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The Chicken and Egg of Pride and Social Rank

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**Abstract**

Prior research has found an association between pride experiences and social rank outcomes. However, the causal direction of this relationship remains unclear. The current research used a longitudinal design ( $N = 1,653$ ) to investigate whether pride experiences are likely to be a cause, consequence, or both, of social rank outcomes, by tracking changes in individuals' pride and social rank over time. Prior research also has uncovered distinct correlational relationships between the two facets of pride, authentic and hubristic, and two forms of social rank, prestige and dominance, respectively. We therefore separately examined longitudinal relationships between each pride facet and each form of social rank. Results reveal distinct bidirectional relationships between authentic pride and prestige, and hubristic pride and dominance, suggesting that specific kinds of pride experiences and specific forms of social rank are both an antecedent and a consequence of one another.

### The Chicken and Egg of Pride and Social Rank

Why do people feel pride? The answer may seem obvious; people feel pride when they achieve important goals that are relevant to their identity (Tracy & Robins, 2004). From an evolutionary perspective, however, the answer to this question must also address what pride makes humans *do*— that is, how feeling pride is functional in promoting behaviors that facilitate survival and reproduction. In fact, many researchers have argued that pride serves a critical evolutionary function: it helps individuals enhance and maintain their social rank (e.g., Nesse, 1990; Shiota et al., 2017; Tracy, Mercadante, Witkower, & Cheng, 2020; Williams & DeSteno, 2009; Witkower, Mercadante, & Tracy, 2020).

Supporting this account, experiences of pride motivate individuals to work hard towards greater achievements, and these accomplishments in turn promote the attainment and maintenance of social rank (Tracy, 2016; Weidman, Tracy, & Elliott, 2016). For example, Williams and DeSteno (2008) found that individuals who were experimentally manipulated to feel pride were more likely to subsequently persevere at tedious tasks, indicating that the experience of pride promotes a desire to achieve and the willingness to work hard to do so, even when that hard work is not immediately rewarding. Pride experiences have been found to improve performance in several domains, including public speaking tasks in laboratory studies (Herrald & Tomaka, 2001) and salespeople's organizational citizenship at work (Verbeke, Belschak, & Bagozzi, 2004).

These kinds of efforts are exactly the behaviors that typically lead to increases in social rank (e.g., Berger, Cohen, & Zelditch, 1972; Shepard 1954; Sutton & Hargadon, 1996). Although few studies have directly linked specific achievements to earned social rank, successful and accomplished individuals tend to acquire high status in stable, long-term social groups (e.g.,

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Cheng, Tracy, & Henrich, 2010; Faunce, 1984; Henrich & Gil-White, 2001; Miyamoto et al., 2018; Van Vugt, 2006). Similarly, among newly acquainted individuals, status is often granted to those who are considered intelligent, useful, and successful in achieving their goals (e.g., Anderson, Brion, Moore, & Kennedy, 2012; Bitterly, Brooks, & Schweitzer, 2017; Cheng, Tracy, Foulsham, Kingstone, & Henrich, 2013). Indeed, numerous studies have demonstrated that accomplished individuals are those who hold high social rank in the eyes of others, suggesting that individual achievements increase one's social rank.

In more direct evidence for an association between pride-motivated effort and resultant social rank, Williams and DeSteno (2009) found that individuals manipulated to feel pride prior to a group problem-solving task were subsequently perceived by fellow group members as more dominant, suggesting that pride experiences promote problem-solving and interpersonal behaviors that increase social standing. Other studies have shown that the cross-culturally recognized and displayed nonverbal expression of pride (Tracy & Matsumoto, 2008; Tracy & Robins, 2008) leads to automatic perceptions of high rank in observers (Brosi, Sporrle, Welpel, & Heilman, 2016; Shariff & Tracy, 2009; Shariff & Tracy, 2011; Shariff, Tracy, & Markusoff, 2013)—including observers from a non-Western, highly isolated, small-scale traditional society (Tracy, Shariff, Zhao, & Henrich, 2013). These findings suggest that humans may possess an evolved tendency to confer social rank upon prideful individuals (Tracy et al., 2020).

However, pride may be more than the emotional engine that drives individuals to pursue their status-related goals; it might also be the emotional reward at the finish line. Successful goal achievement elicits feelings of pride across a variety of domains and populations (Weidman & Tracy, 2020; Tracy et al., 2020), and these pleasurable feelings may serve as a psychological reward for succeeding in a valuable domain and gaining social rank. Thus, the tendency to feel

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pride after success may be an evolved adaptation that motivates individuals to strive for greater social status, and reinforces their efforts when successful, even though they may not consciously recognize a desire for pride as a motivation for task performance or social rank attainment (Sznycer et al., 2017; Tracy et al., 2020). More specifically, pride experiences occur in response to meaningful long-term achievements, such as competitive runners training for a marathon (Weidman, Tracy, & Elliot, 2016) and athletes winning an Olympic judo match (Tracy & Matsumoto, 2008). Pride is also experienced and expressed in response to more minor achievements, such as preschool children winning a fight (Strayer & Strayer, 1976), high-school and college students performing well on an exam or task (Weisfeld & Beresford, 1982; Weidman et al., 2016; Williams & DeSteno 2008; 2009), and children as young as 3 years old successfully completing a challenging task (Belsky, Domitrovich, & Crnic, 1997; Lewis, Alessandri, & Sullivan, 1992; Stipek, Recchia, & McClintic, 1992). In fact, pride responses to achievements tend to be calibrated to the social value of those achievements, such that people expect to feel greater pride in response to events that are more highly valued by members of their society (Sznycer et al., 2017).

Given that pride experiences seem to promote social rank attainment and maintenance; and socially valued achievements, which lead to increases in social rank, likewise elicit feelings of pride, the question arises: Which comes first—pride, or social rank? One possibility is that, like the age-old puzzle of the chicken and the egg, there is no clear unidirectional causal association; instead, the relationship between pride and social rank is bidirectional. In other words, pride experiences may be both a cause and a consequence of increased social rank, and, in the same way, social rank attainment may be both a cause and a consequence of pride experiences.

### **The two facets of pride and social rank**

Taking this theorizing a step further, it is possible that there are two distinct bidirectional relationships between pride and social rank, because both pride and social rank come in two distinct forms (Cheng et al., 2010; Tracy & Robins, 2007). More specifically, pride is comprised of two conceptual and experiential facets, which have been labeled authentic and hubristic pride (Tracy & Robins, 2007). Authentic pride is best understood as feelings of confidence and achievement, and is associated with a psychologically healthy and socially desirable personality profile marked by high levels of agreeableness and conscientiousness, intrinsic motivation, perseverance, and a tendency to engage in a range of prosocial behaviors including empathy, showing respect toward others, making non-prejudicial judgments of outgroups, and considering others' needs (Ashton- James & Tracy, 2013; Carver, Sinclair, & Johnson, 2010; Damian & Robins, 2013; Dickens & Robins, 2020; Michie, 2009; Tracy, Cheng, Robins, & Trzesniewski, 2009; Tracy & Robins, 2007; Verbeke, Belschak, & Bagozzi, 2004; Yeung & Shen, 2017). In contrast, hubristic pride refers to feelings of arrogance and conceit, and is associated with a more psychologically unhealthy and socially undesirable personality profile, marked by disagreeableness and low conscientiousness, psychopathologies such as depression and anxiety, and a tendency to engage in antisocial behaviors like aggression, prejudice, hostility, abusive supervision, and cheating (Ashton- James & Tracy, 2013; Bureau, Ballerand, Ntourmanis, & Lafreniere, 2013; Costello, Unterberger, Watts, & Lilienfeld, 2018; Dickens & Robins, 2020; Mercadante & Tracy, under review; Tracy et al., 2009; Tracy & Robins, 2007; Yeung & Shen, 2017). Despite these differences, however, the two pride facets may share the same evolutionary function: facilitating the attainment and maintenance of social rank (Tracy et al., 2020).

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If this is the case, and pride evolved to serve the distal function of promoting rank attainment, it seems clear how authentic pride does so: by motivating and rewarding hard work, persistence, and achievement, which in turn can boost one's social standing. Yet given the notably divergent psychological profile of hubristic pride, it is less clear how this facet of the emotion serves that same rank-promoting function. How might the experience of an antisocial, psychologically dysfunctional pride help individuals rise to power, particularly given that hubristic pride does not seem to promote hard work and perseverance? Previously, we have argued that the answer to this question resides in the Dominance and Prestige account of social rank attainment (Cheng et al., 2010; Tracy, Shariff, & Cheng, 2010; Tracy et al., 2020).

According to this account, humans evolved to use two distinct strategies to attain social rank: prestige, which involves the demonstration of knowledge and expertise to earn respect and freely chosen deference from followers who wish to learn from wise and skilled leaders; and dominance, which involves the use of aggression and intimidation to instill fear and induce forced deference from followers who obey only to avoid punishment (Cheng et al., 2010; Cheng & Tracy, 2014; Henrich & Gil-White, 2001). Both strategies have been found to effectively promote influence over others in social groups, across a wide range of cultures (Cheng et al., 2013; Cheng et al., 2010; Henrich & Gil-White, 2001; Maner & Case, 2016; von Rueden, Gurven, & Kaplan, 2008; Witkower, Tracy, Cheng, & Henrich, 2020; Witkower et al., under review). Although both strategies effectively promote the attainment of social rank in short-term groups (e.g., Cheng et al., 2013), these strategies may differ in their impact on the maintenance of high social rank over time. One study found that prestige is more effective for the long-term attainment of social rank, whereas dominance may wane in effectiveness over time (Redhead, Cheng, Driver, Foulsham, & O'Gorman, 2018).

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Studies bridging the research supporting a dual-faceted structure of pride with research demonstrating two distinct forms of social rank have found that self-reported authentic pride is typically positively correlated with both dominance and prestige, but more strongly with prestige. Hubristic pride, in contrast, is strongly positively correlated with dominance, and negatively correlated with prestige (Cheng et al., 2010; Dickens & Robins, 2020). Notably, when dominance and prestige are measured via peer-report, arguably a more reliable and valid means of assessing social rank than self-report, prestige is uniquely associated with authentic pride, and dominance is uniquely associated with hubristic pride. In other words, peer ratings show that each rank strategy is related only to the more relevant form of pride (Cheng et al., 2010). Given the evidence reviewed above suggesting the possibility of a bidirectional relationship between generalized pride and social rank, we hypothesize that the relationships between authentic pride and prestige, and between hubristic pride and dominance, respectively, are bidirectional as well.

Specifically, authentic pride may promote and sustain prestige through its associated subjective feelings of accomplishment and achievement, which may mentally prepare individuals to exert the sustained effort needed to acquire knowledge, expertise, and become well-liked—all critical attributes for a prestigious leader. Correspondingly, prestige earned through demonstrations of valuable skills and knowledge is likely to result in the feelings of accomplishment, confidence, and productivity that constitute authentic pride. In a parallel manner, hubristic pride may promote and sustain dominance through its subjective feelings of superiority and arrogance, which might mentally prepare and motivate individuals to intimidate subordinates using tactics like aggression, hostility, and manipulation. These behaviors, over time, are likely to promote a dominant reputation. Those who attain dominance and the power



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that goes along with it are, in turn, likely to experience the feelings of superiority, egotism, and arrogance that constitute hubristic pride.

### **The Present Research**

To test our hypothesis of bidirectional causality between pride and status, we conducted a large-scale longitudinal study ( $N=1,653$  across waves) over the course of two academic semesters. We used cross-lagged longitudinal path analysis to test four predictions: (a) authentic pride in Term 1 would predict increases in prestige at Term 2; (b) prestige in Term 1 would predict increases in authentic pride at Term 2; (c) hubristic pride in Term 1 would predict increases in dominance at Term 2; and (d) dominance in Term 1 would predict increases in hubristic pride at Term 2.

### **Method**

#### **Participants**

Participants from a large west-coast Canadian university were recruited during the Fall, 2018 ( $n = 3260$ ), and Spring, 2019 ( $n = 3857$ ), semesters of the same academic year to complete the study in exchange for course credit. A total of 1,681 participants (80% women;  $M$  age = 20.50 years,  $SD$  age = 2.95 years; 41% East Asian, 24% White/European, 10% South Asian, 11% South East Asian) completed surveys in both semesters (i.e., 52% of the participants who completed the survey in the fall also completed it in the spring; individuals who completed both waves were used in all analyses). These individuals were permitted to complete the survey at any point during the semester, but most did so within the first month (for Term 1, 75% completed the survey in September, 2018; for Term 2, 78% completed the survey in January, 2019), such that the two waves of data were collected between 95 and 210 days apart ( $M = 125.7$  days,  $SD = 19.55$  days). Data were collected as part of a 30-minute pre-testing questionnaire that all

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undergraduate psychology students are encouraged to complete at the beginning of each semester. We did not have a pre-established rule for determining our sample size; we collected data from all participants who independently chose to complete this pre-testing questionnaire throughout the semesters.

### **Measures**

#### *Trait authentic and hubristic pride*

At each wave, participants completed a shortened, 8-item version of the Authentic and Hubristic Pride Scales (Tracy & Robins, 2007) at the trait-level by reporting how often they generally feel each of the items. This abbreviated version of the scale has been found to be highly reliable in prior work (see Mercadante & Tracy, under review). Specifically, authentic pride was assessed with the following four items: “accomplished”, “confident”, “productive”, and “like I am achieving”, which participants rated on a 5-point Likert scale ranging from 1 (Not at all) to 5 (Extremely) ( $\alpha_{\text{wave1}} = .74$ ;  $\alpha_{\text{wave2}} = .76$ ; see Table 1). Hubristic pride was assessed with the same prompt and rating scale using the following four items: “arrogant”, “smug”, “stuck-up”, and “egotistical” ( $\alpha_{\text{wave1}} = .76$ ;  $\alpha_{\text{wave2}} = .79$ ; see Table 1).

#### *Dominance and Prestige*

At each wave, participants also completed a shortened, 8-item version of the Dominance and Prestige scales (Cheng et al., 2010). Included items were those that had the highest factor loadings on each dimension across the two studies that were originally used to validate the full scale (see Cheng et al., 2010). Specifically, prestige was assessed with the following four items: “I am considered an expert on some matters,” “My unique talents and abilities are recognized by others,” “Others seek my advice on a variety of matters,” and “Members of my peer group respect and admire me”, which participants rated on a 7-point Likert scale ranging from 1 (Not at

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all) to 7 (Very much) ( $\alpha_{\text{wave1}} = .74$ ;  $\alpha_{\text{wave2}} = .76$ ; see Table 1). Dominance was assessed with the following four items: “I enjoy having control over others,” “I am willing to use aggressive tactics to get my way,” “I often try to get my way regardless of what people may want,” and “I try to control others rather than permit them to control me” ( $\alpha_{\text{wave1}} = .80$ ;  $\alpha_{\text{wave2}} = .81$ ; see Table 1).

### *Self-esteem*

At the Term 1 assessment, participants also completed the Single-Item Self-Esteem scale (Robins, Hendin, & Trzesniewski, 2001). This entailed responding to the item, “I have high self-esteem”, using a rating scale ranging from 1 (Not very true of me) to 7 (Very true of me).

### *Life Satisfaction*

During the first wave, participants completed the single-item version of the Satisfaction With Life Scale (SWLS; Cheung & Lucas, 2014): “In general, how satisfied are you with your life?”, using a rating scale ranging from 1 (Very dissatisfied) to 7 (Very satisfied).

## **Results**

All data and R code are available online ([here](#)). A cross-lagged longitudinal path analysis was conducted to assess the relations between authentic pride, hubristic pride, prestige, and dominance across time. Rather than constructing two separate cross-lagged path analyses – one examining relations between authentic pride and prestige and the other examining relations between hubristic pride and dominance – we included all variables in a single model to simultaneously test the strength and distinctiveness of all hypothesized effects. This model therefore simultaneously tests whether the pathways included are statistically significant, and whether pathways between variables that are not expected to covary are, in fact, unnecessary for the model to sufficiently fit the data. Consistent with this goal, in our initial model we did not allow cross-lags in either direction between prestige and hubristic pride or dominance and

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authentic pride, as prior research suggests that these pairs of constructs are not strongly intercorrelated (Cheng et al., 2010). However, we planned to incorporate these pathways if the hypothesized model did not sufficiently fit the data. All predictors (i.e., variables at Wave 1) were permitted to intercorrelate, and all criteria (i.e., variables at Wave 2) were permitted to intercorrelate. There was minimal missing data (2%), and all missing values were imputed using Full Information Maximum Likelihood (FIML). Utilizing pairwise deletion rather than FIML did not change any of the regression coefficients presented in Figure 1.

Our hypothesized model fit the data well (see Figure 1),  $\chi^2(8) = 21.90, p = .005^1$ , CFI = .998, TLI = .991, RMSEA = .032 [95% CI: .017 to .049], SRMR = .018. Cross lags between each facet of pride and the corresponding form of social rank were significant,  $ps < .001$ .

Authentic pride at Wave 1 predicted prestige at Wave 2 controlling for Wave 1 prestige ( $\beta = .16, Z = 8.26, p < .001$ ), and hubristic pride at Wave 1 predicted dominance at Wave 2 controlling for Wave 1 dominance ( $\beta = .11, Z = 5.85, p < .001$ ). In other words, individuals dispositionally prone to authentic pride at Wave 1 showed increases in prestige over the course of several months, and individuals prone to hubristic pride at Wave 1 showed increases in dominance over that time period (for coefficients and model specifications, see Figure 1). Significant cross lags also emerged between each form of social rank and the corresponding facet of pride; prestige at Wave 1 predicted authentic pride at Wave 2 controlling for authentic pride at Wave 1 ( $\beta = .10, Z = 5.00, p < .001$ ), and dominance at Wave 1 predicted hubristic pride at Wave 2 controlling for hubristic pride at Wave 1 ( $\beta = .09, Z = 4.21, p < .001$ ). In other words, being highly prestigious at

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<sup>1</sup> In general, the larger the sample size, the more likely a model will fail to “fit” (with conventional  $p < .05$  threshold) using the  $\chi^2$  exact fit test. Given the large sample size in the current study, we focus on other approximate indices to assess model fit (e.g., Barrett, 2007; Bentler & Bonett, 1980; Hu & Bentler, 1999).

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Wave 1 was associated with subsequent increases in trait authentic pride, and being highly dominant at Wave 1 was associated with subsequent increases in trait hubristic pride.

All stability coefficients were significant ( $\beta_s \geq .61$ ,  $Z_s \geq 30.76$ ,  $ps < .001$ ), consistent with the expectation that a propensity to experience each facet of pride or each form of social rank is a stable trait-like disposition. All cross lags and stability coefficients held when analyzing data from men only and women only; for SEM models separated by gender, see SOM.

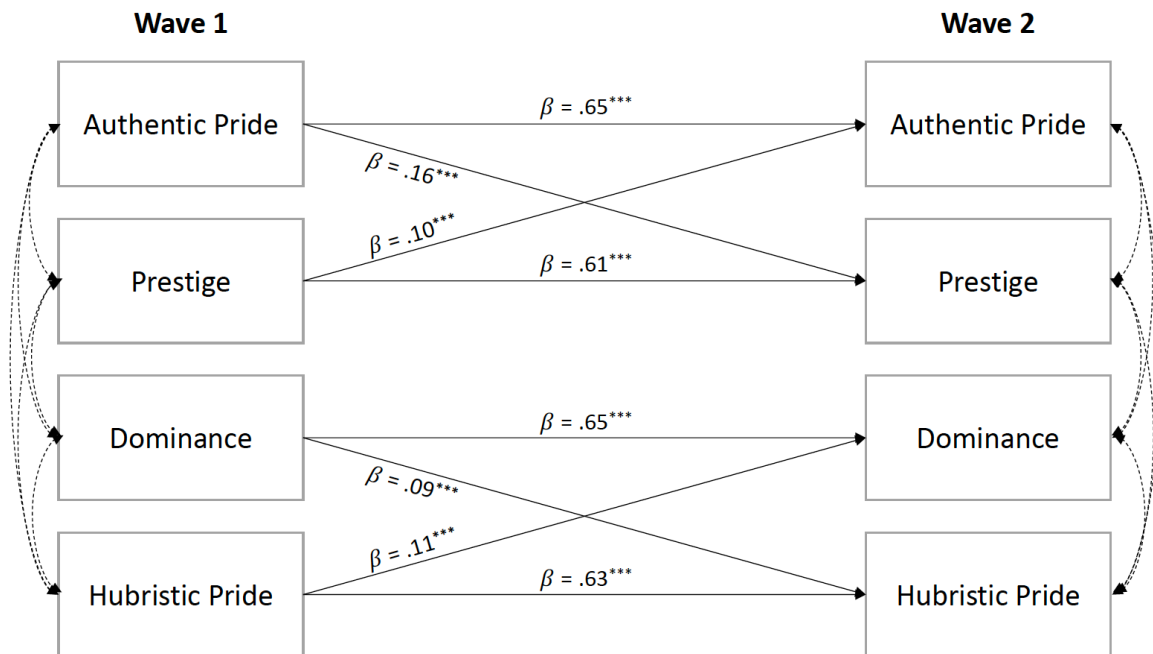


Figure 1. Cross-lagged longitudinal path analysis of the longitudinal relationships between authentic pride, hubristic pride, prestige, and dominance.

*Table 1. Bivariate correlations between all continuous measures, for participants who completed both waves.*

	1	2	3	4	5	6	7	8	9	10
Wave 1										
1. Authentic pride	0.80									
2. Hubristic pride	.15***	0.76								
3. Prestige	.48***	.06*	0.76							
4. Dominance	.13***	.48***	.18***	0.80						
5. Self-Esteem	.58***	.18***	.41***	.21***	--					
6. Life Satisfaction	.50***	-.05*	.33***	-0.02	.43***	--				
Wave 2										
7. Authentic pride	.70***	.08***	.41***	.10***	.50***	.45***	0.82			
8. Hubristic pride	.09***	.67***	.03	.39***	.14***	-.06*	.15***	0.80		
9. Prestige	.46***	.01	.69***	.08**	.37***	.32***	.50***	-.01	0.80	
10. Dominance	.12***	.42***	.14***	.71***	.19***	-.01	.13***	.48***	.14***	0.81

\*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

*Note:* Cronbach's alphas are presented on the diagonal.

### **Exploratory follow-up tests**

One possibility is that individuals who hold positive self-views or are globally satisfied with their lives are more likely to be admired and respected (i.e., prestigious); these individuals are also likely to feel frequent authentic pride. In fact, self-esteem has been found to be positively correlated with both prestige and authentic pride (Tracy, Cheng, Robins, & Trzesniewski, 2004; Brown & Marshall, 2001; Tracy & Robins, 2004; Cheng et al., 2010). Therefore, to test the specificity of the hypothesized relationship between authentic pride and prestige, and ensure that observed effects were not due to shared variance with self-esteem or life satisfaction, we constructed a follow-up model including self-esteem and life satisfaction as covariates. Both covariates were allowed to correlate with all other predictors in the model (i.e., all Wave 1 variables, including each other), and were included as additional predictors of all criterion variables (i.e., Wave 2 variables). All other correlations, cross-lags, stability coefficients, and omitted pathways presented in Figure 1 were retained in the model.

The resulting model fit the data well,  $\chi^2(8) = 19.70, p = .012, CFI > .99, TLI = .99, RMSEA = .030, 95\% CI: [.013 to .046], SRMR = .014$ . Consistent with our primary model, cross lags between each facet of pride at Wave 1 and the corresponding form of social rank at Wave 2 were significant; authentic pride at Wave 1 predicted prestige at Wave 2 controlling for Wave 1 prestige, self-esteem, and life satisfaction ( $\beta = .14, Z = 5.85, p < .001$ ); and hubristic pride at Wave 1 predicted dominance at Wave 2 controlling for Wave 1 dominance, self-esteem, and life satisfaction ( $\beta = .11, Z = 5.49, p < .001$ ). Significant cross lags also emerged between each form of social rank at Wave 1 and the corresponding facet of pride at Wave 2; prestige at Wave 1 predicted authentic pride at Wave 2 controlling for Wave 1 authentic pride, self-esteem, and life satisfaction ( $\beta = .07, Z = 3.46, p = .001$ ); and dominance at Wave 1 predicted hubristic

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pride at Wave 2 controlling for Wave 1 hubristic pride, self-esteem, and life satisfaction ( $\beta = .08$ ,  $Z = 4.05$ ,  $p < .001$ ). These results suggest that the overall pattern of relations shown in Figure 1 is not attributable to shared variance in self-esteem or life satisfaction (for more details, and models with covariates separated by participant sex, see SOM).

An additional follow-up model that included all features of the baseline model with the addition of two bidirectional cross-lags between authentic pride and dominance was constructed, given prior research suggesting a positive correlation between these two variables at the zero-order level, when both are measured through self-report. Including these two additional cross-lags did not significantly improve the model fit,  $\chi^2_{\text{diff}}(2) = 1.62$ ,  $p = .45$ . The pattern of results reported for the baseline model was robust to the inclusion of these additional cross-lags, and neither cross-lag was significant,  $\beta_s < .02$ ,  $Z_s < 1.05$ ,  $p_s > .30$  (for full reporting of that model, see SOM).

## Discussion

The current research provides the first evidence for bidirectional relationships between authentic pride and changes in prestige, and hubristic pride and changes in dominance, and vice-versa, over the course of several months. Specifically, we found that trait authentic pride predicts subsequent increases in prestige, and prestige likewise predicts subsequent increases in authentic pride. Similarly, hubristic pride predicts subsequent increases in dominance, and dominance predicts subsequent increases in hubristic pride. However, it is important to note that the magnitude of these significant cross-lags was relatively small ( $.09 \leq \beta_s \leq .16$ ). This may be due to the fact that we measured change over a short period of time (a few months), and studies have shown that stable personality traits do not shift considerably over such short periods (e.g., Damian, Spengler, Sutu, & Roberts, 2019).



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Indeed, we also found that individuals have fairly stable trait-like tendencies to experience each facet of pride across this time period (all stability coefficient  $\beta$ s  $\geq .65$ ). This result is consistent with the notion that individuals are prone to chronically experience each facet of pride to a certain degree, and these feelings lead them to commonly experience the subjective feelings, cognitions, and motivations that promote a dominant or prestigious reputation (Cheng et al., 2010). Similarly, self-reported prestige and dominance are also largely stable over time ( $\beta$ s  $\geq .61$ ), consistent with the notion that individuals are prone to repeatedly and regularly engage in prestige or dominance strategies over time, which in turn might lead them to repeatedly experience feelings of authentic and hubristic pride, respectively.

Taken together, these results suggest that self-reported prestige, dominance, authentic pride, and hubristic pride are stable over time, but not completely unchanging. The present findings highlight factors that contribute to change in all four dimensions: changes in prestige and dominance that occurred by Wave 2 were partially explained by authentic and hubristic pride at Wave 1, respectively, and changes in authentic and hubristic pride that occurred by Wave 2 were partially explained by levels of prestige and dominance at Wave 1, respectively. Furthermore, these relationships were distinctive; the model fit the data well without including cross-lags between hubristic pride and prestige (and vice-versa), or authentic pride and dominance (and vice-versa).

Although cross-lagged path analysis provides an important step towards assessing causality, future research should more directly test whether the relationships documented here are in fact causal, using experimental manipulation. Specifically, studies are needed to manipulate each facet of pride and assess consequent status-striving behaviors and social rank outcomes; and, correspondingly, to manipulate each form of social rank and assess consequent

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state-level pride experiences. We would expect a pattern similar to the one uncovered in the current study, such that the experience of each facet of pride leads to behaviors that give rise to perceptions of the corresponding form of social rank in that moment, and successful attainment of each form of rank elicits the corresponding pride experience. However, given that dominant and prestigious reputations are built up over time, these relations might be difficult to uncover in a one-time experimental setting. It is more likely that systematic manipulations of authentic or hubristic pride, and of dominance- or prestige-based status, across repeated encounters among the same individuals over time, would have the predicted effects on status reputations and trait-level tendencies to feel each facet of pride, respectively.

In conclusion, the present research suggests that pride experiences and social rank outcomes are both an antecedent and a consequence of one another. These results provide an important step in understanding the interplay between distinct forms of pride and distinct forms of social rank, and they set the stage for future research to investigate how other distinct emotions that previously have been linked to social rank (e.g., anger; Keltner, Gruenfeld, & Anderson, 2003; Tiedens et al., 2001) both cause, and are the result of, distinct rank outcomes. A detailed understanding of the complex relationships between emotions and social rank may illuminate how and why certain people rise in social hierarchies while others do not, and explain their behaviors once rank has been achieved.

## References

- Anderson, C., Brion, S., Moore, D., & Kennedy, J. (2012). A status-enhancement account of overconfidence. *Journal of Personality and Social Psychology, 103*(4), 718-735.
- 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*(4), 466-476.
- Barrett, P. (2007). Structural equation modelling: Adjudging model fit. *Personality and Individual Differences, 42*(5), 815-824.
- Belsky, J., Domitrovich, C., & Crnic, K. (1997). Temperament and parenting antecedents of individual differences in three-year-old boys' pride and shame reactions. *Child Development, 68*(3), 456-466.
- Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88*(3), 588-606.
- Bitterly, T. B., Brooks, A. W., & Schweitzer, M. E. (2017). Risky business: When humor increases and decreases status. *Journal of Personality and Social Psychology, 112*(3), 431-455.
- 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*(6), 698-703.
- 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 *The psychology of social status* (pp. 3-27). Springer, New York, NY.

## Longitudinal relationships between pride and social rank

- Cheng, J. T., Tracy, J. L., & Henrich, J. (2010). Pride, personality, and the evolutionary foundations of human social status. *Evolution and Human Behavior*, *31*(5), 334-347.
- Cheung, F., & Lucas, R. E. (2014). Assessing the validity of single-item life satisfaction measures: Results from three large samples. *Quality of Life Research*, *23*(10), 2809-2818.
- Costello, T. H., Unterberger, A., Watts, A. L., & Lilienfeld, S. O. (2018). Psychopathy and pride: Testing Lykken's hypothesis regarding the implications of fearlessness for prosocial and antisocial behavior. *Frontiers in Psychology*, *9*, 185.
- 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.
- Damian, R. I., Spengler, M., Sutu, A., & Roberts, B. W. (2019). Sixteen going on sixty-six: A longitudinal study of personality stability and change across 50 years. *Journal of Personality and Social Psychology*, *117*(3), 674-695.
- Faunce, W. A. (1984). School achievement, social status, and self-esteem. *Social Psychology Quarterly*, 3-14.
- 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*(3), 165-196.
- 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*(2), 434-450.

## Longitudinal relationships between pride and social rank

- Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Keltner, D., Gruenfeld, D. H., & Anderson, C. (2003). Power, approach, and inhibition. *Psychological Review*, 110(2), 265-284.
- Lange, J., Cheng, J. C., Witkower, Z. & Tracy, J. L. (invited revision). Narcissism and rank attainment: The mediating role of pride.
- 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(3), 630-638.
- Liu, C., Lu, K., Yu, G., & Chen, C. (2012). Implicit association between authentic pride and prestige compared to hubristic pride and dominance. *Psychological Reports*, 111(2), 424-442.
- Liu, C., Yuan, L., Chen, C., & Yu, G. (2016). Authentic and hubristic pride as assessed by self, friends, and strangers. *Social Psychological and Personality Science*, 7(7), 690-696.
- Maner, J. K., & Case, C. R. (2016). Dominance and prestige: Dual strategies for navigating social hierarchies. In *Advances in Experimental Social psychology* (Vol. 54, pp. 129-180). Academic Press.
- Michie, S. (2009). Pride and gratitude: How positive emotions influence the prosocial behaviors of organizational leaders. *Journal of Leadership & Organizational Studies*, 15(4), 393-403.

## Longitudinal relationships between pride and social rank

- Miyamoto, Y., Yoo, J., Levine, C. S., Park, J., Boylan, J. M., Sims, T., ... & Coe, C. L. (2018). Culture and social hierarchy: Self-and other-oriented correlates of socioeconomic status across cultures. *Journal of Personality and Social Psychology, 115*(3), 427-445.
- Nesse, R. M. (1990). Evolutionary explanations of emotions. *Human Nature, 1*(3), 261-289.
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the Rosenberg Self-Esteem Scale. *Personality and Social Psychology Bulletin, 27*(2), 151-161.
- Shariff, A. F., & Tracy, J. L. (2011). What are emotion expressions for? *Current Directions in Psychological Science, 20*(6), 395-399.
- 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*(9), 1178-1193.
- Shiota, M., Campos, B., Oveis, C., Hertenstein, M. J., Simon-Thomas, E., & Keltner, D. (2017). Beyond happiness: Building a science of discrete positive emotions. *American Psychologist, 72*(7), 617-643.
- 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.
- Strayer, F. F., & Strayer, J. (1976). An ethological analysis of social agonism and dominance relations among preschool children. *Child Development, 47*, 980-989.
- Sznycer, D., Al-Shawaf, L., Bereby-Meyer, Y., Curry, O. S., De Smet, D., Ermer, E., ... & McClung, J. (2017). Cross-cultural regularities in the cognitive architecture of pride. *Proceedings of the National Academy of Sciences, 114*(8), 1874-1879.

## Longitudinal relationships between pride and social rank

- Tiedens, L. Z. (2001). Anger and advancement versus sadness and subjugation: the effect of negative emotion expressions on social status conferral. *Journal of Personality and Social Psychology*, 80(1), 86-94.
- Tracy, J. (2016). *Pride: The Secret of Success*. Houghton Mifflin Harcourt.
- 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*, 105(33), 11655-11660.
- Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry*, 15(2), 103-125.
- Tracy, J. L., & Robins, R. W. (2007). The psychological structure of pride: A tale of two facets. *Journal of Personality and Social Psychology*, 92(3), 506-525.
- Tracy, J. L., & Robins, R. W. (2008). The nonverbal expression of pride: Evidence for cross-cultural recognition. *Journal of Personality and Social Psychology*, 94(3), 516.
- 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(2-3), 196-213.
- Tracy, J. L., Mercadante, E., Witkower, Z., & Cheng, J. T. (in press). The evolution of pride and social hierarchy. *Advances in Experimental Social Psychology*.
- Tracy, J. L., Shariff, A. F., & Cheng, J. T. (2010). A naturalist's view of pride. *Emotion Review*, 2(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(1), 163-180.

## Longitudinal relationships between pride and social rank

- Van Vugt, M. (2006). Evolutionary origins of leadership and followership. *Personality and Social Psychology Review*, 10(4), 354-371.
- Verbeke, W., Belschak, F., & Bagozzi, R. P. (2004). The adaptive consequences of pride in personal selling. *Journal of the Academy of Marketing Science*, 32(4), 386-402.
- Von Rueden, C., Gurven, M., & Kaplan, H. (2008). The multiple dimensions of male social status in an Amazonian society. *Evolution and Human Behavior*, 29(6), 402-415.
- Weidman, A. C., Tracy, J. L., & Elliot, A. J. (2016). The benefits of following your pride: Authentic pride promotes achievement. *Journal of Personality*, 84(5), 607-622.
- Weisfeld, G. E., & Beresford, J. M. (1982). Erectness of posture as an indicator of dominance or success in humans. *Motivation and Emotion*, 6(2), 113-131.
- Williams, L. A., & DeSteno, D. (2008). Pride and Perseverance: The Motivational Role of Pride. *Journal of Personality and Social Psychology*, 94(6), 1007-1017.
- Williams, L. A., & DeSteno, D. (2009). Pride: Adaptive social emotion or seventh sin? *Psychological Science*, 20(3), 284-288.
- Witkower, Z., Hill, A., Koster, J., Pun, A., & Baron, A., & Tracy, J. L. (under review). Nonverbal displays of dominance and prestige: Evidence for cross-cultural and early-emerging recognition.
- 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., 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(1), 89-120.



## Longitudinal relationships between pride and social rank

Yeung, E., & Shen, W. (2019). Can pride be a vice and virtue at work? Associations between authentic and hubristic pride and leadership behaviors. *Journal of Organizational Behavior*, 40(6), 605-624.