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Emotional hyper-reactivity in borderline personality disorder is related to trauma and interpersonal themes

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ABSTRACT

Heightened emotional reactivity is one of the core features of borderline personality disorder (BPD). However, recent findings could not provide evidence for a general emotional hyper-reactivity in BPD. The present study examines the emotional responding to self-relevant pictures in dependency of the thematic category (e.g., trauma, interpersonal interaction) in patients with BPD. Therefore, women with BPD ($n=31$), women with major depression disorder ($n=29$) and female healthy controls ($n=33$) rated pictures allocated to thematically different categories (violence, sexual abuse, interaction, non-suicidal self-injury, and suicide) regarding self-relevance, arousal, valence and the urge of non-suicidal self-injury. Compared to both control groups, patients with BPD reported higher self-relevance regarding all categories, but significantly higher emotional ratings only for pictures showing sexual abuse and interpersonal themes. In addition, patients with BPD and comorbid posttraumatic stress disorder showed higher emotional reactivity in violence pictures. Our data provide clear evidence that patients with BPD show a specific emotional hyper-reactivity with respect to schema-related triggers like trauma and interpersonal situations. Future studies are needed to investigate physiological responses to these self-relevant themes in patients with BPD.

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1. Introduction

Emotional dysregulation is considered as the core feature of borderline personality disorder (Barnow et al., 2010; Cheavens et al., 2012). According to Linehan's biosocial theory (1993), dysfunction in emotion regulation is characterized by high sensitivity to emotional stimuli, high emotional intensity and reactivity, and slow return to emotional baseline. The etiology of the emotional dysregulation is assumed to be a result of a transaction between biological vulnerabilities (caused genetically or by intrauterine or early childhood events) and invalidating environments, e.g., physical, sexual or emotional abuse, or neglect (Linehan, 1993; for a review see Crowell et al. (2009)).

Regarding high emotional intensity, several studies found a relationship between self-reported negative affect intensity (NAI) and borderline features (Cheavens et al., 2005; Salsman and Linehan, 2012) as well as higher self-reported NAI in patients with BPD compared with other psychological or personality disorders (Koenigsberg et al., 2002; Yen et al., 2002; Svaldi et al., 2012b). However, affect intensity is the strength with which one habitually *experiences* emotions and must be differentiated from the dynamic process of emotional reactivity, which refers to discrete and proximal emotional *responding* to changes in the environment in at least one emotional response system (e.g., self-reported experiences, expressive behavior, physiological responses; Rothbart and Derryberry, 1981; Gratz et al., 2010). Whereas results regarding higher NAI in BPD provide clear evidence, findings regarding emotional reactivity are mixed (for a review see Rosenthal et al. (2008)). Several recent studies did not find any self-reported or psychophysiological differences between individuals with BPD and healthy controls (HC) in response to negative picture stimuli (Herpertz et al., 1999; Feliu-Soler et al., 2013), negative film clips (Kuo and Linehan, 2009) or emotion eliciting stories (Jacob et al., 2008, 2009). Staebler et al. (2009) examined emotional reactivity to positive and negative emotion eliciting film clips in BPD compared with depressive patients and HC, and they could not find differences between the groups. However, findings from fMRI-studies suggest *hyper*arousability, especially of limbic structures in response to negative picture stimuli (Herpertz et al., 2000; Koenigsberg et al., 2010).

It must be noted that these studies did not use stimuli that are specifically self-relevant for patients with BPD. Most studies examining emotional reactivity in BPD have rather used unspecific

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images of the International Affective Picture System (IAPS; Lang et al., 2008), which possibly do not tap BPD-relevant themes (Suvak et al., 2012). However, according to various cognitive models (e.g., Beck and Freeman, 1990), patients with BPD are characterized by specific maladaptive schemas (e.g., *I am powerless and vulnerable*), which can lead to dysfunctional thoughts, extreme feelings and behaviors. Thus, when measuring emotional reactivity in BPD, schema-relatedness of the stimuli presented might be crucial. In line with this, several studies that *did* use BPD-relevant stimuli found that patients with BPD *do* exhibit a specific emotional hyper-reactivity, e.g., increased physiological reactivity in response to idiographic, aversive scripts of rejection and abandonment (Limberg et al., 2011), or BPD-relevant words (Hazlett et al., 2007). Furthermore, there is a growing body of research suggesting that emotional hyper-reactivity is specifically related to interpersonal triggers (Dixon-Gordon et al., 2013). In the study of Gratz et al. (2010), patients with BPD showed heightened emotional reactivity to negative evaluations, i.e., higher levels of shame, compared to patients with Axis I psychopathology.

Besides interpersonal triggers, traumatic experience and the co-occurrence of a comorbid posttraumatic stress disorder (PTSD) might additionally increase emotional reactions in BPD (Limberg et al., 2011; Dixon-Gordon et al., 2013). In a recent study, the effects of abuse-related film stimuli were investigated in BPD and antisocial personality disorder (Lobbestael and Arntz, 2010). Even though childhood trauma stimuli might be highly self-relevant for both personality disorders, only patients with BPD showed higher self-reported negative affect. In line with this result, recent findings indicated that scenes of sexual abuse and emotional dependence lead to heightened emotional reactions in BPD compared to HC (Elices et al., 2012). Thus, it is necessary to examine emotional reactivity in BPD within specific contexts (Gratz et al., 2010), especially in response to BPD-relevant themes.

Recently, in a study of Sloan et al. (2010), BPD experts created a BPD-relevant picture set from the IAPS showing interpersonal and social situations, by rating images, e.g., regarding self-relevance. The ratings of BPD experts suggested that for individuals with BPD, pictures with high self-relevance would be more unpleasant and arousing than pictures with no self-reference. These results imply that self-relevance could be the pivotal trigger for a specific emotional hyper-reactivity in patients with BPD. However, some important limitations of the study of Sloan et al. (2010) must be considered: First, pictures were rated only by BPD experts, not by patients with BPD. Thus, it remains vague whether patients with BPD would have rated these pictures in the same way. Second, it is unclear whether this picture set is specifically relevant for patients with BPD, since no clinical comparison group was considered to control for psychopathology in general.

So far, there is no study that examines self-relevance of pictures containing different, putatively BPD-relevant themes in *patients* with BPD. Furthermore, only few studies investigated emotional reactivity in BPD compared with a clinical control group (e.g., Staebler et al., 2009; Gratz et al., 2010). Thus, the aim of the present study was to examine self-relevance *and* emotional responding to BPD-relevant pictures in women with BPD compared with women with major depressive disorder (MDD) and female HC. Therefore, participants had to rate pictures with respect to self-relevance, arousal, valence and the urge for non-suicidal self-injury (UNSSI). In contrast to previous studies (e.g., Sloan et al., 2010), we did not use pictures from the IAPS, but identified new pictures which contain putatively BPD-relevant themes, i.e., trauma, interpersonal dysfunctions and (para)suicidal behaviors. The topics of these pictures were allocated to three broad factors, which are theoretically based on the biopsychosocial model of BPD (Linehan, 1993; for a review see Leichsenring et al. (2011)) and are supposed to show high self-relevance for BPD: (1) Trauma, i.e., interpersonal physical violence and sexual abuse (e.g., Ogata et al., 1990; Golier et al., 2003). (2) Interpersonal dysfunction (i.e., disturbed relatedness), which is defined by intense and stormy relationships, fear of abandonment, and oscillation between idealization and devaluation within relationships (e.g., Gunderson, 2007). (3) Non-suicidal self-injury (NSSI) and suicide attempts, which are prevalent dysfunctions in BPD (American Psychiatric Association, 2013; Klonsky and Muehlenkamp, 2007). In contrast to the first two factors of the model, the third factor functions as a type of a control scale, because it did not represent etiological relevance (e.g., trauma) or schema-relatedness (e.g., interpersonal disturbances), but rather regulation strategies to cope with aversive tension and negative emotions (for a review see Klonsky (2007)). Therefore, we assumed that only pictures containing etiological relevance and schema-relatedness (versus coping strategies) elicit emotional hyper-reactivity in BPD.

To ensure that the emotional response pattern is specifically related to BPD, we included not only a healthy control group, but also a clinical control group of patients with MDD. MDD was chosen since mood disorders are among the most frequent comorbid disorders in patients with BPD (71–83%; Zanarini et al., 2009; Kaess et al., 2013).

To further examine BPD specificity of the picture categories, we investigated whether measures of self-relevance and emotional reactivity can discriminate between patients with BPD, patients with MDD and HC.

Furthermore, we sought to implement BPD specificity also in our dependent measures. Present-state dissociation has an important impact on emotional reactivity in BPD (Barnow et al., 2012) by dampening it to avoid emotional overstimulation (Sierra et al., 2002; Ebner-Priemer et al., 2005). Because almost all patients with BPD show dissociative symptoms (Korzekwa et al., 2009), we assessed dissociative symptoms before and after the experiment to control for this emotion regulation mechanism. In addition, UNSSI was assessed after each picture as well as before and after the experiment. UNSSI is another important BPD-specific indicator for acute negative affect, since borderline individuals often engage in NSSI to regulate their heightened inner tension and negative emotions (e.g., Chapman et al., 2006). Therefore, the assessment of UNSSI after each picture provided a fine-grained, BPD-specific measurement of emotional reactivity, next to the global indices like valence and arousal. Further, assessing UNSSI after every picture made it possible to investigate whether some themes trigger stronger UNSSI than others. The pre–post measurement of UNSSI served as a further indicator for acute negative affect and inner tension after watching all pictures.

We hypothesized that patients with BPD would rate all pictures as more self-relevant than patients with MDD and HC. Furthermore, it was expected that only pictures related to trauma or interpersonal themes, but not pictures showing coping strategies like NSSI and suicide attempts, would elicit heightened emotional ratings in BPD, i.e., patients with BPD rate those pictures as more arousing and negative valenced than MDD and HC. Finally, we expected that across the experiment only BPD patients show an increase in the two BPD-specific outcomes dissociation and UNSSI.

2. Method

2.1. Subjects

Patients with BPD ($n=33$) and MDD ($n=34$) were recruited in the Hospital for Psychiatry and Psychotherapy Tiefenbrunn (center I: $n_{BPD}=28$, $n_{MDD}=14$), Goettingen, Germany, and in the outpatient clinic of the Department of Clinical Psychology and Psychotherapy of Heidelberg University (center II: $n_{BPD}=5$, $n_{MDD}=20$), Germany. In the BPD group, all patients fulfilled at least five criteria of the *Diagnostic And Statistical Manual Of Mental Disorders* (DSM-IV-TR; American Psychiatric

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