sup>a</sup>	−0.16*	0.45**
Narcissistic self-aggrandizement <sup>b</sup>	0.56**	0.15*
Social acceptance	−0.16*	0.59**
Aggression	0.55**	−0.38**
Extraversion	0.20**	0.59**
Agreeableness	−0.61*	0.27**
Conscientiousness	0.15*	0.39**
Neuroticism	0.13†	−0.39**
Openness	0.08	0.43**
GPA	0.08	0.24**

<sup>a</sup>Self-esteem controlling for narcissism, created by regressing self-esteem on narcissism and saving the standardized residuals.

<sup>b</sup>Narcissism controlling for self-esteem, created by regressing narcissism on self-esteem and saving the standardized residuals.

*N* = 191.

†*P* < 0.10. \**P* < 0.05. \*\**P* < 0.01.

**Table 3** Correlations of peer-rated dominance and prestige with theoretically related traits, attributes, and abilities, found by Cheng et al. (2010).

	Peer-rated dominance	Peer-rated prestige
<i>Self-rated traits and attributes</i>		
Genuine self-esteem <sup>a</sup>	−0.03	0.24*
Narcissistic self-aggrandizement <sup>b</sup>	0.22*	0.17
Social acceptance	0.08	0.29**
Aggression	0.35**	0.03
Extraversion	0.29**	0.12
Agreeableness	−0.39**	0.15
Conscientiousness	−0.13	0.23*
Neuroticism	−0.02	−0.15
Openness	0.13	0.10
Agency	0.46**	0.39**
Communion	−0.12	0.05
GPA	−0.15	0.19†
<i>Peer-rated abilities</i>		
Advice-giving	0.12	0.56**
Intellectual	−0.06	0.37**
Athletic	0.29**	0.57**
Social skills	0.19†	0.71**
Altruism	−0.36**	0.36**
Cooperativeness	−0.54**	0.33**
Helpfulness	−0.38**	0.39**
Morality	−0.32**	0.31**
Leadership	0.40**	0.73**

<sup>a</sup>Self-esteem controlling for narcissism, created by regressing self-esteem on narcissism and saving the standardized residuals.

<sup>b</sup>Narcissism controlling for self-esteem, created by regressing narcissism on self-esteem and saving the standardized residuals.

*N* = 91.

†*P* < 0.10. \**P* < 0.05. \*\**P* < 0.01.



attain influence. Indeed, a large body of research suggests that acts of aggression, coercion, threats, derogation, debasement, and manipulation are frequently reported and effective ways of “getting ahead” and influencing others (Buss, Gomes, Higgins, & Lauterbach, 1987; Howard, Blumstein, & Schwartz, 1986; Kyl-Heku & Buss, 1996). Those who behave in a bullying, rude, demeaning, and antisocial manner in both experimental contexts (e.g., Van Kleef, Homan, Finkenauer, Gündemir, & Stamkou, 2011) and real-world relationships tend to be the more highly ranked and influential members of the relationship (Keltner, Young, Heerey, Oemig, & Monarch, 1998; Kipnis, Castell, Gergen, & Mauch, 1976). Developmental studies have demonstrated that aggressive behaviors are effective in boosting influence in child and adolescent social groups. Preschoolers who display coercive and aggressive behaviors are more effective at acquiring control over a valued resource (Hawley, 2003). These children are also the recipients of greater eye gaze and visual attention from other children—a conceptual indicator of social rank (La Freniere & Charlesworth, 1983). Furthermore, not only are adolescents who are most desirous of high rank more aggressive, but the display of aggression among adolescents tracks the availability of rank-improvement opportunities (Faris & Ennett, 2012).

Prestigious individuals, in contrast, tend to demonstrate locally valued competencies and skills, such as academic achievement, altruistic behaviors, and athletic, social, intellectual, and advice-giving abilities (in the context of collegiate varsity teams; Cheng et al., 2010); and hunting ability, skill in food production, generosity, number of allies, and nutritional status (in the context of a small-scale Amazonian society; Reyes-Garcia et al., 2009; von Rueden et al., 2011). A large body of research from across the social sciences has documented links between perceived competence in locally valued domains and rank attainment. Technical and task-relevant skills and expertise are among the most frequently nominated qualities important to leadership (Stogdill, 1974), and their possessors generally emerge as most influential members of task-focused groups (e.g., Anderson & Kilduff, 2009a; Littlepage, Schmidt, Whisler, & Frost, 1995). Moreover, meta-analyses reveal that intelligence—a trait that presumably gives rise to diverse skills and abilities emphasized in modern societies—consistently predicts leadership emergence (Lord, De Vader, & Alliger, 1986). In addition, the ethnographic record supplies numerous examples of an association between expertise and rank; hunting skill seems to be a primary means to both respect and societal influence in many foraging, horticultural, and

pastoral societies (e.g., [Gurven & von Rueden, 2006](#); [Wiessner, 1996](#)). Expertise in other valued domains—such as ethnomedicinal knowledge, storytelling, healing or supernatural knowledge, combat, farming, and herding skills—are also associated with respect and influence in small-scale societies (see [von Rueden, 2014](#)).

Further supporting the dominance–prestige evolutionary account, by suggesting that genes for both strategies have been retained in the species because they continue to serve their original function, the use of both strategies has been found to independently and simultaneously advance a person’s rank in contemporary social groups. Using a multimethod approach to study hierarchy formation in small collaborative groups, we found that individuals high in dominance and those high in prestige (based on peer ratings) attained greater influence, and received greater deference, during a group task. More specifically, both peer-rated dominance and peer-rated prestige were positively associated with social influence as judged by other group members and outside observers who watched videos of the group interactions. In addition, both dominant and prestigious group members demonstrated actual behavioral influence, in the form of shaping the group’s decisions on the task. Furthermore, when outside observers watched video clips of the group interactions while wearing an eye-tracker device, they tended to focus their gaze most on highly dominant and highly prestigious group members, suggesting that both forms of high rank result in greater visual attention; this finding held controlling for speaking time and seating position (i.e., whether dominant/prestigious group members tended to sit in the center position). Importantly, for all these associations there was no significant difference between dominance and prestige; both strategies appeared to be equally viable routes to social influence, at least in this laboratory context. Importantly, these patterns have been replicated in naturalistic field groups and non-WEIRD populations ([Brand & Mesoudi, 2019](#); [Garfield & Hagen, n.d.](#)).

These studies provide strong evidence for the central claim of the dominance–prestige account: both remain effective strategies for attaining social rank even in contemporary human groups, and even when dominant and prestigious individuals directly compete for rank within the same group. Furthermore, the finding that both can coexist within groups as viable rank-promoting strategies suggests that human social hierarchies are multi-dimensional. Indeed, dominance is predictive of influence even after controlling for prestige, suggesting that dominant individuals do not acquire their influence by merely invoking misperceptions of high competence

and ability, or by demonstrating social attractiveness (cf. [Anderson & Kilduff, 2009b](#); [Sadalla, Kenrick, & Vershure, 1987](#)). Instead, dominants attain power by evoking fear; in our group interaction study, group members reported perceiving these individuals as intimidating, and their feelings of fear mediated the effect of perceived dominance on rank attainment ([Cheng & Tracy, 2014](#)). In fact, after statistically controlling for group members' fear of dominant individuals, dominance was no longer a significant predictor of social influence.

## 2.4 Two routes to high rank and the selection of two facets of pride

Given evidence for the evolution of two distinct strategies for attaining high rank, it becomes likely that humans would have evolved to experience two distinct pride emotions, each motivating suites of cognitions and behaviors that increase the likelihood of effectively wielding one strategy or the other. The two-facet account of pride reviewed above fits nicely with this expectation; environmental pressures to attain dominance may have selected for genes that encode a propensity to experience hubristic pride, whereas environmental pressures to attain prestige may have selected for genes that encode a propensity to experience authentic pride.

When individuals experience hubristic pride, they evaluate themselves as better in some way than others, and feel a subjective sense of dominance, superiority, and power ([Tracy & Robins, 2007c](#)). Hubristic pride thus may equip individuals with the mental preparedness to assert their power, and motivate behaviors that promote a reputation of dominance: overt hostility, aggression, and a tendency toward interpersonal conflict ([Tracy, Cheng, et al., 2009](#); [Tracy, Robins, & Schriber, 2009](#)). It is this aggression, or threat of aggression, that allows dominant individuals to retain their power, given that their high status is typically not merited on the basis of actual achievements or expertise. The resulting sense of not quite deserving one's status, at least in a meritocracy, may be a cause of the shame and implicit insecurity associated with hubristic pride ([Tracy, Cheng, et al., 2009](#); [Tracy & Robins, 2007c](#); [Tracy, Robins, & Schriber, 2009](#)).

In contrast, competition for prestige would favor individuals who demonstrate knowledge and a willingness to share it but do not arrogate their authority or lash out at subordinates; aggressive interpersonal behaviors would in some sense "raise the price" subordinates must pay to attain the valued knowledge. In fact, overly aggressive behaviors have been

identified as attributes that can “break a leader” in largely prestige-based hierarchies (Ames & Flynn, 2007). Authentic pride thus may have evolved to facilitate the attainment of prestige by promoting a focus on one’s effort and accomplishments, fostering a sense of humility (Weidman, Cheng, & Tracy, 2018), and inhibiting aggression and hostility (Cheng et al., 2010). The evidence that state and trait authentic pride are associated with pro-social behavior, agreeableness, conscientiousness, and voluntary moral action (Hart & Matsuba, 2007; Tracy, Cheng, et al., 2009; Tracy & Robins, 2007d; Tracy, Robins, & Schriber, 2009; Verbeke, Belschak, & Bagozzi, 2004) are consistent with this account.

It also makes sense that an affective mechanism like pride would be a highly functional means for individuals to determine (unconsciously or consciously) which strategy to use. Although both dominance and prestige are viable strategies for acquiring high rank, the effectiveness of each will vary depending on individual attributes (e.g., physical size, skills) and the situation in which it is used. However, as is the case for many psychological processes, conscious, deliberate analysis about which strategy to pursue in a given situation is likely to be costly, as such mental computations are inefficient, error-prone, and potentially hampered by metacognitive awareness (e.g., doubts about one’s competence at, or the social appropriateness of, performing the fitness-maximizing behavior). An automatic affective mechanism propelling the appropriate response in each context, occurring under the radar of any metacognition, would free up valuable mental resources (Plutchik, 1980). Indeed, affect programs guided by automatic analyses of the relative costs and benefits of potential responses to events are thought to have evolved to promote quick behavioral and cognitive responses to recurrent, evolutionarily significant events (Cosmides & Tooby, 2000). From this perspective, pride may be the automatic affect program that allows individuals to cope most effectively with opportunities for rank attainment, and the two facets of pride may have separately evolved to guide behaviors oriented toward the attainment of dominance or prestige specifically (Cheng et al., 2010; Tracy et al., 2010).

Although the hypothesized effects of each facet of pride on each form of status are predicted to occur through an online, state-level, causal process (i.e., via momentary, state experiences of hubristic and authentic pride), these effects may be more readily apparent at the trait level. Given that prestigious and dominant reputations develop over time from repeated interpersonal interactions, it is unclear that a single state experience of either facet of pride would substantially interact with an individual’s

current dominant or prestigious standing to shape his/her longstanding reputation. Indeed, it is more likely that individuals who, due to stable personality characteristics (e.g., narcissism, self-esteem) or other genetically influenced traits (e.g., physical size, intelligence), are chronically prone to experiencing one facet or the other tend to repeatedly experience the suite of subjective feelings, associated cognitions, and motivations toward behavioral patterns that together promote a dominant or prestigious reputation. In other words, while the causal process from pride to status theoretically works at a momentary state level (e.g., the momentary experience of hubristic pride promotes the subjective feelings of grandiosity and behaviors of aggression needed to secure a dominant reputation), it is likely that individuals more typically develop a prestigious or dominant relationship with others by repeatedly experiencing a given pride facet, and thus frequently engaging in the motivated behaviors associated with each form of status.

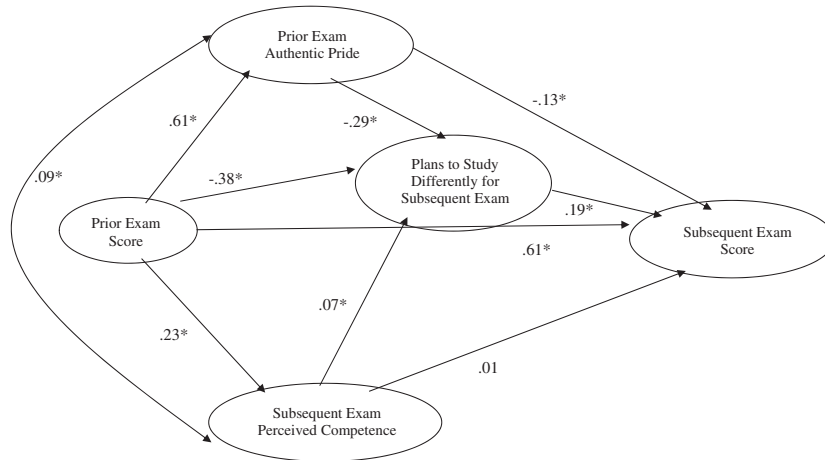
Importantly, the causal dynamics in this model may be bidirectional. Individuals may possess traits such as physical size, narcissism, or aggressiveness that differentially predispose them to activate the suites of behaviors, cognitions, and emotions (including pride) associated with dominance or prestige. Alternatively, differential experiences in using coercion versus succeeding in locally valued activities may differentially activate the dominance or prestige behavioral, cognitive, and affective suites, leading to differences in hubristic and authentic pride, as well as in related personality traits. Such differential state activations may, over the course of development, instill or create trait-like patterns, though it remains plausible that substantial facultative flexibility remains.

Research from our lab provides support for this evolutionary account of the two pride facets (Cheng et al., 2010). First, we found that individuals high in trait levels of authentic pride tend to describe themselves as prestigious, whereas those high in trait hubristic pride are more likely to describe themselves as dominant. Second, this pattern of distinctive associations was replicated in a study examining dispositional pride and social rank among individuals on varsity-level athletic teams. In this study, individuals high in trait authentic pride were viewed as prestigious but not dominant by their teammates, whereas those high in trait hubristic pride were viewed as dominant but not prestigious. That these findings emerged in peer-ratings from teammates points to their ecological validity; varsity teams are real-world groups where status hierarchies play a major role in shaping intragroup behaviors and emotions. Furthermore, the fact that

we can envision the opposite pattern of results emerging, or no relation between peer reports of prestige and dominance and self-reports of each pride facet, points to the falsifiability of the evolutionary theory (Conway & Schaller, 2002).

Other research provides additional support for the role of authentic pride in facilitating the attainment of prestige by motivating socially valued achievements. In one set of studies, long-distance runners who achieved greater training success over the course of a month reported higher levels of authentic pride (in their training) at the end of the month compared to participants who believed they had achieved less success (Weidman et al., 2016). In addition, those who felt less authentic pride regarding their training progress reported stronger intentions to adjust their training habits over the subsequent month, suggesting that training-specific authentic pride allowed runners to gauge the extent to which they were meeting their training goals and following their training plans. These feelings, in turn, influenced runners' subsequent achievement behavior; runners who felt low levels of authentic pride—signaling a lack of training progress—reported stronger intentions to adjust their subsequent training habits, presumably in an effort to increase their likelihood of making progress toward their goal of completing the race.

A similar pattern was uncovered for undergraduate students working to succeed in a psychology class. Students' authentic pride in response to exam performance gauged whether they had performed well on the exam, suggesting that this form of pride serves as an internal signal of success. These feelings also influenced students' plans for subsequent achievement behavior in an adaptive manner, such that those who felt low levels of authentic pride reported stronger intentions to change their study habits for subsequent exams; importantly, this effect could not be attributed to exam score, indicating that authentic pride's impact on achievement goes above and beyond that of simple knowledge of past performance. Finally, authentic pride-driven plans to change study habits predicted improved future exam performance for low-achieving students; those who followed the feedback provided by their authentic pride (i.e., adjusted their studying habits following poor performance) achieved greater success on subsequent exams than did those who did not listen to their pride in this way (Weidman et al., 2016; see Fig. 3). All of these effects were specific to authentic pride, and did not generalize to hubristic pride, suggesting that high levels of this form of pride in particular function to tell individuals they are on track toward achieving their goals, while low levels serve



**Fig. 3** Schematic depiction of the interrelationships between authentic pride, self-efficacy, and exam performance, for low performing students, in Weidman et al. (2016). Note:  $N=1024$ . Parameter estimates are meta-analytically derived, and standardized for ease of interpretation. The figure presents results for students who performed one standard deviation below the mean on a prior exam. An interaction between prior exam score and subsequent exam study plans,  $\beta = -0.08$ ,  $P < 0.001$ , indicated that study plans predicted future exam score more strongly for low-performing ( $\beta = 0.19$ ,  $P < 0.001$ ) than high-performing students ( $\beta = 0.03$ ,  $P = 0.26$ ). \* $P < 0.05$ .

the opposite purpose, telling individuals they must change their behaviors if they are to achieve socially valued success. Given the importance of social achievements to the attainment of prestige, this research points to the crucial role that authentic pride plays in this process.

Several lines of research also provide support for our account of hubristic pride as functioning to facilitate the attainment of dominance. First, in a recent series of studies from our lab, individuals high in hubristic pride became willing to lie about their performance on an anagram-solving task when doing so could help them attain higher status. Interestingly, these individuals did not lie to exaggerate their performance anytime they had the opportunity to show off or impress others. Instead, they lied only when they faced a direct threat to their status, in the form of having to work on a collaborative task with a partner who had just outperformed them on a similar individual task. In contrast, when they expected to work with a partner who had previously performed poorly, or when they were unaware of their partner's prior performance, hubristically proud participants were no more likely to lie about their own performance than were those low in hubristic pride, consistent with the expectation that hubristic pride

motivates antisocial or immoral behavior specifically when such acts might allow for the acquisition of increased social rank. These effects were specific to hubristic pride; we did not observe the same pattern for authentic pride, suggesting that only the former is related to cheating or lying for the sake of status enhancement (Mercadante & Tracy, n.d.-b). These behaviors, in turn, might provide hubristically proud individuals with a distinct advantage in status competitions over others who are less willing to behave immorally.

Although these studies do not provide direct evidence for an association between hubristic pride and dominance, specifically, other studies have found that behaving unethically and immorally is associated with peer perceptions of dominance, whereas prestigious individuals are viewed by their peers as particularly likely to engage in highly ethical and moral behaviors (Cheng et al., 2010). It therefore seems likely that the kind of reputation attained by hubristically proud individuals who engage in a strategy of lying or cheating for status acquisition is, ultimately, one of dominance. Moreover, several other studies also provide indirect support for a link between hubristic pride and dominance. Damian and Robins (2013) found that students prone to hubristic pride demonstrate creativity only if they are *extrinsically* motivated—that is, if they believe their creativity might help them attain some other goal. In other words, these individuals will engage in socially valued behaviors only if they believe that doing so will help them attain clear benefits like improved social standing.

These same researchers also found that those prone to hubristic pride will demonstrate effort or creativity if they are angry, and want to show others up (Damian & Robins, 2012). In this research, participants recalled a time they had felt either happy or angry, and then completed a behavioral measure of creativity. Among those participants who were made to feel happy, only trait authentic pride predicted creativity; those prone to hubristic pride became *less* creative in this condition, suggesting that when things are going well, these individuals bask in their successes, rather than putting in more work or creative effort. In contrast, when hubristically proud participants were made to feel anger, they showed the opposite tendency, becoming more creative. People prone to hubristic pride thus will work hard—which can be important for the attainment of dominance and for social rank in general—but only if they are motivated by the promise of extrinsic rewards, or by an angry or aggressive mood. Similarly, dominant leaders do not seek accomplishments for the sake of contributing valued resources to their group, or helping others, but to prove that they are



stronger, better, or more powerful than others. They tend to prioritize their own benefits and social position over group-level goals (Case & Maner, 2014).

## 2.5 From pride to social rank: Nonverbal signaling

Across species, a variety of adaptive benefits accrue to those who effectively send and receive signals of high rank through readily identified nonverbal displays. Individuals who can successfully communicate their own deservedness of social rank are likely to receive increased social influence and attention (Cashdan, 1998; Cheng et al., 2013; Foulsham, Cheng, Tracy, Henrich, & Kingstone, 2010), a greater allocation of potentially scarce resources (Brown & Maurer, 1986), higher quality mates (Apicella, Feinberg, & Marlowe, 2007; von Rueden et al., 2011; von Rueden & Jaeggi, 2016), and deference (Holland, Wolf, Looser, & Cuddy, 2017; Sell, Cosmides, & Tooby, 2014). Conversely, an ability to recognize high rank in others can help avoid potentially costly agonistic encounters (Ellyson & Dovidio, 1985; Lieberz et al., 2017; Stirrat, Stulp, & Pollet, 2012) as well as facilitate social learning opportunities (Birch, Akmal, & Frampton, 2010; Chudek, Heller, Birch, & Henrich, 2012; Martens, Tracy, & Shariff, 2012; Over, Carpenter, Spears, & Gattis, 2013), the identification of desirable mates (Fink, Neave, & Seydel, 2007; Havlicek, Roberts, & Flegr, 2005), and power maneuvering (Muller & Mazur, 1997; Todorov, 2005). In the context of these environmental pressures, it is likely that evolution would select for human genes that allow individuals to communicate their deservedness of high rank to others, possibly through nonverbal signaling.

Given evidence that pride functions in part as an internal barometer of success (Weidman et al., 2016) and thus of the potential for an increase in social rank, and that the pride expression is spontaneously displayed after success events in valued domains, which are likely to promote social rank (Tracy & Matsumoto, 2008), the nonverbal expression of pride may have evolved in part, as way of communicating information about an individual's increasing social rank (Fessler, 1999; Steckler & Tracy, 2014; Tracy & Robins, 2007a; Tracy et al., 2010; Witkower, Mercadante, & Tracy, 2020).

In fact, considering the rank-signaling properties of the pride nonverbal expression allows us to examine pride's likely phylogenetic history. The pride expression may have phylogenetic origins in more ancient

nonhuman dominance displays, which often involve bodily and head movements that are similar to human displays of pride. For example, high-ranking chimpanzees have been observed to show “inflated” or “bluff” displays after defeating a rival and prior to an agonistic encounter; these include behaviors such as arms raised and body expanded (de Waal, 1989a; Martens, Tracy, Cheng, Parr, & Price, 2010). The chest-beating intimidation displays of mountain gorillas (Schaller, 1963) and the “strutting confident air” characteristic of dominant catarrhine monkeys (Maslow, 1936) also share behavioral similarities with the expansive components of the human pride expression. In addition to these mammals, expansive nonverbal behaviors are used to signal high rank in birds (Ballentine, Searcy, & Nowicki, 2008), arachnids (de Carvalho, Watson, & Field, 2004) and fish (Forsatkar, Nematollahi, & Brown, 2016).

Furthermore, a fairly large body of evidence suggests that pride expressions have been retained to serve a similar signaling function in humans, as they continue to be reliably perceived as communicating high rank (Shariff & Tracy, 2009; Shariff, Tracy, & Markusoff, 2012; Tracy et al., 2013). In early evidence supporting this account, Tiedens, Ellsworth, and Mesquita (2000) found that individuals who are believed to be experiencing pride are assumed by others to be high status, suggesting that people hold an intuitive association between perceptions of pride and status. In other indirect evidence, Williams and DeSteno (2009) found that individuals who were experimentally manipulated to experience pride prior to engaging in a group task were subsequently perceived by others in the group and by outside observers as behaving in a more “dominant” manner, suggesting that something about the pride experience promoted interpersonal behaviors that increased the perceived status of the proud individual.

The most direct evidence that pride displays currently function to communicate high status comes from a series of studies that used several implicit measures to directly address this question (Shariff & Tracy, 2009). These studies found that observers demonstrated an automatic, unavoidable tendency to perceive pride displays as conveying high status, both when pride was compared with low-status emotions and when it was compared with emotions less theoretically relevant to status. This association also emerged when pride was compared with happiness and anger expressions, suggesting that the association between pride and high status cannot be attributed to the positive valence of the pride expression, nor to a tendency to view certain emotions (like anger) as particularly powerful. In an additional study, the implicit association between high status and pride emerged

even when pride displays were compared with displays in which the actor's face was neutral but his arms were extended from his body, making him appear larger. This result demonstrates that the association between pride and high status is not due merely to the increased size or amount of space taken up by those showing pride.

Other research has found that the pride expression communicates high status even when the person showing the expression is known to be low in status (Shariff et al., 2012). A series of studies pit two cues—contextual status information about a target individual and pride expressions displayed by the individual—against each other to test the impact of the pride expression on implicit and explicit status judgments in more realistic contexts, where such conflicting cues are often present. In each study, participants were presented with two otherwise identical targets, each displaying different “context-incongruent” emotion expressions. For example, one target was portrayed as obviously high status (i.e., a skilled and respected soccer team captain) but displaying a shame expression, whereas the other target was portrayed as obviously low status (i.e., the soccer team's unskilled, disrespected water boy) but displaying pride. When participants were probed for their implicit status associations with each target, the low-status but pride-displaying water boy was more strongly associated with high-status concepts than the high-status but shame-displaying captain, suggesting that in certain situations pride (and shame) expressions can outweigh contextual information in informing status judgments.

In a subsequent study, contextual information was made even stronger—one target was portrayed as a neatly groomed businessman who displayed shame, while the other was portrayed as an unclean, shabbily dressed homeless vagrant who nonetheless displayed pride. Even with such a strong contextually derived status differential, the pride display's status signal was still powerful enough to overcome the contextual difference. In this case, participants' implicit high-status status associations with the businessman showing shame were equal to those with the homeless man showing pride, suggesting that the emotion expressions nullified the strong effect of context. Together, these studies demonstrate that pride displays powerfully convey high status, so much so that they can neutralize, and in certain cases override, contradicting contextual information in determining implicit perceptions of a person's status (Shariff et al., 2012).

It is noteworthy that these pride display-high status associations were measured implicitly and shown to be automatic, in that they were unavoidable and occurred without intention (Bargh, 1994). The automaticity of

this association is relevant to the evolutionary account of pride displays; if the expression evolved as a pre-linguistic, pre-conscious form of communication, then its perception is a task that animal brains have been completing for millions of years, and likely occurs through low-level cognitive processes that can elicit adaptive behavioral responses without any need for conscious reflection (Bargh & Pietromonaco, 1982). Furthermore, if understanding pride's functional message required conscious deliberation, the expression would be less effective as a rapid source of information. More practically, these findings suggest that the human ability to rapidly and involuntarily assess the social status of others may be due, in part, to our ability to automatically recognize and interpret displays of pride.

Perhaps most important for our account of pride as an evolved status signal is evidence that the automatic association between pride displays and high-status concepts generalizes across diverse populations. We replicated several of the IAT studies reviewed above in a population of villagers living in a small-scale traditional society on a remote island in Fiji, essentially cut off from the rest of the global population (Tracy et al., 2013). These studies found that the pride expression is strongly implicitly associated with high status among both highly educated North American university students and Fijian villagers, despite the fact that Fijians hold a set of cultural practices and rituals that suppress personal status displays by individuals of both high and low ascribed statuses. That is, Fijian cultural rules sharply prohibit any nonverbal behaviors that communicate an individual's belief that he or she deserves increased status, making Fiji a "tough test" of the question of whether pride is a universal status signal. If the pride display did not evolve as a status signal, there are few cultural explanations as to why status and pride would have become tightly interconnected in Fiji. As a result, the finding that pride displays are strongly and automatically associated with high status in Fiji provides support for the evolutionary account.

## 2.6 Which kind of status does pride signal

Given that the pride expression communicates both authentic and hubristic pride, and the two forms of pride appear to have divergent associations with prestige and dominance, respectively, one might expect the pride display to communicate both forms of high social rank. However, recent evidence suggests that the pride expression is more strongly associated with prestige than dominance.

First, studies have shown that the pride expression triggers automatic associations with concepts related to the possession of knowledge and

expertise (Birch et al., 2010; Martens, 2014), suggesting that the form of status associated with these displays is the more prestigious variety. More direct evidence comes from studies testing whether the critical nonverbal behaviors associated with the pride expression are judged as conveying prestige versus dominance (Witkower, Tracy, et al., 2020). Across a wide range of targets posing various nonverbal expressions, and a variety of participants judging them, displays including expansive posture, a slight smile, and an upwards head tilt—that is, all components of the prototypical pride expression—were perceived as highly prestigious, but *not* as highly dominant, and as significantly more prestigious than dominant.

Further supporting this account, Witkower, Tracy, et al. (2020) coded the nonverbal behaviors spontaneously displayed by individuals engaging in a collaborative group task, among which hierarchies had naturally emerged. Individuals who were perceived by their peers in the group as prestigious tended to display expressions that included an upwards head tilt, slight smile, and expansiveness. In contrast, those perceived as dominant displayed expansiveness but no smile or upwards head tilt. Furthermore, displaying these same behaviors was associated with the attainment of social rank in the group—based on peer ratings and ratings made by outside observers—and the effect of pride displays on increased rank was mediated by perceptions of prestige but not dominance. These findings thus suggest that the pride expression communicates an individual's prestige, which in turn results in conferrals of social rank—but that this same display does not promote perceptions of dominance.

This research raises the question of how dominance is communicated nonverbally, if not through pride. To address this question, Witkower, Tracy, et al. (2020) asked participants to judge the perceived dominance of a range of nonverbal displays which were systematically manipulated to convey different levels of three nonverbal behavioral dimensions: expansiveness (expansive versus neutral), smiling (smile versus no smile), and head angle (tilted upward, level, downward). Interestingly, while the display featuring behaviors associated with pride was most reliably identified as prestige, the display featuring expansiveness but otherwise *opposite* behaviors to pride—no smile and downwards rather than upwards head tilt—led to the highest perceptions of dominance (see Fig. 4). Furthermore, although both prestige and dominance were associated with expansiveness, in the study mentioned above examining hierarchy formation in small groups, we found differences in the *kinds* of expansive behaviors these different high-ranking individuals spontaneously displayed. Prestigious individuals tended to show the subtle forms of expansiveness associated with



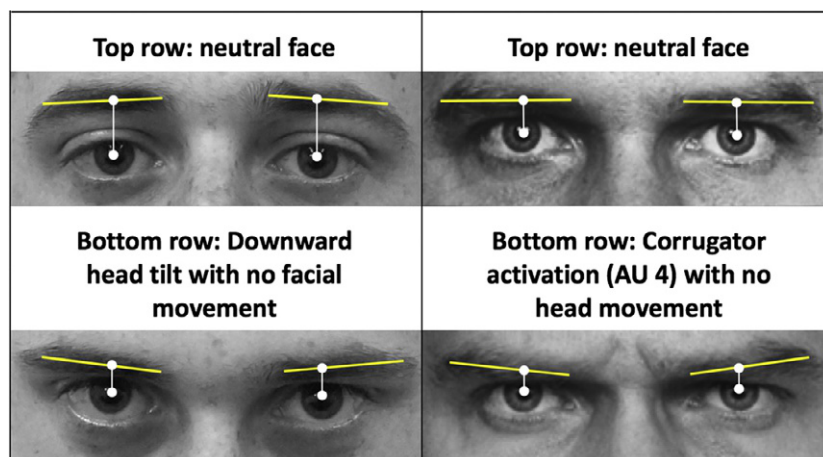
**Fig. 4** Nonverbal displays of prestige (left) and dominance (right). Both displays are reliably recognized at high rates in Western adult and children samples, and by members of isolated small-scale traditional society (see [Witkower, Hill, et al., 2020](#); [Witkower, Tracy, et al., 2020](#)).

pride expressions, like chest expansion and torso pushed out, whereas dominants tended to display more overt and extreme space-taking behaviors ([Witkower, Tracy, et al., 2020](#)).

We subsequently found that this same dominance display—bodily expansiveness, neutral facial expression (i.e., no smile), and head tilt downward—is reliably identified as conveying dominance across targets varying in gender and ethnicity, and by individuals across cultures, including villagers in an isolated small-scale traditional society in Nicaragua ([Witkower, Hill, et al., 2020](#)). These individuals had minimal contact with American culture, making it unlikely that they might have learned about a dominance display through cross-cultural transmission. In fact, even the most isolated individuals from this community—people who were unable to recognize the faces of famous American actors or politicians or the President of Nicaragua, had no formal education, and had never seen an American movie or television show or used the internet—showed high levels of recognition for the dominance display. We further found that toddlers as young as 2-years-old reliably recognized this display, suggesting that these perceptions emerge early in development.

One of the critical behaviors differentiating the dominance display from the pride expression is the presence of a downward, rather than upward, head tilt ([Witkower & Tracy, 2019b](#); [Witkower, Tracy, et al., 2020](#)). In fact, when compared to expansiveness and reduced smiling—the two other

behaviors associated dominance—downwards head tilt led to the largest increase in perceived dominance (Witkower, Tracy, et al., 2020). Recent studies addressed the question of why this behavior, in particular, is so important for communicating dominance and distinguishing it from prestige (Witkower & Tracy, 2019a, 2019b). We hypothesized that a downward head tilt might co-opt the psychology of facial-expression perception by creating the visual illusion of facial dynamics: tilting the head downward causes the eyebrows to take on an apparent V shape and become lowered—the same appearance cues associated with corrugator activity, or Facial Action Unit 4 (i.e., AU4; Ekman & Friesen, 1978)—even when the face in fact remains neutral. As a result, although tilting the head downward does not involve activation of AU4—a facial muscle action associated with anger, threat, and dominance across cultures (Keating & Bai, 1986)—it may function as an imposter of that action unit by causing the same appearance changes, creating the *illusion* of this facial action. In other words, a downwards head tilt may communicate dominance and not prestige because this head movement causes the artificial or illusory appearance of facial muscle movements that are associated with anger, threat, and dominance (see Fig. 5).



**Fig. 5** Visualization of the mechanism proposed by the action-unit-imposter account (Witkower & Tracy, 2019a, 2019b). The top row shows neutral head and face images. The bottom row shows the same faces with a downward head tilt (left) and activation of Action Unit (AU) 4 (right). Both movements create the appearance of a V shape and lowering of the eyebrows. The images on the right are cropped photographs from the Facial Action Coding System, printed with permission from the Paul Ekman Group (Ekman & Friesen, 1978).

Supporting this account, we found that apparent changes to eyebrow V-shape are the critical mechanism accounting for perceivers' tendency to identify a neutral face with the head tilted downwards as dominant (Witkower & Tracy, 2019b). These studies used a variety of methods to support this point; in several, we manipulated eyebrow V-shape appearance and visibility of head tilt, and found that while eyebrow V-shape was necessary and sufficient to form perceptions of dominance from a downward tilted head, visibility of the head tilt itself was not. In other words, participants identified faces as dominant if the head was tilted downward, but not if the eyebrows were not visible; they also did so when they could observe the eyebrows but not the actual head tilt. In another study, participants were photographed twice: once holding their head at a neutral angle and once tilting their head down. These images were subsequently shown to a separate sample of judges who rated their perceptions of targets' dominance. Photos with downward-tilted heads were judged to be more dominant than those with heads held at a neutral angle, supporting previous results. More importantly, measurements taken from the photos showed that tilting one's head downward increased apparent eyebrow V-shape, and this change in V-shape mediated the relationship between head tilt downward and perceivers' judgments of dominance. Overall, these findings suggest that downwards head tilt affects social perceptions by systematically changing the appearance of the face, in much the same way that movements of the facial musculature do.

In addition to the distinctive bodily behaviors associated with dominance and prestige, there are also distinct paralinguistic cues associated with these two forms of social rank; dominant individuals tend to deepen their vocal pitch across the initial moments of a social interaction (Cheng et al., 2013), which may serve to increase their perceived threat potential and formidability (Puts, Apicella, & Cárdenas, 2012). In contrast, prestige is not associated with systematic changes in vocal pitch, consistent with the expectation that pitch deepening amplifies threat but does not influence perceived competence or respect. Deepened vocal pitch is typically associated with increased testosterone levels, and other studies have examined whether dominance and prestige are associated with distinct neuroendocrine profiles, but results are somewhat mixed. Some studies show that individuals high in prestige tend to have lower basal testosterone levels relative to those low in prestige (Johnson et al., 2007). However, gaining social rank in the form of either prestige or dominance can increase testosterone (e.g., Cheng, Kornienko, & Granger, 2018; Zilioli & Watson, 2014).



The downstream consequences of increased testosterone on prestige or dominance behaviors, however, seems to be contingent on several other factors, including the interacting presence of hormones like cortisol (Mehta & Josephs, 2010; Mehta & Prasad, 2015), and contextual factors like competitiveness (e.g., Casto & Mehta, 2019; Mazur & Booth, 1998).

## 2.7 Is pride a uniquely human emotion?

One question that emerges from any consideration of pride's evolutionary history is the extent to which pride is uniquely human, versus having existed in some form in our prehuman primate ancestors. We have argued, here and elsewhere, that human pride is derived from the cognitive processes, emotions, and behaviors associated with dominance-seeking in our evolutionary ancestors (e.g., Cheng et al., 2010; Shariff, Tracy, Cheng, & Henrich, 2010; Tracy & Matsumoto, 2008; Tracy et al., 2010, 2013). Supporting this account, primatologists have observed possible experiences of proto-pride in chimpanzees and other primates, who display "prideful" threat displays in dominance contests (de Waal, 1989a; Fessler & Gervais, 2010). However, numerous social and psychological changes accompanying the dramatic expansion in cognitive abilities that emerged in our lineage over the last several million years have resulted in a human pride that is markedly different from any proto-pride emotion we might identify in our shared ancestors with other primates. The rise of elaborate cultural systems with norms for behavioral regulation, reputation, and self-presentation, coupled with vastly expanded capacities for abstract self-representation and self-evaluation (Markus & Kitayama, 1991; Sedikides, Skowronski, & Dunbar, 2006), have made pride considerably more complex in humans.

This is likely to be the case even for hubristic pride, despite its close association with dominance—which, unlike prestige, also existed in our nonhuman primate ancestors. Some nonhuman primates—especially those with an evidenced capacity for a least minimal self-awareness (e.g., mirror self-recognition; Gallup, 1970; Parker, 1994; Patterson & Cohn, 1994; Suarez & Gallup, 1981)—may experience a proto-pride-like feeling of superiority or power over others. However, human hubristic pride is not a simple subjective or cognitive sense of relative superiority. Humans have a complex self, which dramatically changes the nature of self-conscious emotions such as pride. A complex self, as conceived by self theorists since James (1890), involves a self-reflective interaction between an ongoing

self-awareness (the “I” self) and the capacity for complex self-representations (the “me” self). The resulting self-evaluative process—through which individuals evaluate how their current behavior compares to past behavior, and whether they are approaching an ideal future self, or identity goal—makes self-conscious emotions notably distinct from more “basic” emotions that do not require such high-level self-evaluations (Tracy & Robins, 2004a, 2004b). Among other developments, these self-evaluations are made possible by culturally transmitted scripts about what constitutes a “good person,” which give individuals culturally variable social ideals toward which to strive and against which to compare themselves. When a human experiences hubristic pride, then, she is not simply judging herself to be physically larger or more powerful than an adversary, she is thinking about past selves, social selves, ideal future selves, others’ perceptions of herself, and how her current behaviors reflect on all of these selves. As a result, hubristic pride, like authentic pride, is a complex emotional experience which includes traces of its vestigial origins (e.g., aspects of the associated nonverbal display), but also, in all likelihood, relies on uniquely human cognitive processes, selected by evolutionary forces to meet uniquely human social challenges (Shariff, Tracy, Cheng, & Henrich, 2010). Furthermore, there is another likely distinction between human pride and the proto-pride emotion that our nonhuman primate ancestors may have experienced: primatologists have noted that certain nonhuman primates today, like chimpanzees, display nonverbal signals of dominance during moments of agonistic battle or rank competition but *prior to* the competition, suggesting that the emotion corresponding to these displays may function to motivate the aggression needed to dominate a conspecific (e.g., de Waal, 1989b). Humans’ more cognitively complex sense of self may therefore have promoted a shift in the timing of the emotion, given that, in our species, pride is typically experienced *in response* to success rather than preceding it.



### **3. Does pride serve a secondary function, beyond rank attainment?**

#### **3.1 Cultural evolution and the emergence of human nature**

From a genetic evolutionary standpoint, there are both theoretical and empirical reasons to suggest that pride evolved in the human species to serve the adaptive function of facilitating rank attainment. Yet pride may also have come to serve a secondary function in human history, albeit not one that it

originally emerged to solve. Specifically, pride may play an important role in cumulative cultural evolution, a process that is responsible for the majority of cultural advances humans have made since the beginning of the species' existence. In this account, the existence of pride in the human psychological repertoire—which likely resulted from selection pressures involving the need to attain high social rank, as reviewed above—facilitated the emergence of cultural evolution, by promoting and enabling the learning, advancing, and sharing of cultural knowledge. Pride's role in cultural evolution can thus be seen as an exaptation, whereas its role in status promotion is an adaptation; this distinction is similar to that made between cues and signals. A cue provides information gleaned as a byproduct of something that serves an alternate adaptive purpose; for example, chewing is a reliable cue that someone is eating, but chewing did not originally emerge in mammals for the purpose of communicating that information (Shariff & Tracy, 2011). Likewise, pride is critical for several psychological processes that underpin cumulative cultural evolution, but in all likelihood—given evidence of proto-pride dominance displays in non-human species that lack culture—pride did not originally emerge to serve this function.

Cumulative cultural evolution is the process through which all of a society's cultural knowledge—art, science, technology, belief systems, institutions, and values—build upon each other and progress. The result is a cultural system that includes advances far beyond what would be possible from any one person alone, or any one community of people alone (Mesoudi, 2011). According to a number of scholars, cultural learning is the often-neglected part of evolution that is, in fact, as crucial for humans' continued survival and reproduction as are human genes. While it is somewhat obvious that a large cultural knowledge base passed down from generation to generation is necessary for the emergence of the most complex parts of human cultures, like the ability to build and use computers, humans cannot survive on human genes alone even on a desert island with no computers in sight. Without a fairly sophisticated knowledge base about which of the local plants are edible and which are poisonous, or an ability to build some sort of spear for catching and killing fish, few humans would survive long on any island. Turning to the contemporary societies most humans of today live in, few would successfully find the food they needed if their culture had not developed a system of agriculture, a market system allowing non-farmers to trade supplies or services for food, and the green and white cotton-linen blend imbued with deep cultural meaning and value which we use to represent those supplies and services.

Henrich (2017) makes a strong case for the necessity of cultural learning<sup>2</sup> by noting that many early-to-mid 19th Century European explorers found themselves stranded in faraway lands that were successfully inhabited by other humans, yet failed to survive unless they joined forces with the locals. These explorers lacked the skills needed to forage, gather, or hunt for food, not to mention to convert plants into forms digestible by the delicate human stomach. These abilities, skills, and sets of knowledge are too complex for any human to somehow discover or figure out on his or her own. Instead, they are developed by groups of people over time, and passed from one generation to the next. Importantly, in each new generation improvements are made. As a result, modern small-scale societies that exist today survive off skills that have been honed and perfected over many millennia.

The psychological and social process that has allowed humans to take others' inventions and make them better is social learning (Dean, Kendal, Schapiro, Thierry, & Laland, 2012). Studies have shown that social learning is by far the best way to master any difficult skill; those who can benefit from the knowledge that others have already acquired develop skills and an understanding of their world much more expediently than those who attempt to succeed on their own (Rendell et al., 2010). Interestingly, although humans' very close genetic relatives like chimpanzees demonstrate similar cognitive abilities to humans at some tasks, humans far outperform every other primate in the ability to copy and learn from others (Henrich, 2017). Chimps copy each other, but they do so mindlessly rather than purposefully. Knowing why we copy—what the goal is—makes humans particularly proficient learners, and allows us to innovate: to build on others' successes and push them forward. In other words, humans are excellent learners because we not only copy, but we do so with the intent of accomplishing a particular goal, which means we can choose when to add our own stylistic flair, or make a major advance that improves upon the technique.

### 3.2 Pride and the emergence of cultural evolution

Cumulative cultural evolution depends on three distinct human capacities: (1) developing skills and acquiring useful knowledge, (2) sharing this knowledge with others, and (3) effectively learning shared cultural

---

<sup>2</sup> Henrich's principle argument is that the majority of human advances resulting from cumulative cultural evolution are due not *only* to genes or *only* to culture, but to a combination of the two—culture-driven genetic evolution, also known as gene-culture coevolution.

knowledge so that the process can start all over again, with newly acquired skills becoming the starting point for future advances and innovations. Another way to think of these three abilities is in terms of the three psychological processes that underpin them: (1) a motivation to create, build, and discover—that is, to achieve; (2) a willingness to share and teach one's creations to others; and (3) an ability to learn from others who are experts in certain domains. As we will argue, each of these three psychological processes benefits from, and requires, the human capacity for pride.

Beginning with the first step of developing skills and acquiring knowledge, the research reviewed earlier in this article suggests that pride is the emotion that motivates people to do just this. Pride pushes people to work effortfully in ways that ensure ultimate success; feeling pride increases both persistence at boring tasks (Williams & DeSteno, 2008) and investment of energy into achievement-building activities that yield future rewards (Ho et al., 2016), and is associated with creativity and innovation (Damian & Robins, 2013). Furthermore, a felt absence of pride motivates underperforming individuals to change their ineffective work habits so as to become more productive, and ultimately perform better (Weidman et al., 2016). Many of these behaviors are the result of authentic pride, but hubristic pride can also promote hard work and creativity—albeit in the service of attaining status or impressing others rather than a pure desire for mastery or accomplishment (Damian & Robins, 2013; Mercadante & Tracy, n.d.-a).

In other words, pride is the central, proximate emotional force that motivates people to create, build, and achieve—to take what they know, and make it better. Without pride, humans would have little impetus to improve upon the cultural knowledge they already possess. Indeed, although popular wisdom might hold that inventors, scientists, artists, and other creators are driven by a search for beauty, truth, or knowledge, the desire to feel good about oneself may actually be the most powerful motivator of achievement (Tracy, 2016). Supporting this point, an ethnographic study of biologists found that—contrary to stereotypical views of scientists as disinterested seekers of truth—these individuals' primary motivation for their hard work was to support their own theoretical beliefs (Hull, 1988; see also Mesoudi, 2011). As Hull (1988) noted, the practice of crediting scientists only if they are the first to publish a new finding was originally instituted as a way of incentivizing these individuals to share their work with people outside their own field who might implement it in a practical way, as soon as possible. Over time, however, this practice came to serve a secondary motivational function. Scientists seek out the most

difficult problems to solve, work persistently to solve them, and then seek out new problems in need of solving, because they want to be the solver on record—which means getting the credit that will make them feel pride. Scientists' self-interested motivation, in turn, ensures that science progresses. The desire to feel pride in one's endeavors and discoveries is the affective mechanism that allows major advances to occur.

The second component of cumulative culture is humans' ability and willingness to teach what we know to others. Pride is crucial to this component, as well, because of its role in facilitating the attainment of prestige. As described earlier in this article, prestige evolved in humans as rank attainment strategy distinct from dominance because in a species with social learning, it becomes adaptive to incentivize teaching. In fact, prestige is a viable route to social rank *because* humans are social learners, so group members who have the most to teach are rewarded (Henrich & Gil-White, 2001). Learners defer to them, in exchange for access to copying their skills and knowledge. Correspondingly, to retain their power, prestigious individuals must be generous and helpful teachers. Their high rank is directly predicated on their willingness to share the boons of their expertise with others, so if they become unwilling to do so, they lose their power; group members have little incentive to defer to a cultural expert who will not let them learn. Prestigious individuals cannot intimidate or manipulate others into following them without acquiring a reputation for dominance—which comes with costs that directly interfere with the attainment of prestige, such as followers' dislike, fear, and avoidance. Prestigious individuals therefore have a natural incentive to make themselves available to those who wish to learn. The result is a system wherein those who have most proficiently acquired their society's cultural norms, values, beliefs, and knowledge are, at a proximal level, motivated to teach what they know to others, because doing so brings rewards of higher social rank, deference, and power. Pride may be the critical affective mechanism that supports this process, as it motivates individuals to help others and support them, by cooperating, demonstrating generosity and concern for those who might be disadvantaged, and directly helping those in need (Ashton-James & Tracy, 2012; Dorfman et al., 2014; van der Schalk et al., 2012).

To be clear, the evolution of prestige, like the evolution of pride, can be parsimoniously explained at a purely genetic level: the power and consequent resources that prestige brings to those who possess it increases their fitness, and learning from the most knowledgeable or skilled leaders increases the fitness of followers. In other words, the environmental

pressure to attain high rank in human societies, where social learning is possible, led to the selection of genes that promote prestige-oriented behaviors, cognitions, and emotions. However, prestige would not be an adaptive psychological and behavioral strategy for rank attainment in a species that lacked cultural learning (Henrich, 2017). The evolution of prestige is therefore intertwined with the process of cultural evolution as a whole; humans' ability to transmit and learn cultural knowledge led to the emergence of prestige, which in turn allowed for the cultural evolution of ideas, knowledge, and skills (Henrich, 2017). Pride is therefore relevant to, and a key affective mechanism underlying, the second essential psychological component of cultural evolution, because pride is the emotion that drives the attainment of prestige (Cheng et al., 2010; Tracy, 2016).

Finally, the third psychological process that underpins cultural evolution is accurate learning; in the sense of choosing to learn from the wisest or most skilled group members, so that high-quality cultural knowledge is passed on. In order for adaptive social learning to occur—that is, social learning that results in the transmission of the most valuable cultural knowledge—copying must be discriminatory. Learners need to choose which models to copy, and they ideally will choose those with the cleverest ideas, most useful skills, or largest body of knowledge. This means, essentially, that group members need to determine whom in their group is likely to be prestigious, and then copy the behaviors displayed by those individuals and show those individuals deference so they allow themselves to be copied. Studies using mathematical modeling have demonstrated that if most learners within a population copy a cultural expert, after 20 generations everyone in the society will have acquired a set of skills that are twice as strong as those of that original expert (Henrich, 2017).

Social learners use several strategies to determine whom to learn from. First, young children prefer to learn from people who are similar to them rather than those who are different (Kinzler, Corriveau, & Harris, 2011). This tendency results in a bias to learn knowledge that is shared by those within one's own community or cultural group, a bias that is generally useful for passing on culture-specific wisdom and knowledge. However, this bias is not helpful for discriminating among all the many people who belong to a particular social group but vary in the quality of their skills and knowledge. Learners must therefore also make within-group discriminations on the basis of likely prestige. In fact, by 2 years of age, toddlers choose to learn from social models who demonstrate accurate knowledge, labeling a toy car with the word *car*, instead of the word *duck*, for example

(Koenig & Woodward, 2010). Although this general rule of copying those who demonstrate accuracy is likely to be effective, there are situations in which learners lack access to information about a potential model's history of accuracy, and situations in which it might be adaptive to learn from someone who has been wrong in the past but nonetheless has something of value to offer in the present.

In fact, 2-year-olds do not rely only on concrete evidence of knowledge or accuracy. When young kids lack access to information about actual expertise, they seek out cues of expertise, in the form of displays of certainty. Specifically, when children have no way of determining whether an adult actually possesses knowledge, they will nonetheless choose to copy the adult if he or she displays confidence: speaking with conviction, smiling, and saying "Ahha!" while lifting a raised index finger (Birch et al., 2010). Children are more likely to copy the behaviors of social models who display these signs of confidence compared to models who demonstrate uncertainty, in the form of shrugging, scratching their chin, saying "hmmm", and generally giving off an appearance of confusion (Birch et al., 2010; Brosseau-Liard & Poulin-Dubois, 2014). These displays are so influential that even if a 5-year old discovers that a social model does not possess the expertise he or she appeared confident about, they still trust this person over a model who seems appropriately unsure about what he or she does not know (Tenney, Small, Kondrad, Jaswal, & Spellman, 2011). In other words, children use displays of confidence to guide their social learning more than displays of appropriate humility, and as a result they may, at times, learn incorrect information from overconfident adults. In contrast, adults in this position take into account whether a certain-seeming model has a history of accuracy, and whether their certainty is linked to their accuracy such that the model is more confident about things they know and less confident about things they do not know. However, under cognitive load, adults behave like 5-year olds, defaulting on apparent certainty and trusting a model who is likely to be demonstrating overconfidence (Tenney et al., 2011).

All of these studies point to the importance of displays of certainty or confidence for guiding social learning. It is therefore noteworthy that the displays examined—nonverbal behaviors like index finger raising, smiling, and standing upright—are somewhat similar to the universally recognized nonverbal expression of pride. Although they are not identical—the confidence displays manipulated in these experiments also include verbal statements like "I know"—it seems likely that the message sent by these



displays is that the sender is proud. When taken in combination with the finding that observers viewing pride displays automatically perceive them as conveying high status (Shariff & Tracy, 2009; Shariff et al., 2012; Tracy et al., 2013), and consistently judge these displays as conveying prestige but not dominance (Witkower, Tracy, et al., 2020), it seems reasonable to conclude that pride displays play an important role in communicating a displayer's expertise and shaping social learning.

However, almost all of the research directly examining the factors that guide social learning has focused on young children, making it important to examine whether adults seeking knowledge are also guided by pride displays. From the perspective of cumulative cultural evolution this is important, because adults are particularly likely to advance cultural knowledge by innovating from what they learn. We therefore conducted several studies testing whether adults systematically choose to learn from potential social models who display expressions of pride. We placed research participants in a situation where they were motivated to learn: we gave them a financial incentive to correctly answer a very difficult trivia question, and the opportunity to copy an answer offered by a peer. We did so by asking participants to watch a video of an individual (supposedly another participant completing the same study) answering a difficult trivia question, and then provide their own answer to the same question. For the sake of our cover story, they were also told that that, after they answered the question, they would make personality judgments about the "other participant." In fact, the other participant was a confederate who answered the trivia question incorrectly (to ensure that participants' copying decisions were indicative of copying and not knowledge possession) while posing an expression of pride, shame, happiness, or neutral. Participants copied this confederate's answer 80% of the time, but only if he or she displayed pride. When confederates displayed happiness, participants copied significantly less often, 50% of the time. Confederates displaying shame and neutral expressions were copied even less often, between 20% and 30% of the time, which was no different from chance (Martens & Tracy, 2013). These findings provide somewhat concrete evidence that the pride nonverbal display functions as a cue to expertise that guides social learning.

In subsequent studies, participants' desire to learn from pride-displays was found to generalize past the moment when the display is observed, to a new situation. When participants viewed a confederate posing an emotion expression while answering a difficult trivia question, but then a neutral expression while answering a new question that participants knew

they would also be asked, they were still more likely to copy confederates who had previously displayed pride than those who previously displayed happiness, neutral, or shame (Martens, 2014). This finding is consistent with the conclusion that pride displays communicate prestige—in the sense of a general level of expertise or wisdom—and not only a displayer's momentary confidence in a particular answer.

Together, the research on social learning in adults and children suggests that the pride nonverbal expression plays an important role in cumulative cultural evolution. Pride displays tell observers whom they should copy and learn from, and because these displays are typically shown in response to success (Tracy & Matsumoto, 2008), copying those who display pride is likely to be adaptive at a genetic level, by prompting learning that increases fitness; and also adaptive at a cultural level, by increasing the likelihood that the best knowledge and skills are passed on to others who can improve upon them further (Henrich, 2017). Although people can fake pride displays, posing the expression in situations where they did not actually succeed, in the long run such performative displays are unlikely to shape social learning. Most social interactions are based on longer term relationships built across many different interactions (that is, social partners' reputations). In such situations, studies show, even children will eventually stop copying a social model who displays confidence but has a history of being wrong (Brosseau-Liard, Cassels, & Birch, 2014); furthermore, adults who are caught overclaiming become distrusted and unattractive social partners (Tenney, Meikle, Hunsaker, Moore, & Anderson, 2019).

In other words, when presented with clear-cut evidence that a particular adult should not be treated as a social model, both children and adults stop treating them that way, even if they show pride. Although this finding seems to contradict the prior research discussed above, in which children weighted confidence displays over accuracy, and our adult participants copied pride-displaying confederates who were wrong, the critical difference is in how easy it is for learners to determine that the social model is inaccurate. When kids and adults see signs of pride with no indication of accuracy, or alongside subtle hints of inaccuracy, their copying behaviors are shaped by pride displays, at least to some extent. However, when kids and adults know that a model's pride display is unmerited, they do not let it bias their social learning. Pride displays are not the only indicator of an individual's prestige, but they seem to serve a shortcut signaling function, a quick and easy way for prestigious individuals to inform others that, all else being equal, they should be used as a source of learning.

In sum, pride contributes to each of the three key psychological processes that underlie cumulative cultural evolution: it motivates people to work hard to achieve, create, and develop knowledge and skills; it facilitates the attainment of prestige, which entails a built-in incentive to teach and share the fruits of one's creations with others; and it cues social learning, informing group members which social models they should follow. Pride therefore seems to be the emotion most strongly related to, and even partly responsible for, the cultural evolutionary process that largely shaped humans' ability to reach our current level of scientific, artistic, and technological advancement.

---



#### 4. Conclusions and future directions

The research reviewed in this article provides a strong case for pride as an evolved emotion that functions to help individuals navigate their social hierarchies, motivating them to engage in behaviors that allow them to attain and maintain social rank, and communicating to others which group members are deserving of higher rank and should be targets of social learning. Furthermore, because there are two distinct ways to experience pride, this emotion is related to both adaptive strategies for rank attainment: dominance and prestige.

More specifically, we reviewed evidence in support of pride's status as an evolved faculty of the mind. Pride is associated with a non-verbal expression that is reliably recognized and spontaneously displayed in response to success by individuals across a wide range of cultures and ages, and is also reliably displayed by congenitally blind individuals, who could not have learned it through visual modeling (Tracy & Matsumoto, 2008; Tracy & Robins, 2004b, 2008b). This expression appears to serve an important adaptive function, communicating displayers' high-status across cultures (Shariff & Tracy, 2009; Shariff et al., 2012; Tracy et al., 2013). The pride expression may be homologous with nonhuman dominance displays, which involve similar bodily and head movement. Neurologically, pride experiences have been associated with brain reward centers (Müller-Pinzler et al., 2015; Zahn et al., 2009) and areas implicated in self-relevant or theory-of-mind processing (Simon-Thomas et al., 2012). Developmentally, children first show signs of experiencing pride somewhat later than basic emotions (Lewis et al., 1992; Stipek et al., 1992), but recognize pride at the same time as they first recognize other emotion expressions (Garcia et al., 2015; Tracy et al., 2005).

We also reviewed a large body of evidence suggesting that pride is comprised of two distinct facets: authentic pride, based on specific achievements and associated with feelings of confidence and self-worth; and hubristic pride, based on more stable and uncontrollable attributions and associated with feelings of arrogance and egotism. The two facets have divergent external correlates, with authentic pride linked to high self-esteem, adaptive relationships, and a generally positive and pro-social personality profile; and hubristic pride linked to low self-esteem, anti-social behaviors, problematic relationships, and psychological dysfunction (Tracy, Cheng, et al., 2009; Tracy & Robins, 2007c; Tracy, Robins, & Schriber, 2009). Given that pride functions to facilitate rank attainment, the distinction between the facets may have emerged early in pride's evolution, with each facet functioning to facilitate the attainment of one of two distinct forms of high rank. Specifically, authentic pride is uniquely associated with prestige, a form of high rank based on the demonstration of valuable knowledge and earned respect; and hubristic pride is uniquely associated with dominance, a form of high rank attained through intimidation and aggression, and the elicitation of fear (Cheng et al., 2010).

Although the past decades have seen major advances in our understanding of pride and its role in hierarchy dynamics, a number of open questions remain. First, the finding that the pride expression communicates prestige but not dominance raises questions for prior evidence that both authentic and hubristic pride are associated with the same nonverbal expression, given that hubristic pride is not associated with prestige (Cheng et al., 2010; Tracy & Robins, 2007b). One potential explanation is that although both pride facets are perceived from the same display, hubristic pride can also be identified—perhaps even more strongly—from a somewhat different expression that also includes elements of the dominance display, such as a downward head tilt. Consistent with this expectation, the combination of a downwards head tilt and slight smile has been found to convey antisocial positive emotions including hubristic pride (Witkower & Tracy, n.d.; Witkower, Tracy, & Lange, n.d.). Another possibility that has received some empirical support is that authentic and hubristic pride can be differentiated by observing dynamic qualities of the expression (e.g., fast, slow, jerky, flowing; Lange & Crusius, 2015; Nelson & Russell, 2011, 2014). Future studies are needed to explore this issue, and determine whether there is a distinct, reliably identifiable nonverbal expression of hubristic pride that can be readily discriminated from authentic pride, and the extent to which such a display might shape judgments of dominance.

Another important direction for future research is to examine the experience and function of pride as it is felt about one's group identity. Although all emotions can be experienced in response to events relevant to the personal self and events relevant to the collective or group self (Mackie & Smith, 2018), the process may differ somewhat for the self-conscious emotions, given the necessity of self-evaluations and self-reflection to their elicitation. To experience group-level pride, individuals must feel a sense of collective group identity, and appraise some event as reflecting positively on that identity. An interesting question is whether when such experiences occur, they can take the form of both authentic and hubristic pride, and whether different outcome behaviors will result; parallel questions have been asked about group-level shame and guilt, and studies have demonstrated a distinction similar to that for personal shame and guilt (Schmader & Lickel, 2006). We might predict that collective authentic pride in one's country would promote patriotism and feelings of ingroup solidarity and connection, whereas collective hubristic pride in one's country would promote more nationalistic feelings, along with in-group favoritism and out-group derogation.

Open questions also remain regarding the biological foundations of pride, both in terms of neuroscience and evolutionary origins. Although studies have uncovered certain brain regions associated with pride, more research is needed to determine the ways in which pride's neurological signature is distinct from that of other emotions. Finally, future studies are needed to improve our understanding of the relationship between the two facets of pride and the two forms of social rank, by investigating the causal direction of these associations. Experimental work might fruitfully manipulate each facet of pride separately then place participants in a rank competition, to test whether those made to feel authentic pride display more prestige-oriented behaviors, and are ultimately perceived as prestigious, whereas those made to feel hubristic pride display more dominance-oriented behaviors and become perceived as dominant. Research along these lines might also test whether these relations are bi-directional, by examining whether the attainment of dominance or prestige elicits corresponding experiences of hubristic or authentic pride.

In summary, although numerous important directions for future work lay ahead, we hope that this review has provided the groundwork for such endeavors by clarifying what we currently know about pride and its experience, expression, function, biology, and evolution origins, and its relation to the attainment of social rank, as well as its role in cultural evolution.

The past several decades have seen a major shift in researchers' understanding of and attention toward this emotion; prior to the 1990s (e.g., Tangney & Fischer, 1995), pride was only rarely included in psychological research, and only in the mid-2000s did scholars begin to consider it an emotion of equal importance and biological foundation as the basic emotions of anger, fear, and sadness (e.g., Tracy & Robins, 2004a, 2004b). Today, however, emotion researchers and psychological scientists more broadly regularly study pride and include it in a wide range of research endeavors (see Weidman, Steckler, & Tracy, 2017), making it likely that our understanding of pride will increase moving forward. Similarly, research on social hierarchy, status attainment, and dominance and prestige has vastly expanded over the past several decades. We expect to see continued growth in both of these areas moving forward, along with a more complete elucidation of the affective pathways underlying the attainment of social rank and the various ways in which individuals navigate their hierarchies.

## References

- Ames, D. R., & Flynn, F. J. (2007). What breaks a leader: The curvilinear relation between assertiveness and leadership. *Journal of Personality and Social Psychology*, *92*, 307–324.
- Anderson, C., Hildreth, J. A. D., & Howland, L. (2015). Is the desire for status a fundamental human motive? A review of the empirical literature. *Psychological Bulletin*, *141*, 574–601.
- Anderson, C., & Kilduff, G. J. (2009a). The pursuit of status in social groups. *Current Directions in Psychological Science*, *18*, 295–298.
- Anderson, C., & Kilduff, G. J. (2009b). Why do dominant personalities attain influence in face-to-face groups? The competence-signaling effects of trait dominance. *Journal of Personality and Social Psychology*, *96*, 491–503.
- Anderson, C., & Willer, R. (2014). Do status hierarchies benefit groups? A bounded functionalist account of status. In J. T. Cheng, J. L. Tracy, & C. Anderson (Eds.), *The psychology of social status* (pp. 47–70). New York, NY: Springer Science + Business Media.
- Apicella, C., Feinberg, D., & Marlowe, F. (2007). Voice pitch predicts reproductive success in male hunter-gatherers. *Biology Letters*, *3*, 682–684.
- Armstrong, L., & Jenkins, S. (2000). *It's not about the bike: My journey back to life*. Crows Nest, NSW: Allen & Unwin.
- Ashton-James, C. E., & Tracy, J. L. (2012). Pride and prejudice: How feelings about the self influence judgments of others. *Personality and Social Psychology Bulletin*, *38*, 466–476.
- Ballentine, B., Searcy, W. A., & Nowicki, S. (2008). Reliable aggressive signalling in swamp sparrows. *Animal Behaviour*, *75*, 693–703.
- Bargh, J. A. (1994). The four horsemen of automaticity: Awareness, intention, efficiency, and control in social cognition. In R. S. Wyer & T. S. Srull (Eds.), *Handbook of social cognition* (pp. 1–41). Hillsdale, NJ: Erlbaum.
- Bargh, J. A., & Pietromonaco, P. (1982). Automatic information processing and social perception: The influence of trait information presented outside of conscious awareness on impression formation. *Journal of Personality and Social Psychology*, *43*, 437–449.
- Barkow, J. H. (1975). Prestige and culture: A biosocial interpretation. *Current Anthropology*, *16*, 553–572.

- Beck, A., Cañamero, L., & Bard, K. A. (2010). Towards an affect space for robots to display emotional body language. In *19th international symposium in robot and human interactive communication* (pp. 464–469), IEEE.
- Belsky, J., & Domitrovich, C. (1997). Temperament and parenting antecedents of individual difference in three-year-old boys' pride and shame reactions. *Child Development, 68*, 456–466.
- Berger, J., Rosenholtz, S. J., & Zelditch, M. (1980). Status organizing processes. *Annual Review of Sociology, 6*, 479–508.
- Birch, S. A., Akmal, N., & Frampton, K. L. (2010). Two-year-olds are vigilant of others' non-verbal cues to credibility. *Developmental Science, 13*, 363–369.
- Boehm, C. (1993). Egalitarian society and reverse Dominance hierarchy. *Current Anthropology, 34*, 227–254.
- Boyd, R., & Richerson, P. J. (1985). *Culture and the evolutionary process*. Chicago, IL: University of Chicago Press.
- Brand, C. O., & Mesoudi, A. (2019). Prestige and dominance-based hierarchies exist in naturally occurring human groups, but are unrelated to task-specific knowledge. *Royal Society Open Science, 6*, 181621.
- Brosi, P., Spörle, M., Welppe, I. M., & Heilman, M. E. (2016). Expressing pride: Effects on perceived agency, communality, and stereotype-based gender disparities. *Journal of Applied Psychology, 101*, 1319.
- Brosseau-Liard, P., Cassels, T., & Birch, S. (2014). You seem certain but you were wrong before: Developmental change in preschoolers' relative trust in accurate versus confident speakers. *PLoS One, 9*, e108308.
- Brosseau-Liard, P. E., & Poulin-Dubois, D. (2014). Sensitivity to confidence cues increases during the second year of life. *Infancy, 19*, 461–475.
- Brown, D. (1991). *Human universals*. Philadelphia, PA: Temple University Press.
- Brown, J. D., & Marshall, M. A. (2001). Self-esteem and emotion: Some thoughts about feelings. *Personality and Social Psychology Bulletin, 27*, 575–584.
- Brown, J. H., & Maurer, B. A. (1986). Body size, ecological dominance and Cope's rule. *Nature, 324*, 248–250.
- Burgo, J. (2013). How aggressive narcissism explains Lance Armstrong. January 28, Retrieved from <https://www.theatlantic.com/health/archive/2013/01/how-aggressive-narcissism-explains-lance-armstrong/272568/>.
- Buss, A. H. (2001). *Psychological dimensions of the self*. Thousand Oaks, CA: Sage.
- Buss, D. M., Gomes, M., Higgins, D. S., & Lauterbach, K. (1987). Tactics of manipulation. *Journal of Personality and Social Psychology, 52*, 1219–1229.
- Buttermore, N. (2006). Distinguishing dominance and prestige: Validation of a self-report scale. In *Poster presented at the annual meeting of the Human Behavior and Evolution Society*, PA: Philadelphia, June.
- Campos, J. J., Barrett, K. C., Lamb, M. E., Goldsmith, H. H., & Stenberg, C. (1983). Socioemotional development. Series Ed. and Vol. Eds. In E. Mussen, J. J. Campos, & M. H. Haith (Eds.), *Handbook of child psychology: Vol. 2. Infancy and developmental psychobiology*. New York: Wiley.
- Caporael, L. R. (2001). Evolutionary psychology: Toward a unifying theory and a hybrid science. *Annual Review of Psychology, 52*, 607–628.
- Carver, C. S., Sinclair, S., & Johnson, S. L. (2010). Authentic and hubristic pride: Differential relations to aspects of goal regulation, affect, and self-control. *Journal of Research in Personality, 44*, 698–703.
- Case, C. R., & Maner, J. K. (2014). Divide and conquer: When and why leaders undermine the cohesive fabric of their group. *Journal of Personality and Social Psychology, 107*, 1033–1050.
- Cashdan, E. (1998). Smiles, speech, and body posture: How women and men display socio-metric status and power. *Journal of Nonverbal Behavior, 22*, 209–228.

- Casto, K. V., & Mehta, P. H. (2019). Competition, dominance, and social hierarchy. In L. Welling & T. Schackelford (Eds.), *The Oxford handbook on evolutionary psychology and behavioral endocrinology* (pp. 295–314). Oxford University Press.
- Cheng, J. T., Kornienko, O., & Granger, D. A. (2018). Prestige in a large-scale social group predicts longitudinal changes in testosterone. *Journal of Personality and Social Psychology, 114*, 924–944.
- Cheng, J. T., & Tracy, J. L. (2014). Toward a unified science of hierarchy: Dominance and prestige are two fundamental pathways to human social rank. In J. T. Cheng, J. L. Tracy, & C. Anderson (Eds.), *The psychology of social status* (pp. 3–27). New York, NY: Springer Science + Business Media.
- Cheng, J. T., Tracy, J. L., Foulsham, T., Kingstone, A., & Henrich, J. (2013). Two ways to the top: Evidence that dominance and prestige are distinct yet viable avenues to social rank and influence. *Journal of Personality and Social Psychology, 104*, 103–125.
- Cheng, J. T., Tracy, J. L., & Henrich, J. (2010). Pride, personality, and the evolutionary foundations of human social status. *Evolution and Human Behavior, 31*, 334–347.
- Chudek, M., Heller, S., Birch, S., & Henrich, J. (2012). Prestige-biased cultural learning: Bystander's differential attention to potential models influences children's learning. *Evolution and Human Behavior, 33*, 46–56.
- Conway, L. G., & Schaller, M. (2002). On the verifiability of evolutionary psychological theories: An analysis of the psychology of scientific persuasion. *Personality and Social Psychology Review, 6*, 152–166.
- Cordaro, D. T., Sun, R., Kamble, S., Hodder, N., Monroy, M., Cowen, A., et al. (n.d.). The recognition of 18 facial-bodily expressions across nine cultures. Emotion, in press.
- Cosmides, L., & Tooby, J. (2000). Evolutionary psychology and the emotions. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 91–115). New York: Guilford.
- Damian, R. I., & Robins, R. W. (2012). The link between dispositional pride and creative thinking depends on current mood. *Journal of Research in Personality, 46*, 765–769.
- Damian, R. I., & Robins, R. W. (2013). Aristotle's virtue or Dante's deadliest sin? The influence of authentic and hubristic pride on creative achievement. *Learning and Individual Differences, 26*, 156–160.
- de Carvalho, T. N., Watson, P. J., & Field, S. A. (2004). Costs increase as ritualized fighting progresses within and between phases in the sierra dome spider, *Neriene litigiosa*. *Animal Behaviour, 68*, 473–482.
- de Kwaadsteniet, E. W., & van Dijk, E. (2010). Social status as a cue for tacit coordination. *Journal of Experimental Social Psychology, 46*, 515–524.
- de Waal, F. (1989a). *Chimpanzee politics: Power and sex among apes*. Baltimore, MD: Johns Hopkins University Press.
- de Waal, F. B. M. (1989b). The myth of a simple relation between space and aggression in captive primates. *Zoo Biology, 8*, 141–148.
- Dean, L. G., Kendal, R. L., Schapiro, S. J., Thierry, B., & Laland, K. N. (2012). Identification of the social and cognitive processes underlying human cumulative culture. *Science, 335*, 1114–1118.
- Dickins, L.R., & Robins R.W. (n.d.). Pride: A meta-analytic project (under review).
- Dorfman, A., Eyal, T., & Bereby-Meyer, Y. (2014). Proud to cooperate: The consideration of pride promotes cooperation in a social dilemma. *Journal of Experimental Social Psychology, 55*, 105–109.
- Ekman, P. (1992a). An argument for basic emotions. *Cognition and Emotion, 6*, 169–200.
- Ekman, P. (1992b). Are there basic emotions? *Psychological Review, 99*, 550–553.
- Ekman, P., & Friesen, W. V. (1978). *Facial action coding system: The manual*. Salt Lake City, UT: Research Nexus.



- Ekman, P., Friesen, W. V., O'Sullivan, M., Chan, A., Diacoyanni Tarlatzis, I., Heider, K., et al. (1987). Universals and cultural differences in the judgments of facial expressions of emotion. *Journal of Personality and Social Psychology*, *53*, 712–717.
- Ekman, P., Sorenson, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. *Science*, *164*, 86–88, April 4.
- Ellsworth, P. C., & Smith, C. A. (1988). Shades of joy: Patterns of appraisal differentiating pleasant emotions. *Cognition and Emotion*, *2*, 301–331.
- Ellyson, S. L., & Dovidio, J. F. (1985). Power, dominance, and nonverbal behavior: Basic concepts and issues. In S. L. Ellyson & J. F. Dovidio (Eds.), *Power, dominance, and nonverbal behavior* (pp. 1–27). New York, NY: Springer New York.
- Faris, R., & Ennett, S. (2012). Adolescent aggression: The role of peer group status motives, peer aggression, and group characteristics. *Social Networks*, *34*, 371–378.
- Fessler, D. M. T. (1999). Toward an understanding of the universality of second order emotions. In A. Hinton (Ed.), *Beyond nature or nurture: Biocultural approaches to the emotions* (pp. 75–116). New York: Cambridge University Press.
- Fessler, D. M. T., & Gervais, M. (2010). From whence the captains of our lives: Ultimate and phylogenetic perspectives on emotions in humans and other primates. In P. M. Kappeler & J. Silk (Eds.), *Mind the gap: Tracing the origins of human universals* (pp. 261–280). Springer.
- Fink, B., Neave, N., & Seydel, H. (2007). Male facial appearance signals physical strength to women. *American Journal of Human Biology*, *19*, 82–87.
- Forsatkar, M. N., Nematollahi, M. A., & Brown, C. (2016). The toxicological effect of *Ruta graveolens* extract in Siamese fighting fish: A behavioral and histopathological approach. *Ecotoxicology*, *25*, 824–834.
- Fossati, P., Hevenor, S. J., Graham, S. J., Grady, C., Keightley, M. L., Craik, F., et al. (2003). In search of the emotional self: An fMRI study using positive and negative emotional words. *American Journal of Psychiatry*, *160*, 1938–1945.
- Foulsham, T., Cheng, J. T., Tracy, J. L., Henrich, J., & Kingstone, A. (2010). Gaze allocation in a dynamic situation: Effects of social status and speaking. *Cognition*, *117*, 319–331.
- Fourie, M. M., Rauch, H. G. L., Morgan, B. E., Ellis, G. F. R., Jordaan, E. R., & Thomas, K. G. F. (2011). Guilt and pride are heartfelt, but not equally so. *Psychophysiology*, *48*, 888–899.
- Gallup, G. (1970). Chimpanzees: Self-reflection. *Science*, *167*, 86–87.
- Garcia, D. J., Janis, R., & Flom, R. (2015). Children's recognition of pride. *Journal of Experimental Child Psychology*, *137*, 85–98.
- Garfield, Z. H., & Hagen, E. H. (n.d.). Investigating evolutionary models of leadership among recently settled Ethiopian hunter-gatherers. *The Leadership Quarterly*, in press.
- Graham, S., & Weiner, B. (1986). From an attributional theory of emotion to developmental psychology: A round-trip ticket? *Social Cognition*, *4*, 152–179.
- Gurven, M., & Von Rueden, C. (2006). Hunting, social status and biological fitness. *Biodemography and Social Biology*, *53*, 81–99.
- Halevy, N., Chou, E. Y., & Galinsky, A. D. (2011). A functional model of hierarchy: Why, how, and when vertical differentiation enhances group performance. *Organizational Psychology Review*, *1*, 32–52.
- Harris, P. L., Olthof, T., Terwogt, M. M., & Hardman, C. E. (1987). Children's knowledge of the situations that provoke emotion. *International Journal of Behavioral Development*, *10*, 319–343.
- Hart, D., & Karmel, M. P. (1996). Self-awareness and self-knowledge in humans, apes, and monkeys. In A. E. Russon, K. A. Bard, & S. T. Parker (Eds.), *Reaching into thought: The minds of the great apes* (pp. 325–347). New York: Cambridge University Press.
- Hart, D., & Matsuba, M. K. (2007). The development of pride and moral life. In *The self-conscious emotions: Theory and research* (pp. 114–133). New York, NY: Guilford Press.

- Harter, S. (1983). Developmental perspective on the self-system. Series Ed. and Vol. Ed. In P. H. Mussen & E. M. Hetherington (Eds.), *Handbook of child psychology: Vol. 4. Socialization, personality, and social development* (4th ed., pp. 275–385). New York: Wiley.
- Havlicek, J., Roberts, S. C., & Flegr, J. (2005). Women's preference for dominant male odour: Effects of menstrual cycle and relationship status. *Biology Letters*, *1*, 256–259.
- Hawley, P. H. (2003). Strategies of control, aggression, and morality in preschoolers: An evolutionary perspective. *Journal of Experimental Child Psychology*, *85*, 213–235.
- Heine, S. J., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, *106*, 766–794.
- Henrich, J. P. (2017). *The secret of our success: How culture is driving human evolution, domesticating our species, and making us smarter*. Princeton: Princeton University Press.
- Henrich, J., & Gil-White, F. J. (2001). The evolution of prestige: Freely conferred deference as a mechanism for enhancing the benefits of cultural transmission. *Evolution and Human Behavior*, *22*, 165–196.
- Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2–3), 61–83.
- Herrald, M. M., & Tomaka, J. (2002). Patterns of emotion-specific appraisal, coping, and cardiovascular reactivity during an ongoing emotional episode. *Journal of Personality and Social Psychology*, *83*, 434–450.
- Hill, K., & Hurtado, A. M. (1989). Hunter-gatherers of the New World. *American Scientist*, *77*, 436–443.
- Ho, S.-Y., Tong, E. M. W., & Jia, L. (2016). Authentic and hubristic pride: Differential effects on delay of gratification. *Emotion*, *16*, 1147–1156.
- Hofmann, W., & Fisher, R. R. (2012). How guilt and pride shape subsequent self-control. *Social Psychological and Personality Science*, *3*, 682–690.
- Holland, E., Wolf, E. B., Looser, C., & Cuddy, A. (2017). Visual attention to powerful postures: People avert their gaze from nonverbal dominance displays. *Journal of Experimental Social Psychology*, *68*, 60–67.
- Howard, J. A., Blumstein, P., & Schwartz, P. (1986). Sex, power, and influence tactics in intimate relationships. *Journal of Personality and Social Psychology*, *51*, 102–109.
- Hull, D. L. (1988). A mechanism and its metaphysics: An evolutionary account of the social and conceptual development of science. *Biology and Philosophy*, *3*, 123–155.
- Imada, T., & Ellsworth, P. C. (2011). Proud Americans and lucky Japanese: Cultural differences in appraisal and corresponding emotion. *Emotion*, *11*, 329–345.
- Izard, C. E. (1971). *The face of emotion*. East Norwalk, CT: Appleton-Century-Crofts.
- James, W. (1890). *The principles of psychology*. Cambridge, MA: Harvard University Press.
- Johnson, R. T., Burk, J. A., & Kirkpatrick, L. A. (2007). Dominance and Prestige as differential predictors of aggression and testosterone levels in men. *Evolution and Human Behavior*, *28*, 345–351.
- Keating, C. F., & Bai, D. L. (1986). Children's attributions of social dominance from facial cues. *Child Development*, *57*, 1269–1276.
- Keltner, D. (1995). Signs of appeasement: Evidence for the distinct displays of embarrassment, amusement, and shame. *Journal of Personality and Social Psychology*, *68*, 441–454.
- Keltner, D., Young, R. C., Heerey, E. A., Oemig, C., & Monarch, N. D. (1998). Teasing in hierarchical and intimate relations. *Journal of Personality and Social Psychology*, *75*, 1231–1247.
- Kiesler, D. J. (1983). The 1982 interpersonal circle: A taxonomy for complementarity in human transactions. *Psychological Review*, *90*, 185–214.
- Kinzler, K. D., Corriveau, K. H., & Harris, P. L. (2011). Children's selective trust in native-accented speakers. *Developmental Science*, *14*, 106–111.
- Kipnis, D., Castell, J., Gergen, M., & Mauch, D. (1976). Metamorphic effects of power. *Journal of Applied Psychology*, *61*, 127–135.

- Kircher, T. T. J., Brammer, M., Bullmore, E., Simmons, A., Bartels, M., & David, A. S. (2002). The neural correlates of intentional and incidental self-processing. *Neuropsychologia*, *40*, 683–692.
- Koenig, M. A., & Woodward, A. L. (2010). 24-month-olds' sensitivity to the prior inaccuracy of the source: Possible mechanisms. *Developmental Psychology*, *46*, 815–826.
- Kornilaki, E. N., & Chloverakis, G. (2004). The situational antecedents of pride and happiness: Developmental and domain differences. *British Journal of Developmental Psychology*, *22*, 605–619.
- Kyl-Heku, L. M., & Buss, D. M. (1996). Tactics as units of analysis in personality psychology: An illustration using tactics of hierarchy negotiation. *Personality and Individual Differences*, *21*, 497–517.
- La Freniere, P., & Charlesworth, W. R. (1983). Dominance, attention, and affiliation in a preschool group: A nine-month longitudinal study. *Ethology and Sociobiology*, *4*, 55–67.
- Lagattuta, K. H., & Thompson, R. A. (2007). The development of self-conscious emotions: Cognitive processes and social influences. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research* (pp. 91–113). New York: Guilford Press.
- Laland, K. N., & Galef, B. G. (2009). *The question of animal culture*. Cambridge, MA: Harvard University Press.
- Lange, J., & Crusius, J. (2015). The tango of two deadly sins: The social-functional relation of envy and pride. *Journal of Personality and Social Psychology*, *109*, 453–472.
- Laukka, P., Elfenbein, H. A., Söder, N., Nordström, H., Althoff, J., Iraki, F. K. E., et al. (2013). Cross-cultural decoding of positive and negative non-linguistic emotion vocalizations. *Frontiers in Psychology*, *4*, 353.
- Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, *68*, 518–530.
- Lewis, M. (2000). Self-conscious emotions: Embarrassment, pride, shame, and guilt. In M. Lewis & J. M. Haviland-Jones (Eds.), *Handbook of emotions* (2nd ed., pp. 623–636). New York: Guilford.
- Lewis, M., Alessandri, S. M., & Sullivan, M. W. (1992). Differences in shame and pride as a function of children's gender and task difficulty. *Child Development*, *63*, 630–638.
- Lieberz, K. A., Windmann, S., Geniole, S. N., McCormick, C. M., Mueller-Engelmann, M., Gruener, F., et al. (2017). The facial width-to-height ratio determines interpersonal distance preferences in the observer. *Aggressive Behavior*, *43*, 460–470.
- Lima, C. F., Alves, T., Scott, S. K., & Castro, S. L. (2014). In the ear of the beholder: How age shapes emotion processing in nonverbal vocalizations. *Emotion*, *14*, 145–160.
- Lima, C. F., Castro, S. L., & Scott, S. K. (2013). When voices get emotional: A corpus of nonverbal vocalizations for research on emotion processing. *Behavior Research Methods*, *45*, 1234–1245.
- Littlepage, G. E., Schmidt, G. W., Whisler, E. W., & Frost, A. G. (1995). An input-process-output analysis of influence and performance in problem-solving groups. *Journal of Personality and Social Psychology*, *69*, 877–889.
- Lord, R. G., De Vader, C. L., & Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, *71*, 402–410.
- Mackie, D. M., & Smith, E. R. (2018). Intergroup emotions theory: Production, regulation, and modification of group-based emotions. In J. M. Olson (Ed.), *Vol. 58. Advances in Experimental Social Psychology* (pp. 1–69). New York: Academic Press.
- Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, *98*, 224–253.

- Martens, J. P. (2014). The pride learning bias: Evidence that pride displays cue knowledge and guide social learning (T). University of British Columbia. Retrieved from <https://open.library.ubc.ca/collections/ubctheses/24/items/1.0166990>.
- Martens, J. P., & Tracy, J. L. (2013). The emotional origins of a social learning bias: Does the pride expression cue copying? *Social Psychological and Personality Science*, 4, 492–499.
- Martens, J. P., Tracy, J. L., Cheng, J., Parr, L. A., & Price, S. (2010). Do the chimpanzee bluff display and human pride expression share evolutionary origins? In *Poster presented at the annual meeting for the Society for Personality and Social Psychology*. Las Vegas, NV. January.
- Martens, J. P., Tracy, J. L., & Shariff, A. F. (2012). Status signals: Adaptive benefits of displaying and observing the nonverbal expressions of pride and shame. *Cognition and Emotion*, 26, 390–406.
- Maslow, A. H. (1936). The role of dominance in the social and sexual behavior of infrahuman primates: I. Observations at Vilas Park Zoo. *The Pedagogical Seminary and Journal of Genetic Psychology*, 48, 261–277.
- Mazur, A. (1985). A biosocial model of status in face-to-face primate groups. *Social Forces*, 64, 377–402.
- Mazur, A., & Booth, A. (1998). Testosterone and dominance in men. *Behavioral and Brain Sciences*, 21, 353–363.
- Mehta, P. H., & Josephs, R. A. (2010). Testosterone and cortisol jointly regulate dominance: Evidence for a dual-hormone hypothesis. *Hormones and Behavior*, 58, 898–906.
- Mehta, P. H., & Prasad, S. (2015). The dual-hormone hypothesis: A brief review and future research agenda. *Current Opinion in Behavioral Sciences*, 3, 163–168.
- Mercadante, E.J., & Tracy, J. L. (n.d.-a). Why, for some, more is never enough: The emotional underpinnings of greedy acquisition (in preparation).
- Mercadante, E.J., & Tracy, J.L. (n.d.-b). Hubristic pride predicts strategic dishonesty in response to status threats (in preparation).
- Mesoudi, A. (2011). *Cultural evolution: How Darwinian theory can explain human culture and synthesize the social sciences*. Chicago, IL: University of Chicago Press.
- Mueller, C. M., & Dweck, C. S. (1998). Praise for intelligence can undermine children's motivation and performance. *Journal of Personality and Social Psychology*, 75(1), 33–52.
- Muller, U., & Mazur, A. (1997). Facial dominance in Homo sapiens as honest signaling of male quality. *Behavioral Ecology*, 8, 569–579.
- Müller-Pinzler, L., Gazzola, V., Keysers, C., Sommer, J., Jansen, A., Frässle, S., et al. (2015). Neural pathways of embarrassment and their modulation by social anxiety. *NeuroImage*, 119, 252–261.
- Nelson, N. L., & Russell, J. A. (2011). When dynamic, the head and face alone can express pride. *Emotion*, 11, 990–993.
- Nelson, N. L., & Russell, J. A. (2014). Dynamic facial expressions allow differentiation of displays intended to convey positive and hubristic pride. *Emotion*, 14, 857–864.
- Norenzayan, A., & Heine, S. J. (2005). Psychological universals: What are they and how can we know? *Psychological Bulletin*, 131, 763–784.
- Orth, U., Robins, R. W., & Soto, C. J. (2010). Tracking the trajectory of shame, guilt, and pride across the life span. *Journal of Personality and Social Psychology*, 99, 1061–1071.
- Over, H., Carpenter, M., Spears, R., & Gattis, M. (2013). Children selectively trust individuals who have imitated them. *Social Development*, 22, 215–224.
- Parker, S. T. (1994). Incipient mirror self-recognition in zoo gorillas and chimpanzees. In S. T. Parker, R. W. Mitchell, & M. L. Boccia (Eds.), *Self-awareness in animals and humans* (pp. 301–307). Cambridge: Cambridge University Press.
- Patterson, F., & Cohn, R. H. (1994). Self-recognition and self-awareness in lowland gorillas. In S. T. Parker, R. W. Mitchell, & M. L. Boccia (Eds.), *Self-awareness in animals and humans* (pp. 273–290). Cambridge: Cambridge University Press.
- Pinker, S. (2002). *The blank slate: The modern denial of human nature*. London: Penguin.

- Plutchik, R. (1980). *Emotion: A psychoevolutionary synthesis*. New York: Harper and Row.
- Puts, D. A., Apicella, C. L., & Cárdenas, R. A. (2012). Masculine voices signal men's threat potential in forager and industrial societies. *Proceedings of the Royal Society B: Biological Sciences*, *279*, 601–609.
- Rendell, L., Boyd, R., Cownden, D., Enquist, M., Eriksson, K., Feldman, M. W., et al. (2010). Why copy others? Insights from the social learning strategies tournament. *Science*, *328*, 208–213.
- Reyes-Garcia, V., Molina, J. L., McDade, T. W., Tanner, S. N., Huanca, T., & Leonard, W. R. (2009). Inequality in social rank and adult nutritional status: Evidence from a small-scale society in the Bolivian Amazon. *Social Science & Medicine*, *69*, 571–578.
- Roberts, B. W., Wood, D., & Caspi, A. (2008). The development of personality traits in adulthood. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (pp. 375–398). New York, NY: Guilford Press.
- Robins, R. W., Tracy, J. L., & Trzesniewski, K. (2010). Naturalizing the self. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality* (3rd ed., pp. 421–447). New York: Guilford.
- Ronay, R., Greenaway, K., Anicich, E. M., & Galinsky, A. D. (2012). The path to glory is paved with hierarchy: When hierarchical differentiation increases group effectiveness. *Psychological Science*, *23*, 669–677.
- Roseman, I. J. (1991). Appraisal determinants of discrete emotions. *Cognition and Emotion*, *5*, 161–200.
- Sadalla, E. K., Kenrick, D. T., & Vershure, B. (1987). Dominance and heterosexual attraction. *Journal of Personality and Social Psychology*, *52*, 730–738.
- Sauter, D., & Scott, S. K. (2007). More than one kind of happiness: Can we recognize vocal expressions of different positive states? *Motivation and Emotion*, *31*, 192–199.
- Shaller, G. B. (1963). *The mountain gorilla: Ecology and behavior*. Chicago, IL: University of Chicago Press.
- Schmader, T., & Lickel, B. (2006). The approach and avoidance function of guilt and shame emotions: Comparing reactions to self-caused and other-caused wrongdoing. *Motivation and Emotion*, *30*, 42–55.
- Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of well-being: Informative and directive functions of affective states. *Journal of Personality and Social Psychology*, *45*, 513.
- Sedikides, C., Skowronski, J. J., & Dunbar, R. I. M. (2006). When and why did the human self evolve. In M. Schaller, J. A. Simpson, & D. Kenrick (Eds.), *Evolution and social psychology: Frontiers in social psychology* (pp. 55–80). New York, NY: Psychology Press.
- Sell, A., Cosmides, L., & Tooby, J. (2014). The human anger face evolved to enhance cues of strength. *Evolution and Human Behavior*, *35*, 425–429.
- Shariff, A. F., & Tracy, J. L. (2009). Knowing who's boss: Implicit perceptions of status from the nonverbal expression of pride. *Emotion*, *9*, 631–639.
- Shariff, A. F., & Tracy, J. L. (2011). What are emotion expressions for? *Current Directions in Psychological Science*, *20*, 395–399.
- Shariff, A. F., Tracy, J. L., Cheng, J. T., & Henrich, J. (2010). Further thoughts on the evolution of pride's two facets: A response to Clark. *Emotion Review*, *2*, 399–400.
- Shariff, A. F., Tracy, J. L., & Markusoff, J. L. (2012). (Implicitly) judging a book by its cover: The power of pride and shame expressions in shaping judgments of social status. *Personality and Social Psychology Bulletin*, *38*, 1178–1193.
- Shi, Y., Chung, J. M., Cheng, J. T., Tracy, J. L., Robins, R. W., Chen, X., & Zheng, Y. (2015). Cross-cultural evidence for the two-facet structure of pride. *Journal of Research in Personality*, *55*, 61–74.

- Sigall, H., & Gould, R. (1977). The effects of self-esteem and evaluator demandingness on effort expenditure. *Journal of Personality and Social Psychology*, 35, 12–20.
- Simon-Thomas, E. R., Godzik, J., Castle, E., Antonenko, O., Ponz, A., Kogan, A., et al. (2012). An fMRI study of caring *vs* self-focus during induced compassion and pride. *Social Cognitive and Affective Neuroscience*, 7, 635–648.
- Simon-Thomas, E. R., Keltner, D. J., Sauter, D., Sinicropi-Yao, L., & Abramson, A. (2009). The voice conveys specific emotions: Evidence from vocal burst displays. *Emotion*, 9, 838–846.
- Steckler, C., & Tracy, J. L. (2014). The emotional underpinnings of social status. In J. T. Cheng, J. L. Tracy, & C. Anderson (Eds.), *The psychology of social status* (pp. 201–224). New York, NY: Springer.
- Stipek, D., Recchia, S., & McClintic, S. (1992). Self-evaluation in young children. *Monographs of the Society for Research in Child Development*, 57(1), 1–98, Serial No. 226.
- Stirrat, M., Stulp, G., & Pollet, T. V. (2012). Male facial width is associated with death by contact violence: Narrow-faced males are more likely to die from contact violence. *Evolution and Human Behavior*, 33, 551–556.
- Stogdill, R. M. (1974). *Handbook of leadership* (1st ed.). New York: Free Press.
- Suarez, S., & Gallup, G. G. (1981). Self recognition in chimpanzees and orangutans, but not gorillas. *Journal of Human Evolution*, 10, 175–188.
- Takahashi, H., Matsuura, M., Koeda, M., Yahata, N., Suhara, T., Kato, M., et al. (2008). Brain activations during judgments of positive self-conscious emotion and positive basic emotion: Pride and joy. *Cerebral Cortex*, 18, 898–903.
- Takahashi, H., Yahata, N., Koeda, M., Matsuda, T., Asai, K., & Okubo, Y. (2004). Brain activation associated with evaluative processes of guilt and embarrassment: An fMRI study. *NeuroImage*, 23, 967–974.
- Tangney, J. P., & Dearing, R. L. (2002). *Shame and guilt*. New York: Guilford.
- Tangney, J. P., & Fischer, K. W. (Eds.), (1995). *Self-conscious emotions: The psychology of shame, guilt, embarrassment, and pride*. New York: Guilford.
- Tangney, J. P., Wagner, P., & Gramzow, R. (1989). *The test of self-conscious affect (TOSCA)*. Fairfax, VA: George Mason University.
- Tenney, E. R., Meikle, N. L., Hunsaker, D., Moore, D. A., & Anderson, C. (2019). Is overconfidence a social liability? The effect of verbal versus nonverbal expressions of confidence. *Journal of Personality and Social Psychology*, 116, 396–415.
- Tenney, E. R., Small, J. E., Kondrad, R. L., Jaswal, V. K., & Spellman, B. A. (2011). Accuracy, confidence, and calibration: How young children and adults assess credibility. *Developmental Psychology*, 47, 1065–1077.
- Tiedens, L. Z., Ellsworth, P. C., & Mesquita, B. (2000). Sentimental stereotypes: Emotional expectations for high- and low-status group members. *Personality and Social Psychology Bulletin*, 26, 560–575.
- Tinbergen, N. (1963). On aims and methods of ethology. *Zeitschrift für Tierpsychologie*, 20, 410–433.
- Todorov, A. (2005). Inferences of competence from faces predict election outcomes. *Science*, 308, 1623–1626.
- Tracy, J. L. (2016). *Take pride: Why the deadliest sin holds the secret to human success*. Boston: Houghton Mifflin Harcourt.
- Tracy, J. L., Cheng, J. T., Martens, J. P., & Robins, R. W. (2011). The emotional dynamics of narcissism: Inflated by pride, deflated by shame. In W. K. Campbell & J. D. Miller (Eds.), *The handbook of narcissism and narcissistic personality disorder: Theoretical approaches, empirical findings, and treatments* (pp. 330–343). Hoboken, NJ: John Wiley & Sons.
- Tracy, J. L., Cheng, J. T., Robins, R. W., & Trzesniewski, K. H. (2009). Authentic and hubristic Pride: The affective core of self-esteem and narcissism. *Self and Identity*, 8, 196–213.

- Tracy, J. L., & Matsumoto, D. (2008). The spontaneous expression of pride and shame: Evidence for biologically innate nonverbal displays. *Proceedings of the National Academy of Sciences of the United States of America*, *105*, 11655–11660.
- Tracy, J. L., & Prehn, C. (2012). Arrogant or self-confident? The use of contextual knowledge to differentiate hubristic and authentic pride from a single nonverbal expression. *Cognition and Emotion*, *26*, 14–24.
- Tracy, J. L., & Randles, D. (2011). Four models of basic emotions: A review of Ekman and Cordaro, Izard, Levenson, and Panksepp and Watt. *Emotion Review*, *3*, 397–405.
- Tracy, J. L., & Robins, R. W. (2004a). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry*, *15*, 103–125.
- Tracy, J. L., & Robins, R. W. (2004b). Show your pride: Evidence for a discrete emotion expression. *Psychological Science*, *15*, 194–197.
- Tracy, J. L., & Robins, R. W. (2007a). The nature of pride. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research* (pp. 263–282). New York, NY: Guilford Press.
- Tracy, J. L., & Robins, R. W. (2007b). The prototypical pride expression: Development of a nonverbal behavior coding system. *Emotion*, *7*, 789–801.
- Tracy, J. L., & Robins, R. W. (2007c). The psychological structure of pride: A tale of two facets. *Journal of Personality and Social Psychology*, *92*, 506.
- Tracy, J. L., & Robins, R. W. (2007d). Emerging insights into the nature and function of pride. *Current Directions in Psychological Science*, *16*, 147–150.
- Tracy, J. L., & Robins, R. W. (2008a). The automaticity of emotion recognition. *Emotion*, *8*, 81–95.
- Tracy, J. L., & Robins, R. W. (2008b). The nonverbal expression of pride: Evidence for cross-cultural recognition. *Journal of Personality and Social Psychology*, *94*, 516–530.
- Tracy, J. L., Robins, R. W., & Lagattuta, K. H. (2005). Can children recognize pride? *Emotion*, *5*, 251–257.
- Tracy, J. L., Robins, R. W., & Schriber, R. A. (2009). Development of a FACS-verified set of basic and self-conscious emotion expressions. *Emotion*, *9*, 554–559.
- Tracy, J. L., Robins, R. W., Schriber, R. A., & Solomon, M. (2011). Is emotion recognition impaired in individuals with autism spectrum disorders? *Journal of Autism and Developmental Disorders*, *41*, 102–109.
- Tracy, J. L., Shariff, A. F., & Cheng, J. T. (2010). A naturalist's view of pride. *Emotion Review*, *2*, 163–177.
- Tracy, J. L., Shariff, A. F., Zhao, W., & Henrich, J. (2013). Cross-cultural evidence that the nonverbal expression of pride is an automatic status signal. *Journal of Experimental Psychology: General*, *142*, 163–180.
- Trivers, R. (1985). *Social evolution*. Menlo Park, CA: Benjamin Cummings.
- Van Der Schalk, J., Bruder, M., & Manstead, A. (2012). Regulating emotion in the context of interpersonal decisions: The role of anticipated pride and regret. *Frontiers in Psychology*, *3*, 513.
- Van Kleef, G. A., Homan, A. C., Finkenauer, C., Gündemir, S., & Stamkou, E. (2011). Breaking the rules to rise to power how norm violators gain power in the eyes of others. *Social Psychological and Personality Science*, *2*, 500–507.
- Verbeke, W., Belschak, F., & Bagozzi, R. P. (2004). The adaptive consequences of pride in personal selling. *Journal of the Academy of Marketing Science*, *32*, 386–402.
- von Rueden, C. (2014). The roots and fruits of social status in small-scale human societies. In J. Cheng, J. Tracy, & C. Anderson (Eds.), *The psychology of social status* (pp. 179–200). New York: Springer.
- von Rueden, C., Gurven, M., & Kaplan, H. (2011). Why do men seek status? Fitness payoffs to Dominance and Prestige. *Proceedings of the Royal Society B: Biological Sciences*, *278*, 2223.

- von Rueden, C. R., & Jaeggi, A. V. (2016). Men's status and reproductive success in 33 nonindustrial societies: Effects of subsistence, marriage system, and reproductive strategy. *Proceedings of the National Academy of Sciences of the United States of America*, *113*, 10824–10829.
- von Rueden, C. R., Redhead, D., O'Gorman, R., Kaplan, H., & Gurven, M. (2019). The dynamics of men's cooperation and social status in a small-scale society. *Proceedings of the Royal Society B: Biological Sciences*, *286*, 20191367.
- Weidman, A. C., Cheng, J. T., & Tracy, J. L. (2018). The psychological structure of humility. *Journal of Personality and Social Psychology*, *114*, 153–178.
- Weidman, A. C., Steckler, C. M., & Tracy, J. L. (2017). The jingle and jangle of emotion assessment: Imprecise measurement, casual scale usage, and conceptual fuzziness in emotion research. *Emotion*, *17*, 267–295.
- Weidman, A. C., Tracy, J. L., & Elliot, A. J. (2016). The benefits of following your pride: Authentic pride promotes achievement. *Journal of Personality*, *84*, 607–622.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, *92*, 548–573.
- Weisfeld, G. E., & Beresford, J. M. (1982). Erectness of posture as an indicator of dominance or success in humans. *Motivation and Emotion*, *6*, 113–131.
- Wiessner, P. (1996). Leveling the hunter: Constraints on the status quest in foraging societies. In P. Wiessner & W. Schiefelhoevel (Eds.), *Food and the status quest* (pp. 171–192). Providence: Bergahn Books.
- Williams, L. A., & DeSteno, D. (2008). Pride and perseverance: The motivational role of pride. *Journal of Personality and Social Psychology*, *94*, 1007–1017.
- Williams, L. A., & DeSteno, D. (2009). Pride: Adaptive social emotion or seventh sin? *Psychological Science*, *20*, 284–288.
- Witkower, Z., Hill, A., Koster, J., Pun, A., & Baron, A., & Tracy, J. L. (2020). Evidence for two distinct universally understood nonverbal signals of status in humans, in preparation.
- Witkower, Z., Mercadante, E. J., & Tracy, J. L. (2020). How affect shapes status: Distinct emotional experiences and expressions facilitate social hierarchy navigation. *Current Opinion in Psychology*, *33*, 18–22.
- Witkower, Z., & Tracy, J. L. (2019a). Bodily communication of emotion: Evidence for extrafacial behavioral expressions and available coding systems. *Emotion Review*, *11*, 184–193.
- Witkower, Z., & Tracy, J. L. (2019b). A facial action imposter: How head tilt influences perceptions of dominance from a neutral face. *Psychological Science*, *30*, 893–906.
- Witkower, Z., & Tracy, J. L., (n.d.). How and why head position changes the perception of facial expressions of emotion (under review).
- Witkower, Z., Tracy, J. L., Cheng, J. T., & Henrich, J. (2020). Two signals of social rank: Prestige and dominance are associated with distinct nonverbal displays. *Journal of Personality and Social Psychology*, *118*, 89–120.
- Witkower, Z., Tracy, J. L., & Lange, J. (n.d.). Illuminating the schade: Uncovering a distinct expression of schadenfreude (in preparation).
- Zahn, R., Moll, J., Paiva, M., Garrido, G., Krueger, F., Huey, E. D., & Grafman, J. (2009). The neural basis of human social values: Evidence from functional MRI. *Cerebral Cortex (New York, NY)*, *19*, 276–283.
- Zilioli, S., & Watson, N. V. (2014). Testosterone across successive competitions: Evidence for a 'winner effect' in humans? *Psychoneuroendocrinology*, *47*, 1–9.