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Demystifying authenticity: Behavioral and neurophysiological signatures of self-positivity for authentic and presented selves

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ABSTRACT

Authenticity has captivated scholars. But what is it? An emerging view considers it exaggerated favorability (self-enhancement), whereas traditional views regard it as self-accuracy and self-consistency. We tested these theoretical views by contrasting the authentic self with the presented self, a highly desirable representation. Behaviorally, participants ascribed less positivity to the authentic self: They endorsed more negative traits and were faster to admit having them; also, they endorsed fewer positive traits and were slower to admit having them. Neurally, participants manifested preferential processing of threatening information (P1), followed by preferential processing of favorable information (N170), about the presented self (than authentic self), indicating its brittleness. At a later stage (LPP), participants engaged in more elaborate processing of threatening and favorable information about the authentic self, indicating its subjective importance. Authenticity, albeit mostly positive, allows room for negativity.

1. Introduction

The concept of authenticity has been gathering traction. Commentators have hailed the rise of the age of authenticity (Wilkinson, 2018), and the term was declared word of the year in 2023 by Merriam-Webster (BBC, 2023). Institutions (e.g., educational centers, mental health and wellness organizations, workplaces) encourage authenticity, as do art (e.g., expressionist art, folks art and cultural crafts, street art and graffiti), fashion, literature, TV shows, movies, sports coaches, song, magazine articles, blogs, and self-help books. Individuals, across ages, walks of life, and cultures, are normatively prescribed to pursue it (Bauer, 2017; Ferrara, 1993; Guignon, 2004).

Despite its seemingly recent appeal, the concept has a long history. It was articulated by Aristotle (384/322 BCE; Tredennick and Thomson, 1976) and pondered by existential philosophers (Golomb, 1995) and sociologists (Erickson, 1995). Intrigued, psychologists have joined in, prioritizing it in their research agendas (Sedikides and Schlegel, 2024; Sutton, 2020). Yet, the nature of authenticity remains elusive (Baumeister, 2019; Hicks et al., 2019).

In this article, we placed the concept under empirical scrutiny. Following other scholars, we define authenticity as the perception of being one's true self (Kernis and Goldman, 2006). But what is the nature of this perception? Authenticity has been predominantly conceptualized as self-accuracy, self-consistency, and self-enhancement, with the last view gaining evidentiary ground (Sedikides and Schlegel, 2024). In two experiments, we put the self-enhancement view of authenticity to a rigorous test (Platt, 1964). We did so by comparing the authentic self-concept against another highly positive self-concept, the self that is presented to others (i.e., the presented self). If the experience of authenticity is only associated with self-enhancement, we would expect to see this pattern reflected in the content of true self concepts, such that they are just as positive as the presented self-concept. However, if the experience of authenticity is also associated with self-accuracy or self-consistency, we would expect to observe a more mixed valence in true self-concepts compared to the presented self-concept. We implemented both behavioral and neuroscientific techniques. We asked if the authentic self, compared to the presented self, is a fierce denouncer of undesirable information and an unabashed consumer of desirable

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information (self-enhancement view), or, alternatively, if the authentic self is prone to exploring or accepting the possibility of having some undesirable attributes (self-accuracy and self-consistency views).

1.1. Views of authenticity

One view of authenticity focuses on self-accuracy, the veracious representation or unbiased processing of characteristics and beliefs that comprise one's identity (Kernis and Goldman, 2006). Indeed, people high in authenticity report eagerness, rather than avoidance, to explore identity-relevant information (Kernis and Goldman, 2006), and are less defensive when encounter evidence that their prior behavior does not faithfully reflect their ideals (Lakey et al., 2008). However, self-accuracy is difficult to attain or empirically verify (Vazire and Wilson, 2012), particularly in the case of the authentic self. It is not clear how the authentic self could be measured directly, and both self and observer reports risk being erroneous. Additionally, individuals who believe they are unbiased in the processing of self-relevant information report that they possess more favorable than unfavorable attributes, thus calling into question how unbiased they are (Gillath et al., 2010).

Authenticity has also been viewed as self-consistency, the alignment of one's behavior with internal standards, goals, or values (Kernis and Goldman, 2006; Wood et al., 2008). In accord with this view, authenticity is related to self-rated overlap across aspects or roles of one's life (Boucher, 2011), experimentally-induced identity integration across roles increases authenticity (Ebrahimi et al., 2020), and incongruence between one's gender identity (female) and experimentally assigned self-presentation (masculine) decreases authenticity (Dormanen et al., 2020). However, people consider their socially desirable behaviors authentic regardless of whether these behaviors are congruent or incongruent with their self-concept (Sheldon et al., 1997), appraise themselves as authentic when their behaviors align with positive (than negative) behaviors regardless of whether they have traits that underlie these behaviors (Fleeson and Wilt, 2010), and deem enacted desirable (than undesirable) behaviors as more authentic (Jongman-Sereno and Leary, 2016).

Additionally, authenticity has been viewed as self-enhancement, the subjectively exaggerated favorability of one's self-attributes. People regard their true self as positive and moral (Strohminger et al., 2017), endorsing highly positive traits is associated with endorsing authenticity (Bailey and Iyengar, 2023), and daily self-aggrandizement predicts rises in daily authenticity (Guenther et al., 2024). Further, the more favorably people judge a personal change in their lives, the more likely they are to believe the change was guided by authenticity (Bench et al., 2015), and people consider more authentic the times in which they expressed behaviorally a positive (than negative) trait (Bailey and Iyengar, 2023). Lastly, favorable (vs. unfavorable) feedback, and future behavioral positivity (expressing much higher caring, understanding, and kindness than currently held) versus future behavioral negativity (expressing much lower caring, understanding, and kindness than currently held), heighten authenticity, while induced authenticity (thinking of a time in which one felt true to themselves) versus inauthenticity (thinking of a time in which one felt untrue to themselves) heightens self-aggrandizement (Guenther et al., 2024). The link between valence and authenticity is so strong that experimental manipulations of positive affect increase authenticity (Chen et al., 2023; Lenton et al., 2013). In addition, individuals who self-report as being high on authenticity are more prone to *appear* to be authentic. For example, self-proclaimed authentic individuals try to strategically convey authenticity to others, even when such behaviors were inconsistent with their objective experiences (Hart et al., 2020). Taken together, there is enough evidence to suggest that authenticity judgments are a form of self-enhancement, leading some researchers to question whether authenticity has any meaning at all beyond valence (Jongman-Sereno and Leary, 2019).

1.2. The authentic self and the presented self

As stated above, evidence is stronger for the self-enhancement view compared to the self-accuracy and self-consistency views of authenticity. But can the self-enhancement view account for the full conceptual range of authenticity? Is authenticity just positivity or self-enhancement?

We addressed these questions by comparing the authentic self with the self that individuals present to others. The presented self is the benchmark of positive self-presentation.[1] Stakes are high for the presented self as it can facilitate or undermine cooperation, reputation, respect, status, and access to social groups, professional resources (e.g., jobs, promotions, housing), or personal resources (e.g., friends, partners; Dores Cruz et al., 2021; Vonasch et al., 2018). Consequently, self-presentations typically promote a sanitized portrait of the individual, overemphasizing, if not extolling, one's strengths and underemphasizing, if not concealing, one's weaknesses (Baumeister, 1982; Roth et al., 1986; see Study S1, Supplementary Material). Indeed, the words people select to describe their true self are less socially desirable than the words they select to describe their presented self (Schlegel et al., 2009).

The presented self is not an ephemerality. Instead, it is internalized as part of the private self. Theory and empirical findings bolster this assertion. According to symbolic interactionism and role theory (Stryker and Statham, 1985), people construct their sense of self though social interactions, and in particular the behaviors they enact or roles they play as well as others' reactions to these behaviors or roles. Research findings concur. Strategic self-presentations influence subsequent private self-views; that is, people shift both their overall evaluations of themselves and their evaluations of specific characteristics of themselves in the direction of their preceding self-presentations (Leary, 1995). Also, changes in self-evaluations that occurred in one context because of self-presentations carry over to a new context in the absence of self-presentational pressures (Schlenker, 2003). Taken together, the presented self constitutes a mental representation, just like the authentic self. To clarify, we do not argue that the presented self is inauthentic, and we do not contrast the authentic with the presented self. Indeed, a given trait can be endorsed as part of both selves. Rather, we examine whether the authentic self is inherently positive by comparing it to the benchmark of favorability, the presented self.

1.3. A combination of behavioral with event related potential assessment to examine authenticity

We collected behavioral data (Experiments 1–2) by means of the self-reference valence (SR-valence) task. This is a variant of the self-reference task, which indicates improved memory and faster reaction times for trait adjectives that are accompanied by self-referential instructions ("does the word describes you?") relative to control, including other-referential, instructions (Northoff and Bermpohl, 2004). In the SR-valence task, participants judge whether positive versus negative traits are self-descriptive or non-self-descriptive (D'Argembeau et al.,

[1] Self-presentation can serve various goals beyond favorability, including the projection of both positive and negative attributes (Schlenker, 1980). However, self-enhancement remains a potent motive, particularly in contexts where individuals seek to maintain or enhance their social image. Research has established that individuals are more likely to engage in self-enhancing presentations to be perceived favorably, boost their self-esteem, achieve social approval, and make the best possible impression (Leary, 2007; Paulhus et al., 2003; Schlenker & Leary, 1982; Sedikides & Gregg, 2008). Furthermore, individuals who self-derogate are enhanced by others (e.g., increased numbers of "likes" and comments from their network friends; Bareket-Bojmel et al., 2016; Lee et al., 2014). Therefore, the current study regards the presented self as the "benchmark of positive self-presentation."

2005). The task allows assessing the endorsement of positive versus negative traits (trait endorsement), and the speed of this endorsement (reaction time). Reaction time is used as a proxy for cognitive processing speed (Jensen, 2006). In the context of self-reference tasks, it can reflect the cognitive accessibility of self-concept information (Schlegel et al., 2009); indeed, faster reaction times are indicative of stronger, more accessible associations with the self-concept (Cai et al., 2016; Rameson et al., 2010). In the SR-valence task, higher endorsement (i.e., judging more traits as self-descriptive), or faster reaction time thereof, of positive than negative traits (i.e., Valence × Endorsement interaction) is a signature of self-positivity (Cai et al., 2016).

We also collected neuropsychological data (Experiment 2) to examine the extent to which neurocognitive processes tracked behavioral performance on the SR-valence task. Although research directly exploring the neural underpinnings of authenticity is scant (Sedikides and Schlegel, 2024), there is a growing body of literature examining related constructs, such as self-referential processing. This research often focuses on how the brain processes emotionally salient stimuli, including emotional word tasks, offering insights into mechanisms that may overlap with the experience of authenticity.

Prior event related potential (ERP) studies have identified distinct stages of emotional word processing: the P1, which differentiates between non-threatening and threatening information; the N170 and early posterior negativity, which reflect emotional and non-emotional discrimination; and the late positive potential (LPP), which distinguishes between positive and negative words (Zhang et al., 2014). Similar stages of emotional processing have also been observed in facial recognition studies (Luo et al., 2010). These three stages of emotional processing provide a useful framework for understanding self-reference responses to stimuli of varying emotional valence.

Recently, a stream of EEG literature has addressed self-reference processing in emotional word contexts via the SR-valence task. In one study, negative traits elicited larger N170 responses in East-Asian (but not Western) participants, and self-descriptive traits, particularly negative ones, produced larger LPP responses compared to non-self-descriptive traits (Cai et al., 2016). In another study, P1 and LPP effectively captured biased self-reference processing in female adolescents with depression (Auerbach et al., 2015). Specifically, depressed participants (vs. non-depressed controls) exhibited greater P1 amplitudes following negative words. Non-depressed controls showed greater LPP activity following positive (vs. negative) words, whereas depressed participants demonstrated the opposite pattern. Further, in yet another study, emotional content rapidly captured attention (reflected in augmented early posterior negativity for unpleasant and pleasant nouns vs. neutral ones), followed by higher-order self-referential processing (manifested as augmented LPPs for unpleasant nouns only when preceded by personal pronouns; Herbert et al., 2011). However, self-referential processing may occur earlier than emotional processing, with self-other discrimination emerging as early as the P1, and interactions between self-reference and emotional valence appearing later, manifested in the LPP (Zhou et al., 2017). Despite variations in prioritizing self-referential versus emotional processing, this literature indicates that self-referential processing in emotional contexts operates through multiple stages, and it is possible to identify distinct markers of it at different stages.

Informed by these findings, we considered three ERP components as covert measures of attention allocated independently of behavioral responses: P1, N170, and LPP. We offer a detailed description of them in the introduction to Experiment 2.

1.4. Pitting the authentic self against the presented self via self-positivity

We subjected the favorability of the authentic self to a litmus test, comparing it to the presented self. Specifically, we examined the relative strength of self-positivity for the authentic and presented selves. We offered two competing hypotheses (Platt, 1964). To test them, participants responded to a series of positive and negative traits, indicating whether each trait described their authentic and presented self while reaction time was being recorded (Fig. 1). First, in line with the self-enhancement view, we hypothesized that the strength of self-positivity would be comparable for the authentic and presented selves. Self-enhancement is thought to operate broadly, manifesting across self-representations (Sedikides, 2020a, 2021; Sedikides and Gregg, 2008). This view anticipates an interaction between valence (positive vs. negative traits) and endorsement (self-descriptiveness vs. non-self-descriptiveness) that remains independent of self (authentic vs. presented). Second, in line with the self-accuracy and self-consistency views, we hypothesized that the strength of self-positivity would be weaker for the authentic compared to the presented self. These views highlight the importance of recognizing both the genuinely positive and genuinely negative aspects of oneself, as doing so contributes to greater accuracy or self-consistency (Kernis and Goldman, 2006; Lakey et al., 2008; Wood et al., 2008). However, this recognition may not extend to the presented self, where accuracy and consistency are not directly relevant. Consequently, these views anticipate an interaction involving valence, endorsement, and self.

1.5. Transparency and openness

We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study, and we follow Journal Article Reporting Standards (Appelbaum et al., 2018). All data, analysis code, and research materials are available at [https://osf.io/khauc/?view_only=19682103eecd4e62a2bfdae7cc4e485c]. We analyzed the data using Jamovi, version 2.3.21 (Şahin and Aybek, 2020), R, version 4.3.1 (R Core Team, 2023) and the package *ggplot*, version 3.4.3 (Wickham and Wickham, 2016). We addressed the issue of multiple comparisons using Bonferroni corrections. Neither experiment was preregistered.

2. Experiment 1

In Experiment 1, we tested behaviorally the strength of self-positivity for the authentic self versus the presented self. We implemented a 2 (self: authentic self vs. presented self) × 2 (valence: positive traits vs. negative traits) × 2 (endorsement: self-descriptiveness vs. non-self-descriptiveness) within-subjects design.

2.1. Method

2.1.1. Participants and design

We focused our power analysis on the hypothesis derived from the self-accuracy and self-consistency views because they require a significant three-way interaction, whereas the self-enhancement view only requires a significant Valence × Endorsement interaction. We used *Superpower* (Lakens and Caldwell, 2021) to conduct a simulation-based power analysis. We carried out 2000 Monte Carlo simulations, assuming a correlation among within-subject factors of 0.5 and a common standard deviation of 1.00. We sought to have sufficient power to detect small-to-moderate ($d = 0.20$) reductions in self-positivity for the authentic (vs. presented) self. Based on these parameters, 50 participants were needed to detect a significant three-way interaction with 80 % power. We considered this our minimum sample size and proceeded to recruit 339 University of [MASKED] introductory psychology students (from the corresponding participant pool) throughout the

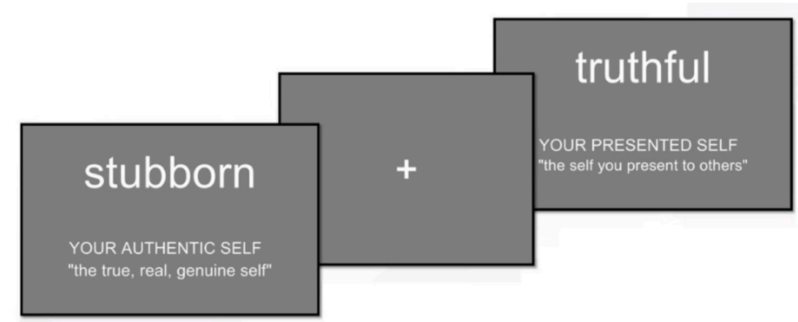

Fig. 1. The trial event diagram.
Note. For each trial, participants made a binary judgement (yes vs. no) as to whether a trait described their authentic self and presented self. We randomized, separately for each participant, the order of traits and blocks of traits referring to the authentic self or presented self. Each trait was displayed on the computer screen until a response (key-pressing) occurred but no longer than 6 s, or the screen would automatically switch to the next trial. We randomized interstimulus intervals between 800 and 1200 ms, during which we presented a central fixation.

semester in exchange for course credit. We excluded six participants for the following reasons (see data processing pipeline under "Data Recording and Data Analysis"): (a) two did not complete the whole task, (b) two evinced >50 % missing data after we removed "no response" trials (i.e., longer than 6 s), "impossibly fast" trials (i.e., <200 ms) ,[2] as well as the 1 % slowest and 1 % fastest trials, and (c) two manifested mean reaction time that exceeded ± 3 standard deviations (Morís Fernández and Vadillo, 2020). All procedures used in the current experiment were approved by the University of [MASKED] ethics committee (No. IRB2021–1268 M).

We used a multilevel model (MLM)/hierarchical linear model (HLM) to analyze reaction times. This model requires a minimal threshold of five observations when testing fixed effects (McNeish and Stapleton, 2016); here, these effects pertained to self, valence, and endorsement. Thus, we excluded an additional 111 participants, because they engaged in fewer than five trials in at least one condition; for example, we excluded participants who only endorsed two negative traits as their presented self (participants excluded per condition: negative descriptive traits for the presented self, $n = 83$; negative descriptive traits for the authentic self, $n = 29$; positive non-descriptive traits for the presented self, $n = 22$; positive non-descriptive traits for the authentic self, $n = 20$) .[3] The final sample consisted of 222 participants (131 women, 89 men, 2 unknow) ranging in age from 18 to 22 years ($M = 18.68$, $SD = 0.92$). Of them, 124 identified as White, 54 as Latinx, 19 as Asian, 14 as mixed race, and 9 as Black (two did not indicate their ethnicity).

2.1.2. Stimuli and procedure

Anderson (1968) introduced a list of 555 personality traits rated for likableness and meaningfulness. Chandler (2018) tested the replicability of Anderson's list by asking participants to rate each trait's likableness (0 = *least favorable or desirable*, 6 = *most favorable or desirable*). The resulting ratings were highly correlated with Anderson's ratings ($r = 0.96$, $p < 0.001$). We selected 85 positive traits and 85 negative traits from Chandler's list.[4] The likableness of the selected positive traits ($M = 4.71$, $SD = 0.53$) was much higher than the likableness of the selected negative traits ($M = 1.22$, $SD = 0.42$), $t(168) = 47.99$, $p < 0.001$, Cohen's $d = 7.36$.

Participants completed the SR-valence task in a quiet laboratory room via computer. They were shown a list of positive and negative traits, and judged whether each trait was self-descriptive or non-self-descriptive (D'Argembeau et al., 2005). Participants evaluated each trait twice: once for the authentic self and once for the presented self. We defined the authentic self as "the true, real, genuine self," and the presented self as "the self you present to others" (see Fig. 1 for the trial event diagram). We programmed and administered the experiment using jsPsych (Version 6.3; de Leeuw, 2015).

2.1.3. Data recording and data analysis

The main dependent variables were trait endorsement (judgments of positive vs. negative traits as self-descriptive or non-self-descriptive) and reaction time (RT; speed of trait endorsement). We created a reaction time data processing pipeline based on Morís Fernández and Vadillo's (2020) suggestions. First, we excluded "no response" trial (i.e., longer than 6 s) or "impossibly fast" trials (i.e., <200 ms). Second, we removed the 1 % slowest and 1 % fastest trials. Third, we removed participants with >50 % missing data. Finally, we computed the mean reaction time. We did not log transform the RT data, because they were normally distributed (Skew and Kurtosis < ± 2 for each trial type in each study; Byrne, 2013).

2.2. Results

2.2.1. Trait endorsement

We entered the number of trait endorsements (i.e., self-descriptive vs. non-self-descriptive) into a three-way Analysis of Variance (ANOVA) with self (authentic self vs. presented self), valence (positive trait vs. negative trait), and endorsement (self-descriptive vs. non-self-descriptive) as within-subjects factors.

The Valence × Endorsement interaction was significant, $F(1, 221) = 3478.21$, $p < 0.001$, $\eta_p^2 = 0.94$. Participants endorsed more positive traits (66.09 ± 8.31) than negative traits (15.34 ± 7.57) as self-descriptive, $t(221) = 58.45$, $p < 0.001$, 95 % CI = [49.05, 52.47], *Cohen's* $d = 3.92$, but judged more negative traits (66.79 ± 8.65) than positive traits (15.78 ± 6.95) as non-self-descriptive, $t(221) = 59.22$, p

[2] Two participants evinced >50% missing data after we removed the 1% slowest and 1% fastest trials, rather than the "no response" trials (i.e., longer than 6 seconds) and "impossibly fast" trials (i.e., <200ms). To ensure consistency between the "Participants and Design" (pp. 9-10) and "Data Recording and Data Analysis" (p. 11) section, we included references to "no response" trials and "impossibly fast" trials under "Participants and Design."

[3] Some participants had fewer than 5 trials in more than one condition; for example, one participant could judge fewer than 5 negative traits as self-descriptive of the presented self, and the same participant could also judge fewer than 5 negative traits as self-descriptive of the authentic self; hence the total number of participants is greater than 111.

[4] These traits are listed in both Anderson's and Chandler's lists, and represent extremes in terms of likability ratings—either occupying the lower end (i.e., negative traits) or the upper end (i.e., positive traits) of the spectrum.

< 0.001, 95 % CI = [49.31, 52.70], *Cohen's d* = 3.97. This pattern replicates self-positivity (Cai et al., 2016; Shi et al., 2017). Moreover, self-positivity was evident for both the authentic self and the presented self (Supplementary Material).

Crucially, the Self × Valence × Endorsement interaction was significant, $F(1, 221) = 47.85$, $p < 0.001$, $\eta_p^2 = 0.18$. We examined the Self × Endorsement interaction separately for positive traits and negative traits, testing whether self-positivity was stronger for one kind of self versus another (Fig. 2a). In the case of positive traits, participants endorsed positive traits as equally descriptive of the presented self (66.71 ± 8.76) and the authentic self (65.48 ± 9.74), $t(221) = 2.23$, $p = 0.746$, 95 % CI = [0.14, 2.31], *Cohen's d* = 0.15, and judged positive traits as equally non-descriptive of the authentic self (16.16 ± 8.04) and the presented self (15.40 ± 7.81), $t(221) = 1.49$, $p = 1.000$, 95 % CI = [−0.24, 1.77], *Cohen's d* = 0.10. However, in the case of negative traits, participants endorsed more negative traits as descriptive of the authentic self (18.09 ± 9.63) than the presented self (12.58 ± 8.06), $t(221) = 8.83$, $p < 0.001$, 95 % CI = [4.28, 6.74], *Cohen's d* = 0.59, and judged more negative traits as non-descriptive of the presented self (69.79 ± 8.86) than the authentic self (63.78 ± 10.83), $t(221) = 9.33$, $p < 0.001$, 95 % CI = [4.74, 7.28], *Cohen's d* = 0.63. The authentic self evinced weaker self-positivity than the presented self.

Finally, the Self × Endorsement interaction was significant, $F(1, 221) = 65.18$, $p < 0.001$, $\eta_p^2 = 0.23$. Participants endorsed more traits as descriptive of the authentic self (41.79 ± 5.61) than the presented self (39.64 ± 4.74), $t(221) = 6.72$, $p < 0.001$, 95 % CI = [1.52, 2.77], *Cohen's d* = 0.45, but judged more traits as non-descriptive of the presented self (42.60 ± 4.62) than the authentic self (39.97 ± 5.51), $t(221) = 8.41$, $p < 0.001$, 95 % CI = [2.01, 3.24], *Cohen's d* = 0.56. The authentic self appeared to be more inclusive than the presented self.

2.2.2. Reaction times

We used MLM to analyze reaction time (RT) and employed the R package 'lme4' (Bates et al., 2015) to fit it (for the model settings see Supplementary Material).

The Valence × Endorsement interaction was significant, $\beta = -126.53$, $t_{72690} = -35.40$, $p < 0.001$. We followed up with simple slope analyses in MLM (Curran et al., 2015). Participants were faster to endorse positive traits than negative traits as self-descriptive ($\gamma = -158.28$, $z = -31.88$, $p < 0.001$), but were faster to reject (i.e., non-endorse) negative traits than positive traits as self-descriptive ($\gamma = 94.78$, $z = 18.60$, $p < 0.001$). This pattern of results replicates self-positivity (Cai et al., 2016; Shi et al., 2017). Moreover, self-positivity was evident for both the authentic self and the presented self (Supplementary Material).

Crucially, the Self × Valence × Endorsement interaction was significant on RT, $\beta = 8.76$, $t_{72627} = 2.48$, $p = 0.013$. We examined the Self × Endorsement interaction separately for positive traits and negative traits, testing whether self-positivity was stronger for one kind of self versus another (Fig. 2c). In the case of positive traits, participants endorsed positive traits faster for the presented self than the authentic self ($\gamma = 9.85$, $z = 2.29$, $p = 0.022$), and rejected positive traits faster for the presented self than the authentic self ($\gamma = -20.73$, $z = -2.35$, $p = 0.019$). In the case of negative traits, participants endorsed negative traits faster for the authentic self than the presented self ($\gamma = -38.07$, $z = -4.17$, $p < 0.001$), and did not differ in their rejection of negative traits for the two selves ($\gamma = 7.85$, $z = 1.83$, $p = 0.067$). We display in Table S1 detailed results of the fixed effects of the MLM.

2.3. Discussion

Participants endorsed an equivalent number of positive traits as descriptive of the authentic and presented self, while judging an equivalent number of such traits as nondescriptive of the two selves. However, participants judged more negative traits as descriptive of the authentic than presented self and judged more such traits as

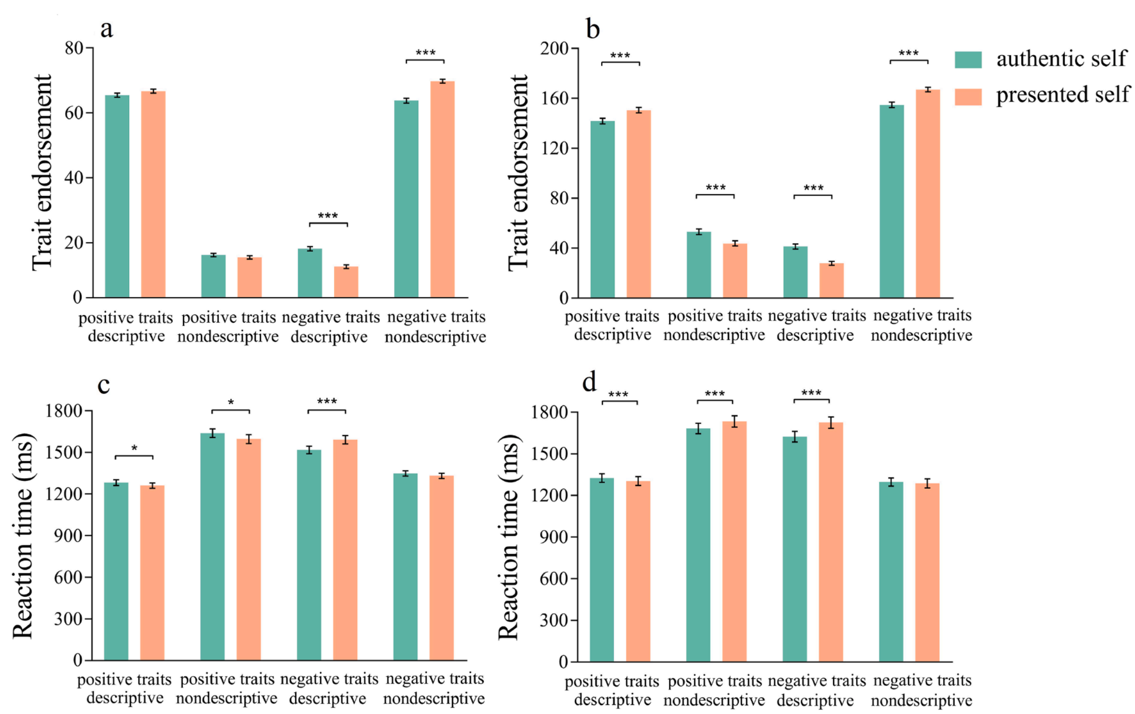

Fig. 2. Behavioral manifestations of self-positivity for the authentic self and presented self in experiments 1 and 2.
Note. (**a**) Endorsement of self-descriptive traits and non-self-descriptive traits in Experiment 1. (**b**) Endorsement of self-descriptive traits and non-self-descriptive traits in Experiment 2 (see Tables S3 and S4 for fixed effects of self, valence, endorse, and their interactions on endorsement). (**c**) Reaction time of self-descriptive traits and non-self-descriptive traits in Experiment 1 (see Table S1 for fixed effects of self, valence, endorse, and their interactions on reaction time). (**d**) Reaction time of self-descriptive traits and non-self-descriptive traits in Experiment 2 (see Tables S5 and S6 for fixed effects of self, valence, endorse, and their interactions on reaction time). Error bars represent SEM; ***$p < 0.001$. **$p < 0.01$. *$p < 0.05$.

nondescriptive of the presented than authentic self. Further, they were faster to endorse positive traits for the presented than authentic self and were faster to endorse negative traits for the authentic than presented self. Overall, self-positivity was weaker for the authentic than presented self, in line with the self-accuracy and self-consistency views. Next, we sought to re-test these behavioral findings and explore pertinent neuropsychological underpinnings.

3. Experiment 2

In Experiment 2, we tested the strength of self-positivity for the authentic versus presented self not only behaviorally (with an identical procedure to Experiment 1′s), but also neuropsychologically. We examined neural mechanisms via EEG in a 2 (self: authentic self vs. presented self) × 2 (valence: positive traits vs. negative traits) × 2 (endorsement: self-descriptiveness vs. non-self-descriptiveness) within-subjects design. Specifically, we considered P1, N170, and LPP as covert measures of attention allocated independently of behavioral responses.

The P1 is the initial positive deflection in the parieto-occipital region, and typically emerges 60–90 ms post-stimulus with a peak between 100 and 130 ms (Luck, 2014). Originating in the visual cortex, the P1 has conventionally been conceptualized as an early sensory-evoked component in relation to sensory amplification and selective attention (Hillyard et al., 1998). Multiple studies have indicated that the P1 is sensitive to emotional stimuli (for reviews, see: Mueller et al., 2013; Schindler and Bublatzky, 2020). Moreover, some studies observed larger P1 amplitudes evoked by negative stimuli (e.g., faces, words) compared to neutral counterparts (Luo et al., 2010; Zhang et al., 2014), indicating that the P1 can differentiate between non-threatening and potentially threatening information (Zhang et al., 2014). Such early emotional response may signify rapid extraction of emotion-related information and may function—at least partly— independent of subsequent, more nuanced emotional processes such as N170 (Vuilleumier and Pourtois, 2007). Relevant to Experiment 2, in a SR-valence task, depressed female adolescents (compared to healthy counterparts), who generally maintain a negative self-view (Auerbach et al., 2014), displayed heightened P1 amplitudes in response to negative words, but not to positive words (Auerbach et al., 2015). Building on this finding, we proposed two competing hypotheses. Aligning with the self-enhancement view—positivity is reassuring, whereas negativity is threatening, to the self—we hypothesized that P1 responses would be larger for negative versus positive self-descriptive traits and would be comparable across both selves. This pattern would be reflected in a Valence × Endorsement interaction indicating heightened sensitivity to negative self-relevant information for both the authentic and presented selves. Alternatively, aligning with the self-accuracy and self-consistency views—where positivity is reassuring to self, and negativity is not threatening to the authentic self—we hypothesized that P1 responses would still be larger for negative versus positive self-descriptive traits, but that this effect would be attenuated for the authentic self compared to the presented self. This pattern would be reflected in a Self × Valence × Endorsement interaction indicating reduced sensitivity to negative self-relevant information specifically for the authentic self.

The N170 is a negative deflection that typically peaks at approximately 170 ms after stimulus onset over the lateral occipito-temporal regions, especially over the right hemisphere (Luck, 2014). The N170 is known for being face-sensitive: it manipulates a larger peaking in response to face-elicited stimuli than non-face-elicited stimuli (Rossion and Jacques, 2012). In addition, the N170 can be modulated by the valence of the facial expression, with a significantly augmented negativity for emotional relative to neutral facial expression (Luo et al., 2010). Such modulation has also been found in emotional word processing (Zhang et al., 2014). Moreover, negative adjectives elicit larger N170 amplitudes than positive adjectives (Montalan et al., 2008). The above findings indicate that the N170 can reflect early attention to stimuli with emotional valence, especially for negative emotional stimuli, with a larger N170 amplitude representing the allocation of more attentional resources (Cai et al., 2016). Building on these findings, we offered two competing hypotheses, similar to those for P1. First, aligning with the self-enhancement view—positivity is reassuring to the self, but negativity is threatening to the self—we hypothesized that N170 responses would be larger for negative versus positive self-descriptive traits, and comparable across both selves. This pattern would be reflected in a Valence × Endorsement interaction, evincing earlier attention to negative self-relevant information for both selves. Second, aligning with the self-accuracy and self-consistency views—positivity is reassuring to the self, and negativity is not threatening to the authentic self—we hypothesized that N170 responses would be larger for negative versus positive self-descriptive traits, but that this effect would be attenuated for the authentic compared to the presented self. This pattern would be reflected in a Self × Valence × Endorsement interactions, evincing reduced earlier attention to negative self-relevant information, in particular for the authentic self.

The LPP manifests as a sustained positive deflection typically observed approximately 400–500 ms post-stimulus presentation, persisting for several hundred milliseconds at the midline centroparietal region (Hajcak et al., 2012). Notably, the LPP exhibits an augmented amplitude in response to emotionally arousing stimuli when compared to neutral stimuli, spanning various modalities such as pictures, faces, hand gestures, and words (Hajcak and Foti, 2020). Moreover, the LPP is sensitive to self-referent information, exhibiting greater amplitudes for self-referent relative to non-self-referent content (A. Hudson et al., 2020; Jordan, et al., 2022; Żochowska et al., 2021). In addition, the LPP can capture both emotional and evaluative processing with respect to the self. For instance, some studies have found augmented LPP responses to negative (vs. positive) stimuli when participants refer to themselves (Cai et al., 2016; Herbert et al., 2011), whereas other studies report the reverse, with greater LPP responses following positive versus negative words during the self-reference task (Auerbach et al., 2015; Shestyuk and Deldin, 2010). Although findings remain mixed, the amplified LPP in self-referential tasks may reflect deeper processing of self-relevant information, in line with the LPP's broader role in sustained attention and elaborative processing (Auerbach et al., 2015; Hajcak et al., 2012), as well as in signaling stimulus significance and motivational relevance (i.e., activation of appetitive or aversive motivational systems; Hajcak and Foti, 2020). These variations in LPP response may imply underlying factors, such as differences in self-representation (e.g., presented vs. authentic self), that influence how self-relevant information is processed.

Building on these findings, we offered two competing hypotheses. First, congruent with the self-enhancement view—positivity is reassuring, but negativity is threatening, to self—we hypothesized that LPP responses would be larger for positive versus negative self-descriptive traits and would be comparable across the two selves. This pattern would be reflected in a Valence × Endorsement interaction, manifesting more elaborative processing and stimulus significance of positivity for both the authentic and presented selves. Alternatively, congruent with the self-accuracy and self-consistency views—positivity is reassuring to self, while negativity is not threatening to the authentic self—we hypothesized that LPP responses would be larger for positive versus negative self-descriptive traits, but that this effect would be weaker for the authentic versus presented self. This pattern would be reflected in a Self × Valence × Endorsement interaction, manifesting elaborative processing and stimulus significance of positivity, specifically weaker for the authentic self.

3.1. Method

3.1.1. Participants and design

Based on the power analysis from Experiment 1, we sought to test at least 50 participants. We recruited, until the end of the academic year, 157 University of [MASKED] introductory psychology students (from the participant pool) for course credit. We excluded seven participants for the following reasons: one did not complete the whole task, five encountered equipment failures (e.g., keyboard, EEG acquisition equipment; Tacikowski and Nowicka, 2010), one manifested mean reaction time exceeded ± 3 *SD*s (Cai et al., 2016). Additionally, we excluded 29 participants, because they failed to meet the requirement for ERP analysis due to insufficient (< 5) EEG trials[5] (participants excluded per condition: negative descriptive traits for the presented self, $n = 24$; negative descriptive traits for the authentic self, $n = 9$; positive non-descriptive traits for the presented self, $n = 6$). The final sample comprised 121 participants (97 women, 24 men) aged between 18 and 46 years ($M = 19.83$, $SD = 3.45$). We did not collect ethnicity information, but we note that over 90 % of the sponsoring University's undergraduates are White. All procedures used in the current experiment were approved by the University of [MASKED] ethics committee (No. 67,233).

3.1.2. Stimuli and procedure

The stimulus materials were 200 positive traits and 200 negative traits from Anderson's personality list. We increased the number of traits due to requirements of EEG experiments. Based on Chandler's (2018) ratings, the likableness of the selected positive traits ($M = 4.74$, $SD = 0.50$) was higher than that of the selected negative traits ($M = 1.33$, $SD = 0.48$), $t(398) = 67.88$, $p < 0.001$, Cohen's $d = 6.79$. We programmed the experiment using PsychoPy (Version 2021.2.3; Peirce, 2007).

3.1.3. Data recording and data analysis

We collected the EEG data continuously from 64 scalp sites using Ag/AgCl electrodes mounted in an elastic cap (Neuroscan, NC), with an online reference to the left mastoid and off-line algebraic re-reference to the average of left and right mastoids. We mounted a ground electrode midway between FPz and Fz. We recorded the vertical electrooculogram (VEOG) and horizontal electrooculogram (HEOG) from two pairs of electrodes, with one placed above and below the left eye, and another placed 10 mm from the outer canthi of each eye. We based the electrode cap on the 10–20 system. We kept electrode impedances below 5 kΩ. We amplified and sampled the signals at 1000 Hz with an online bandpass filter from 0.10 to 100 Hz.

In offline processing, we initially pre-processed the EEG data by using EEGLAB, an open-source toolbox running in the MATLAB environment (Delorme and Makeig, 2004). We digitally filtered the EEG data with a band-pass filter (high pass: 0.10 Hz, low pass: 40 Hz, 50 Hz notch), segmented them from 200 ms prior to 1000 ms following the onset of each word, and baseline corrected them to the −200–0 ms. We identified bad channels by visual inspection of the waveforms and replaced them by using a spherical spline identified interpolation (SSI; Perrin et al., 1989). We corrected segments contaminated by blinks, eye movements, and other artifacts using an independent component analysis (ICA) algorithm (Delorme and Makeig, 2004) and ICLabel, a proposed statistical model, to automatically label ICA components (Pion-Tonachini et al., 2019). We also excluded bad segments where a voltage deviation on any channel of ± 75 μV.

Then, we averaged the ERPs for each of the eight conditions (2 [self: authentic self vs. presented self] × 2 [valence: positive traits vs. negative traits] × 2 [endorsement: self-descriptiveness vs. non-self-descriptiveness]). We excluded data from trials where a participant had not responded (reaction time > 6 s) or provided an improper response (in <200 ms). There was an average of 739.51 trials per participant. We display information on the number of retained EEG trials per condition in Supplementary Material (Table S2).

Our ERPs of interest were quantified following best practices (Luck and Gaspelin, 2017). For each ERP, we employed a collapsed localizer approach, in which a grand average of all conditions is created and used to identify where each component is spatially and temporally maximal. For the P1, we measured the mean amplitude between 90 ms and 130 ms over 9 parieto-occipital sites: P3, P4, Pz, PO3, PO4, POZ, O1, O2, and OZ. For the N170, we measured the mean amplitude between 120 ms and 200 ms over 16 temporal-parieto-occipital sites: TP7, TP8, P1, P2, P3, P4, P5, P6, P7, P8, PO3, PO4, PO7, PO8, O1, and O2. Finally, for the LPP we measured the mean amplitude between 350 ms and 800 ms over 15 frontal-central-parietal sites: F3, FZ, F4, FC3, FCZ, FC4, C3, CZ, C4, CP3 CPZ, CP4, P3, P4, and Pz. These measurement locations and time windows are consistent with previous literature on P1 (e.g., Luo et al., 2010), N170 (e.g., Hinojosa et al., 2015), and LPP (e.g., Webber et al., 2022). The main dependent variables were trait endorsement, reaction time (RT), and ERPs (N170, P300, LPP). For the RT, we adopted the same preprocessing steps as in Experiment 1 to reduce the false-positive rate.

3.2. Results

3.2.1. Trait endorsement

We entered the number of trait endorsements into a three-way ANOVA. The Valence × Endorsement interaction was significant, $F(1, 120) = 1172.22$, $p < 0.001$, $\eta_p^2 = 0.91$. Participants endorsed more positive traits (146.22 ± 22.55) than negative traits (34.62 ± 18.61) as self-descriptive, $t(120) = 33.77$, $p < 0.001$, 95 % $CI = [105.03, 118.15]$, *Cohen's* $d = 3.07$, but judged more negative traits (160.95 ± 20.07) than positive traits (48.48 ± 21.48) as non-self-descriptive, $t(120) = 34.53$, $p < 0.001$, 95 % $CI = [106.01, 118.91]$, *Cohen's* $d = 3.14$. This pattern replicates self-positivity (Cai et al., 2016; Shi et al., 2017). Moreover, self-positivity was evident for both the authentic self and the presented self (Supplementary Material). We provide in Table 1 the 30 most commonly endorsed positive and negative traits, and we display in Fig. 3 positive and negative self-portraits based on trait frequency.

Crucially, the Self × Valence × Endorsement interaction was significant, $F(1, 120) = 57.50$, $p < 0.001$, $\eta_p^2 = 0.32$. We examined the Self × Endorsement interaction separately for positive traits and negative traits, testing whether self-positivity was stronger for one kind of self versus another (Fig. 2b). In the case of positive traits, participants endorsed more such traits as descriptive of the presented self (150.61 ± 24.03) than the authentic self (141.83 ± 25.01), $t(120) = 5.02$, $p < 0.001$, 95 % $CI = [5.31, 12.24]$, *Cohen's* $d = 0.46$, but judged more such traits as non-descriptive of the authentic self (53.14 ± 24.72) than the presented self (43.83 ± 22.31), $t(120) = 5.31$, $p < 0.001$, 95 % $CI = [5.84, 12.79]$, *Cohen's* $d = 0.48$. In the case of negative traits, participants endorsed more such traits as descriptive of the authentic self (41.35 ± 23.02) than the presented self (27.88 ± 17.66), $t(120) = 8.58$, $p < 0.001$, 95 % $CI = [10.35, 16.57]$, *Cohen's* $d = 0.78$, but judged more such traits as non-descriptive of the presented self (167.08 ± 19.27) than the authentic self (154.81 ± 24.90), $t(120) = 7.01$, $p < 0.001$, 95 % $CI = [8.81, 15.74]$, *Cohen's* $d = 0.64$. Again, as in Experiment 1, the authentic self manifested weaker self-positivity than the presented self: Participants endorsed fewer positive traits for the authentic self than the

[5] Researchers have provided guidelines for the number of trials for ERP experiments, with 20 trials suggested for the P300 (Cahn & Polich, 2006) and 8-12 trials for LPP (Moran et al., 2013). However, apart from a specific number of trials, researchers must also consider factors that may influence the ability to obtain a "stable" ERP waveform, such as sample size, anticipated effect magnitude, and noise level (Boudewyn et al., 2018). Moreover, the representativeness of the sample can vary substantially based on number of trials. This was a crucial consideration in the current study. Specifically, with 5 trials per condition, 121 participants remain, out of the original 150 (80.67%). With 8 trials per condition, 107 participants remain (71.33%), and, with 20 trials per condition, only 61 participants remain (40.67%). Here, a greater number of trials excluded corresponds to reduced sample representativeness. As such, participants likely to evince strong self-positivity may be excluded due to insufficient trials, especially the ones in the presented self, negative traits, self-descriptiveness condition. Consequently, we opted for 5 trials per condition to maximize participant inclusion. Importantly, the results were comparable across 121, 107, and 61 participants.

Table 1
The most common endorsed positive and negative traits in experiment 2.

Positive traits	Count	Negative traits	Count
Loyal	233	nervous	159
respectful	232	clumsy	152
good-natured	232	insecure	148
kind	232	headstrong	144
friendly	231	stubborn	142
polite	230	nosey	142
nice	230	oversensitive	141
decent	229	overcritical	140
helpful	229	gossipy	127
well-mannered	229	Lazy	119
considerate	228	childish	119
reliable	228	jumpy	118
moral	227	messy	118
likable	227	moody	111
grateful	227	noisy	109
understanding	227	complaining	103
pleasant	227	fault-finding	101
trustworthy	227	frustrated	99
kind-hearted	227	touchy	98
kindly	226	irritable	98
reasonable	226	superstitious	97
trustful	226	jealous	95
thoughtful	226	bossy	94
appreciative	226	untidy	93
sympathetic	226	ultra-critical	89
warm-hearted	225	mediocre	86
open-minded	225	unhealthy	83
educated	224	petty	82
able	223	unproductive	81
good	223	loud-mouthed	80

presented self and endorsed more negative traits for the authentic self than the presented self.

Lastly, the Self × Endorsement interaction was significant, $F(1, 120) = 5.24$, $p = 0.024$, $\eta_p^2 = 0.04$. Participants endorsed more traits as descriptive of the authentic self (91.59 ± 10.76) than the presented self (89.25 ± 11.08), $t(120) = 2.73$, $p = 0.043$, 95 % *CI* = [0.65, 4.04], *Cohen's d* = 0.25, but judged an equivalent number of traits as non-descriptive of the presented self (105.45 ± 11.68) and the authentic self (103.98 ± 11.73), $t(120) = 1.60$, $p = 0.668$, 95 % *CI* = [−0.35, 3.31], *Cohen's d* = 0.15. As in Experiment 1, the authentic self was more inclusive than the presented self. The above results were comparable to those we obtained for *N*s of 107 and 61 (Supplementary Material, Tables S3 and S4).

3.2.2. *Reaction times*

We analyzed the RT data via MLM applying the same model as in Experiment 1 (Supplementary Material). The Valence × Endorsement interaction was significant, $\beta = -166.93$, $t_{94375} = -58.22$, $p < 0.001$. We followed up with simple slope analyses. In replication of self-positivity, participants exhibited quicker endorsement of positive traits than negative traits as self-descriptive ($\gamma = -177.56$, $z = -47.46$, $p < 0.001$), but exhibited faster rejection of negative traits than positive traits as self-descriptive ($\gamma = 156.31$, $z = 36.52$, $p < 0.001$). Moreover, self-positivity was evident for both the authentic self and the presented self (Supplementary Material).

Crucially, the Self × Valence × Endorsement interaction was significant, $\beta = 21.75$, $t_{94329} = 7.74$, $p < 0.001$. We examined the Self × Endorsement interaction separately for positive traits and negative traits, testing whether self-positivity was stronger for one kind of self versus another (Fig. 2d). In the case of positive traits, participants endorsed positive traits faster for the presented self than the authentic self ($\gamma = 14.65$, $z = 4.00$, $p < 0.001$), and rejected positive traits faster for the authentic self than the presented self ($\gamma = -33.23$, $z = -5.19$, $p < 0.001$). In the case of negative traits, participants endorsed negative traits faster for the authentic self than the presented self ($\gamma = -37.43$, $z = -4.87$, $p < 0.001$), and did not differ in their rejection of negative traits for the authentic self and the presented self ($\gamma = 1.69$, $z = 0.48$, $p = 0.629$). As in Experiment 1, self-positivity was weaker for the authentic self than the presented self. The results were comparable for *N*s of 107 and 61 participants (Tables S5 and S6).

3.2.3. *ERP*

In Fig. 4, we depict the amplitudes of P1, N170, and LPP while participants underwent the SR-valence task.

We used MLM to analyze ERP data (for the model settings see Supplementary Material).

P1. The model revealed a significant Valence × Endorsement interaction, $\beta = -0.05$, $t_{7616} = -3.12$, $p = 0.002$. We followed up with simple slope tests (Curran et al., 2015). The elicited P1 was larger when endorsing negative traits as self-descriptive (vs. non-self-descriptive) ($\gamma = 0.07$, $z = 3.42$, $p < 0.001$), whereas the elicited P1 was equivalent when endorsing positive traits as self-descriptive and non-self-descriptive ($\gamma = -0.02$, $z = -0.99$, $p = 0.320$). P1 can reflect the processing of threatening information (Zhang et al., 2014). As such, the threat potential of having negative, self-descriptive traits emerged very early during processing of self-relevant information.

This threat potential was linked distinctly to the authentic and presented self, as evinced by the critical Self × Valence × Endorsement interaction, $\beta = 0.06$, $t_{7616} = 2.94$, $p < 0.001$ (Figs. 4a, 5. a1-a2, and 6a). The P1 was larger when participants endorsed negative traits as descriptive of the presented than authentic self ($\gamma = -0.26$, $z = -9.20$, $p < 0.001$), but it was equivalent when they endorsed positive traits as descriptive of the presented than authentic self ($\gamma = -0.004$, $z = -0.14$, $p = 0.882$). (For the results of P1 in judging the non-self-descriptiveness of positive and negative traits, see Supplementary Material.) The modulation of the P1 suggested preferential processing of negative information referring to the presented (vs. authentic) self. The authentic self exhibited weaker sensitivity to potentially threatening information at the very initial stage of processing, in line with the self-accuracy and self-consistency views.

N170. Although the Valence × Endorsement interaction was not significant, $\beta = 0.004$, $t_{13544} = -0.40$, $p = 0.693$, the crucial Self × Valence × Endorsement interaction was significant, $\beta = 0.03$, $t_{13544} = 2.94$, $p = 0.003$ (Figs. 4b, 5. b1-b2, and 6b). The N170 was larger when participants endorsed positive traits as descriptive of the presented than authentic self ($\gamma = 0.06$, $z = 3.35$, $p < 0.001$), but the N170 was not larger when participants endorsed negative traits as descriptive of the authentic versus presented self ($\gamma = -0.03$, $z = -1.72$, $p = 0.085$). (For the results of N170 in judging the non-self-descriptiveness of positive and negative traits, see Supplementary Material.) Given that the N170 reflects early attentional resource allocation to emotional stimuli (Cai et al., 2016; Montalan et al., 2008; Zhang et al., 2014), we inferred preferential processing of positive information referring to the presented (vs. authentic) self. That is, the presented self showed greater sensitivity to positive information in this subsequent stage of processing, a pattern opposite to the hypotheses derived from all three theoretical views. We provided an explanation for the conflicting result patterns of P1 and N170 in the General Discussion.

LPP. The model revealed a significant Valence × Endorsement interaction, $\beta = -0.31$, $t_{12698} = -20.57$, $p < 0.001$. The LPP was larger when participants endorsed negative (vs. positive) traits as self-descriptive ($\gamma = -0.17$, $z = -7.78$, $p < 0.001$), and was larger when they rejected positive (vs. negative) traits as self-descriptive ($\gamma = 0.45$, $z = 21.30$, $p < 0.001$). This result is in line with prior findings (Cai et al., 2016; Herbert et al., 2011).

More importantly, the Self × Valence × Endorsement interaction was also significant, $\beta = 0.04$, $t_{12698} = 2.54$, $p = 0.011$ (Fig. 4c, 5 c1-c2, and 6c). The LPP was larger when participants endorsed positive traits as descriptive of the authentic (than presented) self ($\gamma = 0.14$, $z = 4.72$, $p < 0.001$), and was also larger when participants endorsed negative traits as descriptive of the authentic (than presented) self ($\gamma = 0.19$, $z = 6.35$, $p < 0.001$). (For the results of LPP in judging the non-self-descriptiveness of

Fig. 3. Positive and negative self-portraits based on trait endorsement in experiment 2.

positive and negative traits, see Supplementary Material.)

These findings did not fully align with our initial hypotheses derived from the three theoretical views. According to a burgeoning perspective, the LPP reflects sustained attention and elaborative processing (Auerbach et al., 2015; Hajcak et al., 2012), along with stimulus significance, with larger LPP responses observed in conjunction with significant stimuli that demand more elaborative processing (Hajcak and Foti, 2020). Therefore, our results indicated that individuals allocate more sustained attention and engage in deeper processing for both favored authentic self (i.e., positive and self-descriptive traits) and disfavored authentic self (i.e., negative and self-descriptive traits), a pattern somewhat compatible with the self-accuracy and self-consistency views. We revisit the issue in General Discussion.

3.3. Discussion

Experiment 2 replicated behavioral evidence that self-positivity is weaker for the authentic than presented self. We found neurophysiological differences for the P1, N170, and LPP. We also found asymmetrical neural patterns during the earlier processing stages (P1, N170). Participants showed a larger P1 for negative traits descriptive of the presented (vs. authentic) self. This patter was reversed at the subsequent processing stage (N170). Finally, we observed a larger LPP for the authentic (vs. presented) self.

4. General discussion

What does it mean to be authentic? We tested the emerging view of authenticity as self-enhancement against more traditional views of it as self-accuracy and self-consistency. To do so, we placed authenticity

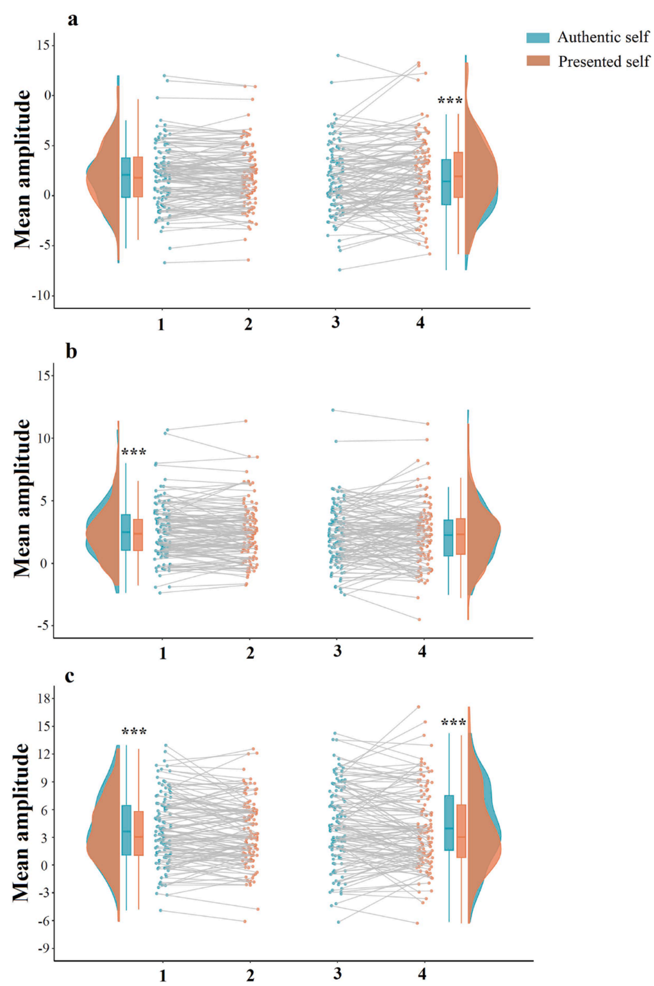

Fig. 4. Neural manifestations of self-positivity for the authentic self and presented self in experiment 2.
Note. (**a**) P1 mean amplitude for the authentic self and presented self in judging the self-descriptiveness of positive and negative traits. (**b**) N170 mean amplitude for the authentic self and presented self in judging the self-descriptiveness of positive and negative traits. (**c**) LPP mean amplitude for the authentic self and presented self in judging the self-descriptiveness of positive and negative traits (see Tables S7 to S12 for fixed effects of self, valence, endorse, and their interactions on P1, N170, and LPP; see Fig. S1 for the mean amplitude of P1, N170, and LPP for the authentic self and presented self in judging the non-self-descriptiveness of positive and negative traits). 1 = authentic self, positive traits, self-descriptiveness; 2 = presented self, positive traits, self-descriptiveness; 3 = authentic self, negative traits, self-descriptiveness; 4 = presented self, negative traits, self-descriptiveness. ****p* < 0.001.

under the behavioral and neuropsychological microscope, comparing it with a highly positive mental representation, the presented self. We tested two competing hypotheses (Platt, 1964). First, in line with the self-enhancement view, we hypothesized that the strength of self-positivity would be comparable for the authentic and presented selves. Alternatively, in line with the self-accuracy and self-consistency views, we hypothesized that the strength of self-positivity would be weaker for the authentic compared to presented self.

4.1. Summary of findings

4.1.1. Behavioral evidence

Across two experiments, we replicated self-positivity (the Valence × Endorsement interaction). In terms of trait endorsement, participants overall endorsed more positive than negative traits as self-descriptive but judged more negative than positive traits as non-self-descriptive. Further, in both experiments, participants evinced self-positivity for both the authentic and presented self (Supplementary Material). In regard to reaction times, in both experiments, participants showed faster endorsement of positive than negative traits as self-descriptive and showed faster rejection of negative than positive traits as self-descriptive. Likewise, in both experiments, participants manifested self-positivity for both the authentic and presented self (Supplementary Material).

Our main interest was in the relative strength of self-positivity tethered to the authentic versus the presented self (the three-way interaction among endorsement, valence, and self). The results were similar across experiments. In terms of trait endorsement, in both experiments, participants judged more negative traits as descriptive of the authentic than presented self, but judged more such traits as nondescriptive of the presented than authentic self. In Experiment 2, participants endorsed more positive traits as descriptive of the presented than authentic self and endorsed more such traits as nondescriptive of the authentic than presented self. In regard to reaction times, in both experiments, participants were faster to endorse positive traits for the presented than authentic self but were faster to endorse negative traits for the authentic than presented self.

In summary, participants endorsed a higher number of negative traits, and a lower number of positive traits, as part of the authentic than presented self. Also, participants were speedier in endorsing negative traits, but slower in endorsing (or speedier in denouncing) positive traits, for their authentic than presented self. Taken together, the behavioral results across experiments suggest that the self-positivity was weaker for the authentic than presented self. This is a challenge to the self-enhancement view of authenticity, which would anticipate equal degree of favorability for the authentic and presented self-concepts. In contract, the behavioral results are consistent with the self-consistency and self-accuracy views. Therefore, the authentic self, albeit positive on its own, is less positive than the presented self.

4.1.2. Neuropsychological evidence

P1, N170, and LPP amplitudes constituted the neuropsychological evidence. Initially, participants exhibited augmented P1 responses when endorsing negative traits as self-descriptive versus non-self-descriptive) (Valence × Endorsement interaction), and this effect was attenuated for the authentic self compared to the presented self (Self × Valence × Endorsement interaction). Subsequently, participants exhibited augmented N170 responses when endorsing positive traits as descriptive of the presented than authentic self (a three-way interaction among endorsement, valence, and self). Finally, participants exhibited augmented LPP responses when endorsing both positive and negative traits as self-descriptive (vs. non-self-descriptive) (a two-way interaction between endorsement and valence), and these effects were more pronounced for the authentic than presented self (Self × Valence × Endorsement interaction). Collectively, these neuropsychological results were compatible with the self-consistency and self-accuracy views. We provided a detailed interpretation in later sections.

4.2. Empirical implications

Here, the neuropsychological findings were nuanced, manifesting intricate processing sequences. At the very early processing stage, the P1 component was heightened when participants endorsed negative (but not positive) traits as self-descriptive versus non-self-descriptive. Moreover, this pattern was attenuated for the authentic than presented self, which aligns with the self-consistency and self-accuracy views. Previous research indicates that P1 reflects early attentional allocation (Hillyard et al., 1998) and is sensitive to negative information (Luo et al., 2010; Zhang et al., 2014), with stronger P1 responses evoked by negative (compared to neutral) stimuli. Therefore, our results indicate that participants allocated more attentional resources to negative traits about the presented than authentic self. That is, they evinced

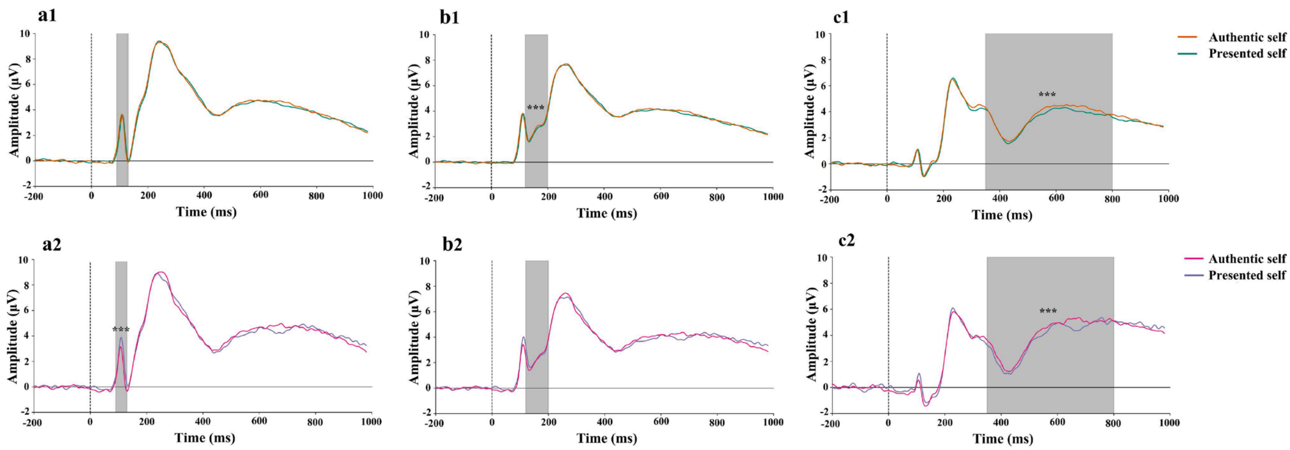

Fig. 5. Grand averages for the ERPs of self-positivity for the authentic self and presented self in experiment 2.
Note. (**a1**) Grand averages of P1 for the authentic self and presented self in judging the self-descriptiveness of positive traits. (**a2**) Grand averages of P1 for the authentic self and presented self in judging the self-descriptiveness of negative traits. (**b1**) Grand averages of N170 for the authentic self and presented self in judging the self-descriptiveness of positive traits. (**b2**) Grand averages of N170 for the authentic self and presented self in judging the self-descriptiveness of negative traits. (**c1**) Grand averages of LPP for the authentic self and presented self in judging the self-descriptiveness of positive traits. (**c2**) Grand averages of LPP for the authentic self and presented self in judging the self-descriptiveness of negative traits (see Fig. S3 for grand averages of P1, N170, and LPP for the authentic self and presented self in judging the non-self-descriptiveness of positive and negative traits).

showed preferential processing of information that posed a threat to their presented (vs. authentic) self. Alternatively, negative information is less threatening for the authentic self, indicating the authentic self was more unperturbable than the presented self. Although prior studies typically report null interactions between self-relevance and valence in the P1 response within SR-valence tasks (Ding et al., 2020; Fields and Kuperberg, 2012; Hudson et al., 2020b; Wieser et al., 2014; Zhou et al., 2017), our findings may introduce a novel direction for exploring the P1's role in SR-valence processing.

However, at the subsequent processing stage, this pattern reversed: the N170 amplitude was heightened when participants endorsed positive traits as descriptive of the presented than authentic self. Previous research indicates that the N170 component reflects early attentional resource allocation to emotional stimuli (Zhang et al., 2014), especially negative ones (Cai et al., 2016; Montalan et al., 2008). Therefore, our results suggest that participants allocated more attentional resources to positive traits about the presented than authentic self. Stated otherwise, participants manifested preferential processing of positive (but not negative) information referring to their presented than authentic self, which diverged from hypotheses offered by all three theoretical views. However, both the authentic and presented selves demonstrated a more negative N170 deflection in response to negative traits than to positive ones (Table S9, Supplementary Material; main effect of Valence: $\beta = 0.10$, $t_{13544} = 11.11$, $p < 0.001$, negative valence = 2.36 ± 3.39, positive valence = 2.56 ± 3.31), which is still consistent with N170's broad sensitivity to negativity.

Interestingly, the differentiation between the authentic self and the presented self emerged with positive rather than negative traits—a pattern opposite to that observed in the P1 stage. Two explanations may account for this pattern. First, this differentiation reflects the distinct stages of emotional processing (Luo et al., 2010; Pourtois et al., 2013; Zhang et al., 2014). Specifically, early modulation of the P1 by emotion rapidly distinguishes between non-threatening and threatening information, which can facilitate swift detection of threatening stimuli. Then, at a later stage (N170), more nuanced emotional discrimination occurs, enabling refined feature recognition and emotion assessment. In accord with this reasoning, the earliest component (P1) showed initial selective attention to and rapid detection of negative traits, whereas the subsequent N170 reflected more nuanced processing for the authentic and presented self on positive traits. Although the N170 is typically linked to negative information processing (Rossion and Jacques, 2012), a meta-analysis revealed that N170's sensitivity to emotional stimuli is heterogeneous, with both negative (e.g., angry, fearful) and positive (e.g., happy) faces eliciting heightened N170 amplitudes compared to neutral faces (Hinojosa et al., 2015). The meta-analytic finding suggests that the N170 stage also involves attentional resources for positive stimuli. Considering that this stage likely entails more nuanced, self-reference processing, it is possible that the broadly positive content of the self (Alicke and Sedikides, 2009; Sedikides and Gregg, 2008) contributed to greater differentiation between the authentic and presented selves, specifically for positive traits. Moreover, this positivity is more pronounced for the presented self, which is compatible, to some extent, with the self-consistency and self-accuracy views.

Second, the asymmetrical neural patterns during the earlier processing stages (P1, N170) are partially accounted for by the mobilization-minimization hypothesis (Taylor, 1991; see also Sedikides et al., 2016). According to it, negative or threatening information triggers swift physiological, cognitive, emotional, and social responses (i.e., mobilization), followed by counteractions to minimize, undo, or even reverse these initial responses (i.e., minimization). In the context of our research, negative self-descriptive information received preferential processing initially (mobilization; P1), followed by preferential processing of positive, self-descriptive information (minimization; N170). Moving beyond this hypothesis, the mobilization-minimization dynamic was more strongly associated with the presented than authentic self. The presented self is more brittle (e.g., changeable, malleable, fluctuating, and shifting) and so needed to be defended more strongly; alternatively, the authentic self is more robust or stable and so in less need of defense (Study S2, Supplementary Material). From this vantage point, the findings of N170 were also in line with the self-consistency and self-accuracy views.

Past research has indicated that self-reference processing can elicit an augmented N170 (Caharel et al., 2007; Keyes et al., 2010; Shi, 2016). However, few studies have examined how the self-reference sensitivity of the N170 interacts with its emotion-sensitive properties, with most of them reporting a null Self-Reference × Emotional Valence interaction (McCrackin and Itier, 2018; Qun et al., 2018; Wieser et al., 2014). Our findings may thus open a promising new direction for exploring the N170's role in processing self-referential valence.

Lastly, at the ensuing processing stage, participants exhibited augmented LPP responses when endorsing both positive and negative traits as self-descriptive (vs. non-self-descriptive) of the authentic than

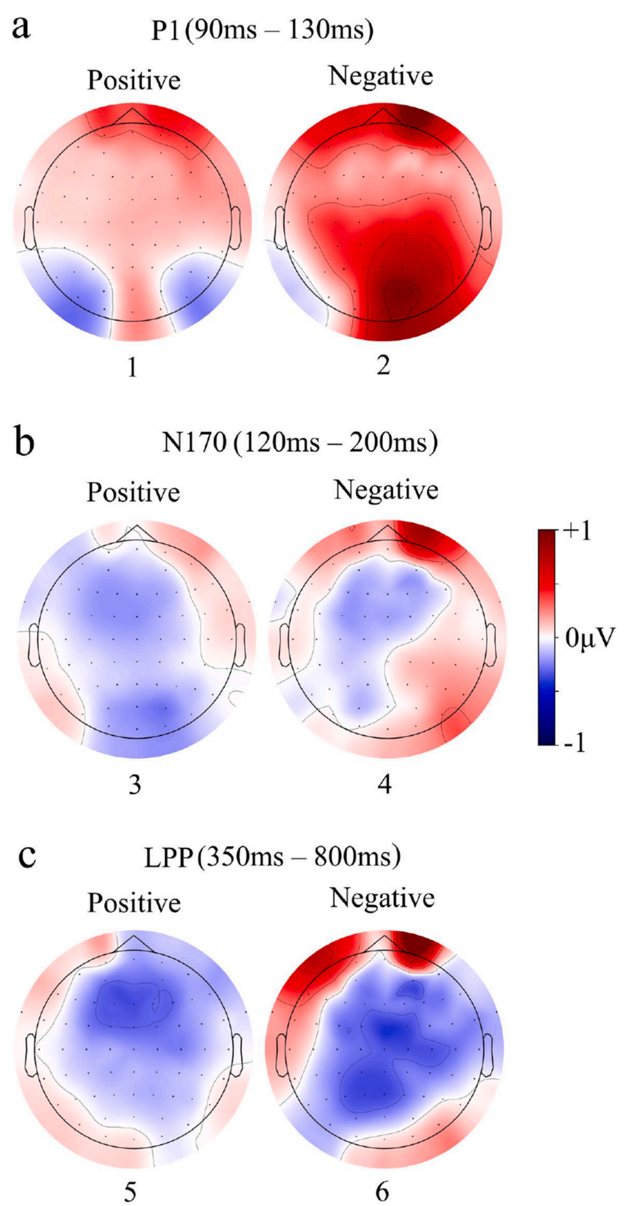

Fig. 6. Topological maps of self-positivity for the authentic self and presented self in experiment 2.

Note. (**a**) P1 amplitude difference between the presented self and authentic self in judging the self-descriptiveness of positive and negative traits. (**b**) N170 amplitude difference between the presented self and authentic self in judging the self-descriptiveness of positive and negative traits. (**c**) LPP amplitude difference between the presented self and authentic self in judging the self-descriptiveness of positive and negative traits (see Fig. S2 for amplitude difference of P1, N170, and LPP between the presented self and authentic self in judging the non-self-descriptiveness of positive and negative traits). 1 = P1 amplitude of descriptiveness judgments on positive traits for the presented self minus P1 amplitude of descriptiveness judgments on positive traits for the authentic self; 2 = P1 amplitude of descriptiveness judgments on negative traits for the presented self minus P1 amplitude of descriptiveness judgments on negative traits for the authentic self; 3 = N170 amplitude of descriptiveness judgments on positive traits for the presented self minus N170 amplitude of descriptiveness judgments on positive traits for the authentic self; 4 = N170 amplitude of descriptiveness judgments on negative traits for the presented self minus N170 amplitude of descriptiveness judgments on negative traits for the authentic self; 5 = LPP amplitude of descriptiveness judgments on positive traits for the presented self minus LPP amplitude of descriptiveness judgments on positive traits for the authentic self; 6 = LPP amplitude of descriptiveness judgments on negative traits for the presented self minus LPP amplitude of descriptiveness judgments on negative traits for the authentic self.

presented self. Although these findings were incompatible with our original hypotheses derived from the three theoretical views, they were largely congruent with the self-accuracy and self-consistency views. According to an emerging literature, the amplified LPP amplitudes reflect sustained attention and elaborative processing (Auerbach et al., 2015; Hajcak et al., 2012) as well as stimulus significance (Hajcak and Foti, 2020). Within this framework, our findings suggest that participants regarded the authentic self as more significant and engaged in more elaborative processing, as demonstrated by their stronger responses (LPPs) to both threatening (negative, descriptive) and non-threatening (positive, descriptive) information about the authentic self. Participants may have considered both positive and negative aspects as integral to their authentic self, largely in line with the self-accuracy and self-consistency views. Further, most LPP experiments select stimuli based on normative valence or arousal rather than stimulus significance. We asked participants to judge whether an identical set of traits (thus holding valence and arousal constant) represents the authentic self and presented self. Insofar as participants regard their authentic self as more important, valuable, and significant than their presented self (Study S3, Supplementary Material), our findings provide a rigorous test of and strong support for the stimulus significance perspective of LPP.

4.3. *Theoretical implications*

Our findings help to clarify the three theoretical views on authenticity. Some researchers conceptualized authenticity through the lens of self-accuracy, the candid and unbiased processing of identity relevant information (Kernis and Goldman, 2006; Lakey et al., 2008). In part because self-accuracy is difficult to empirically verify (Vazire and Wilson, 2012), others conceptualized authenticity as self-consistency, the alignment of one's behavior with internal standards, goals, or values (Kernis and Goldman, 2006; Wood et al., 2008). Still, other researchers considered authenticity as self-enhancement (Bailey and Iyengar, 2023; Bench et al., 2015; Guenther et al., 2024; Strohminger et al., 2017). Although evidence is stronger for the self-enhancement view (Sedikides and Schlegel, 2024), our results pose a challenge to it. While still positive, the authentic self allows for some acknowledgment of negativity, a results pattern more compatible with the self-accuracy and self-consistency views. It appears as if people know they have some negative traits that they are unwilling to share with others (top panel of Fig. 2; see also: Cheung et al., 2014; Preuss and Alicke, 2017). Future research would benefit from examining how the two pathways to authenticity—reflected in the theoretical views—function both independently and jointly.

The findings contribute a novel perspective to the literature on authenticity as self-enhancement by incorporating the processing of negative traits. Although prior research has largely emphasized the connection between authenticity and the endorsement of positive traits (Guenther and Sedikides, in press), our findings underscore the crucial role of distancing oneself from negative traits in shaping authenticity.

4.4. *Limitations and future directions*

Our goal was to establish the internal validity of our findings, and hence our use of convenience samples was justified (Mook, 1983; Sherman, 2024). Yet, for generalizability, future studies would do well to test non-WEIRD samples.

Our method primarily compared the authentic self with the presented self in terms of self-positivity. We did not directly measure each motive (i.e., self-enhancement, self-accuracy, self-consistency). Nevertheless, our findings provide indirect evidence of how these motives may shape the expression of authenticity. Let us take the case of self-enhancement. The discrepancy in self-positivity between the authentic and the presented self indicates that the presented self may be influenced by self-enhancing concerns, whereas the authentic self reflects a more balanced or realistic appraisal. Let us now consider self-accuracy. If individuals acknowledge both strengths and weaknesses in their authentic self, this practice could point to a more unerring self-perception. In contrast, preference to endorse strengths but reject weaknesses in the presented self could suggest that this self is influenced by self-enhancement concerns, thereby lacking a degree of realistic appraisal. Finally, let us focus on self-consistency. Showing smaller self-positivity in one's authentic self might be driven by strong internal alignment, acknowledging one's weakness, whereas larger self-positivity in the presented self might indicate inconsistencies, potentially driven by external pressures to conform to social expectations. Future research would benefit from more direct measurement in testing the relation between authenticity and these motives.

We defined the presented self for participants as "the version of the self you present to others." It is possible that participants found the presented self more difficult to process. In line with this possibility, it has been reported that the true self is slightly easier to describe than the actual self, suggesting that the true self might also be easier to process than the authentic self (Schlegel et al., 2011). However, the effect size in the relevant study was very small (Cohen's $d = 0.11$), indicating that the size of processing differences is negligible at best. Our findings are also compatible with a lack of significant processing differences. Although we found evidence that the authentic self is more robust, more significant, and less sanitized (Supplements Material), we obtained no evidence to suggest that the authentic self is more difficult to process; that is, we observed no difference in reaction times when participants made decisions on the authentic versus presented self. Specifically, participants endorsed positive traits faster for the presented than authentic self. Moreover, participants endorsed negative traits faster for the authentic than presented self. Finally, they did not differ in their rejection of negative traits for the authentic and presented selves. These result patterns emerged in both experiments. Nonetheless, future research should delve into the intricacies of how individuals define their presented self across varying contexts to increase understanding of differences between the two selves.

Further, our neural evidence relied on EEG, which has excellent temporal resolution but poor spatial resolution (Cohen, 2017). Functional magnetic resonance imaging (fMRI) studies of reward-relevant brain regions may complement our findings. Reward-related brain regions like the striatum are critical to self-processing (Berridge and Kringelbach, 2013; Delgado, 2007). Thinking about the self feels good and activates parts of the striatum (Enzi et al., 2009). Evidence of decreased striatal activation when making judgments about the authentic (vs. presented) self would bolster our findings. However, increased striatal activation when making judgments about the authentic (vs. presented) self would support the self-enhancement view of authenticity. Other neuroscientific studies link self-enhancement to both structural (Chavez and Heatherton, 2015; Chester et al., 2016) and functional (Chavez and Heatherton, 2015) connectivity between self-relevant (medial prefrontal cortex) and reward relevant (striatum) brain regions. If self-enhancement underlies the authentic self, we would expect particularly strong connectivity between medial prefrontal cortex and the striatum when participants make judgments about the authentic self. However, based on our findings, we would obtain weaker connectivity between medial prefrontal cortex and the striatum when participants make judgements about the authentic self. No fMRI studies have so far distinguished between the authentic and presented self. Such studies would complement our findings and enrich the emerging neuroscience of authenticity.

4.5. Conclusion

Authenticity has held an enduring fascination with intellectuals, researchers, and the public. We aimed to capture the essence of it. Although authenticity is largely self-enhancing, it also entails a willingness to explore the possibility of unfavorable pockets of selfhood or even admit one's weakness. Authenticity entails the notion that the self is highly positive, but this notion appears to be secure enough to tolerate partial negativity or inconsistency.

CRediT authorship contribution statement

Chengli Huang: Writing – review & editing, Writing – original draft, Visualization, Methodology, Investigation, Funding acquisition, Data curation. **Constantine Sedikides:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization. **Douglas J. Angus:** Writing – review & editing, Visualization. **William E. Davis:** Writing – review & editing, Data curation. **James W. Butterworth:** Data curation. **Alexiss Jeffers:** Data curation. **Rebecca Schlegel:** Writing – review & editing, Data curation. **Nicholas J. Kelley:** Writing – review & editing, Writing – original draft, Supervision, Data curation, Conceptualization.

Declaration of competing interest

The authors declare no conflict interests.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.neuroimage.2025.121046.

Data availability

Data will be made available on request.

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