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Emotional hyperreactivity in response to childhood abuse by primary caregivers in patients with borderline personality disorder



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ABSTRACT

Background: One of the core postulated features of borderline personality disorder (BPD) is extreme emotional reactivity to a wide array of evocative stimuli. Findings from previous experimental research however are mixed, and some theories suggest specificity of hyper emotional responses, as being related to abuse, rejection and abandonment only.

Objective: The current experiment examines the specificity of emotional hyperreactivity in BPD.

Method: The impact of four film clips (BPD-specific: childhood abuse by primary caregivers; BPD-nonspecific: peer bullying; positive; and neutral) on self-reported emotional affect was assessed in three female groups; BPD-patients ($n = 24$), cluster C personality disorder patients ($n = 17$) and non-patient controls ($n = 23$).

Results: Results showed that compared to the neutral film clip, BPD-patients reacted with more overall negative affect following the childhood abuse clip, and with more anger following the peer bullying clip than the two other groups.

Limitations: The current study was restricted to assessment of the impact of evocative stimuli on self-reported emotions, and the order in which the film clips were presented to the participants was fixed.

Conclusions: Results suggest that BPD-patients only react generally excessively emotional to stimuli related to childhood abuse by primary caregivers, and with excessive anger to peer-bullying stimuli. These findings are thus not in line with the core idea of *general* emotional hyperreactivity in BPD.

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1. Introduction

Borderline personality disorder (BPD) is a severe mental disorder that is mostly characterized by instability (APA, 2005). This instability is expressed in interpersonal relationships, identity, and affect. Following the biosocial theory (Linehan, 1993), the essence of BPD is postulated to be a dysregulated emotional system (Rosenthal et al., 2008). According to this general emotional dysregulation theory, the dysregulation includes three components: emotional sensitivity (low threshold for emotional responses), emotional hyperreactivity (intense emotional reactions to evocative cues), and a slower return to baseline arousal (Linehan, 1993). The current study focuses on the second component, and contrasts the general emotion hyperreactivity theory to theories that hypothesize that BPD is characterized by stronger emotional

responsivity to specific stimuli, such as emotional, sexual and physical abuse (see e.g. Lobbestael & Arntz, 2012; Rosenthal et al., 2008).

During the last decade, three lines of studies emerged to assess emotional reactivity in BPD. The first line used the Affect Intensity Measure (AIM, Larsen & Diener, 1987) to quantify self-reported characteristic intensity of positive and negative emotional reactions. BPD-patients reported higher intensity of negative affect than non-patient controls (Bland, Williams, Scharer, & Manning, 2004; Levine, Marziali, & Hood, 1997), and BPD-traits showed to be related to affect intensity on a dimensional level both in analogue (Cheavens et al., 2005; Rosenthal et al., 2008) and hospitalized samples (Yen et al., 2002). More strict comparisons with patient samples suffering from other personality disorders (Henry et al., 2001; Koenigsberg et al., 2002) and/or bipolar disorders (Henry et al., 2001) however failed to show affective hyperreactivity assessed with the AIM to be specific for BPD. The second line of studies likely reflects a more valid way of testing the emotional

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hyperreactivity hypothesis because these studies included confrontation with emotional stimuli in an experimental setting. Such studies have the advantage of not being hypothetical in nature, or prone to retrospective distortion. Findings were mixed. One abuse-related film clip led BPD-patients to report increased fear (Arntz, Klokman, & Sieswerda, 2005) or negative affect (Lobbestael & Arntz, 2010), but this was also observed in Cluster-C personality disorder patients in one study (Lobbestael, Arntz, Cima, & Chakhssi, 2009). In other studies using different emotional film clips BPD-patients did not display heightened affect in response to any emotional stimuli compared to a variety of control groups (Kuo & Linehan, 2009; Staebler, Gebhard, Barnett, & Renneberg, 2009; Veen & Arntz, 2000). In contrast, BPD-patients were sometimes shown to report more negative affect after confrontation with all kind of emotional film clips when compared to depressed or non-patients (Jacob et al., 2008, 2009). Laboratory emotional reactivity studies using stimuli like personalized scripts or anger-induction interviews did not find BPD-patients to react differently than other groups (Lobbestael et al., 2009; Schmahl et al., 2004). The third line of studies used ambulatory assessment to track alternations in affect over time. Only a handful of studies included clinical control groups, but findings are mixed as to whether the observed emotional hyperreactivity is BPD-specific, or rather a trans-diagnostic phenomenon (see e.g. Santangelo et al., 2014; Trull et al., 2008).

Taken together, results of previous studies on emotional reactivity vary across stimulus type (e.g., film clips, personalized scripts), emotional valence of the stimulus (i.e. neutral, positive, negative, anger- or abuse-related), comparison groups (i.e. non-patients, other Axis I or II groups), and emotional outcomes (self-reported total negative affect vs. specific emotions). There are hardly any studies that included enough variation across these factors to allow drawing specific conclusions about the presumed emotional hyperreactivity in BPD. The current study aimed to fill this gap by designing an experiment with the following characteristics; (1) film clips were selected as stimulus type because their dynamic nature optimally mimics reality, a meta-analysis showed them to be among the most potent subjective and physiological emotion induction methods (Westermann, Spies, Stahl, & Hesse, 1996), and media presentations were the most commonly reported trigger of recall of victimization by abuse victims (Elliott, 1997); (2) four differently valenced film clips were used; childhood abuse by primary caregivers, peer bullying, positive, and neutral. The first film clip can be considered BPD-specific because BPD-schemata have been shown to mainly center around abandonment, rejection and abusive themes (see Lobbestael & Arntz, 2012 for an overview) and there is a large body of evidence showing BPD to be related to abuse by primary caregivers (Bierer et al., 2003; Johnson, Cohen, Chen, Kasen, & Brook, 2006; Lobbestael, Arntz, & Bernstein, 2010); (3) both a non-patient and a Cluster C personality disorder comparison group were included to allow drawing personality disorder specific conclusions; and (4) the impact of the film clips was assessed on self-reported tension, depression, anger, vigor, and fatigue, and total negative affect.

There is a possibility that BPD-patients display increased baseline levels of emotional intensity (Kuo & Linehan, 2009). Indeed, some studies demonstrated a negative baseline affect in BPD but also in other pathological comparison groups (Kuo & Linehan, 2009; Lobbestael et al., 2009; Lobbestael & Arntz, 2010; Staebler et al., 2009), while others did not found higher negative baseline effect in BPD at all (Arntz et al., 2005; Veen & Arntz, 2000). Therefore, the current study will operationalize emotional reactivity as the change in self-reported emotions after confrontation with emotional film clips compared to a neutral film clip. This allows distinguishing whether possible higher emotional intensity in

BPD-patients is due to increased baseline levels or to increased reactivity. With this experiment, we aim to contribute to the knowledge on the disorder- and valence specificity of emotional reactivity in BPD, albeit restricted to the use of film clips and self-reported outcome measures. We hypothesize BPD-patients to respond emotionally hyperreactive after watching the BPD-specific film clip of childhood abuse by primary caregivers.

2. Method

2.1. Participants

Data were analyzed from $N = 64$ female subjects, divided into three groups: patients with BPD ($n = 24$) or cluster C personality disorder (CIC-PD, $n = 17$) and non-patient controls (NpCs) without psychopathology ($n = 23$). Patients were recruited from the general community and mental health care institutions within the Netherlands and Belgium. General exclusion criteria were psychotic or bipolar disorder, age <18 and >65 , intoxication by alcohol or drugs during testing, IQ below 80 and not being native speaker of the Dutch language. The CIC-PD patients were not allowed to have more than two BPD criteria, and NpCs could not have an Axis I or II disorder. The characteristics of the study groups are presented in Table 1.

Testing of between group differences revealed that there were no differences in age, education level or marital status.¹ The BPD group had significantly more axis II disorders than the CIC-PD group. There were no differences in number of axis I disorders.

2.2. Materials

2.2.1. Screening instruments

Dutch versions of the Structured Clinical Interview for DSM-IV Axis I and Axis II disorders (SCID I and SCID II, First, Spitzer, Gibbon, & Williams, 1997; First, Spitzer, Gibbon, Williams, & Benjamin, 1994; Van Groenestijn, Akkerhuis, Kupka, Schneider, & Nolen, 1999; Weertman, Arntz, & Kerkhofs, 2000) were used to assess DSM-IV axis I and II diagnoses. Previous studies have supported the reliability and validity of the SCID I and II. Inter-rater reliability proved to be adequate for SCID I (Lobbestael, Leurgans, & Arntz, 2011; Martin, Pollock, Bukstein, & Lynch, 2000; Zanarini & Frankenburg, 2001; Zanarini et al., 2000) and SCID II (Lobbestael et al., 2011; Maffei et al., 1997; Weertman, Arntz, Dreessen, van Velzen, & Vertommen, 2003). Furthermore, internal consistencies of the trait scales of the SCID II were satisfactory (Maffei et al., 1997). Interviewers were extensively trained and supervised by the first author.

2.2.2. Emotional states

Self-reported affect was assessed with the Profile of Mood States (POMS), short version (McNair, Lorr, & Droppleman, 1992), with five subscales of tension, depression, anger, vigor, and fatigue, and one total negative affect score. Participants had to indicate to which degree each of the 32 items suited their current emotional state on a 5-point likert scale ranging from 'not at all' to 'very strong'. The internal reliability of the subscales of the Dutch version of the POMS appeared to be good (De Groot, 1991). The five-factor model of the Dutch version demonstrated to outperform a one-factor model (Wald & Mellenbergh, 1990; Wicherts & Vorst, 2004).

¹ Further analyses did reveal that age marginally affected the group comparison scores. Therefore, age was added as a extra predictor in all group analyses.

Table 1
Comparison between the groups on the demographic measures (N = 67).

	BPD (n = 24)	CIC-PD (n = 17)	NpC (n = 26)	Statistics	P Value
Age	31.04 (11.14)	34.06 (13.40)	40.39 (14.08)	Kruskall-Wallis: $\chi^2 = 5.39$.07
Education				Kruskall-Wallis: $\chi^2 = 3.36$.19
no education	–	–	–		
primary school	–	1	–		
high school	10	1	7		
secondary education	12	13	14		
higher education	2	2	5		
Marital status				Kruskall-Wallis: $\chi^2 = 1.17$.56
Single	13	12	15		
Married	11	5	11		
Number axis I disorders	1.88 (1.12)	1.59 (.94)	–	Kruskall-Wallis: $\chi^2 = .77$.38
Number axis II disorders	2.75 (1.67)	1.53 (.62)	–	Kruskall-Wallis: $\chi^2 = 5.45$.02

2.2.3. Film clips

2.2.3.1. Neutral film clip. A fragment of ‘Tango zwischen eis und palmen’, a nature film that shows several landscape views, different animals and soft music, was used as a neutral film clip (duration: 10 min). *Childhood abuse by primary caregivers film clip.* The childhood abuse by primary caregivers film clip consisted of composed scenes derived from the commercial movie ‘No child of mine’ by Hibbert (1997). In this 20 min fragment, a 13-year old girl was physically, emotionally and sexually abused and neglected by her parents and other primary caretakers. This fragment previously showed to strongly increase negative affect (Arntz et al., 2005; Lobbestael & Arntz, 2010).

2.2.3.2. Peer bullying film clip. The peer bullying film clip consisted of the bully-scene from the commercial movie ‘My Bodyguard’ by Bill (1980) in which a new boy at school is bullied and blackmailed by a group of classmates (duration: 10 min). This film clip was previously shown to induce anger (Gross & Levenson, 1995; Lobbestael, Arntz, & Wiers, 2008).

2.2.3.3. Positive film clip. ‘Elementary dating’, a part from the live shows of Mr. Bean (performed in Boston, USA, 1991), was used as a positive film clip. This 10-min long film clip depicts a dating course for men where the right and wrong moves a man can make during the first date are shown. This fragment previously showed to increase positive affect (Lobbestael & Arntz, 2010).

2.2.4. Procedure

Patients were contacted to participate in this study by their therapists who provided them with general verbal information and an information letter. If the patients indicated that they were willing to participate, they were contacted by the experimenter. Non-patients were recruited from the general population via snowball sampling of the social network of the experimenters. The therapists of the health care settings or the experimenters of the current study made the SCID diagnoses of the patients during intake. The experimenters interviewed the non-patient group and were extensively trained during 2-days of theoretical training, and scored audiotapes of 10 SCID interviews under supervision before testing independently. This training previously showed raters to display excellent inter-rater agreement (Lobbestael et al., 2011). During the experimental session, the following instruction was given (from Philippot, 1993): “We are going to show you a film fragment. We are interested in how the scenes themselves make you feel. Therefore, your ratings should reflect the impact of the segment on you, rather than your feelings due to other factors, such as the weather or personal problems. We are interested in how this film segment makes you feel rather than how you think you should feel or how you think others would feel.” The film clips were shown to the

participants in a set order: the childhood abuse by primary caregivers film clip, the neutral film clip, the peer bullying film clip, and the positive film clip. The experimenter stayed in the test room with the participant during the entire experiment to ensure that they watched and attended the film clips. After each film clip, participants rated their current emotional state on the POMS. Finally, participants were debriefed, thanked for their participation and received a small financial compensation. The experiment was approved by the ethics committee psychology of Maastricht University, the Netherlands. All subjects gave written informed consent.

2.2.5. Statistical analyses

To test whether self-reported emotions differed between the film clips, a 4 (film clips) \times 5 (emotional states) repeated measure ANOVA was performed, followed by a MANOVA including the POMS total scale. Paired sample t-tests between the target emotion and each of the four non-target emotions were performed for each film clip to assess whether the four film clips successfully induced the intended emotions (childhood abuse by primary caregivers film clip: depression, peer bullying film clip: anger, positive film clip: vigor). To assess possible baseline differences in emotions, an ANOVA with the POMS scores after the neutral clip as dependent variables and group as fixed factor was performed for each emotional state. Bonferroni-corrected post-hoc group comparisons were done to specify the group contrasts. Because of group differences in affect after watching the neutral clip, residual scores were calculated for each emotional subscale after watching the emotional clip corrected for the emotional subscales after watching the neutral clip. Group differences in emotional reactivity were calculated by means of ANOVAs with these residual scores as dependent variables and group and age as fixed factor. Bonferroni-corrected post-hoc group comparisons were done to specify the group contrasts of emotional reactivity.

3. Results

3.1. Emotional states yielded by the film clips

A 4 \times 5 repeated-measure ANOVA revealed a significant interaction between film clip and the 5 distinct emotional states, $F_{HOT}(52,12) = 11.46$, $p < .001$, while a MANOVA revealed a significant main effect of POMS total score, $F_{HOT}(60,4) = 49.31$, $p < .001$, indicating that the self-reported emotional profiles differed by film clip. The childhood abuse by primary caregivers film clip appeared to elicit more depression than fatigue, vigor, and tension, p 's $< .008$, but a comparable level of anger, $p = .76$. The anger-related film clip appeared to elicit more anger than depression, fatigue, and tension, p 's $< .001$, but a comparable level of vigor, $p = .33$. The positive film

clip appeared to elicit more vigor than other emotions, p 's < .001. The mean emotional scores of the groups after watching the film clips are displayed in Table 2.

3.2. Group differences in emotional state after the neutral film clip

The mean raw and residual emotional scores of the groups after watching the neutral film clips are displayed in Table 2, along with the main group and age effects. The groups differed significantly on all emotional states, except anger and depression. Post-hoc comparisons (Table 3) showed that the BPD-group scored higher than the NpC group on tension and total negative affect, and lower on the vigor scale. The CIC-PD group also scored higher on total negative affect and lower on the vigor scale compared to the NpC group. Overall, these results indicate that the BPD and CIC-PD groups reported comparable levels of negative affect after

watching the neutral film clip, which were higher than those reported by the NpC group.

3.3. Group differences in emotional reactivity

3.3.1. Childhood abuse by primary caregivers versus neutral film clip

The mean raw and residual emotional scores of the groups after watching the neutral versus the childhood abuse by primary caregivers film clips are displayed in Table 2, along with the main group and age effects. The groups differed significantly on all emotional states except vigor. Post-hoc comparisons (Table 3) showed that the BPD-group had a larger difference between the neutral and childhood abuse by primary caregivers film clips than the CIC-PD and NpC groups on all these (sub)scales, except for the difference between BPD and CIC-PD on fatigue. These results

Table 2
Mean raw and residual scores and standard deviations of all groups on all POMS (sub) scales after the four movie fragments, and differences between emotional and neutral fragments, along with the main effect of group and age.

(Contrast) Movie	POMS subscale	Raw scores		Residual scores		Raw scores		Residual scores		Raw scores		Residual scores		Main effect group		Main effect age	
		BPD		BPD		CIC-PD		CIC-PD		NpC		NpC		F	p	F	p
		M	SD	M	SD	M	SD	M	SD	M	SD	M	SD				
Neutral	Depression	2.75	4.05	NA	NA	2.53	3.30	NA	NA	1.09	2.83	NA	NA	1.46	.24	.02	.89
	Anger	3.54	5.23	NA	NA	1.47	1.81	NA	NA	.83	2.42	NA	NA	3.09	.053	.02	.88
	Fatigue	4.63	4.94	NA	NA	5.00	3.67	NA	NA	1.78	3.00	NA	NA	3.28*	.04	.51	.48
	Vigor	6.25	3.87	NA	NA	7.47	3.62	NA	NA	12.35	4.13	NA	NA	12.05**	<.001	2.35	.13
	Tension	3.75	4.64	NA	NA	2.24	2.95	NA	NA	.48	1.24	NA	NA	6.56*	.003	1.53	.22
Total	28.42	18.01	NA	NA	23.76	10.47	NA	NA	11.83	10.97	NA	NA	7.36**	.001	.12	.74	
Childhood abuse by primary caregivers	Depression	17.04	7.99	NA	NA	9.65	6.18	NA	NA	5.61	4.82	NA	NA	NA	NA	NA	NA
	Anger	16.58	6.93	NA	NA	9.41	7.00	NA	NA	5.70	5.41	NA	NA	NA	NA	NA	NA
	Fatigue	8.50	6.30	NA	NA	7.24	5.88	NA	NA	2.13	2.78	NA	NA	NA	NA	NA	NA
	Vigor	4.42	3.03	NA	NA	5.59	4.11	NA	NA	10.83	5.67	NA	NA	NA	NA	NA	NA
	Tension	11.71	6.26	NA	NA	5.76	4.52	NA	NA	1.00	1.51	NA	NA	NA	NA	NA	NA
Total	69.42	24.96	NA	NA	46.47	23.15	NA	NA	23.61	14.16	NA	NA	NA	NA	NA	NA	
Peer bullying	Depression	5.71	5.79	NA	NA	2.53	3.26	NA	NA	2.83	5.53	NA	NA	NA	NA	NA	NA
	Anger	10.46	6.45	NA	NA	4.12	4.30	NA	NA	5.04	6.28	NA	NA	NA	NA	NA	NA
	Fatigue	3.42	4.46	NA	NA	3.59	4.24	NA	NA	2.26	3.78	NA	NA	NA	NA	NA	NA
	Vigor	5.75	4.18	NA	NA	7.59	3.71	NA	NA	10.57	4.73	NA	NA	NA	NA	NA	NA
	Tension	5.54	5.20	NA	NA	1.88	2.80	NA	NA	1.57	3.54	NA	NA	NA	NA	NA	NA
Total	39.38	20.59	NA	NA	24.53	14.42	NA	NA	21.13	18.58	NA	NA	NA	NA	NA	NA	
Positive	Depression	.92	2.10	NA	NA	.71	1.96	NA	NA	.35	1.67	NA	NA	NA	NA	NA	NA
	Anger	.83	1.90	NA	NA	.41	1.18	NA	NA	.56	1.93	NA	NA	NA	NA	NA	NA
	Fatigue	2.13	3.47	NA	NA	2.71	3.06	NA	NA	1.35	3.20	NA	NA	NA	NA	NA	NA
	Vigor	10.46	4.20	NA	NA	9.35	4.42	NA	NA	13.22	4.07	NA	NA	NA	NA	NA	NA
	Tension	1.75	4.29	NA	NA	1.18	2.30	NA	NA	.39	1.20	NA	NA	NA	NA	NA	NA
Total	15.17	12.79	NA	NA	15.65	9.42	NA	NA	9.43	10.07	NA	NA	NA	NA	NA	NA	
Childhood abuse by primary caregivers vs. Neutral	Depression	14.29	8.19	.73	1.07	7.12	5.07	-.23	.68	4.52	4.20	-.59	.55	16.75**	<.001	1.28	.26
	Anger	13.04	8.71	.64	.98	7.94	6.48	-.14	.86	4.87	5.41	-.57	.68	14.84**	<.001	4.14*	.05
	Fatigue	3.88	6.85	.39	1.14	2.24	6.77	.12	1.14	.35	1.70	-.49	.31	4.85*	.01	.01	.94
	Vigor	-1.83	4.23	-.17	1.01	-1.88	3.35	-.11	.88	-1.52	3.67	.26	1.04	1.36	.26	.29	.59
	Tension	7.96	6.84	.71	1.13	3.53	4.56	-.10	.76	.52	1.16	-.67	.20	16.00**	<.001	.06	.81
Total	41.00	28.70	.64	1.09	22.71	22.30	-.10	.87	22.71	22.30	-.59	.46	12.96**	<.001	1.25	.27	
Peer bullying vs. neutral	Depression	2.96	5.01	.30	1.13	.00	2.42	.38	.52	1.74	4.47	-.03	1.04	3.41*	.04	4.89*	.03
	Anger	6.92	7.34	.45	1.04	2.65	3.52	-.39	.61	4.22	6.46	-.18	1.01	6.95*	.002	7.24*	.01
	Fatigue	-1.21	3.48	-.07	.97	-1.41	4.72	-.10	1.34	.48	1.65	.15	.69	.13	.88	1.85	.18
	Vigor	-.50	4.11	-.11	1.21	.12	2.87	.19	.86	-1.78	2.47	-.03	.85	.45	.64	.04	.84
	Tension	1.79	3.95	.33	1.12	-.35	1.54	-.39	.42	1.09	3.70	-.06	1.07	3.71*	.03	4.30*	.04
Total	10.96	18.50	.31	1.1	.76	10.86	-.40	.68	9.30	15.90	-.03	1.0	3.73*	.03	6.01*	.02	
Positive vs. Neutral	Depression	-1.83	3.61	.02	1.33	-1.82	1.78	-.07	.72	-.74	1.89	.04	.76	.19	.83	4.17*	.05
	Anger	-2.71	4.91	-.08	1.20	-1.06	1.78	-.06	.72	-.26	1.14	.13	.96	.30	.74	.05	.83
	Fatigue	-2.50	4.19	-.11	1.10	-2.29	3.74	.04	1.07	-.43	1.93	.08	.84	.07	.94	1.78	.19
	Vigor	4.21	5.00	.20	1.19	1.88	3.02	-.30	.90	.87	3.06	.01	.80	1.37	.26	.47	.50
	Tension	-2.00	1.79	-.40	1.26	-1.06	1.68	.01	.98	-.09	.42	.40	.33	2.75	.07	2.18	.15
Total	-13.25	12.99	-.26	1.24	-8.12	6.04	.14	.77	-2.39	6.10	.17	.81	.95	.39	.80	.38	

Note: * $p < 0.05$; ** $p < 0.001$; positive mean scores of the difference scores (emotional fragment vs neutral) indicate an increased negative affect after the emotional film clip compared to the neutral film clip, negative mean scores indicate a decreased negative affect; NA = not applicable: main effect of groups are not presented for the emotional film clips because the primary intent of this study is to assess group differences after the neutral film clip, and group differences of the contrasts between the neutral and the emotional film clips.

Table 3

Bonferroni-corrected post-hoc contrasts between the group on the POMS (sub)scales after the neutral movie and after the contrast scores between the movies.

(Contrast) Movie	POMS (sub)scale	Group contrasts	MD	t	p	
Neutral	Fatigue	BPD vs. CLC-PD	-.46	-0.36	1.00	
		BPD vs. NpC	2.58	2.09	.12	
		CLC-PD vs. NpC	3.04	2.32	0.71	
	Vigor	BPD vs. CLC-PD	-1.04	-0.85	1.00	
		BPD vs. NpC	-5.55**	-4.69	<.001	
		CLC-PD vs. NpC	-4.50*	-3.58	.002	
	Tension	BPD vs. CLC-PD	1.64	1.56	.37	
		BPD vs. NpC	3.65*	3.62	.002	
		CLC-PD vs. NpC	2.01	1.88	.20	
	Total	BPD vs. CLC-PD	4.51	1.01	.95	
		BPD vs. NpC	16.15*	3.75	.001	
		CLC-PD vs. NpC	11.64*	2.54	.04	
Childhood abuse by primary care- givers vs. Neutral	Depression	BPD vs. CLC-PD	.98*	3.79	.001	
		BPD vs. NpC	1.40**	5.62	<.001	
		CLC-PD vs. NpC	.42	1.58	.36	
	Anger	BPD vs. CLC-PD	.83*	3.14	.01	
		BPD vs. NpC	1.37**	5.40	<.001	
		CLC-PD vs. NpC	.54	2.00	.15	
	Fatigue	BPD vs. CLC-PD	.27	0.91	1.00	
		BPD vs. NpC	.88*	3.07	0.10	
		CLC-PD vs. NpC	.61	1.99	.15	
	Tension	BPD vs. CLC-PD	.81*	3.26	.01	
		BPD vs. NpC	1.40**	5.63	<.001	
		CLC-PD vs. NpC	.58	2.20	.10	
	Total	BPD vs. CLC-PD	.77*	2.85	.02	
		BPD vs. NpC	1.31**	5.05	<.001	
		CLC-PD vs. NpC	.54	1.96	.16	
	Peer-bullying vs. Neutral	Depression	BPD vs. CLC-PD	.75*	2.5	.05
			BPD vs. NpC	.53	1.83	.22
			CLC-PD vs. NpC	-.22	-0.72	1.00
		Anger	BPD vs. CLC-PD	.92*	3.21	.01
			BPD vs. NpC	.86*	3.14	.01
			CLC-PD vs. NpC	-.06	-0.19	1.00
		Tension	BPD vs. CLC-PD	.77*	2.58	.04
			BPD vs. NpC	.57	1.96	.16
			CLC-PD vs. NpC	-.21	-0.67	1.00
Total		BPD vs. CLC-PD	.77*	2.61	.03	
		BPD vs. NpC	.54	1.91	.18	
		CLC-PD vs. NpC	-.30	-0.98	1.00	

Note: *p < 0.05; **p < 0.001. Only the group contrasts of those POMS (sub)scales that had a significant main group effect are reported.

indicate that the BPD group largely reported more overall negative affect after watching the childhood abuse by primary caregivers film clip than after watching the neutral film clip compared to the other groups.

3.3.2. Peer bullying versus neutral film clip

The mean raw and residual emotional scores of the groups after watching the neutral versus the peer bullying film clip are displayed in Table 2, along with the main group and age effects. The main group effect of depression, anger, tension, and total negative affect were significant. Post-hoc comparisons (Table 3) showed that the BPD-group had a larger increase in these affect scales from the neutral to the peer-bullying clip compared to the CLC-PD group, while the BPD-group only differed from both control groups in their steeper increase in anger of the peer bullying versus neutral film clip.

3.3.3. Positive versus neutral film clip

The mean raw and residual difference scores of the groups after watching the neutral versus the positive film clip are displayed in Table 2, along with the main group and age effects. There were no significant group differences. (Fig. 1)

4. Discussion

The current study examined the effect of viewing film clips on the emotional state of BPD-patients, as compared to CLC-PD and

NpC control groups. The film clips were successful in inducing the targeted emotions in the three groups. The main finding was that BPD-patients reacted generally emotionally stronger to the film depicting childhood abuse by primary caregivers. This effect appeared to be disorder-specific because it was not shown by the CLC-PD and NpC groups. BPD-patients only reported more anger following the peer-bullying clip compared to both control groups. These findings imply that, compared to NpC and CLC-PD groups, BPD-patients are unique in their general negative affect following childhood abuse confrontation, and in their increased anger after confronted with peer-bullying. These findings are not in line with the core idea of general emotional hyperreactivity in BPD as stated in Linehan's (1993) biopsychosocial model. Instead of BPD-patients being characterized by consistent emotional intense responses to all types of evocative stimuli, the present results suggest that BPD-patients are only extremely emotionally reactive to specific stimuli, such as child abuse in the context of their primary caregivers. Our findings replicate two previous studies using the same primary care abuse stimulus (film clip 'No child of mine'), albeit those effects were less pronounced since one study only found extreme anxiety ratings in BPD (Arntz et al., 2005), and another study found BPD-patients to differentiate from antisocial PD and non-patient comparison groups, but not from a CLC-PD group (Lobbestael et al., 2009). Two others studies using different abuse-related triggers (other film clips or personalized scripts) did not found hyper emotionality in BPD-patients (Schmahl et al., 2004; Veen & Arntz, 2000). This could indicate that the triggers in these other studies

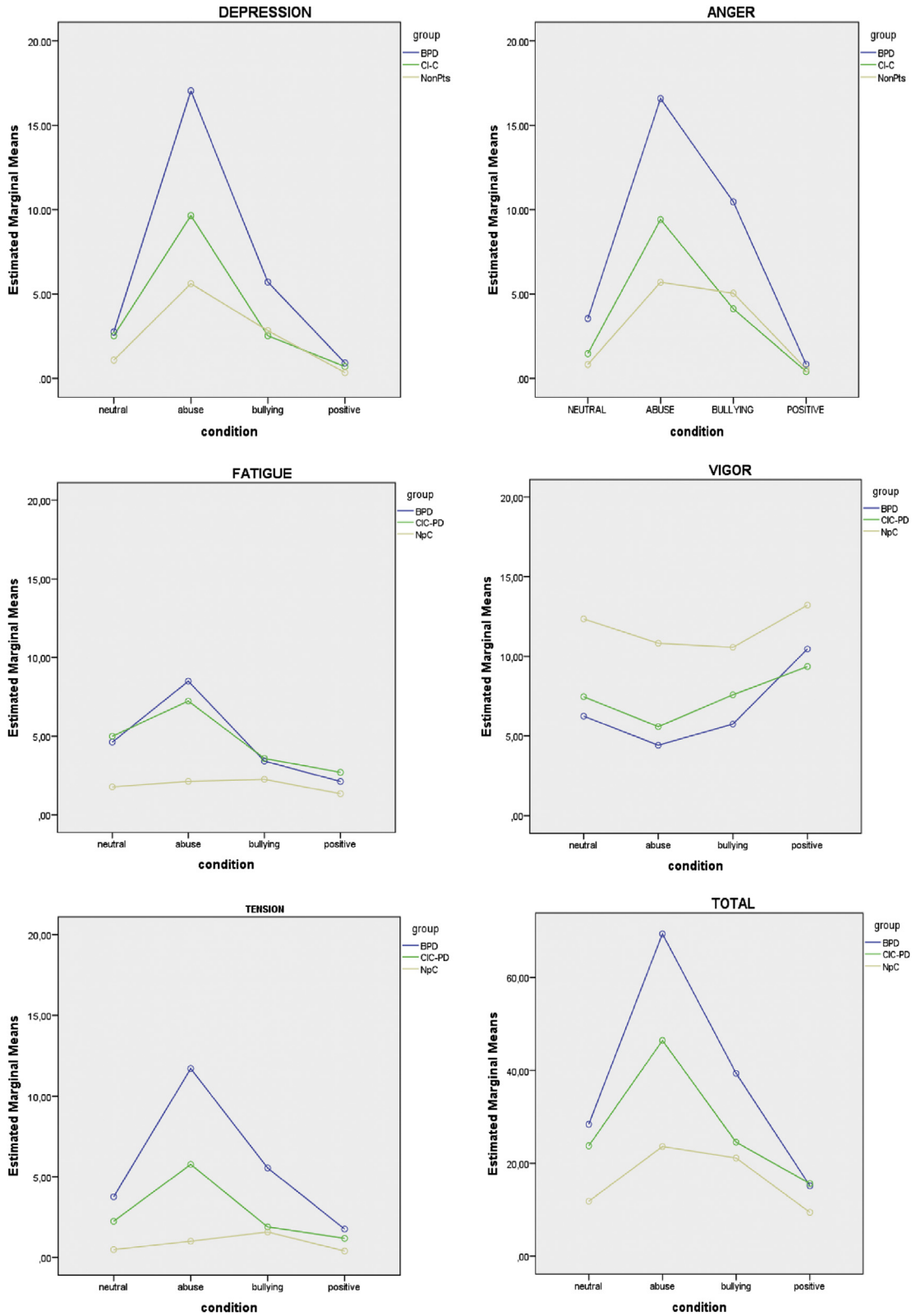


Fig. 1. Mean raw scores of emotion ratings by emotion type, group and film type (neutral, childhood abuse by primary caregivers, peer bullying, and positive).

were less intense or did not only target childhood abuse by primary caregivers suggesting that emotional response of BPD-patients depends on the nature of the abusive stimulus, or to lack of controlling for baseline affect which results in a less pure measure of

emotional reactivity. The fact that BPD-patients showed increased overall emotional responses exclusively in reaction to the childhood abuse by primary caregivers trigger is in line with other studies that failed to show specific hyperresponsivity after

confrontation with anger-related (Jacob et al., 2008, 2009; Kuo & Linehan, 2009; Lobbestael et al., 2009), or other emotional triggers (Kuo & Linehan, 2009). This exclusive overall childhood abuse by primary caregivers hyperreactivity might also explain why studies using trait-like affective intensity measures (e.g. Henry et al., 2001; Koenigsberg et al., 2002) failed to show a general hyperreactivity in BPD.

During data collection of the current study, a paper was published reporting prospective indications that BPD is related to peer bullying (Wolke, Schreier, Zanarini, & Winsper, 2012). This could imply that the peer bullying film clip we used is also (partly) BPD-specific, which is reflected in BPD-patients' increased anger response following peer bullying stimuli. Several explanations are possible. First, the peer bullying film clip used in this study could have been less emotionally intense and therefore not have been strong enough to exceed emotional threshold for other negative emotions other than anger in BPD-patients. Second, the protagonist in the peer bullying film clip was male, which could have hampered identification with the female participants in this study. Third, the status of peer bullying as a causal risk factor of BPD (Wolke et al., 2012) is less established than childhood abuse and still requires replication. It could for example be the case that children tend to attract more peer bullying because of certain BPD-traits displayed, making childhood bullying a less fundamental part of the emotional make-up of BPD-patients when compared to childhood abuse by primary caregivers.

Although BPD-patients reported more negative affect after watching the neutral film clip, CIC-PD patients showed a similar pattern. Our findings thus do not suggest BPD to be specifically characterized by extreme general negative affectivity. Instead, together with other studies (Arntz et al., 2005; Kuo & Linehan, 2009; Lobbestael et al., 2009; Lobbestael & Arntz, 2010; Staebler et al., 2009), our findings suggest that high baseline affect levels are a shared characteristic of a wider array of psychopathological groups.

Interestingly, confrontation with the childhood abuse by primary caregivers trigger led to a wide array of negative emotions (i.e. depression, anger, tension, and overall negative affect) in BPD. So it seems BPD-patients are not impaired in the ability to control one specific affect when their emotional buttons are being pushed, but rather display a pattern of dysregulation in many emotions. This is largely in line with previous studies (Herpertz, Gretzer, Muhlbaier, Steinmeyer, & Stass, 1998; Jacob et al., 2008, 2009).

Across all participants, the childhood abuse by primary caregivers film clip did not only induce depressive feelings, but also anger, which is not surprising given the injustice done to the main character in the film clip. The peer bullying film clip appeared to elicit vigor next to anger, which can be explained by anger being an energizing emotion.

Several limitations should be considered in evaluating our findings. First, the current study was restricted to assessment of the impact of evocative stimuli on self-reported emotions. Physiological and neurological response patterns (see Rosenthal et al., 2008 for an overview) are likely to reveal different, albeit informative aspects of emotional responses. Second, the abuse film clip contained fragments representing a broad array of abusive events (i.e. physical, emotional and sexual abuse, neglect) and perpetrators (i.e. mother, father, school teacher) to adequately exemplify childhood abuse. Consequently, this clip was of longer duration than the other clips (i.e. 20 versus 10 min), which might have increased the negative overall impact it had on mood. Third, while the POMS is an excellent measure to reliably assess different negative emotions in clinical populations, it does not extensively assess positive affect. Hence possible differences in distinct positive emotions could not be assessed in the current study with the exception of vigor. Finally,

the order in which the film clips were presented to the participants was not randomized. This was opted because it was preferable to intermit the two negative film clips with a neutral clip to avoid possible carry-over effects, and to end the experiment with the positive film clip because of ethical reasons. It seems unlikely though that the emotional ratings after viewing the neutral film clip were affected by prior presentation of the childhood abuse by primary caregivers-related film clip because (1) mean emotional levels were comparable to those obtained in a previous study where the neutral film clip was shown first (Lobbestael et al., 2009); and (2) the change scores between post-neutral and post-childhood abuse by primary caregivers-related assessment was still high enough to observe differences between the groups while change scores would have been lower in case of prolonged impact of the childhood abuse by primary caregivers film clip.

Future studies on emotional reactivity in BPD should continue the use of different emotional stimuli, strict comparison groups and controlling for baseline emotional levels. More research is needed before the conclusion is warranted that emotional hyperreactivity in BPD is uniquely related to childhood abuse by primary caregivers triggers across all stimulus types. Candidates for other BPD-specific triggers in future studies are rejection, abandonment, adult-abuse or shame (see Jacob et al., 2009). It would be informative for further studies to experimentally test the causal and underlying factors of (abuse-related) emotional hyperreactivity in BPD. Likely candidates would be abusive childhood experiences, and difficulties in affect regulations.

The current study was of the first in its kind to simultaneously assess the impact of confrontation with a BPD-relevant theme (i.e. childhood abuse by primary caregivers) next to negative (i.e. peer bullying), positive and neutral stimuli, and to use both a PD-pathological and non-pathological control group. BPD-patients were found to report a hyperreactive pattern of an array of negative emotions specifically in reaction to triggers related to childhood abuse by primary caregivers, and a specific hyper-anger response following peer-bullying stimuli. These findings are not in line with the hypothesis of a *general* emotional hyperreactivity in BPD, although further studies using other BPD-specific stimuli and BPD-nonspecific negative stimuli are needed in order to confirm this. Studies like this one of emotional reactivity in BPD can potentially assist in specifying treatment focus of this highly challenged patient group.

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