



Reframing neuropsychological findings, interpersonal deficits and cognitive processes in the case of borderline personality disorder

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Abstract

Empirical evidence and therapeutic interactions have suggested that individuals with Borderline Personality Disorder (BPD) may demonstrate deficits in neuropsychological cognitive and interpersonal aspects. 'Borderline Personality Disorder' term refers to a psychiatric syndrome that is characterized by emotion dysregulation, impulsivity, risk-taking behavior, irritability, feelings of emptiness, self-injury, and fear of abandonment, as well as unstable interpersonal relationships. Many typical symptoms of Borderline Personality Disorder occur within interpersonal contexts, suggesting that BPD is characterized by aberrant social cognition. To assess the empirical evidence and evaluate Borderline Personality Disorder impact under social and emotional cognition effect, Borderline Disorder symptoms and etiology perception are strongly involved. Studies concerning behavioral and neural underpinnings of the disorder, cognitive processes that help people to interact effectively with each other depending upon the exchange of social signs based on social cognition theory, are also discussed. Authors main objective is to review the influence of neuropsychological cognitive and interpersonal features, within the frame of cognitive functions as well as under emotional and social cognition influence.

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Introduction

Cognitive psychology or else cognitive neuroscience is related with the perception of basic component processes of perception, attention, categorization, discrimination, generalization, learning, memory, as well as how these processes work together, how they are affected by emotion and the conditions under which they are disrupted. Almost every symptomatic aspects of Borderline Personality Disorder reflect the outcome of some atypical cognition. In addition, a key point in order to perceive Borderline Disorder is the potential interactions between cog-

niton and emotion [1]. Borderline Personality Disorder (BPD) is characterized by a pervasive instability of interpersonal relationships, affects, self-image, marked impulsivity, dissociation, and psychotic symptoms. The empirical evidence from studies of cognitive processes, brain function, attachment, and dissociation that support this theory are reviewed and discussed [2]. However, research has focused increasingly on developmental precursors to psychological disorders that were previously assumed to emerge only in adulthood [3].



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A key goal of researchers is to clarify cognitive features related to BPD phenotype in order to help to establish reliable markers that reflect the mechanisms of the disorder and that are likely to have biological correlates. There are several cognitive functions related to the disorder, however, research focuses additionally on cognition-emotion interactions. It is suggested that the evaluation of cognition component processes is a crucial approach in order to clarify the cognitive features of the BPD phenotype. Finally, it is important to analyze the way that these features “fit together” and interact with BPD patient’s development throughout their lifetime. Therefore, the identification of differences of BPD compared to control groups concerning cognitive features could provide evidence to enhance the BPD phenotype perception, provide significant clues about the underlying mechanisms of Borderline pathology, and enlighten potential neurocognitive deficits. Results from experimental cognitive studies lead to evidence regarding deficits noticed while evaluating BPD patients, however determining the circumstances that these deficits are observed (e.g., under what mood state, or under which co-occurring disorders) is considered essential [1].

Borderline Personality Disorder

Borderline Personality Disorder (BPD) is a disorder that affected individuals in multiple domains of their everyday functioning. This disorder is considered to be a major burden to public health systems due to BPD patients high suicide rate, frequency in self-injuries, dropout rates in psychotherapy, and other medical costs [4]. The frequency of Borderline Personality Disorder occurrence in the average of the population is estimated to be 5.9% while 75% of them are noticed to be women [5]. According to Linehan, Borderline Personality Disorder’s diagnostic criteria are also involved with a pattern of emotional vulnerability, cognitive dysregulation, and behavioral dysfunction [6]. According to the Diagnostic and Statistical Manual 5 (DSM-5), Borderline Personality Disorder is defined as “a pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity, beginning by early adulthood” [7]. Initially, individuals suffering from BPD, experience intense emotional dysregulation while their emotional responses are extremely intense. They are unable to control anger, sadness or anxiety as well as features of common co-occurring disorders depressive and bipolar disorders, substance misuse, eating disorders are also noticed. Secondarily, people dealing with BPD are characterized by the interpersonal relationship’s skills shortage. For instance, due to their fear concerning real or imaginary abandonment, they tend to be stuck to dysfunctional relationships while they make frantic efforts in order to avoid loneliness. As they are unable to put up with loneliness, they almost immediately idealize potential caregivers or lovers and act impulsively (spend a lot of time together, share very personal details, etc.) or they devalue them rapidly considering that they didn’t care strongly enough for them. Additionally, they are involved with extreme and impulsive behaviors, i.e. they may be engaged in gambling, binge eating, substance abuse, unsafe sex, reckless driving or present suicidal-parasuicidal behavior. It is worth mentioning that intentional self-damaging behavior and suicidal attempts are typical behavioral pattern related to Borderline Personality Disorder. Moreover, during periods of extreme stress, they may experience nonpsychotic forms of thought dysregulation, like dissociative symptoms which clear up when stress is lightened. Finally, patients dealing with BPD tend to express emptiness feelings, i.e. suggesting that they don’t know who they are or

making sudden shifts in self-image like values, goals, friends, career, etc. [7].

It is worth mentioning that until the early ‘90s, Borderline Personality Disorder was mainly viewed within a psychological and psychoanalytical frame. However, the biosocial model suggests that there is a biologically vulnerable emotion regulation system (high sensitivity to emotional stimuli, emotional intensity, slow return to emotional baseline). This system, in the case of BPD patients, is malfunctioning, therefore emotions are hardly regulated in terms of experiencing, labeling, and reducing [6]. Moreover, BPD is characterized by a high degree of heritability, while is about five times more likely to be noticed in the case of first-degree relatives [7]. Related behavioral and brain imaging research studies suggest that genetics are strongly affecting both development and acquisition of higher order or else executive functions such as attentional systems, working memory, and aspects of cognitive inhibition [4]. However, once children with Borderline Personality Disorder biological predisposition, grow up in invalidating environments during childhood and experience stressful or traumatic events, tend to develop BPD in adulthood [8].

Borderline personality disorder and brain scanning evidence

Borderline Personality Disorder’s typical characteristic is emotion dysregulation in addition to behavioral deficits like chronic depression, mood instability, and irritability and anger outbursts. However, characteristics like several negative effects, low effortful control and non-coherent sense of self and others are deficits linked with emotion regulation dysfunction [9]. Nevertheless, clinical research and brain scans suggest that these behavioral and emotional dysregulations are additionally met in cases like acute and diffuse brain injury (head trauma, encephalitis, etc). It is worth mentioning that brain scanning research suggest that Borderline Personality Disorder is linked with frontal lobe dysfunction [4,10] and particularly with decreased dorsolateral and ventromedial prefrontal activity (subgenual anterior cingulate and medial orbitofrontal cortex) and temporolimbic dysfunction [9,11].

Additional brain scanning studies suggest that the brain area of the amygdala is connected with emotional responses modulation and cognitive processes interaction [12]. In the case of Borderline Personality Disorder patients, the amygdala is noticed to present an abnormal activity in the presence of negative stimuli while this dysregulation is connected to medial orbitofrontal dysfunction [9]. According to Goldstein et al. [13] study the interaction between emotional (negative emotions) and inhibitory systems were evaluated with the use of a paradigm of a linguistic go/no-go probe. According to this case study results, BPD patients rated more negatively the negative emotional words while their reaction times were noticed to be longer compared to the control group. In addition, Borderline Personality Disorder patients were noticed to make more errors of omission and commission, presenting a decreased ability to inhibit and restrain impulse expression. These results, blended with fMRI scan findings suggest a failure of frontolimbic function while this dysfunction is linked with BPD disability to regulate their behavior during negative emotional states [13]. Moreover, patients with BPD, present an abnormality in the attentional network, specifically in the anterior attentional system including the anterior cingulate gurus which are involved in conflict resolution [14]. This system is regulated by the neural circuitry of the prefrontal cortex and the basal ganglia [15].

Borderline personality disorder and social-emotional cognition

Disturbed social and personal relationships have been suggested to be another typical characteristic linked with Borderline Personality Disorder diagnosis [16]. Several studies suggest that social cognition progress is related to inhibitory control, working memory, and planning abilities. The term social cognition describes the ability to understand and interpret another person's beliefs, emotions, and intentions, overlapping the concept of theory of mind and mentalizing [17]. In Preißler et al., [17] study BPD patients were involved with a film displaying social interactions (intentions, emotions, thoughts) among several characters. Borderline Personality Disorder individuals presented significantly impaired abilities in inferring the emotions, thoughts, and intentions of the displayed movie characters. These results enhance previous studies related with emotional recognition where the BPD subjects presented deficits in fast discrimination of neutral and negative facial expressions as well as integrated facial and prosodic stimuli [17]. These deficits justify the biased cognitive processes that favor the negative interpretation of incoming information related to BPD clinical symptoms (fear of abandonment, subsequent suicidal gestures or threats, etc.) In the case of participants who were dealing with comorbid post-traumatic stress disorder (PTSD), these impairments were noticed to be even greater. Additionally, the recognition of intentions impairment was greater in the case of Borderline Personality Disorder group, while control group supported the simulation theory, i.e. that people are able to perceive mental states of others based on their own mental state [18]. Therefore, the process of experiential learning is suggested to be crucial for social cognition development thus, environmental factors like trauma seem to influence these learning dependent abilities [19].

Borderline disorder and cognitive processes

Several cognitive studies have examined the processing of affective information in the case of Borderline Personality Disorder patients. People that have developed effortful control can inhibit emotionally arousing rewards or punishments to obtain a longer-term goal. This process is deliberate and highly associated with the way people socially interact. On the other hand, low effortful control produces a tendency towards poor interpersonal relations [14]. The effect of emotional dysfunction in the networks of attention produces the tendency towards biased cognitive processes that favor the negative interpretation of incoming information either general or personal. These incoming information's are related to selective attention to threatening stimuli, selective memory for negative information, and cognitive distortions. Cognitive distortions according to Cognitive Theory are extreme terms and beliefs like "The world is dangerous and malevolent" "I am powerless and vulnerable", "I am inherently unacceptable", "Others will reject me and abandon me", etc. [20].

In Posner et al., [14] study, the Attention Network Task (ANT) was used in order to assess three attentional functions, namely alerting, orienting and conflict resolution. The alerting function is the capacity to sustain an alert cognitive state and in this case study, an alert was provided by a warning signal with no information about where the target would occur. The orienting resolution is the identification and selection of sensory stimuli and the orienting stimuli were induced by a spatial cue that indicated where the target would be. The conflict resolution or else executive control is the capacity to decide among competing responses based upon a principle or goal and was in this case pro-

vided by flankers surrounding the target. The results suggested that Borderline Personality Disorder patients have shown impairment in the anterior attentional system which is associated with the regulation of effortful control. Moreover, BPD patients show converging results, namely deficits in conflict resolution in comparison with matched controls in the Attention Network Task (ANT) [14]. Relative results were suggested in Rogosh and Cicchetti work, in the case of children scoring high on Borderline Personality Disorder characteristics [21].

Hoermann et al., [22] after analyzing adults suffering from Borderline Disorder suggested that high self-reported effortful control is associated with reduced susceptibility to cognitive conflict, better self-reported interpersonal as well as better personal functioning. These results lean towards the fact that highest executive neurocognition deficits could be considered as a biomarker of identifying Borderline Personality Disorder subjects with high risk [22]. Berenson et al., [23] study was related with attention to social cues in the case of rejection sensitive population (people anxiously expect interpersonal rejection). Results suggested that Borderline Personality Disorder participants presented a vigilant-avoidant pattern of attentional bias, signifying that rejection sensitivity can undermine the attention processes [23]. Finally, Davids and Gastpar suggested that Borderline Personality Disorder co-occurs with Attention Deficit Hyperactivity Disorder (ADHD) in adulthood. Therefore this dissociation in Borderline Personality Disorder is probably linked to a special form of behavioral inhibition and sustained attention comparable to Attention Deficit Hyperactivity Disorder [24].

Discussion & future work

The ability to regulate emotional responses to events is considered to be crucial for mental and physical health. However, our knowledge is limited in reference to the biological and neural bases of cognitive-emotional control. Authors main objective is to summarize behavioral and neurocognitive research in order to shed light both in borderline personality disorder pathogenesis and symptomatology. Therefore, this review study focus on recent findings on psychological, social-emotional, behavioral, cognitive and brain imaging studies related to Borderline Personality Disorder [25]. This type of disorder arises from the inappropriateness of cognitions, emotions, and behavior in a given environmental context. Borderline Personality Disorders features are linked with long-lasting or even permanent dysfunction of the central nervous system as well as the way interpersonal processes are embodied [26]. Behavioral deficits namely social-emotional cognition failures in Borderline Personality Disorder include altered social inference and emotional empathy, hyper mentalization, and poorer facial emotion recognition.

To date, however, both clinical and empirical research of Borderline Personality Disorder rehabilitation is considered to be quite limited. Experimental approaches to study cognitive features of Borderline Personality Disorder are in elementary phase while the cognitive dimension of Borderline Disorder is poorly understood. However, to author's knowledge, the potential cognitive training of executive functioning and its possible impact on the processes related to impaired emotional and social skills were not yet evaluated. Authors future work leans towards the implementation of an attention enhancement test, blending the use of both computerized or paper and pencil version in order to evaluate the potential cognitive enhancement in the case of Borderline Personality Disorder patients. In addition, this cognitive enhancement approach is suggested to be

combined with psychotherapeutic protocols which have been noticed to be effective in the case of Borderline Personality Disorder rehabilitation. In particular the use of Dialectical Behavior Therapy, Transference Focused Psychotherapy, Schema Focused Therapy, Supportive Psychotherapy, and Metallization Based Therapy is proposed [27]. The above-mentioned psychotherapeutic protocols are basically addressed to social and cognitive skills enhancement. This approach aims to affect the anterior attentional system, in order to help people suffering from BPD to inhibit emotionally arousing stimuli to obtain a longer-term goal. Under this rehabilitation protocol, emotional abilities, as well as social skills, are expected to be regulated.

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