



Functional trade-offs in authentic pride and gender differences among U.S. undergraduates

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Abstract

Tracy and Robins (*Psychological Inquiry*, 15(2), 103–125, 2004) theorized that there are two facets of pride: authentic (e.g., “accomplished”) and hubristic (e.g., “arrogant”). While these facets are assumed to function simultaneously over time, it remains unclear whether they differ by gender, given that pride is associated with various social behaviors (Magee *Journal of Happiness Studies*, 16(5), 1091–1115, 2015; Yeung & Shen *Journal of Organizational Behavior*, 40(6), 605–624, 2019). In this study, we recruited 118 U.S. college students (54.2% female; 49.18% Non-Hispanic White; mean age = 19.12 years) who participated in a group discussion task and reported their levels of authentic and hubristic pride at three-time points. We used the Repeated-Measures Actor-Partner Interdependence Model (RM-APIM, Kenny et al., 2006) and calculated two change scores (e.g., T2 - T1) as outcomes for the dependent variables. We also graphed the topological state of each facet of pride simultaneously (Butner et al. *Psychological Methods*, 20, 1–25, 2015). Our findings suggest that: (1) both facets significantly predicted their stability over time for both genders, and (2) females had a lower value of authentic pride but reached stability in authentic pride more quickly than males. These results suggest that females may be more quickly guided by what they perceive as socially expected behavior by themselves and others in authentic pride, even at lower values. In contrast, males may prioritize maintaining higher levels of authentic pride over quickly responding to social cues.

Keywords Dynamical systems theory · Trade-off · Authentic pride · Hubristic pride · And gender difference

Pride is not a simple or basic emotion but rather is constructed from various components such as the reward system, self and others expectations in the brain (neural substrates; LeDoux & Brown, 2017; Tracy & Robins, 2007a, b). Social cognition indicates the process by which people understand and interpret social information, including others’ thoughts and feelings, which emphasizes the socially constructed nature of pride, potentially indicating that it’s shaped by social norms, interactions, and understandings, including seeking, attaining, and signaling power and status

(Cheng et al., 2010). Pride, thus, reflects the intentions or motives of oneself, others, and even larger social groups (Salice & Montes Sánchez, 2016; Takahashi et al., 2008; van Osch et al., 2018).

Two facets of pride have been distinguished: *authentic* and *hubristic* (Tracy & Robins, 2004, 2007a, b). These two facets are conceptually distinguished by how states of the self, as the object of the self-regulatory system, are mentally represented (Lewis, 2000; Tracy & Robins, 2004). Authentic pride (“AP” hereafter) focuses more on *positive* views of the self (e.g., “fulfilled,” “productive”), and hubristic pride (“HP” hereafter) focuses more on *negative* views of the self (e.g., “arrogant,” “conceited”) (Tracy & Robins, 2004, 2007a, b; Tracy et al., 2009). Further, AP may reflect views of prestige (e.g., eminence, status), while HP is associated with social dominance (Bolló et al., 2018).

Once pride emerges, it can trigger behavioral changes that may either be helpful or hurtful for the self (Eagly & Wood, 2012; Leary, 2007; Lewis, 2000; Tracy & Robins, 2004). As such, pride is often considered critical for self-referenced rewards after accomplishing a certain task (Roth

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et al., 2014; Takahashi et al., 2008). Higher AP is associated with greater reward sensitivity, persistence, self-control, racial socialization, and age, whereas higher HP is related to alcohol consumption, aggression, and unrealistic ambitions (Carver et al., 2010). One study showed that higher AP was associated with self-reported one's moral behavior. In contrast, higher HP was associated with both ethical and unethical self-reported one's behaviors in achievement settings (Bureau et al., 2013). The adolescent and emerging adulthood years appear to be particularly important for regulating pride with respect to enhancing self-esteem and well-being as a way to construct and reconstruct individuals' experiences within personal and intergenerational narratives using emotions (Fivush et al., 2010; Hernández et al., 2017). Positive and prosocial behaviors are generally associated with AP, while HP is associated with either negative or antisocial behaviors. Despite advances in understanding pride in diverse reward functions, little is known about the dynamic pride itself (i.e., dynamic stability further below).

Facets of pride as dynamic manifestations of the mechanism of reward

To understand the dynamism of pride, it is essential to address "the State of the Self that emerges over time" (SS). SS can be considered as a part of the abstract whole life-space, which can be understood as a way to emerge to form a map, a topology (Lewin, 1943). This life-space is shaped based on an individual's psychological forces (Lewin, 1943). Within the life-space, that is, topology, various "forces" act upon the individual. These forces can be positive, driving the person toward a particular goal, or negative, pushing them away from something. The forces can stem from the individual's internal psychological state (such as needs, desires, and fears) and the external environment (such as social norms, stereotypes, and physical obstacles).

SS indicates a condition of the self at a given moment, which may not be related to one aspect of the self, such as self-control, self-identity, or self-concept, but an amalgam (i.e., emerged) state of the self. SS may emerge by matching the position of the self and social information, where the self is in one's life-space, whether it is real or imagined social information with respect to the self. When the self is perceived to be in a state where one's expected SS is far away, a tendency to bridge the gap between the position of SS and the expected position in psychological life-space may arise. To reduce and/or eliminate this gap, there should be internal dynamism in relation to SS. To sustain itself over time, the self must align with information in its environment. We propose that pride acts as a psychological force that influences this alignment by pushing and pulling on the SS based on reward mechanisms.

The reward system (Schultz, 2015) indicates that the feeling of pride motivates the self to maintain its position by repeatedly feeling pride. In light of SS's attractive nature of reward, the self may manifest as the emergent flow by maintaining pride. Thus, for SS to sustain, facets of pride reflecting the evaluations of the self may aid psychological forces to fluctuate and thus be dynamic as a part of the whole life-space (Lewin, 1943), that is, topology. As psychological forces fluctuate, the shape of topology may change over time. Although pride is considered as a social and self-conscious emotion based on the evaluation of the self, recent researchers (LeDoux & Brown, 2017) indicate that emotions go through a higher-order representation based on working memory. In light of these conjectures, gender stereotypes and gender roles, for instance, may be used based on information stored and then retrieved to the working memory as a way to push and pull the representation of the self, which would reflect more on AP relative to HP in public settings.

In the presence of signals of pride in social contexts, individuals may encounter a temporal trade-off within and outside their SS, with consequences of maintaining facets of pride. For instance, displays of HP might facilitate immediate gratification (Ho et al., 2016) and reward (Schultz, 2015) within SS, but also have the consequence of reduced prestige (i.e., being considered socially dominant by others; Driskell et al., 1993). Boasting about one's ability as an excellent figure skater after winning a prize might result in immediate attention from peers and others, but could also risk coming off as arrogant (i.e., hubristic). Simultaneously, individuals may trade off between risk and gain in the regulation of AP.

Displays of AP might entail a cost of delayed gratification within SS (Ho et al., 2016) by letting others pay attention to one's efforts rather than one's internal and stable quality (i.e., talent). However, displaying less self-centered attention would facilitate influence on others through gains in prestige (Driskell et al., 1993; Tracy & Robins, 2007a, b). For instance, a figure skater who attributes one's outstanding performance to one's greater efforts and persistence (i.e., AP) may delay earning immediate attention from peers and others by distancing the self and his/her competence but essentially attain recognition by sharing one's skills over time. This may even lead to earning a leadership role after one's retirement by sharing knowledge on how to attain certain skill sets. On the other hand, if the figure skater attributes his/her achievement to innate talent (i.e., HP), this may hinder the skater from transferring his/her knowledge to others since skills are innate. Thus, he/she may be able to show skills but not necessarily be able to transfer the knowledge on how to help others improve. In short, HP may be associated with immediate self-centered gains in attention but the loss of influence, while AP may be associated with delayed self-centered benefits but a gain of influence. In social contexts, maintaining AP would aid in sustaining SS due to the

purposes of maintaining prestige and responses to reward sensitivity to SS, especially in public settings.

Gender differences in the two facets of pride

Research has indicated gender differences in social development, emotional reactivity, and emotional intensity (Diener et al., 1985; Domes et al., 2010; Tangney & Tracy, 2012; Geary, 2010; Tracy & Robins, 2007a, b). However, it remains unclear how gender may moderate the function of pride (Else-Quest et al., 2012). A meta-analysis that utilized mean-based analyses with various methods, including scenario-based pride measures, found no differences in AP or HP between men and women (Else-Quest et al., 2012). However, it is unclear whether gender differences were not shown in the aforementioned meta-analysis because of different methods for measuring pride and of non-longitudinal measures; thus, it is worthwhile to investigate gender differences further. Gender differences in pride may emerge when we measure over time due to their complexity instead of looking at correlations based on one-time measures (Barbu et al., 2011).

To understand how the dynamic reporting of pride might be moderated by gender, we first need to consider the system of the self to maintain SS (Leary, 2007; Lewis, 2000). Higher HP would work against the goal of maintaining prestige in social settings for the self-system (Bolló et al., 2018). Thus, to maintain SS in a social setting, avoiding negative evaluations of SS is one of the strategies of the self. The strategies each gender employs may differ in their appearance to others and/or are expected by others. In particular, the previous research suggests that females under age 30 tended to feel less job pride while they were feeling higher job satisfaction, although women above the age of 30 tend to feel higher job pride overall (Magee, 2015). In line with these findings, another study (Brosi et al., 2016) indicates that people tend to link pride expression to agentic and interpersonal hospitality ascriptions when a woman expresses pride more than a man. Taken together, it is reasonable to assume that females may adjust their pride expression to maintain SS, whereas males are less concerned with this approach.

Perspectives from dynamical systems theory

Dynamical systems theory (DST) argues that most psychological phenomena reflect the existence of *attractors*, which are the points to which phenomena tend to converge. According to DST, attractors are points in a topological space where *the behavior of the system* returns to previous values (Carver & Scheier, 1998; Nowak et al., 2005; Powers, 1973; Thelen & Smith, 2006; Vallacher & Nowak, 1994). In this study, we can imagine SS as the movement of its

behavior, indicated by the attractor basin in Fig. 1. An attractor basin is a hyperbolic topological state. We can infer the state of a system based on the movements of the behavior as indicated by the pink trace. As time passes, the pink trace converges onto the attractor set point. The center contour lines on the bottom plane represent a 2D attractor state over time, and the center contour line is expressed as a peak of a mountain, which indicates an attractor set point. In the context of the current study, the movement of the pink trace simulates the behaviors of the self system. If the behavior of the system converges on and/or orients the direction towards the bottom of the convex basin over time, the self system indicates an attractor state.

Using the logic of DST, it is reasonable to suggest that the system of the self forms an attractor state according to the movements of each facet of pride, which functions to maintain and/or facilitate the SS. The tendency of the self to maintain its stability in the face of self-conscious emotions implies an attractor for the self-regulatory system (Ellis & Newton, 2000). For example, to maximize the potential sustainment of SS, it may be essential for the self-regulatory system to form its attractor state via self-conscious emotion. SS may be able to sustain by maintaining a topological life-space via pride, as indicated by the contour in Fig. 1. Even in perturbation, the two facets of pride may converge in the attractor state, assuming that the self-regulatory system is in constant control (Powers, 1973).

In addition to attractors, *attractor stability* refers to the direction of change toward the center of the attractor basin according to each discrete trajectory (cone) of the pink trace

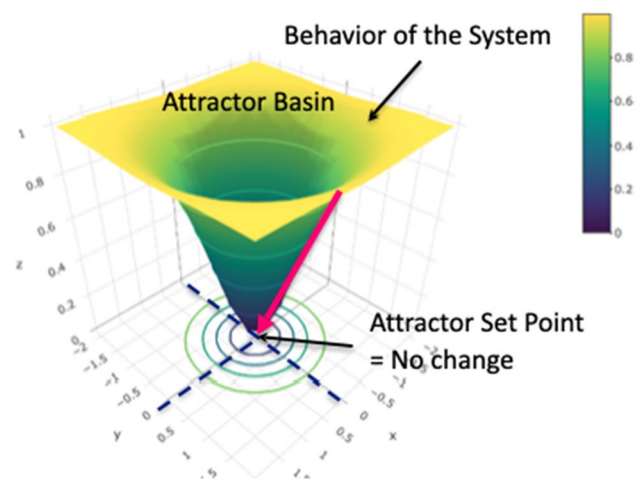


Fig. 1 An attractor basin is a hyperbolic topological state. We can conclude about a state of a system based on the movements of behavior of the system indicated by the pink trace. As time passes, the pink trace converges on to the attractor set point. The center contour lines on the bottom plane represent 2D, an attractor state over time, and the center contour line is expressed as a peak of a mountain, which indicates an attractor set point

in time, as seen in Fig. 2a. Each cone indicates a vector arrow that suggests a direction and speed of a discrete trajectory of the behaviors of the system (i.e., change in HP over AP over time), which emerges to form an attractor state by heading and converging on the middle 0 point, indicating an attractor set point. The present study assumes that each facet of pride forms an attractor state to maximize its dynamism of SS. In the context of the current study, we assume each facet of pride may function as an independent agent in the self-regulatory system, as indicated by previous research (Nowak et al., 2005; Tangney & Tracy, 2012). *Coupling* is another term which indicates concurrent directional changes in stability; each facet of pride changes its direction in tandem with the other facet as if they possessed the same fate.

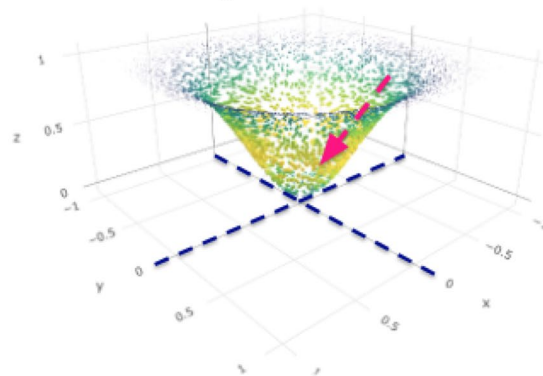
Present study: dynamical systems theory and gender differences in authentic pride

While theorists and researchers argue that these facets of pride are different constructs and emerging adults tend to show decreasing HP and increasing AP in the process of internalizing their social worlds (Orth et al., 2010),

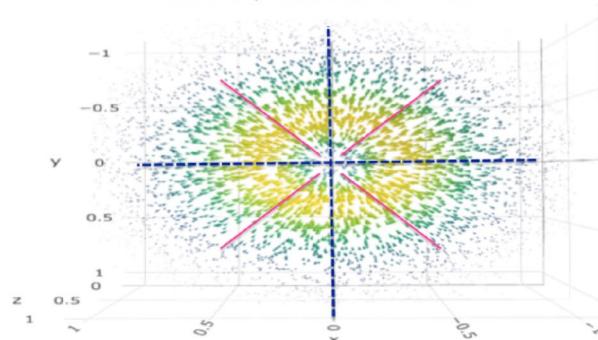
it is still unknown whether each facet of pride stabilizes itself independently (as a stable attractor) or concurrently (through coupling) over time. If gender differentiates an attractor state in pride, the return point in the attractor state, which is akin to a dynamic reference point in time, may diverge. As aforementioned, Brosi et al. (2016) showed that females perceive themselves negatively in expressing their achievement (i.e., AP) in a social setting. Suppose females conceive they would be negatively judged by reporting their achievement state. In that case, they should report less AP in a social setting due to avoid negative gender-based stereotypes of being hostile to sustain the self in a given context. Moreover, females suppress expression after initial positive feedback (Brosi et al., 2016). However, it is unknown whether females tend to return to lower AP positions more dynamically than males, which will be tested as a part of our hypothesis (H1a). If the previous result is reflected in this study, then according to the DST, there should be a distinct difference in AP dynamics at the reference point (i.e., position) than HP.

Fig. 2 Direction and speed of each step (each cone-shape arrow head) of trajectory indicates change in authentic pride over change in hubristic pride and converges to the center as an attractor state in time

A: 3D Side of the Attractor Basin-Each Cone Head (cone shape) Contributes to the Emergent State of the Attractor Basin



B: 2D Top of the Attractor Basin



Direction and speed of each step (each cone-shape arrow head) of trajectory of the pink line indicates change in authentic pride over change in hubristic pride and converges to the center as an attractor state in time

Hypothesis 1a: The position of AP would be less for females than males in this context.

In addition to its position, the speed of swirling in at a certain position should be critical since faster speed may buffer against other social information that may hinder its speed and its expression. To capture this dynamism, it is essential to measure pride over time, as pride is inherently a social emotion that emerges and flows in time. In this study, we tested the temporal stability indicating dynamism of the two facets of pride by measuring and hence observing how each facet varies across social contexts and whether these dynamics differed by each facet of pride as another part of the hypothesis (i.e., Hb: Simultaneous dynamism of both facets of pride).

Hypothesis 1b: AP and HP would be dynamic simultaneously over time for both genders.

Gender differences may emerge by showing different return speeds to its attractor with time (i.e., narrower slope if faster or wider slope if slower the speed of the attractor basin in Fig. 2a). Although mean levels of both AP and HP are comparable across males and females (Else-Quest et al., 2012), females tend to use adaptive regulation strategies (reappraisal v. suppression) more often than males (Nolen-Hoeksema, 2012). By using reappraisal strategies, females may reduce the gap between the SS (i.e., where the SS is) and expected and/or perceived social information faster (i.e., where imagined or actual social information is/should be) in the process of flow of the self-conscious emotion of pride. For example, as indicated by prior work showing that self-awareness of pride reduces the expression of pride in females, it may be reasonable to think that females may be faster at bridging the gap between SS and social information. Thus, we hypothesized that females would show more maintenance of the attractor state of AP than males, eventually resulting in a faster return in AP (main hypothesis).

Hypothesis 1c: Females would adjust their speed of return to their AP faster than males.

According to social role theory (Eagly & Wood, 2012) and research (Brosi et al., 2016), statistically speaking, fewer females are in managerial roles due to social stereotypes, with a less propensity towards agentic but communally biased behavior. In line with the social role theory, regulatory fit theory (Higgins et al., 1997; Sassenberg et al., 2013) further suggests that females tend to focus on prevention needs by maintaining security, while males tend to focus on promotion needs by achieving.

Final hypothesis While both facets of pride function simultaneously, in public settings, females may position lower in AP when the context and its task are mismatched with usual roles and stereotypes, and thus they may adjust more quickly relative to males.

Methods

Participants

Adolescent and emerging adulthood college students ($N = 118$, 54.24% female; mean (SD) age = 19.12 (2.77) years) in an East Coast private university in the US participated in the study over two visits in exchange for partial course credit for General Psychology classes as compensation. The ethnicity of participants was 48.18% Caucasian, 30% Hispanic, 10% Asian or Pacific Islander, 8.18% Other, and 3.64% Black or African American. Three to six participants were randomly assigned to each discussion group, forming 27 groups. Before conducting the study, we performed a pilot test in which we trained research assistants to act as confederates. Confederates were included in the pilot study to test the entire procedure of the present study and to determine the time required for a group to discuss the given task. In the pilot study, we excluded 28 individuals from the current analysis: three discrete individuals, three groups of 3 participants with one or two confederates who already knew the research hypotheses, and two groups of 6 individuals (3 individuals per group) and two groups of 10 individuals (5 individuals per group) due to technical issues. Thus, the total number of participants was 146, and the final analyses were performed using 118, excluding 28 individuals.

Procedure

The university's Institutional Review Board approved the study, which used a simple random sampling to capture states of pride over three-time points. Participants completed three time-point measures of state pride in large, classroom-based group sessions during their first General Psychology courses at baseline (T_1). First-year undergraduates voluntarily chose to attend the current study, thus we invited them to attend small laboratory sessions ($n = 3-6$ per group). At small-group sessions, these participants completed pre-discussion (T_2) and post-discussion ratings (T_3) of the pride measure. Participants chose seats at a round table, completed, and signed on a written informed consent form. Although we believe that the experience of pride may arise even in the absence of others, since imagined or real social presence can contribute to a state of pride, the context of the current study is necessary to capture the dynamism in pride. Specifically, we asked participants to report their state pride

in the mere presence of others at Time 1, and in the presence of group members before (Time2) and after (Time3) the compensation committee task. The first study was conducted in a large group setting to capture both females' and males' social presence. We then introduced a negotiation task to see how both genders changed their pride states in two consecutive periods prior and posterior to the negotiation task, which were developed by John and Robins (1994).

By using the Compensation Committee task to examine how both facets of pride change in the context of gender roles and their regulatory fit, which are less aligned with females and more aligned with males, we can investigate the tendency to reduce the speed at which individuals return to a reference value. The misfit between the context and social stereotypes for females may be less related to the reward to the self. Therefore, it is crucial to understand the misfits between gender, task, and context due to gender stereotype biases, which would help us understand how higher-level leadership roles manifest differently according to gender in the real world. Females may need to overcome their disadvantages, which are embedded in social stereotypes, social roles, and social identity, to attain a higher role in society.

The research assistant described the study as an investigation of group decision-making processes during the task of distributing merit-based bonus money based on a script. Participants completed state measures of pride (T_2) before the group-based Compensation Committee Task (described below) and then reported state levels of pride as their post-task (T_3). Participants were instructed to present their candidate's case to other members of the meeting, with the goals of 1) negotiating a high bonus for their candidate, 2) allocating a fixed amount of bonus money in the best interest of the company, and 3) completing the task within a specified period of time (3 minutes for each participant, with an additional 2 minutes for closing the meeting). After the task, research assistants thanked the participants and let them know that they could reach out to the research team with any concerns and if they need any counseling due to the participation of the current study.

Measures

The Compensation Committee Task (CCT; John & Robins, 1994) The CCT involved informing participants that they were to take part in a company's compensation committee meeting. Participants were seated at a round table; no leader was assigned. They were told that the goal of the meeting was to distribute \$25,000 among three to six fictional candidates in a way that was fair and in the best interest of the company. Each participant was randomly assigned a written

summary of a candidate, including biographical information, employment background, salary, and appraisals of prior job performance.

Authentic and Hubristic Pride Scale. (AHPS; Tracy & Robins, 2007b) The AHPS was used to measure both AP and HP three times. The scale consists of 7-items designed to assess both trait- and state-like tendencies for AP (7 items, e.g., "achieving," "fulfilled," "productive") and HP (7 items, e.g., "arrogant," "conceited," "pompous") pride. Participants indicated the extent to which each item was a presentation of their state pride on a five-point scale ranging from 1 (Not at all) to 5 (Extremely). Both scales had high internal consistency in the sample, with alphas of .91 at baseline, .88 at pre-discussion, and .91 at post-discussion for AP and .80 at baseline, .83 at pre-discussion, and .83 at post-discussion for HP. Omega coefficients were also calculated and were .94 at baseline, .91 at pre-discussion, and .93 at post-discussion for AP and .85 at baseline, .88 at pre-discussion, and .87 at post-discussion for HP, indicating high levels of reliability for both facets of pride from alpha to omega.

Data analysis

As suggested by Butner et al. (2015), we used an a priori theoretical topology model to test for dynamic changes in the two facets of pride. The approach allowed us to move from theory to topology and from topology to equation. Specifically, we created two change-as-outcome scores for each individual and each facet of pride, using pre-discussion (T_2) and post-discussion (T_3) scores. To do this, we first created a lead variable ($T + 1$) for each of these three time points. We then subtracted the baseline (T_1) and the pre-discussion (T_2) scores from each lead, resulting in two change scores per individual for facet of pride (please read Butner, Crenshaw, Munion, Wong, & Baucom, 2018).

We used the Repeated Measures of Actor-Partner Interdependence Model (RM-APIM, Kenny et al., 2006) to examine the simultaneous stability of the two facets of pride and gender differences. This was done using a dynamical systems approach, as suggested by Butner et al. (2015; 2018), with restricted maximum likelihood (REML) estimation. The analysis involved creating a single equation with two change outcome variables for each facet of pride, with dummy coding variables indicating which dependent variable each facet of pride predicts between changes in authentic (Dummy_{AP} = 1; Dummy_{HP} = 0) and in hubristic pride (Dummy_{AP} = 0; Dummy_{HP} = 1) simultaneously over time. The gender variable was entered as a second-order parameter.

We created each model to investigate simultaneous change states between two facets of pride over time with "unstructured" covariance allowing for separate error variances for each outcome and an error covariance between them (level 1).

Two discrete intercepts corresponding to each facet of pride were entered at level 2. Specifically, we used a difference score (i.e., $\Delta AP = AP_{t+1} - AP_t$) as our dependent variable for each individual and for each facet by subtracting the value of the previous pride score from the value of the current pride score, resulting in two change scores per person per pride. The change scores were entered as dependent variables, and the three current AP scores (T) were used as the predictors.

We constructed discrete and parallel models for AP and HP, indicating a linear and yet dynamic mixed effects equation for individual *i* and time *t*. We entered dummy variables for both pride variables to indicate each equation. The equation for the two simultaneous changes in AP or HP is shown as Model I.

Results

Preliminary analyses

The means, standard deviations, and intercorrelations of the variables are presented in Table 1. The low correlations between T₁ and T₂ on types of pride measure may be due to different levels of social presence at baseline (large group setting), and later lab settings (small group settings). An analysis of variance (ANOVA) was used to compare age, number of individuals in a group, AP and HP at baseline (T₁), and pre-discussion (T₂) and post-discussion (T₃) scores by gender. The results indicated that, on average, males reported significantly higher levels of HP at pre-discussion (T₂) compared to females, $F(1,114) = 4.24, p < .05$ with means of 1.53 ($SD = 0.62$) for males and 1.32 ($SD = 0.47$) for females.

As seen in Fig. 3, the x-axis refers to the current state (T) using the three time-point scores (T₁, T₂, and T₃), indicating where each facet of pride is, and the y-axis refers to two change scores at the next two adjacent time points (T + 1), indicating where each facet of pride goes. In dynamical systems theory, an attractor is a state towards which a system tends to evolve over time. Thus, in this case, the negative slope indicates that the state of the system of AP and HP returns to its attractor, which is the point of 0 on the y-axis. This means the system tends to maintain stability and not change much from the attractor state.

We plotted the estimated multilevel model equations simultaneously. As shown in Fig. 4a, we created a scatter plot using observed scores of the facets of pride. Then, we added contour lines to represent the topological state in Fig. 4b. Each contour line simultaneously shares the same standard deviations of two facets along the curve. Figure 4c shows trajectories, indicated by arrows, from the difference between pre- and post-discussion ratings of the two facets. Figure 4d is a two-dimensional topological state representation of AP and HP drawn from a pair of simultaneously estimated multilevel model equations (actor-partner models using change in AP and HP). As seen in this figure, the facets of pride do not influence each other, as indicated by the straight arrow tails. Rather, the overall pattern of the two facets of pride concurrently converged on the attractor of the highest peak of the middle contour line in the topological state without spiral tendencies, indicating an absence of a coupling effect between the two facets of pride. This means that each facet of pride independently converged on an attractor, showing the absence of influence with one another over time. These preliminary analyses indicated the use of a linear model, allowing us to capture each attractor

Table 1 Mean, standard deviation, and correlation of AP and HP scores and correlations of AP and HP scores among 77 undergraduates after listwise deletion

Variables	1	2	3	4	5	6	7	8	9
1. T ₁ : Baseline authentic pride	1								
2. T ₂ : Pre-authentic pride	.44**	1							
3. T ₃ : Post-authentic pride	.27*	.78**	1						
4. T ₁ : Baseline hubristic pride	0.04	0.13	0.01	1					
5. T ₂ : Pre-hubristic pride	0.09	0.20	0.12	.62**	1				
6. T ₃ : Post-hubristic pride	0.12	0.14	0.17	.32**	.71**	1			
7. Age	-0.09	-0.18	-0.09	-0.09	-0.09	-0.06	1		
8. Number of Individuals in a Group	-0.21	-0.06	-0.13	-0.02	0.07	-0.09	0.11	1	
9. Gender	-0.12	0.07	0.10	0.07	.24*	0.05	-0.12	0.10	1
<i>n</i>	88	116	113	88	116	113	108	113	118
<i>M</i>	3.43	3.18	3.14	1.47	1.34	1.27	19.12	4.77	.46a
<i>SD</i>	0.87	0.74	0.84	0.50	0.49	0.50	2.77	1.30	-
<i>Range</i>	4.00	3.43	3.86	2.29	2.71	2.29	22	4	-

T₁ equals Time₁, T₂ equals Time₂, and T₃ equals Time₃. Gender is coded 0 for females and 1 for males; therefore, the mean value for gender indicates the proportion of males, and the pre-hubristic pride score is correlated with males

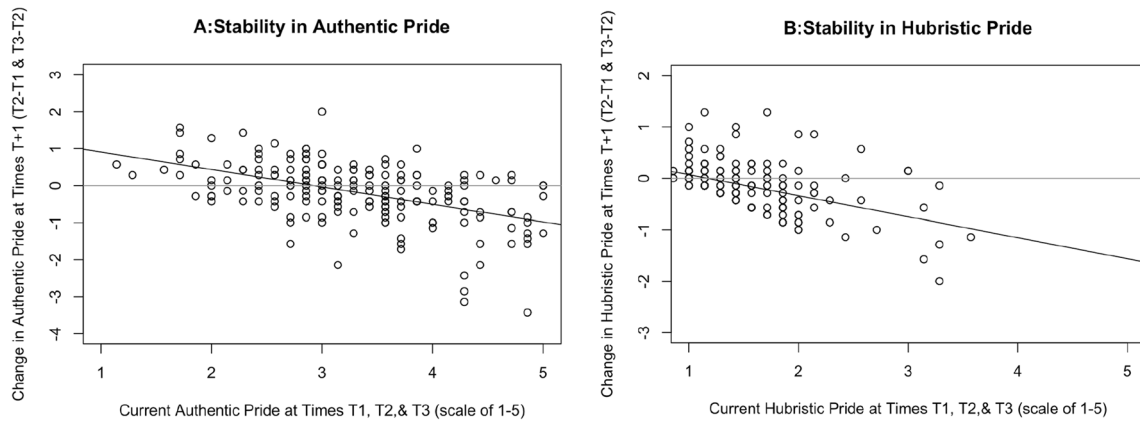


Fig. 3 Scatter plot of each facet of pride using three time points on the x-axis and its discrete two change scores between baseline (t) and pre-discussion (t + 1), and between pre- (t) and post-discussion (t + 1)

on the y-axis. The negative slope of each facet of pride indicates an attractor state by locking in data points and converging on the 0 point on the y-axis

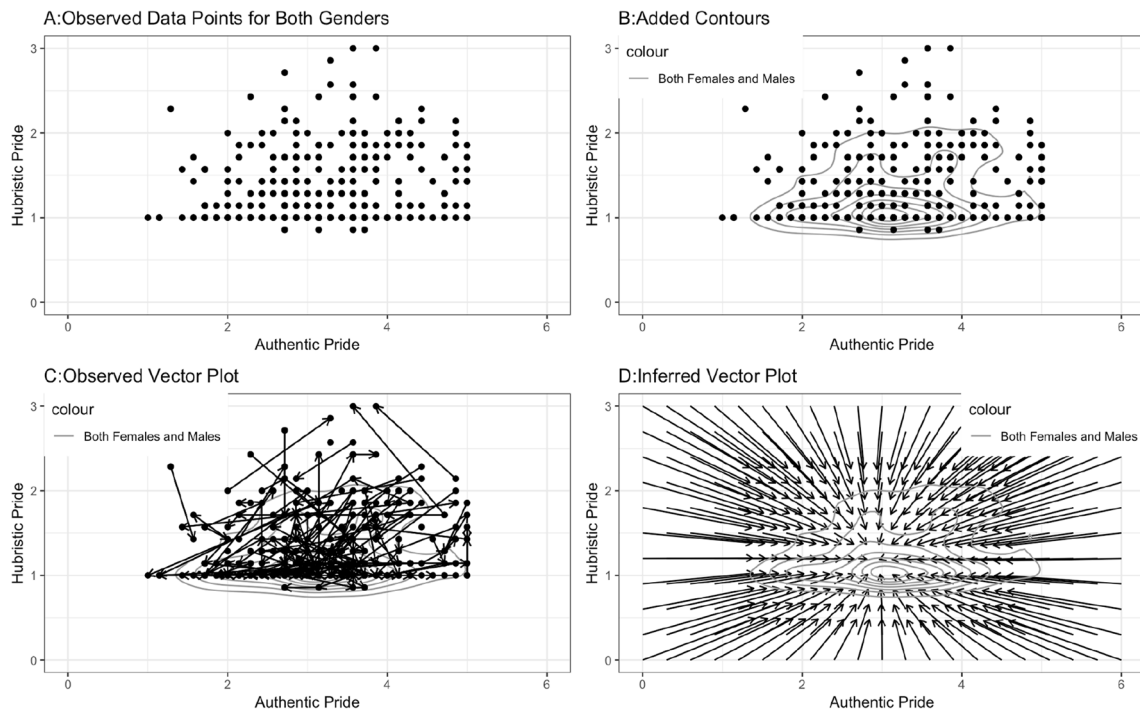


Fig. 4 Vector flow field for both genders created from scatter plot data. The inferred vector plot and the contour lines illustrate an attractor state between changes in authentic pride and in hubristic pride over time

independently, as opposed to a nonlinear equation, which would capture multiple attractor states over time.

Primary analyses

RM-APIM models were created to examine whether the two facets of pride significantly predicted their stability. First, the effects for each facet of pride as predictors of their own effect on stability were statistically significant

and negative in value, which suggests that each facet of pride forms attractor stability over time, as shown in Table 2 ($\beta_{30} = -0.70, t(172.04) = -12.23, p < .001$ for AP; $\beta_{40} = -0.48, t(179.25) = -8.99, p < .001$ for HP), which supports Hypothesis 1b. Second, as predicted, coupling was not statistically significant ($\beta_{50} = 0.06, t(197.16) = 1.46, NS$; $\beta_{60} = 0.00, t(193.85) = 0.45, NS$).

Model II shows the second change-as-outcome RM-APIM model to investigate if the dynamism in the two

Table 2 Repeated measures Actor-Partner Interdependence Model results for change in the two facets of pride using multilevel modeling Among 108 USA Undergraduates

Change-as-outcome	Model I: Attractor Stability				Model II: Gender Differences			
	B	SE	<i>t</i>	95% CI [LL, UL]	B	SE	<i>t</i>	95% CI [LL, UL]
Intercepts								
Authentic pride (AP) (β_{10})	2.02**	0.22	9.03	[1.58, 2.46]	1.10**	0.34	3.21	[0.43, 1.78]
AP as a function of gender (β_{11})					1.44**	0.44	3.28	[0.58, 2.31]
Hubristic pride (HP) (β_{20})	0.59**	0.13	4.66	[0.34, 0.84]	0.52**	0.19	2.72	[0.14, 0.91]
HP (β_{21}) as a function of gender					0.14	0.26	0.55	[-0.37, 0.65]
Attractor Stability in								
AP (β_{30})	-0.70**	0.06	-12.23	[-0.81, -0.59]	-0.35**	0.09	-3.71	[-0.54, -0.17]
AP (β_{31}) as a function of gender					-0.52**	0.12	-4.50	[-0.75, -0.29]
HP (β_{40})	-0.48**	0.05	-8.99	[-0.59, -0.38]	-0.48**	0.08	-6.15	[-0.63, -0.33]
HP (β_{41}) as a function of gender					-0.03	0.11	-0.28	[-0.25, 0.18]
Coupling in								
HP on stability in AP (β_{50})	0.06	0.10	1.46	[-0.12, 0.25]	-0.02	0.13	-0.13	[-0.28, 0.25]
HP by gender on stability in AP (β_{51})					0.09	0.18	0.47	[-0.28, 0.45]
AP on stability in HP (β_{60})	0.00	0.03	0.45	[-0.07, 0.06]	0.03	0.05	0.53	[-0.08, 0.14]
AP by gender on stability in HP (β_{61})					-0.05	0.07	-0.69	[-0.19, 0.09]

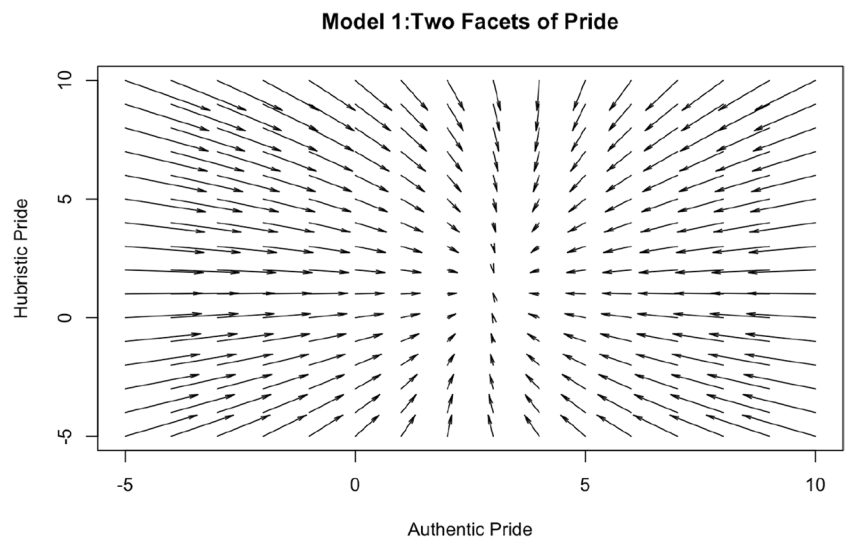
AP Authentic Pride, HP Hubristic Pride. Gender is coded as 0 for males and as 1 for females. Bold text indicates statistically significant effects. * $p < .05$. ** $p = \text{or} < .01$

aspects of pride differs as a function of gender. First, consistent with Model I, AP was significant and negative in value ($\beta_{30} = -0.35$, $t(175.72) = -3.71$, $p < .001$), meaning that AP predicted its change, which informs a stable attractor and supports Hypothesis 1a. Second, the speed of attractor in AP differed as a function of gender, indicating that females tended to be faster in returning back to the stability of AP ($\beta_{31} = -0.52$, $t(192.79) = -4.50$, $p < .001$), which supports Hypothesis 1c. The negative value in HP was also significant and consistent with Model I, suggesting the stability

of the attractor but with no gender difference ($\beta_{40} = -0.48$, $t(167.92) = -6.15$, $p < .001$; $\beta_{41} = -0.03$, $t(177.10) = -0.28$, NS). Third, in line with Model I, no coupling effect was shown for either facet of pride and as a function of gender.

Figure 5 below shows the simultaneous change relationships in two facets of pride based on model I as indicated by Hypothesis 1b. While the tails of the arrow lengths are based on the distance between the 0 value on each value point of facets of pride, the length of the vector arrows indicates speed and direction toward the attractor. The faster the

Fig. 5 Vector flow field of the results in Model I from Table 2



speed, the longer the arrow tails are. The two facets of pride stabilized to an attracted point as suggested by straight vector arrow tails, and there were no coupling effects indicated (Butner et al., 2015).

Figure 6 below portrays the relationship between AP and gender. Females showed faster stability with a lower attractor value, while males showed slower stability with a higher attractor value in AP over time, as indicated by Hypothesis 1a and c. This means that females show a trade-off between the position of the attractor and the speed of its return to that lower attractor value in AP. In contrast, males make a trade-off between the position of the attractor value and the slower speed of its return to the attractor in AP.

Figure 7 shows the simultaneous change in the relationship in facets of pride for each gender. As shown in Table 2 (Model II) and Figs. 6 and 7, females show a lower attractor value than males and faster attraction in AP than males as indicated by the longer vector tails and no difference

in HP indicated by no difference in the size of the vector tails towards y-axis as indicated by the final hypothesis (Table 2).

In sum, although each facet of pride showed a stable attractor state, the trade-off effects appeared in the topological state in AP between genders. For females, the steeper attractor basin with a lower attractor value indicates a faster convergence but sacrifices the position of the mental representation of SS (steeper slope in Fig. 6 and longer vector tails in Fig. 7A). For males, the less steep attractor basin with a slower convergence with a higher attractor value showed that they appeared to value a higher position of the mental representation of SS in AP by sacrificing its speed of response.

Discussion

We evaluated the simultaneous dynamic function of both AP and HP over time among emerging adult undergraduates at a private university. Theory suggests that these two facets of pride function in response to personal and contextual factors. However, research to date has not examined how these facets operate dynamically in a social setting or differences in their operation based on gender. The primary finding of the current study was that both AP and HP functioned simultaneously over time as a stable construct. From a dynamical systems perspective, each facet of pride may therefore be conceptualized as a stable construct (i.e., attractor, as shown in Fig. 2).

To our knowledge, this is the first time that the theoretical assumption of stability (i.e., attractor) has been tested in facets of pride. Furthermore, the trade-off between the position of the attractor (i.e., stability) and the speed of its return has not been described in AP in social settings.

Both facets appear to function simultaneously, thereby filling a gap in the literature by supporting the simultaneous

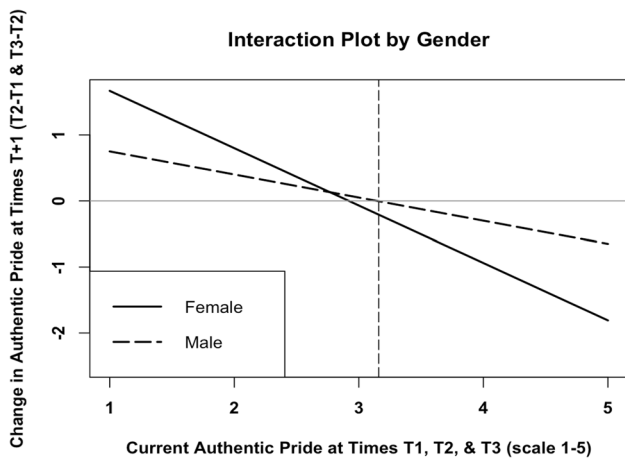


Fig. 6 Interaction plot between current authentic pride and gender, predicting change in authentic pride in Model II (β_{31}) from Table 2

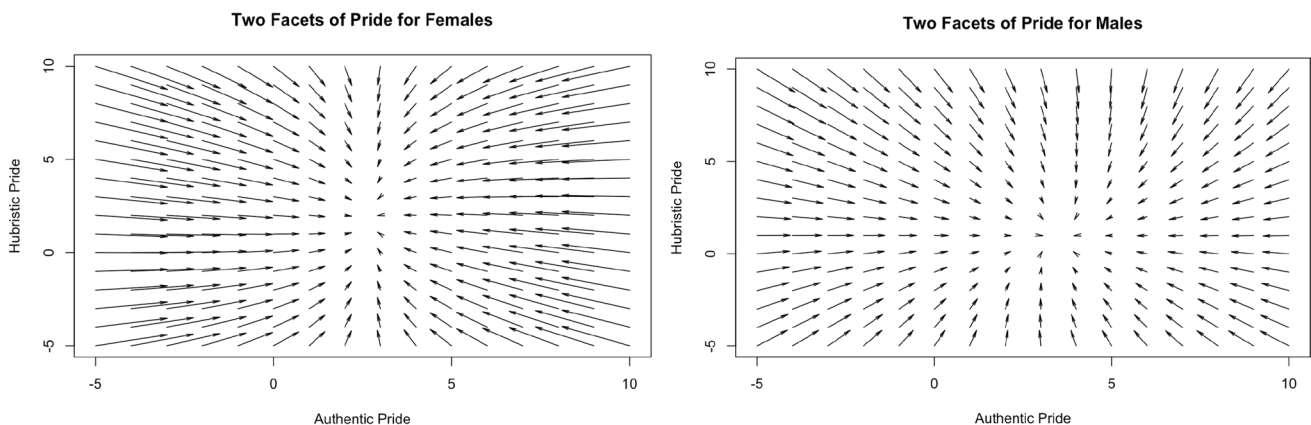


Fig. 7 Vector flow plot between changes in authentic and hubristic pride by each gender showing big differences in the attractor set point (in the space in vectors without tails) and the speed of vectors (longer tails indicating faster return to the attractor)

function of each facet. If each facet functions simultaneously, it opens the door to diverse theoretical thinking and research to understand multifaceted human functioning, where people can be prosocial and/or antisocial and vice versa.

Although AP is active, this does not mean that HP is covert; Hypothetically, consider the cases of renowned international entrepreneurs, celebrated for their groundbreaking innovations in technology and their generous philanthropic efforts. At the same time, these individuals face private accusations of serious ethical misconduct within the companies, including harassment or exploitation of employees, creating complex and contrasting portrayals of success and moral failures. These great achievements and dominance could be associated simultaneously with both AP and HP, while followers' silence about their behaviors could also be associated with both facets of pride. Their colleagues, directly and indirectly, sustained their high positions in industry by associating themselves with AP and HP to maintain and advance in their careers and society. For followers and colleagues, it may have been advantageous to sustain and thrive by protecting and being bystanders during the events, which may contribute to their AP and HP over time. However, people who tried to help the victims of the event may have felt less AP at the time, but it may be related to a higher level of AP later. Thus, it is not simple to say whether facets of pride could be advantageous in the absence of information for a longer period of time.

In the stability pattern, gender differences in AP are significant. A quicker adjustment of AP may benefit females by helping them align with social cues for gaining prestige through apparent gender stereotypic behavior. Faster attractor stability may entrain the self in a topological space to reside over time and maintain its place more quickly to sustain prestige. The faster speed in females may allow the self less quiescence by operating the self system. For males, the combination of a higher value of the attractor and a slower speed to its return may indicate that SS could be more quiescent in the operation of the regulatory system over time. Namely, maintaining a higher returning reference point of SS was more important for males than females, even in AP.

In real-life circumstances, for example, male workers may refuse to change their approach to a certain task even after receiving negative feedback from customers or evaluators based on their higher level of AP. In contrast, female workers may be more receptive to criticism from senior colleagues based on their faster return to AP. Men may benefit from maintaining a higher level of AP in their tasks, even if they need more time to be fully qualified. Concurrently, women may underestimate their abilities and downplay their qualifications for a specific task. In this sense, women may be more inclined than men to embrace and adjust to social expectations of gender roles and stereotypes, even if, at times, it may

be disadvantageous for them to advance higher in organizations, even if they are equally or better qualified to fulfill a certain role or complete a certain task within organizations. Without recognizing and addressing this pattern across different genders within an organization and adjusting it, the organization may remain imbalanced in terms of equality and diversity issues that we all face in the twenty-first century, which could eventually lead to a higher female turnover rate. Thus, lower values of AP would negatively impact overall female well-being. In comparison, higher values of AP would likely have a lesser negative impact on overall male well-being, especially among adolescents and young adults.

Even in the current hypothetical compensation committee organizational setting, the lower level of females' state of AP may be associated with gender identity (Eagly & Wood, 2012). In the context of a higher agentic organizational setting, such as in the current study of the hypothetical compensation committee meeting, it is less related to the communal aspect of the environment and more related to agentic nature, as indicated by the higher AP for males of emerging adulthood undergraduates. Thus, the AP for females is lower and yet faster to align with the misfit between the gender/group identity and/or belonging and the situation they find themselves in, as indicated by the social role theory and regulatory fit model (Eagly & Wood, 2012; Eagly et al., 2000; Higgins et al., 2003).

There are some limitations to the current findings. First, the study was limited to late adolescents and young adults at a U.S. private university, which may not be generalizable to other populations. It is unknown whether public university students or different age groups would show the same results, as the current sample's self-conscious emotion may still be in the development process, especially for the advanced organizational task. Second, participants may have displayed heightened consciousness of AP given the study context (a laboratory setting amongst peers), where individuals were situated in an artificial lab setting that may not represent natural, unobserved interactions. Third, self-report measures may not accurately portray pride phenomena. Fourth, in our sample of 118 participants, each individual had three instances of measurement, and thus, we are adequately powered to test the linkages between AP and HP over time. Based on the result below, using Monte Carlo Power simulation analysis, the proportion of replication samples ranges from .55 to .56. Hence, although the study is underpowered, it is not biased due to the limited sample size in this study. The ratio of female to male college graduates in the study is similar to the U.S. nationwide statistics (Leukhina & Smaldone, 2022). Last, the scale means something different across gender, although partial invariance was reached after deleting one variable in AP and two variables in HP. Nonetheless, it is an important finding indicating that

AP and HP are inherently different across different groups of males and females for current emerging adulthood. Further studies need to explore whether gender differences are consistent at the measurement levels in this age group as adult invariance across different gender (Körner & Schütz, 2023).

Despite these limitations, the present study offers valuable conceptual insights and provides evidence concerning their functions regarding the dynamic facets of pride that operate simultaneously over time. It also confirms that gender differences may exist in AP but not HP in social settings. Furthermore, examining the intraindividual variability and the interaction between intra- (i.e., within-person change) and inter- (i.e., gender difference) individual change patterns can provide a more nuanced understanding of the two facets of pride and their functioning over time. Therefore, the current findings lay a foundation for exploring the assumption of stability in the two facets of pride and determining how they function in social contexts.

The current investigation, which uses two simultaneous change scores on two facets of pride as dependent variables, is theoretically and methodologically beneficial. First, it is crucial to determine whether one or both facets of pride exhibit simultaneous stability over time. This implies that individuals in a group may not be in the absence of HP, but their AP may stabilize more as a function of gender. Secondly, although the change score for the next time point was used in the present finding, it is essential to consider the specific time intervals between measures to gain a more comprehensive understanding of the dynamics of pride.

Although the regression analysis using each AP or HP change score as the dependent variable seems to indicate the same story, it is assumptive to conclude for the following reasons. The presence of temporal linkage between the two facets of pride over time based solely on the stability of each facet's prediction of its change even after taking HP into account ($B = -0.205^*$ $R^2 = .11$, $F(2, 81) = 4.78$, $p = .011$), and HP stabilizes overtime after taking AP into account ($B = -0.415^*$ $R^2 = .280$, $F(2, 81) = 15.723$, $p = .000$) for females. The same pattern persists for males indicating that AP stables even after taking HP into account ($B = -0.643^*$ $R^2 = .366$, $F(2, 111) = 33.616$, $p = .000$), and HP stabilizes over time even after taking AP into account ($B = -0.417^*$ $R^2 = .238$, $F(2, 111) = 17.370$, $p = .000$). These regression analyses did not suggest us any temporal information between AP and HP, unlike the simultaneous dynamic function of both facets of pride, as we found.

The main implication of the present study is that both facets of pride demonstrate the dynamic maintenance of SS in social contexts. At the theoretical level of the self, it may be important for individuals to experience both facets of pride simultaneously to maintain and diversify their mental representations and embodied emotions over time. However,

it may take effort to understand how dominance-based HP would function within and between personal relationships in social and public settings as AP sometimes may conceal its relationship with HP. Additionally, individuals may display pride differently in private interpersonal contexts than in public settings, and managing AP may sometimes obscure how a particular emotion is dynamically related to prosocial behavior over time in various aspects of private and/or public spheres. Therefore, both facets of pride may function together to benefit SS. In summary, SS manifests in each facet of pride and the speed of regulation in AP matters. Gender differences play a role in the speed and value of AP, with females being faster than males.

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Authors' contributions Arin You and Daniel Fulford designed the study in collaboration with others. You drafted the initial article, performed data analyses, graphed the data, and interpreted the graphs with Jonathan E. Butner; all authors contributed to writing and revision.

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Data availability Data will be available upon request.

Code availability Coding source is cited in the manuscript.

Declarations

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Conflict of interest There is no conflict of interest with respect to the order of authorship or the publication of this article.

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