

Neural Basis of Pride: A Comparative Perspective

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Pride is a positive emotional experience that arises from evaluating one's own achievements. Neurobiological research demonstrates that the coordinated activity of brain regions associated with theory of mind, self-referential processing, emotion, reward, and memory constitutes the neural basis of pride, while comparative neurophysiological studies have revealed similarities and differences in the neural substrates between pride and other basic emotions as well as moral emotions. These findings provide a foundation for understanding the complex neural mechanisms underlying pride. Future research should conduct in-depth investigations into the neural mechanisms of different types of pride and the interactions between pride and cognitive processes.

Full Text

The Neural Basis of Pride: A Comparative Perspective

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Abstract

Pride is a positive emotional experience that arises when evaluating one's own achievements. Neuroimaging studies have demonstrated that the coordinated activity of brain regions associated with theory of mind, self-referential processing, emotion, reward, and memory constitutes the neural basis of pride. Comparative neurophysiological research has further revealed both similarities and differences between the neural substrates of pride and those of basic emotions and moral emotions. These findings provide a foundation for understanding the complex neural mechanisms underlying pride. Future research should explore the neural mechanisms of different types of pride and the interactions between pride and cognitive processes.

Keywords: pride; self-conscious emotion; moral emotion; basic emotion; neural basis

Classification: B842

Pride is a positive emotional experience that arises from evaluating one's achievements attributed to oneself against internalized standards. From a psychological composition perspective, pride is a positive self-conscious emotion (Lewis, 1997, 2016; Stanculescu, 2012; Tangney, 1999; Tracy & Robins, 2004a) as well as a social and moral emotion (Armony & Vuilleumier, 2013; Tangney et al., 2007). Regarding psychological processes, Williams and DeSteno (2008) note that pride is evoked whenever individuals perceive affirmation from themselves or others, whether internal or external. Additionally, pride is accompanied by specific behavioral manifestations (Lewis, 1995) and distinctive, recognizable nonverbal expressions (Tracy & Robins, 2004b).

Research on psychological function indicates that pride helps maintain a positive self-concept and facilitates the generation of adaptive behaviors (Tracy & Robins, 2007a).

Based on its source, pride can be categorized into pride derived from personal achievements and pride originating from collectives or cultures such as family, groups, society, or nation (Liu et al., 2014; Tracy & Robins, 2007a). However, most current research focuses on individual-level pride (Ding, 2018; van Osch et al., 2018). Additionally, pride can be divided into two types: authentic and hubristic. Previous investigators have primarily examined authentic pride, which is achievement-oriented and attributed to personal effort (Tangney & Tracy, 2012). This form of pride influences self-regulatory processes (Salerno et al., 2015), promotes the development of personal capabilities, and encourages behaviors that align with personal and social standards, thereby possessing greater adaptive value (Tracy et al., 2009; Williams & DeSteno, 2008). Research demonstrates that authentic pride induction enhances task persistence and motivates pursuit of long-term goals (Shimoni et al., 2019; Williams & DeSteno, 2008). Even at low levels, it prompts individuals to modify strategies and increase effort (Gilchrist et al., 2018; Weidman et al., 2016). Numerous empirical findings also reveal that authentic pride, as a functional positive social emotion (Williams & DeSteno, 2009), facilitates prosocial (Etxebarria et al., 2015; Wubben et al., 2012) and pro-environmental behaviors (Bissing-Olson et al., 2016; Onwezen et al., 2013; Schneider et al., 2017).

In contrast, hubristic pride is more closely associated with arrogance and conceit, involving the belief that ability is the primary factor underlying success and maintaining an unconditionally positive view of oneself. It correlates positively with narcissism, rejection sensitivity, and trait anxiety, and largely contributes to aggressive, transgressive, and even antisocial behaviors (Tracy & Robins, 2004a, 2007b, 2014; Tracy et al., 2010).

In recent years, pride has attracted considerable attention from researchers

(Miceli et al., 2017), leading to the establishment of relatively fixed research paradigms and focal points. Regarding induction methods, investigators have primarily employed textual materials (Takahashi et al., 2008), images (Simon-Thomas et al., 2012), and video clips (Hu et al., 2017, 2019) to evoke pride, or utilized scales to assess different types of pride (Kong et al., 2018; Takeuchi et al., 2016). More recently, researchers have adopted a dynamic perspective by eliciting pride through interpersonal interaction feedback in experimental settings (Ding, 2018), offering greater timeliness and ecological validity. In terms of research content, numerous studies have focused on individual development of pride (Orth, Robins, & Soto, 2010; Webb et al., 2016), cross-cultural investigations (Furukawa et al., 2012; Shi et al., 2015; Sznycer et al., 2017), and examinations of its functional roles across various social domains in conjunction with basic emotions such as joy (Karsh & Eyal, 2015) and moral emotions like guilt (Lunardo & Saintives, 2018). Compared with behavioral experimental research, neuroscience studies can more deeply reveal the mechanisms underlying pride generation and function from an alternative perspective. Currently, such research concentrates on two aspects: clarifying the neural basis of different pride types and comparing the neural mechanisms of pride with those of basic emotions, other moral emotions, and self-conscious emotions.

2 The Neural Basis of Pride

According to existing literature, Takahashi et al. (2008) conducted the first fMRI study on pride, finding that when pride was induced through reading and imaginative immersion, two brain regions closely associated with social cognition and theory of mind—the right posterior superior temporal sulcus (pSTS) and left temporal pole (TP)—showed increased activation. Theory of mind refers to the ability to understand one's own and others' mental states, constituting a crucial component of social cognition that is essential for interpersonal interaction (Fett et al., 2015). Takahashi and colleagues argued that because pride is a self-conscious emotion arising from positive evaluations by oneself or others, it necessitates processing relevant social information, thereby activating these regions involved in early social cognition. Moreover, the activation of pSTS, a relatively late-maturing brain region, provides neural evidence for pride's emergence after basic emotions.

Subsequent research has demonstrated that pride generation activates a broader brain network. First among these are core regions involved in theory of mind (Fett et al., 2015; Schurz et al., 2014). Gilead et al. (2016) presented situational questions to guide participants in recalling or imagining events involving pride and other emotions, revealing activation in pSTS, temporoparietal junction (TPJ), and inferior frontal gyrus (IFG) during pride states. Li et al. (2013) also observed TPJ activation during pride, and investigations into the neural basis of professional pride similarly showed activity in pSTS and TPJ (Hong et al., 2019). Additionally, Kong et al. (2018) found that pride induced changes in

bilateral superior temporal gyrus (STG).

Second, brain regions associated with self-referential processing play a crucial role in pride generation. For instance, Stolz et al. (2020) designed test tasks that elicited different levels of internal control beliefs (attributions) to investigate the neural mechanisms of pride. They found that pride experiences resulting from high internal control levels under positive task feedback activated ventromedial prefrontal cortex (vmPFC), dorsomedial prefrontal cortex (dmPFC), and anterior cingulate cortex (ACC). The researchers noted that self-attribution of positive behavioral outcomes stems from recognizing one's own effort or ability, and such self-representation and self-evaluation serve important functions in pride generation, driving enhanced activation in these regions. Numerous other studies have also observed activity in vmPFC (Gilead et al., 2016; Zahn et al., 2009), dmPFC (Roth et al., 2014), and ACC (Gilead et al., 2016; Li et al., 2013). Furthermore, pride activates posterior medial cortex (PMC), an important region for self-referential processing (Simon-Thomas et al., 2012).

Moreover, research has shown that pride induction activates brain regions involved in emotional information processing, including the amygdala (Roth et al., 2014), insula, dorsolateral prefrontal cortex (DLPFC) (Hong et al., 2019; Roth et al., 2014), and ventrolateral prefrontal cortex (VLPFC) (Hong et al., 2019). It also engages regions associated with reward processing, such as orbitofrontal cortex (OFC) (Gilead et al., 2016; Kong et al., 2018) and ventral striatum (Roth et al., 2014; Stolz et al., 2020).

Beyond these regions, the neural basis of pride also encompasses areas related to memory, including the hippocampus (Ding, 2018), parahippocampal gyrus (Simon-Thomas et al., 2012; Zahn et al., 2009), posterior cingulate cortex (PCC) (Kong et al., 2018; Roth et al., 2014), and precuneus (Roth et al., 2014; Stolz et al., 2020). This is primarily because emotion generation depends on affective experiences of past situational events, while episodic memory retrieval also facilitates better understanding of one's own and others' emotional and mental states (Murray et al., 2013).

In summary, pride is closely associated with cognitive and affective processes including theory of mind, self-referential processing, emotion processing, reward stimulus processing, and memory. Pride generation presupposes self-awareness and requires the formation of stable self-representations. Positive self-reflection and self-evaluation of one's characteristics and behaviors from both self and other perspectives influence the formation and development of pride (Muris & Meesters, 2014). However, identifying brain regions can only provide a rough delineation of the psychological components associated with pride. Further clarification of pride's generation and functional mechanisms requires evidence from systematic comparisons of its neural basis.

3.1 Comparison of Neural Bases Across Different Pride Types

As previously mentioned, researchers categorize pride into authentic and hubristic types. A recent study used scales to differentiate tendencies toward authentic versus hubristic pride and employed fMRI to compare the neural bases of these two pride types using fractional amplitude of low-frequency fluctuations (fALFF) during task-based resting states. The findings revealed that authentic pride positively correlated with fALFF in bilateral superior temporal gyrus (STG), which participates in social cognition and interpersonal functioning. In contrast, hubristic pride showed positive correlations with fALFF in left orbitofrontal cortex (OFC) involved in reward processing and negative correlations with fALFF in posterior cingulate cortex (PCC) associated with memory and self-referential processing. These results suggest that the neural substrates of the two pride types may be relatively independent. The researchers proposed that authentic pride is linked to social information processing such as reputation, while inappropriate cognition and evaluation of reward processing and self-referential processes trigger hubristic pride (Kong et al., 2018). However, Gilead et al. (2016) also observed OFC activation when inducing authentic pride through manipulated recall or imagination. Whether these contradictory findings stem from the validity of the pride type distinction or from the complexity of pride's neural basis remains to be further investigated.

Researchers have also compared the neural bases of group-, social-, and national-related pride. Hong et al. (2019) conducted person (self, other/uniform, casual attire)-adjective (positive, negative) matching tasks with uniform-wearing professionals (nurses, police officers, etc.). fMRI results showed that when matching photos of oneself in uniform with adjectives, activation appeared in posterior brain regions related to theory of mind, such as posterior superior temporal sulcus (pSTS) and temporoparietal junction (TPJ). Additionally, activation in striatal regions including the caudate nucleus and putamen, as well as the insula, revealed relationships between reward processing, empathy, and professional pride. Enhanced activity in right ventrolateral prefrontal cortex (VLPFC) and left dorsolateral prefrontal cortex (DLPFC), which are involved in self-emotion regulation, implied components of social responsibility associated with one's profession. These results suggest that professional pride may stem from individuals' positive self-evaluation and identification with their professional group.

Another study on social pride used responsibility attribution feedback for team success or failure to induce high, medium, and low levels of pride and guilt. High-level pride activated dorsal striatum and dorsal anterior cingulate cortex (dACC), which are associated with reinforcement learning of personally obtained behaviors. At both high and low pride levels, activation was also observed in frontal eye field (FEF) related to attention and response selection. Right temporoparietal junction (RTPJ), closely linked to theory of mind and moral judgment, was active across these pride levels, indicating that RTPJ activation is associated with pride induced by attributions based on performance of oneself or in-group members during task success (Li et al., 2013).

Furthermore, Takeuchi et al. (2016) assessed individuals' patriotism and nationalism using national identity scales, proposing that both are based on positive evaluation but that patriotism, not involving comparisons with other nations, represents a pure form of pride. Voxel-based morphometry (VBM) revealed that patriotism levels negatively correlated with regional gray matter density (rGMD) in rostralateral prefrontal cortex (RLPFC), suggesting that patriotism may be regulated by cognitive neural mechanisms related to subjective well-being. Reduced rGMD also correlates with prosocial traits such as empathy.

These studies demonstrate that different pride types activate overlapping brain regions, primarily those associated with theory of mind, self-referential processing, emotion processing, and reward stimuli, revealing the fundamental brain regions underlying pride. Differences in activation patterns across pride types reflect the manifestation of specific psychological components.

3.2 Comparison of Neural Bases Between Pride and Basic Emotions

Because they involve multiple cognitive processes such as self-evaluation and self-reflection, the mechanisms and recognition of self-conscious emotions are more complex than those of basic emotions (Caillaud et al., 2020; Sznycer, 2019). Some researchers have compared the neural mechanisms of pride as a self-conscious emotion with those of basic emotions.

Joy and pride are both positive emotions, but pride is associated with persistence toward long-term goals, whereas joy typically reflects immediate gratification (Eyal & Fishbach, 2010). An ERP study using an implicit association paradigm found that when recognizing facial emotions, the amplitude of the slow positive wave (SPW) during pride recognition was significantly larger than that during joy, indicating that pride-related facial processing requires more cognitive resources (daSilva et al., 2016). This indirectly demonstrates that pride is more complex than basic emotions like joy. fMRI results from Takahashi et al. (2008) showed that when participants were presented with short sentences evoking pride or joy and asked to imagine these emotions, joy conditions activated ventral striatum (including nucleus accumbens), anterior cingulate cortex (ACC), insula, and hippocampus, with ventral striatum activity showing significant positive correlation with joy ratings. However, these regions were not observed to change during pride induction, leading to the speculation that induced pride is fundamentally different from joy and that the pleasure derived from it is insufficient to activate the ventral striatum. Nevertheless, accumulating evidence indicates that pride is indeed associated with the ventral striatum (Roth et al., 2014; Stolz et al., 2020), and the neural mechanism of pride generation involves positive emotional experiences resulting from value stimulus evaluation that activate the ventral striatum.

Gilead et al. (2016) evoked and compared the neural bases of two self-conscious emotions (pride and guilt) with two basic emotions (joy and anger) using imag-

ination and recall methods. They found that during basic emotion induction, activity was stronger in earlier-developing parts of the brain network system, including occipital cortex, somatosensory cortex, and parahippocampal gyrus involved in visuospatial perception and tactile processing. During self-conscious emotion induction, frontal regions extending from medial prefrontal cortex (mPFC) to dorsal anterior cingulate cortex (dACC) associated with self-control and self-referential processing were activated. Particularly during pride induction, ventromedial prefrontal cortex (vmPFC) extending to orbitofrontal cortex (OFC) involved in self-referential and reward processing showed enhanced activity.

In a recent fMRI study, researchers had participants identify and infer others' pride and several other emotions, comparing activated theory-of-mind-related brain regions. The results showed that compared with neutral emotions, both self-conscious emotions (including pride and embarrassment) and basic emotions (including joy, anger, and surprise) activated multiple important theory-of-mind brain regions, indicating that inferring any emotion in others can trigger changes in the brain's theory-of-mind processing system. However, emotional complexity leads to different activation patterns—compared with basic emotions, reasoning about self-conscious emotions produced stronger activity in right temporoparietal junction (RTPJ), suggesting that self-conscious emotions including pride require higher-level inference (Caillaud et al., 2020).

The above evidence indicates that pride emerges after basic emotions and possesses a more complex neural basis, primarily manifested in that pride-activated regions subserve higher-level cognitive functions—not only involving perceptual processing but also requiring the coordinated development of different cognitive functions including theory of mind, self-referential processing, and self-reflection.

3.3 Comparison of Neural Bases Between Pride and Moral Emotions

Previous research has frequently compared the neural bases of pride and gratitude, two positive moral emotions. EEG studies have shown that the generation of positive emotions including pride and gratitude is associated with enhanced alpha oscillations in frontal and central brain regions, partially reflecting that these emotions require substantial cognitive processing. Alpha oscillations are also linked to mirror neuron system (MNS) activity, which facilitates the perception and understanding of others' emotions (Hu et al., 2017). Functional near-infrared spectroscopy (fNIRS) research has found that these emotions positively correlate with oxy-hemoglobin (HbO) in medial prefrontal cortex (mPFC), indicating involvement of more self-related information processing (Hu et al., 2019). Many researchers have also found that gratitude activates brain regions including mPFC and perigenual anterior cingulate cortex (pgACC) that participate in theory-of-mind processing, empathy, and moral cognition (Fox et al., 2015; Kini et al., 2016; Yu et al., 2018).

fMRI studies comparing pride and gratitude have yielded numerous meaningful results. Zahn et al. (2009) used moral behavior judgment tasks to elicit several moral emotions (pride, gratitude, guilt, indignation) and found that both pride and gratitude experiences activated the mesolimbic reward system and basal forebrain. Superior anterior temporal lobe (aTL), associated with abstract social concept representation, also showed enhanced activity. These findings suggest that the subjective experience of moral emotions generated during behavioral evaluation is partly based on individuals' understanding of abstract social concept content, and that differences between moral emotions may originate from distinct patterns of fronto-mesolimbic brain functional activity.

Subsequently, Zahn et al. (2014) used the same experimental paradigm to more deeply compare the neural mechanisms of pride, gratitude, and other moral emotions. Voxel-based morphometry revealed that individuals experiencing pride showed reduced grey matter volumes in precuneus involved in visual imagery and self-related information processing. In contrast, gratitude was associated with increased grey matter volumes in right posterior inferior temporal regions related to social cognition, implying better understanding of others' intentions. These results suggest that differences in grey matter volumes in posterior cortical regions associated with visuospatial representation may influence subjective experiences of different moral emotions, and that gratitude relies more on posterior cortical brain system development compared to pride.

Additionally, a study comparing gratitude and pride induced through real social interactions found that pride more extensively involved reward-related brain regions such as bilateral putamen, caudate nucleus, and the hippocampal memory system. Gratitude, however, engaged the theory-of-mind system including bilateral TPJ, dmPFC, IFG, TP, and STG, as well as reward-processing regions like right ventral striatum and left putamen (Ding, 2018). This partially reflects the neural mechanisms underlying pride' s self-orientation versus gratitude' s other-orientation.

Unlike gratitude, guilt, shame, and embarrassment are moral and self-conscious emotions that, like pride, are self-directed. Multiple studies indicate that these three moral emotions share some overlapping brain regions with pride. For example, guilt and shame activate important brain regions involved in theory of mind, self-referential processing, and emotion processing (Wagner et al., 2011; Zhu et al., 2019). Recalling pride- and shame-related events both activate typical emotion processing circuits and self-referential brain regions (Roth et al., 2014). Investigations into embarrassment' s neural mechanisms similarly observed active theory-of-mind-related regions (Müller-Pinzler et al., 2015; Takahashi et al., 2004). A meta-analysis of guilt' s neural basis also demonstrated that guilt is associated with neural networks related to theory of mind, self-representation, and social cognition (Gifuni et al., 2017).

However, inconsistencies have emerged when comparing cortical activation regions between pride and other moral emotions. This is particularly evident in medial prefrontal cortex (mPFC) activation related to self-reflection and theory

of mind. Takahashi et al. (2008) initially investigated pride's neural mechanisms using fMRI, hypothesizing based on previous findings that guilt and embarrassment activate mPFC (Takahashi et al., 2004) that pride would similarly activate mPFC. However, they failed to observe activity in this region, suggesting that pride involves less self-reflection compared to guilt and embarrassment.

Subsequent research has extensively explored mPFC. Most current neuroimaging studies on moral emotions such as guilt demonstrate mPFC activation (Gilead et al., 2016; McLatchie et al., 2016; Müller-Pinzler et al., 2017). In contrast, numerous studies indicate that pride induction does not activate mPFC (Ding, 2018; Hong et al., 2019; Li et al., 2013; Simon-Thomas et al., 2012), although some studies, as mentioned earlier, have observed enhanced mPFC activity under pride conditions (Roth et al., 2014; Zahn et al., 2009).

Recent research has discovered that different self-conscious emotions activate distinct mPFC subregions. The positive self-conscious emotion of pride is associated with vmPFC, whereas guilt more strongly engages dmPFC. Researchers suggest that previous failures to detect mPFC activation may be due to insufficient pride arousal levels (Gilead et al., 2016), while Stolz et al. (2020) observed activation in both regions during pride. Therefore, the relationship between pride and mPFC activation remains inconclusive and requires further investigation.

Additionally, although both pride and shame studies have identified changes in emotion-processing brain regions, the positive affective experience in pride produces higher activation levels in related neural networks (Roth et al., 2014). Moreover, pride shows more robust activation in self-referential and reward-processing regions compared to guilt (Gilead et al., 2016).

Beyond neuroimaging comparisons of neural bases, some studies have used physiological responses to compare pride and guilt. These investigations found that compared to pride-induction participants, guilt-induction participants showed significantly increased heart rate and prolonged cardiac sympathetic nervous excitation. This dissociative result indicates that these two distinct moral emotions have unique motivational functions (Fourie et al., 2011).

Furthermore, comparisons between the neural bases of pride and compassion have revealed that compassion activates midbrain periaqueductal gray (PAG) associated with distress experience and empathy, whereas pride activates posterior medial cortex (PMC) related to self-referential processing. However, pride shows lower activation in anterior insula and inferior frontal gyrus (IFG) associated with empathy, possibly because greater self-focus triggers higher levels of pride experience (Simon-Thomas et al., 2012).

Researchers have also found that using fMRI visual decoding with multivoxel pattern analysis as neural signal feedback can differentiate brain activity patterns between affiliative emotion and pride. Compared to pride, the brain activation signature of affiliative emotion increased significantly after neurofeedback training, enabling individuals to use decoded signals to enhance distributed neu-

ral activity related to affiliative emotion, thereby voluntarily controlling neural networks associated with affiliative feelings (Moll et al., 2014).

Finally, both pride and self-esteem involve self-evaluation processes and share a close relationship (Stanculescu, 2012; Tracy et al., 2009; Tracy & Robins, 2007b). However, no study to date has directly compared the neural mechanisms of self-esteem and pride within the same research context. Nevertheless, existing research reveals substantial overlap in brain regions activated by these two constructs. For example, individuals with high self-esteem show larger hippocampal gray matter volumes (Lu et al., 2018), and self-esteem is associated with mPFC, anterior/posterior cingulate cortex (ACC/PCC) related to self-information processing (Yang et al., 2016), as well as TPJ (Agroskin, Klackl, & Jonas, 2014), OFC, and ventral striatum (Kawamichi et al., 2018)—regions that overlap with pride. This commonality arises because self-esteem also encompasses psychological processes including self-referential processing, theory of mind, emotion, reward, and memory (Wang, 2018; Yang et al., 2017). Thus, pride and self-esteem share commonalities in their generation and formation mechanisms.

In summary, pride shows greater overlap in activated brain regions with different moral emotions. Both pride and gratitude activate theory-of-mind-related regions. Activation in reward value-processing regions is also observed in both emotions, suggesting that evaluation of value stimuli can evoke positive moral emotions, though gratitude may involve learning processes rather than simple affective responses to value stimuli (Ding, 2018). Additionally, comparisons of neural bases between pride and guilt or self-esteem reveal common activation in brain regions associated with theory of mind and self-referential processing, indicating that pride generation is based on understanding and attributing intentions and behaviors to oneself and others. Nevertheless, inconsistent results across numerous studies suggest that the neural bases of pride and other moral emotions require further investigation.

4 Summary and Outlook

In summary, research on the neural mechanisms of pride has yielded substantial findings. On one hand, studies on pride's neural basis have revealed its associations with cognitive activities including theory of mind, self-referential processing, emotion processing, reward stimulus processing, and memory, demonstrating that pride is a complex self-conscious emotion involving multiple psychological components. On the other hand, comparisons between the neural bases of pride and those of basic emotions and moral emotions have identified varying degrees of overlap in their generation and functional processes, indicating complex relationships of mutual foundation, partial overlap, or mutual influence. Overall, research on pride's neural mechanisms provides a solid foundation for understanding the essence of this complex psychological process. Future research may

focus on two aspects:

First, research on specialized neural mechanisms of pride, specifically the neural bases of different categories and intensities (arousal levels) of pride. At the categorical level, only one study to date has examined the neural basis of authentic versus hubristic pride (Kong et al., 2018), and the mechanisms it suggests require further validation. Additionally, neural evidence for group-, social-, and national-level pride remains scarce compared to individual pride. At the intensity level, researchers have speculated that different pride intensities may be expressed differently in neurophysiological indicators (Gilead et al., 2016), but this requires further empirical confirmation.

Second, neural mechanism research on pride needs greater depth. Previous studies have predominantly been static investigations identifying brain regions activated by pride, with fewer ERP studies exploring processing dynamics. While numerous studies have compared pride's neural mechanisms with those of basic and moral emotions, research on how pride influences neural mechanisms of cognitive processes such as perception, evaluation, and decision-making remains limited. Future studies should incorporate ERP technology more extensively into pride research and deeply investigate the neural basis of relationships between pride and cognitive activities.

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The Neural Basis of Pride: A Comparative Perspective**SHEN Lei; JIANG Daitai; CHEN Ning; LIU Wei**

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Abstract: Pride is a positive emotional experience arising from evaluating one's own achievements. The neural basis researches have shown that the synergistic actions between regions of the brain that relate to the theory of mind, self-referencing, emotion, reward, and memory constitute the neural basis of pride. A comparison of neurological and physiological studies revealed similarities and differences in the neural basis of pride, basic emotions, and moral emotions. These findings provide the basis for understanding the complex neural mechanisms of pride. Future research should explore the neural mechanisms of different types of pride and the interaction between pride and cognitive processes.

Key words: pride; self-conscious emotion; moral emotion; basic emotion; neural basis

Note: Figure translations are in progress. See original paper for figures.

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