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Individual differences in components of impulsivity and effortful control moderate the relation between borderline personality disorder traits and emotion recognition in a sample of university students

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ABSTRACT

Dysfunctions in social cognition characterize personality disorders. However, mixed results emerged from literature on emotion processing. Borderline Personality Disorder (BPD) traits are either associated with enhanced emotion recognition, impairments, or equal functioning compared to controls. These apparent contradictions might result from the complexity of emotion recognition tasks used and from individual differences in impulsivity and effortful control. We conducted a study in a sample of undergraduate students ($n=80$), assessing BPD traits, using an emotion recognition task that requires the processing of only visual information or both visual and acoustic information. We also measured individual differences in impulsivity and effortful control. Results demonstrated the moderating role of some components of impulsivity and effortful control on the capability of BPD traits in predicting anger and happiness recognition. We organized the discussion around the interaction between different components of regulatory functioning and task complexity for a better understanding of emotion recognition in BPD samples.

1. Introduction

Borderline Personality Disorder (BPD) is a severe condition characterized by marked impulsivity as well as instability in affects, self-image, and interpersonal relationships (APA, 2013). Only recently, researchers started investigating the connections between disrupted interpersonal relationships that characterize BPD and social cognitive functioning. Recent reviews (Roepke et al., 2012; Herpertz and Bertsch, 2014) have focused on social cognitive dysfunctions in BPDs, highlighting some inconsistencies. In terms of emotion processing, results showed either enhanced, impaired, or equal performances between BPDs and controls (e.g., Domes et al., 2009; Daros et al., 2013; Dinsdale and Crespi, 2013). Considering the central role of negative affect in the origins of interpersonal relationships problems in BPDs, literature focused mainly on negative emotions, particularly on anger. Whereas a recent meta-analysis on studies using facial emotion stimuli at 100% intensities (Daros et al., 2013) showed that BPDs experienced more difficulties in anger and disgust recognition, another meta-analytic work (Mitchell et al., 2014) on studies investigating basic emotion recognition and detection, complex social emotional recognition, or functional imaging data found no specific significant differences between BPDs and controls. These mixed results call for a more specific investigation, highlighting the need to take into account the emotion under scrutiny and the fact that different tasks may tap into specific processes related to different components of emotion processing. However, even when focusing on a single paradigm, results are not clear. For example, using dynamic facial expressions to examine emotional sensitivity (i.e., detection threshold for emotional faces in terms of speed), Lynch et al. (2006) demonstrated that BPD participants had a lower detection threshold for emotional faces across valences though Domes et al. (2008) and Baez et al. (2014) found no such relation. In the same vein, either equal functioning between BPDs and controls (Jovev et al., 2011) or higher detection threshold in BPDs as compared to controls for anger and happiness (Robin et al., 2012) is reported in adolescents populations.

Still considering processing speed of specific emotions but among the general population, happy faces are processed faster and more accurately compared to other emotions (happy face advantage; Leppänen and Hietanen, 2004). When considering clinical populations, one could wonder whether the apparent bias toward negative stimuli related to BPD traits would override the

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happy advantage such that angry faces would be processed faster and more accurately than happy ones. On the one hand, Matzke et al. (2014) found reduced facial responding to positive social signal in BPDs. On the other hand, some research using dynamic emotion recognition paradigms (Domes et al., 2008; Jovev et al., 2011) report the presence of the happy face advantage also among individuals with high BPD traits.

To try shedding light on these inconclusive results, some authors hypothesized a different performance of BPD patients in simple, low-order tasks of emotion processing compared to more complex and ecological tasks (e.g., Preißler et al., 2010). They showed that BPD patients performed equally to controls in a simple emotion recognition task, the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001) whereas their functioning was impaired in a more complex social cognition task, the Movie for the Assessment of Social Cognition (MASC, Dziobek et al., 2006). Moreover, Minzenberg et al. (2006) found that BPDs showed normal abilities in recognizing isolated facial and prosodic emotions, whereas impairments emerged in recognizing integrated information. BPDs seem to not benefit from the emotional cue provided by a second channel of information, such as congruent prosodic priming, as the non BPDs usually do (Paulmann and Pell, 2011; Rigoulot and Pell, 2012). Because complex tasks require the processing of different sources of information and sometimes involve the inhibition of task-irrelevant information, this lack of benefits might be due to top-down regulation failures.

On the one hand, BPDs might be better in simple emotion recognition tasks because of a bottom up processing advantage that enhances the salience of emotional stimuli in terms of memory and attention (Berenson et al., 2011; Renneberg et al., 2012). On the other hand, BPDs might perform worse in complex tasks because of failures in top down regulatory processes due to low effortful control (Posner et al., 2003) and high impulsivity that characterize them (Lenzenweger et al., 2004). In other words, the different degrees of regulatory capacities that can characterize different subgroups of BPDs (Hoermann et al., 2005) could be thus responsible of the mixed functioning in emotion recognition reported in previous research. Gardner et al. (2010) found that only healthy participants high in BPD traits and low in effortful control showed lower accuracy in anger and surprise recognition. However, in line with the need to consider impulsivity and regulatory processes as multidimensional features (e.g., Hamilton et al., 2015), one could hypothesize that not all dimensions of effortful control and impulsivity are relevant for moderating performance of individuals high in BPD traits. For example, inhibitory control rather than attention control might be at work in complex tasks that require the inhibition of task irrelevant information. On the contrary, effortful attention might be more significant in simple tasks where focus on a single information would lead to good performance. In the same vein, motor impulsivity might not be particularly relevant whereas non-planning and attentional impulsivity could be at work for complex and simple tasks. Finally, these different components of impulsivity and effortful control might not play the same role in respect to speed and accuracy.

1.1. The present study

The inconsistent results regarding emotion processing in BPDs calls for a more thorough investigation about the moderating role of contextual elements and individual differences in impulsivity and effortful control. First, the differences might be connected to the complexity of the task. Second, regulatory processes, connected to impulsivity and effortful control, could play a moderating role on the relation between BPD traits and emotion recognition. We thus aim at investigating whether there is a dissociation between preserved functioning in low order emotion processing tasks and dysfunctions in adequate processing of emotional stimuli coming from multiple sources and whether this dissociation depends on individual differences in regulatory processes. We thus tested whether BPD traits in healthy individuals would be linked to performances in an anger and happiness recognition task involving low- versus higher-order elaboration. For this purpose, we used a dynamic emotion recognition task that requires the processing of visual emotional information (unimodal) or the processing of both acoustic and visual emotional information (multimodal congruent and incongruent). The different conditions should allow distinguishing between complex higher-order emotion processing, that requires taking into account information from different sources (i.e., the multimodal conditions) with the inhibition of task irrelevant information when needed (i.e., the multimodal incongruent condition) and more simple low-order emotion processing (i.e., the unimodal condition). We decided to focus on anger for two main reasons. First, anger is central in BPD pathology from a descriptive (APA, 2013), theoretical (Kernberg and Caligor, 2005), and empirical (Lenzenweger et al., 2012) perspective. Second, the focus on only two emotions (anger and happiness) leads to a binary choice task from which reaction times and accuracy scores are usually more reliable than from a task in which a choice among 6 emotions might increase the part of construct irrelevant variance. Moreover, in previous studies using dynamic emotion recognition paradigms (Lynch et al., 2006; Domes et al., 2008; Jovev et al., 2011; Robin et al., 2012; Baez et al., 2014) sensitivity (i.e., speed in the detection of an emotion) and accuracy (at 100% expression) were measured in separate phases. In the present research, the focus on two emotions allows assessing both accuracy and reaction time in one single response.

In this contribution, we first investigated whether the happy advantage demonstrated in previous research in non-clinical samples (e. g., Leppänen and Hietanen, 2004) would depend[1] on BPD traits (H1). Then, we aimed at testing whether the potential facilitation effect (i.e., better performances) of congruent prosodic priming on emotion recognition (e.g., a neutral face dynamically morphing into an angry face with Angry primes) demonstrated in previous work (Paulmann and Pell, 2011; Rigoulot and Pell, 2012) would vary with BPD traits (H2). Considering the different patterns of results related to negative and positive emotion recognition (Daros et al., 2013), we expect that this potential facilitation effect would be different for anger and for happiness (H2a-b). Moreover, we hypothesized that a deterioration effect (i.e., worse performances) of incongruent multimodal information (e.g., a neutral face dynamically morphing into an angry face with Happy primes) would vary with BPD traits across emotions (H3). Similar to the facilitation effect hypothesis, we expect that this deterioration effect might not be the same for anger and happiness recognition (H3a-b). Finally, we explored whether individual differences in Effortful Control and Impulsivity and their respective subscales would moderate the relation between BPD traits and the identification of angry and happy facial emotion (H4). In accordance with the need to consider different components of regulatory processes (Hamilton et al., 2015), we hypothesized that not all effortful control and impulsivity subcomponents would be significant moderators for speed and accuracy.

[1] Throughout the text, we refer to “dependence” without implying causal links between variables.