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The relationship between self-other distinction and empathy in social cognition

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Abstract: Social interaction requires us to process constantly changing social information, including the behaviors, opinions, beliefs, and emotions of others. Distinguishing the psychological and emotional states that occur simultaneously between others and ourselves is essential to adapt to the complex social environment. Positive empathy can provide an emotional bridge to promote pro-social behaviors, while negative empathy may become a breeding ground for social crime. And the Self-Other Distinction helps to avoid self-centeredness and promote the development of compassionate and humanistic care in society.

Keywords: Self-Other Distinction; Empathy; Personal distress.

1. The concept and structure of empathy

The concept of empathy has been put forward for a hundred years, but the definition of it has not reached a consensus yet. At present, empathy is defined from the multi-dimensional orientation of emotion and cognition and from the point of view of neuroscience.

Gladstei (1983) divides empathy into two components: emotional empathy, which refers to responding to another person's emotions with the same emotion, focusing on the feelings and experiences of others' emotional states; and cognitive empathy, which refers to opinion/role selection, focusing on reasoning and judging emotional states. On this basis, Davis (2018) defines empathy as the structure of an individual's set of responses to the experiences of others, including individual and situational prerequisites, processes that generate empathy, intrinsic cognitive and emotional changes in the individual, and behavioural responses to others in interpersonal interactions. Further, he divides affective empathy into two components: self-directed personal distress and other-directed empathic concern. Also, with the development of brain imaging technology, Decety's research (2006) based on the empathic brain mechanisms suggests that empathy depends on separable information processing mechanisms, and emphasizes the part of the empathic functional model that monitors and regulates cognitive and emotional processes to prevent confusion between self and others. From the above definitions, we find that besides emotional and cognitive features, objectiveness is also an important feature of empathy. Individuals need to distinguish the emotional experience of self from that of others first, and then there is an empathic response that points to self or to others. Individual consciousness is formed in the dynamic interaction between self and other, while empathy is a unique and non-reducible self-displacing response, and this confrontation between individual and other consciousness is inevitable, whether it is self-empathy or empathy for others. This means that how we regulate our emotions to maintain the boundaries between ourselves and others is the key factor to empathy. If we confuse the feelings of self and other, and make the representations of the self and other overlap absolutely, then the ability to choose between the self-other perspectives will be affected, and the individual may produce non-adaptive behavior, self-directed personal distress (Decety, 2006).

Personal distress is a kind of aversive emotional response that focuses on oneself (Batson & Shaw,1991). As one of the first scholars to separate self-directed personal pain from other-directed empathy concerns from the structure of empathy, Davis (1983) argues that the self-directed component reflects the fact that when another person experiences a negative event, individuals tend to experience emotional discomfort such as pain and anxiety, which may be due to feeling insecure in a stressful interpersonal environment, and indirectly reflect shyness, low self-esteem, and lack of social skills; On the other hand, the other-oriented component expresses alternative emotions, such as warmth, compassion, and concern for others who are experiencing discomfort.

Based on the above concepts, Davis developed the Interpersonal Relation Index, which includes four subscales: Personal Distress, Empathy Concern, Perspective Taking and Fantasy (Davis,1983), the first two scales measure self-and other-directed emotional empathy, and the last two scales measure cognitive empathy. Currently, IRI is the most commonly used empathy self-report measure in psychiatric research and clinical evaluation (Ilgunaite et al,2017). However, a large number of studies have focused on other-directed emotions and neglected self-directed empathy studies, whereas existing cognitive neuropsychological studies have shown that individual distress and empathy concerns activate relevant brain regions to varying degrees (Jackson et al), which suggests that we should also pay attention to self-directed empathy, especially in the psychopathology area.

2. The self-other distinction in emotional and cognitive empathy

The ability of self-other distinction is based on self-concept and other-concept. The self-other distinction in emotional empathy can be identified by mirroring self-recognition tests and observing children's emotional and behavioral responses

to peers in distress. The study found that 16 to 24 months-old children can respond to a broken teddy bear friend by crying and consoling (Bischof-Köhler,1994). A study which using money to induce positive and negative emotions in 6 to 13 years-old children and adults finds that the self-other distinction required to overcome emotional self-centeredness increases significantly throughout childhood and adulthood (Steinbeis et al, 2015); And most of the fundamental changes in children's self-other cognitive understanding occur between the ages of 3 and 4, when children can successfully pass the false belief task (Flavell, 1999), and may have constructed a different mental representation of others from their own. Because of the close relation and difference between cognitive empathy and theory of mind and perspective-taking, there are many disputes on the development of cognitive empathy self-other. Neuroimaging partially demonstrated the above developmental effects, with a significant decrease in Right Supramarginal Gyrus (RSMG) activity in children compared with adults, children also had lower functional connectivity between the RSMG and the Left Dorsolateral Prefrontal Cortex (Steinbeis et al, 2015; Gweon et al, 2012).

3. The neuropsychological basis of the self-other distinction

Social communication needs to understand other people's thoughts and feelings, but at the same time, it also produces its own thoughts and feelings. The psychological representation and emotional experience that successfully distinguishes others from self is crucial to achieving certain social goals. Research in social psychology and social neuroscience has shown that self-other conscious differentiation is one of the major functional components of the bottom-up and top-down information processing that generates empathy. And some psychiatric symptoms, such as the control illusion in schizophrenia, are characterized by a failure to distinguish between self-generated and other-generated behaviors (Blakemore, 2003).

Neuroimaging studies have shown that there are two key areas responsible for the self-other distinctions. The first is the Medial Prefrontal Cortex (mPFC). Researchers have compared the differences in brain areas activated by individuals making self-other judgments through meta-analysis and found that the ventral mPFC is more activated by self-related judgments (Denny et al, 2012). A large number of studies have also found that vMPFC preferentially responds to self-reference processes such as autobiographical memory and self-introspection, while MPFC activity is abnormal in patients with mental disorders during self-reference tasks (Heatherton, 2011). The second is the Temporoparietal Junction (TPJ), a junctional area between the inferior parietal and inferior temporal cortices, and the distribution of different connections in the TPJ subregion may be respectively responsible for self-other motor, cognitive and emotional distinctions (Steinbeis, 2016). Among these, the right Parieto-Temporal Junction (rTPJ) may be involved in the differentiation of cognitive domains. rTPJ has been found to be associated with multisensory integration of vision and somatosensory, which facilitates mental representations of self-other faces and body images based on a mental rotation task (Zeugin, 2020). Whereas high borderline personality disorder shows an other-centered bias in the self-other face morphing task, which may be related to rTPJ (Meulemeester et al, 2021). Similar to viewpoint taking, theoristic studies of mind have also found that inhibiting cortical excitability of rTPJ may impair an individual's ability to infer the mental or emotional state of others (Mai, 2016). In addition, the Right Supramarginal Gyrus (rSMG), located dorsal to the TPJ, may be responsible for the emotional self-other distinction (Quesque & Brass, 2019). A study using fMRI to assess egocentric bias in the affective domain suggests that rSMG can overcome empathy bias (Silani et al, 2013). Another study used fMRI data to compare and analyze TPJ and rSMG resting state connectivity during theory of mind tasks and emotional egocentric tasks in autistic patients and healthy controls, and the results showed that the connection integrity of the rSMG network may be related to the unimpaired emotional self-other discrimination function of ASD patients (Hoffmann, 2016).

4. The relationship between developmental disorders of self-other distinction and empathy-related mental illness

4.1. Self-other distinction disorder and schizophrenia

People with schizophrenia have empathy deficits. A meta-analysis of studies examining empathic tendencies in schizophrenia which use the IRI scale found that schizophrenia patients had lower self-reported tendencies for empathic concern, perspective taking and fantasy than healthy controls, while personal distress was significantly higher than healthy controls, and that personal distress may exacerbate empathic tendencies and capacities in schizophrenia patients (Bonfils et al, 2017). One study found that schizophrenics with suicide attempts had stronger emotional empathy and higher scores on IRI Personal Pain Subscale (Wang et al, 2020), further neuroimaging studies have shown a reduction in TPJ cortical thickness in patients with schizophrenia (Massey et al, 2017), this area affects the self-other distinction. Thus, the reason for the individual suffering of patients with schizophrenia may be due to the difficulty in distinguishing between self-other emotions or in suppressing self-centeredness, which makes the patient more likely to empathize with the negative emotions of others.

4.2. Self-other distinction disorder and Borderline Personality Disorder

Borderline personality disorder (BPD) is a chronic psychiatric disorder whose core symptoms are emotional instability, impulsivity, and restlessness, with more negative self-evaluation. Studies have shown that there is a separation of cognitive empathy and emotional empathy in patients with BPD, and patients show impaired cognitive empathy measurement, but emotional empathy increases, mainly in personal pain (Harari et al, 2016). Recent neuroimaging evidence has found that patients with BPD have more activation of the RTPJ in the face of negative feedback than in the face of positive feedback, whereas healthy controls have the opposite neural response. This suggests that BPD patients are more concerned with negative self-information (Schie et al, 2020; Beeney et al, 2016).

4.3. Self-other distinction disorder and depression

Depression is related to cognitive impairment and emotional processing. Patients tend to think and pay attention to the negative information related to self and make negative attribution to themselves, showing lower social information perception and processing ability (Thoma et al, 2011). A study on the relationship between depression and empathy and the sub-components of empathy showed that depression was not correlated with overall empathy impairment, but depression was significantly positively correlated with emotional empathy (Yan et al, 2021). Among them, patients with depression reported higher personal pain compared to healthy controls, and the occurrence of social avoidance behavior in patients with depression may be to avoid personal distress (Guhn et al, 2020).

4.4. Self-other distinction disorder and Bipolar Disorder

Bipolar disorder (BD) is a common psychiatric disease with high incidence, high prevalence, high recurrence rate and high disability rate, refers to the mood swinging back and forth between normal, high (mania), low (depression). At present, there are few direct studies on bipolar disorder empathy, but a large number of studies have shown that the emotion perception and emotion regulation ability of BD patients are impaired (Phillips et al, 2008), and according to Eisenberg (Eisenberg, 1983), individuals who are unable to regulate or suppress intense emotions are more likely to experience self-focused personal pain. In fact, some studies have found that bipolar disorder patients' individual pain scores in IRI increase with the severity of their symptoms (Cusi et al, 2010)

5. Conclusion

Research on the development of self-other distinction can help us better understand the social cognitive mechanism. As one of the representative abilities of social cognition, empathy and the potential mechanism of self-other distinction have a profound impact on group behavior, group emotion, and group cognition, and should be given more attention.

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