



Experimental investigation of cognitive and affective empathy in borderline personality disorder: Effects of ambiguity in multimodal social information processing



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ABSTRACT

Borderline personality disorder (BPD) is characterized by affective instability and interpersonal problems. In the context of social interaction, impairments in empathy are proposed to result in inadequate social behavior. In contrast to findings of reduced cognitive empathy, some authors suggested enhanced emotional empathy in BPD. It was investigated whether ambiguity leads to decreased cognitive or emotional empathy in BPD. Thirty-four patients with BPD and thirty-two healthy controls were presented with video clips, which were presented through prosody, facial expression, and speech content. Experimental conditions were designed to induce ambiguity by presenting neutral valence in one of these communication channels. Subjects were asked to indicate the actors' emotional valence, their decision confidence, and their own emotional state. BPD patients showed increased emotional empathy when neutral stories comprised nonverbally expressed emotions. In contrast, when all channels were emotional, patients showed lower emotional empathy than healthy controls. Regarding cognitive empathy, there were no significant differences between BPD patients and healthy control subjects in recognition accuracy, but reduced decision confidence in BPD.

These results suggest that patients with BPD show altered emotional empathy, experiencing higher rates of emotional contagion when emotions are expressed nonverbally. The latter may contribute to misunderstandings and inadequate social behavior.

1. Introduction

Borderline Personality Disorder (BPD) is characterized by a pervasive pattern of instability in emotion regulation, self-image, impulse control, and interpersonal relationships (APA, 2013). One of the most stable and debilitating symptoms in BPD are difficulties in interpersonal relationships (Gunderson, 2007; Gunderson et al., 2011). In the course of interpersonal conflict, patients are also more likely to show emotional hyperactivity and emotion dysregulation (Gunderson and Lyons-Ruth, 2008; Hepp et al., 2017), and show dysfunctional behaviors such as suicide attempts or non-suicidal self-injurious behavior (Brodsky et al., 2006; Welch and Linehan, 2002). In search of factors possibly causing interpersonal problems in BPD, previous research has pointed, among other factors, to difficulties in emotion recognition and empathy (for an overview, see (Lazarus et al., 2014)).

Empathy, the ability to understand and experience the thoughts and emotions of interaction partners (Davis, 1983; Eisenberg and Miller, 1987), is crucial for successful social interaction. Two facets,

cognitive and affective empathy, are commonly distinguished (Davis et al., 1987). Cognitive empathy describes the ability to cognitively understand the perspective, reactions, and emotions of others. Overlapping constructs are mentalization and theory of mind. Closely related to cognitive empathy, emotion recognition is the ability to accurately determine the emotional states of others from their emotional expression (Ekman and Friesen, 1971). Affective empathy is conceptualized as emotional responding, which is congruent with the emotion of an interaction partner (Davis et al., 1987). Moreover, as a precursor of affective empathy, emotional contagion was described as an automated mirroring of the emotional reaction of another person (Hatfield et al., 1994), also present in babies and animals (Singer and Klimecki, 2014). Affective empathy is a less studied field in BPD than cognitive empathy (Dinsdale and Crespi, 2013; Roepke et al., 2012).

1.1. Self-reported empathy in BPD

Five studies investigated affective and cognitive empathy using a

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self-report measure, the Interpersonal Reactivity Index (IRI; (Davis, 1983)). The first study found self-reported affective empathy on both IRI subscales (empathic concern and personal distress) to be higher in BPD than in nonclinical controls, whereas self-reports of cognitive empathy (i.e., the subscale perspective taking) was lower in the BPD group (Guttman and Laporte, 2000). Three other studies using the IRI also reported lower cognitive empathy with regard to the IRI subscale perspective taking (Dziobek et al., 2011; Harari et al., 2010; New et al., 2012). However, regarding affective empathy, findings are less clear: Three of the four studies found higher values on the subscale personal distress, but no significant effects for self-reported empathic concern (Dziobek et al., 2011; Matzke et al., 2014; New et al., 2012). Higher values in personal distress in BPD might result from heightened emotional contagion (Hatfield et al., 1993; Herpertz and Bertsch, 2014), while empathic concern was described as a more mature form of empathy (Singer and Klimecki, 2014), leading to emotions like compassion. However, one study did not find any significant differences between BPD patients and healthy controls with regard to affective empathy (Harari et al., 2010). Finally, a recent study found affective empathy to be higher in female adolescents with BPD than in psychiatric control patients (Kalpakci et al., 2016). Notably, the authors used the Basic Empathy Scale for self-reported emotional empathy (Jolliffe and Farrington, 2006), explicitly assessing congruent affective reactions.

1.2. Behavioral measures of cognitive empathy in BPD

A relatively large body of studies investigated emotion recognition abilities in BPD patients. Most of the studies asked patients with BPD and healthy controls (HC) to categorize an emotional expression from a picture or photograph. Two meta-analyses in BPD found reduced emotion categorization abilities (Daros et al., 2013; Mitchell et al., 2014). The authors conclude that patients more often rated neutral faces as negative emotional, and had difficulties with the detection of anger and disgust. However, one could argue that studies using images of facial expressions are lacking ecological validity, because social cognition is likely to rely on multimodal and dynamic stimuli. During everyday communication, cues from different communication channels have to be integrated, such as facial expressions, speech content, and prosody (Regenbogen et al., 2012a). Only a few studies used film clips to study emotion categorization in BPD (Baez et al., 2015; Preissler et al., 2010) and in adolescents with high versus low borderline traits (Sharp et al., 2011), confirming impairments in the recognition of emotions. A study by Minzenberg et al. (2006) found impaired ability for emotion recognition only with integrated audiovisual stimuli, but not with isolated visual or auditory stimuli. A recent study from our own group tested whether difficulties in emotion recognition in BPD are based on deficits in the recognition of isolated social cues (Niedtfeld et al., 2016), and showed reduced emotion recognition abilities in BPD whenever facial expressions were presented.

In addition to emotion recognition abilities, confidence in emotion judgements was investigated in four studies, asking how confident subjects were with regard to their decisions. Two studies (Kaletsch et al., 2014; Thome et al., 2016) reported lower confidence in ratings of emotion intensity in BPD, the first with regard to the emotional valence of body movements, the second with regard to facial expressions. One study showed enhanced confidence in BPD (Schilling et al., 2012), using the reading the mind in the eyes test. A recent study using dynamic stimuli of facial expressions found no difference with regard to confidence ratings between BPD and HC (Lowyck et al., 2016).

1.3. Behavioral measures of affective empathy in BPD

There are three studies assessing facets of affective empathy at the behavioral level in BPD (Dziobek et al., 2011; Matzke et al., 2014; Wingenfeld et al., 2014). Two of these studies used the multifaceted

empathy test (Dziobek et al., 2008), showing pictures of complex social situations to investigate cognitive and emotional empathy (“How much do you feel for the person?”). The first study reports deficits in this measure of affective empathy in BPD (Dziobek et al., 2011), the second does not find significant differences between BPD patients and healthy controls (Wingenfeld et al., 2014). The third study assessed facial electromyography during a facial recognition task. The authors hypothesized that BPD patients show increased facial mimicry, which could be interpreted as a basal form of empathy (Matzke et al., 2014). However, the results of the study point to a general tendency in BPD to react with augmented activation of the corrugator supercilii muscle (i.e. frowning) to all displays of negative expressions. The authors interpreted this finding as evidence for a negativity bias, but not for heightened affective empathy in BPD.

1.4. The current study

The current study was designed to investigate cognitive and affective empathy in BPD using multimodal stimuli with high ecological validity. Additionally, it is aimed at a deeper understanding of the influence of ambiguity on cognitive and emotional empathy in BPD. In contrast to our previous study (Niedtfeld et al., 2016), which investigated the recognition of isolated information channels (text only, video without audio, and audio only) as compared to videos (all channels containing the same emotion), in this study we focused on the impact of ambiguity between information channels. In daily life, communication is not always as clear as in the laboratory. There is evidence that inconsistencies between verbal and nonverbal information result in a larger influence of nonverbal cues on emotion ratings (Argyle et al., 1971; Jacob et al., 2012). A study in healthy controls found that inconsistencies between verbal and nonverbal information decrease emotion recognition and affective empathy differentially, dependent on the affected communication channel (Regenbogen et al., 2012a). A recent study on emotion recognition in BPD demonstrated that patients relied more on nonverbal cues when verbal and nonverbal signals were contradictory (Bruck et al., 2016).

Since previous research suggests impairments in cognitive empathy in BPD, it was hypothesized that (1) BPD patients would show lower performance in emotion recognition than HC, and (2) this emotion recognition deficit would be most pronounced when stimuli are ambiguous. Furthermore, BPD patients were expected (3) to experience lower confidence with regard to the emotion recognition task. Finally, it was hypothesized that (4) those with BPD show altered affective empathy (i.e. experience of the same emotion as their interaction partner) as compared to healthy controls.

2. Methods

2.1. Participants

Thirty-five unmedicated women diagnosed with BPD according to the DSM-IV (APA, 2013) and 32 healthy women were invited to participate in the study. Healthy subjects were recruited by newspaper advertisement, patients at the Department of Psychosomatic Medicine, Central Institute of Mental Health (CIMH) in Mannheim, Germany. Trained clinicians assessed BPD diagnosis and axis I comorbidities with the German version of the Structural Clinical Interview for DSM-IV Axis-I (Wittchen et al., 1997) and Axis-II (Fydrich et al., 1997). Healthy subjects did not fulfil criteria of any axis I or II disorder. Exclusion criteria for patients were current substance abuse, bipolar disorder, schizophrenia, and a current severe depressive episode. One patient had to be excluded due to the disclosure of substance dependency after participation.

Further assessments included self-ratings of BPD symptoms with the Borderline Symptom List-23 (BSL-23) (Bohus et al., 2009), current mood with the Positive and Negative Affect Schedule (PANAS) (Watson

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