



ORIGINAL ARTICLE

Volitional determinants of self-harm behaviour and suicidal risk in persons with borderline personality disorder



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Abstract

Background and objectives: We investigated differential mediators of the risk of suicidal behaviour and self-harm behaviour in a group of sixty-four patients with borderline personality disorder.

Methods: The study included an interview to assess suicidal attempts, the Childhood Trauma Questionnaire (CTQ), volitional competences and self-regulation (VCQ), depression (BDI) and self-harm (SH) behaviour. We postulated two different serial multiple mediation models originating in emotional neglect in childhood, one leading to suicide attempts (through threat-related state orientation and depression) and the other leading to self-harm behaviour (through prospective state orientation and demand-related stress).

Results: The serial multiple mediation models were confirmed, with the postulated variables serving as partial mediators of suicide attempts and of self-harm behaviour. In addition to emotional neglect, there were two additional predictors: Sexual abuse in childhood (for suicide attempts) and physical abuse in childhood (for self-harm behaviour).

Conclusions: The results highlight the critical importance of experiences of emotional neglect and other forms of abuse in childhood for the development of pathology in BPD patients. These early experiences of neglect promote deficits in self-regulation of emotion (state orientation), which together with depression or demanding circumstances, lead to an increase in the risk of suicide, or in self-harm behaviour, respectively.

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Introduction

Personality disorder is sometimes accompanied by suicidal behaviour. As for borderline personality, research suggests that 10% of people who have committed suicide and kill themselves have been diagnosed with this disorder.¹ One third of a group of young people who have committed suicide were also diagnosed with borderline personality. However, it is not clear how the personality disorder increases the risk of suicidal behaviour. Hawton et al.,² state that in the suicide risk groups there are people with clearly labile mood who are aggressive, impulsive, and experiencing feelings of alienation. This description fits borderline personality disorder (BPD); people with this disorder often attempt suicide on impulse during a large uncontrolled tension.³ Depressive experiences, and impulsiveness were the characteristics of people with BPD. Up to 60% of BPD patients attempt suicide, (90% among hospitalised patients), and 8–10% of patients suffering from this problem who attempt to commit suicide die as a consequence.^{1,4} Suicidal behaviour includes suicidal attempts, prepared and interrupted acts of suicide, and active vs. passive suicidal thoughts and potentially suicidal behaviour.⁵

Borderline patients are not only characterized by suicide attempts but also by self-harm behaviour or “non-suicidal self-injury” (NSSI), which is considered to be any deliberate self-inflicted damage to the surface of the body likely to induce bleeding, bruising, or pain without suicidal intent and for purposes not socially sanctioned⁶ (see DSM-V; APA, 2013), such as skin cutting, burning, stabbing, hitting, scraping or carving.⁷ Self-harm behaviour (NSSI) is to be distinguished from suicide attempts, whether successful or not, and it is being proposed in the DSM-V as a condition for further study.^{6,8} Many patient groups show self-harm behaviour (i.e., of NSSI). Notable among them are BPD patients, who have a 60–80% probability of showing it.⁹ Despite their comorbidity, some researchers think that self-harm behaviour and suicidal attempts are distinct, each related to different degrees of lethality.¹⁰ Muehlenkamp and Gutierrez¹¹ further argue that the purpose of self-harm behaviour in BPD is to relieve pain, whereas the purpose of suicide attempts is to end one’s life. In addition, whereas suicide attempts are rare in BPD, instances of self-harm behaviours are more frequent.¹² In other words, the main function of self-harm behaviour is emotion regulation, to keep on living despite personal distress, which is lacking in serious suicide attempts.

If self-harm behaviour and suicide attempts have different aims and functions in BPD patients it is important to identify the factors leading to each, from childhood on. It can be assumed that the roots of BPD are found in childhood experiences. The idea that BPD is associated with childhood trauma has been proposed for many years.^{1,13,14} It can be presumed that at least some patients with BPD experienced some kind of trauma in childhood, and the childhood trauma is associated with suicidal tendencies and self-harm behaviour.^{14–16} The Childhood Trauma Questionnaire¹⁷ is a self-report instrument to assess the degree of trauma experienced. In the present research we explore the hypothesis that both suicidal tendencies and self-harm behaviour in BPD can be traced back to traumatic events in childhood, as they are reported by the patient.

Research shows that an important factor protecting from suicide are self-regulation competencies.¹⁸ People who meet the criteria of BPD have problems with emotion regulation, showing impulsivity, high emotional intensity, and high reactivity to emotional evocative stimuli.¹ Based on personality systems interactions¹⁹ (PSI; Kuhl, 2000) theory and dialectical behaviour therapy¹ we assume that emotional support in the first years of life is a critical element for developing healthy self-regulation skills. Lack of emotional support or even *emotional neglect* after self-expression of needs in infancy should therefore be a risk factor in developing BPD and other maladaptive patterns of self-development associated with poor self-regulatory skills.²⁰ One type of self-regulation deficit that may result from insufficient or inadequate responsiveness of the caregiver in infancy is state orientation.^{20,21} State orientation after failure (SOF) is characterized by the inability to calm oneself after failure and other aversive or threatening events and relates to perseverating negative affect. These persons cannot stop ruminating about painful events or unrealistic intentions, instead of concentrating on a realistic action plan.²² Prospective (decision-related) state orientation (SOD) is characterized by inaction or indecision and is related to an inability to counterregulate low positive affect.^{22,23} Being unable to upregulate low positive affect these persons tend to procrastinate, especially when the intended activity is boring or difficult, or under demanding conditions. Depressive patients tend to have higher scores on either type of state orientation which ameliorates, however, after clinical treatment.²⁴

As a consequence of traumatic events or early experiences of emotional neglect related to an invalidating environment,¹ BPD patients may develop a heightened sensitivity to emotional rejection in social interactions.²⁵ Indeed, it has been found that BPD patients have increased scores on the rejection sensitivity questionnaire as compared to normal controls.²⁶ It can be assumed that fear of losing social support (increased rejection sensitivity) may increase symptoms in BPD patients, including depression and suicide attempts. Social support is a resource that protects patients at risk from suicide attempts.²⁷

Note that BPD patients not only report higher levels of negative affect but also have higher alexithymia,^{28,29} that is, an inability to identify and describe emotions. New et al.²⁸ found that BPD patients had higher scores in the Toronto Alexithymia Scale (TAS 20) and had more difficulties in identifying their emotions than control group participants. There are indications that the roots of alexithymia in BPD patients may be related to childhood abuse.³⁰ According to PSI theory¹⁹ perseveration of excessive levels of negative affect (presumably elicited by childhood trauma or emotional neglect in infancy) impairs self-access which in turn interferes with the quality of social interaction on a personal level.

In this study we carried out serial multiple mediation analyses,^{31,32} which allow to chain multiple mediators between predictor and outcome variables. Specifically, we aim to investigate in a sample of BPD patients the chain of variables starting with different aspects of reported childhood trauma comparing two different pathways, one leading towards suicide attempts, and the second resulting in self-harm.

Our main hypothesis concerning the serial multiple mediation model leading to *suicide attempts* in BPD patients is that emotional neglect (EN) in childhood should be the predictor variable at the beginning of the chain. Among the various scales assessed by the Childhood Trauma Questionnaire (CTQ) emotional neglect, physical neglect, emotional abuse, physical abuse, and sexual abuse, EN in childhood should be especially relevant because it is tantamount to low responsiveness towards the infant's expressed emotions and a failure to help the child cope with negative emotionality. To the extent that children acquire emotion regulation by internalizing external regulation of their emotions^{19,20} low responsiveness presumably associated with emotional neglect should impede the development of emotion regulation as assessed by threat- or failure-related state orientation characterized by uncontrollable rumination, respectively^{19,20} (SOF: Kuhl, 2000, 2011). This prediction is spelled out in model 1 by introducing EN as a predictor of the ruminative form of state orientation (SOF). In light of the vast amount of studies confirming the role of rumination as a in depression^{33–35} model 1 specifies the ruminative form of state orientation (SOF) to predict depression, DEP.^{24,36} The final step in model 1 is based on the assumption that the combination of perseverating negative affect and depression may seriously jeopardize access to the implicit self³⁷ to such an extent that the person virtually loses access to her own experiences, including her "reasons for living".³⁸ Therefore, depression is expected to predict the number of suicide attempts SUIC in model 1.²⁷ In sum, the postulated serial multiple mediator model describes the following chain: EN > SOF > DEP > SUIC.

Our main hypothesis concerning the route leading to *self-harm behaviour* in BPD is through a different serial multiple mediation model (i.e., NSSI). As in model 1, the chain that we postulate in model 2 originates in EN in childhood. However, EN is now used as a predictor of the second form of state orientation which is characterized by low positive affect, indecisiveness and procrastination rather than rumination (i.e., decision-related state orientation, SOD), especially under stressful demanding (DEM) conditions.^{23,22,19} According to theory and research, decision-related state orientation is associated with an impaired ability to upregulate low positive affect elicited by demanding conditions involving uncompleted intentions and motivational load.^{23,29} Therefore, an increase in demand-related stress is the third step assumed in model 2. The last step in model 2 is based on the emotional state presumably associated with demand and motivational load. Presumably, uncompleted intentions increase the level of tension experienced. The idea that uncompleted intentions give rise to feelings of tension has been postulated since the early days of experimental motivation research^{40,41} and confirmed in recent studies.³⁹ Pulling this idea together with the clinical notion that self-harm may aim at the relief of tension⁴² we arrive at the final step in model 2 which assumes self-harm to be a direct result of tension-related stress as operationalized by subjective feeling of demand and motivational load (e.g., uncompleted intention). As discussed previously, we do not assume that self-harm behaviour predicts the number of suicide attempts which results in two separate paths leading to either suicidal risk or self-harm, respectively. In sum, our assumed serial multiple mediator model 2 describes the following chain: EN > SOD > DEM > SH.

In addition to the above theoretically-derived models originating in EN in childhood, we will exploratively examine other aspects of the CTQ: physical neglect, emotional abuse, physical abuse, and sexual abuse, as possible predictors of suicide attempts and self-harm behaviour, using serial multiple mediation analyses. These analyses will provide alternative models to contrast with our postulated models, which can help shed light on the origins of these types of self-destructive behaviour in BPD patients.

In sum, the main aim of this study is to test the hypothesis that different serial multiple mediation models lead to suicide attempts and to self-harm behaviour with a group of patients diagnosed with the BPD, each originating in EN in childhood.

Materials and methods

The study included 64 patients with a diagnosis of borderline personality disorder. Patient survey was conducted in closed health care facilities in Poland. The group consisted of 48 women (78%) and 16 men (22%) aged between 19 and 43 ($M = 27.49$, $SD = 6.43$ vs. $M = 27.68$, $SD = 6.31$). Patients were diagnosed based on the ICD-10 in the direction of emotionally unstable personality, borderline type (F 60.31). Ninety percent of the interviewed patients reported suicide attempts in the past (3 attempts on average). In 78% of the patients a comorbid disorder was diagnosed. BPD was associated with depression in 23 patients (36%), with anxiety disorders in 21 patients (32%), adjustment disorders in 10 patients (15%) and eating disorder in 20 patients (30%). Additionally, drug addiction in 17 patients (26%) was revealed.

The Childhood Trauma Questionnaire¹⁷ (CTQ; Bernstein and Fink, 1998) in polish adaptation. This self-report instrument of childhood experiences has the scales: Emotional neglect, Emotional abuse, Physical abuse, Sexual abuse, and Physical neglect. Responses to the items are given on 5-point Likert scales. Scores for each scale may range from 0 to 25 (Cronbach's alphas lie between 0.72 and 0.91). Two sample items of the scale Emotional neglect, which is relevant for testing our two models: "I felt loved" and "Family was source of strength" (both items Reversed). Example items from the other CTQ scales are: Emotional abuse "Called names by family"; Physical abuse "Hit hard enough to leave bruises"; Sexual abuse "Made to do sexual things"; and Physical neglect "Not enough to eat".

The Self-Harm-Inventory⁴³ (SHI; Sansone et al., 1998), in polish adaptation, was applied to measure self-destructive behaviour. Sample items are: "Have you ever on purpose, or intentionally ... banged your head?" (Yes or No) or "Have you ever on purpose, or intentionally ... engaged in physically abusive relationships?" (Yes or No). Test scores range from 0 to 22 (the sum of yes answers) and a score of 5 or higher suggests a propensity towards self-destructive behaviour. The Cronbach's alpha of the SHI is 0.83.

Self-regulation competencies were assessed with the Volitional Components Inventory⁴⁴ (VCI; Kuhl and Fuhrmann, 1998) in polish adaptation (with permission of the authors) by Blasczyk-Schiep¹⁸ (2004). Responses to the items of this inventory are given on 4-point Likert scales. Scores of the subscales range from 0 to 12. Among them: (a) State vs. action orientation after threat or failure (SOF vs.

AOF), which relates to self-regulation of negative affect. State oriented people report uncontrollable rumination after failure or other aversive experiences whereas action oriented people are able to disengage from such rumination whenever they want to focus on something else. (b) State vs. action orientation related to demands (SOD vs. AOD), which relates to the recruitment of positive affect to carry out one's intentions in difficult or demanding situations. State oriented people need external help and encouragement to avoid procrastination whereas action oriented ones are able to motivate themselves (i.e., upregulate positive affect) to enact their intentions. We inverted the usual coding of these two subscales, with action orientation indexed by low scores (towards 0) and state orientation by high scores (towards 12). The Cronbach's alpha of SOF and SOD are 0.80 and 0.82, respectively. We measured threat-related (SOF) and demand-related (SOD) stress with the same inventory (Cronbach's alpha >0.80, in each case). Sample items are: "I must deal with big changes in my life." (threat-related stress) and "My studies (or my job) are at present a big burden for me." (demand-related stress).

Depression was measured with the polish adaptation of the Beck Depression Inventory (BDI). This standardized instrument is widely used to diagnose depression. The more points the patient gets in 21 items of the BDI, the more likely he/she can be expected to be depressive⁴⁵ (Beck et al., 1961).

We additionally assessed suicidal risk with the Reasons for Living Inventory (RFL-I) in polish adaptation (with permission of the author) by Blasczyk-Schiep¹⁸ (2004). The RFL-I is theoretically grounded and measures the probability of suicide based on a theory specifying factors that may mitigate suicidal thoughts. It was developed by Linehan et al.⁴⁶ and contains 48 items answered on a Likert scale from 1 to 6. The measure is divided into six subscales: Survival and coping beliefs, responsibility to family, child concerns, fear of suicide, fear of social disapproval, and moral objections. Scores are reported as a total average and also separately for each subscale. RFL-I is an inventory which checks how the patient perceives the reasons to keep on living, as well as the consequences of suicide.⁴⁶ Low results indicate suicidal

risk. The Cronbach's alphas of RFL-I subscales lies between 0.73 and 0.87.

Patients were recruited in the clinic and were asked to fill in the battery of questionnaires. Their participation was voluntary. The alleged purpose of the study was to investigate the factors related to their disease. Participants were asked questions about suicide attempts and their age, education, marital status, and duration of their illness. The patients answered the questionnaires in the following order: VCQ, BDI, CTQ, and RFL-I. Informed consent was obtained for experimentation with human subjects. The patients gave informed consent, and their anonymity was preserved.

To examine our assumed serial multiple-mediator models, we applied the SPSS macro PROCESS developed by Hayes.³¹ This macro includes a formal test of indirect effects using bootstrapping. In this study, bias-corrected bootstrap confidence intervals were calculated, based on 5000 bootstrap resamples. An indirect effect is statistically significant when the 95% bootstrap confidence interval does not include zero.³²

Results

Descriptive statistics and inter-correlations among the variables measured in this study are listed in Table 1. Almost all of the variables correlate significantly with each other. The only exceptions are SOF and SOD and number of suicide attempts. Most variables did not correlate significantly with Gender (coded: 1 = *men*; 2 = *women*), with the exception of the dependent variables: Suicide attempts and self-harm behaviour, with women showing a higher tendency to show those behaviours than men. These results however may not be reliable because of the uneven number of male (16) compared to women (48) participants in our sample. Note that EN in childhood correlates significantly with all mediator and outcome variables included in the two serial multiple regression analyses, as we hypothesized. Descriptively, the total score of the reasons for living inventory was included. In each case, RFL-I had significant negative correlations with all other (risk) variables, which can be expected (see Table 1).

Table 1 Descriptive statistics (means and standard deviations) and inter-correlations among the variables of the study ($N = 64$).

	<i>M</i>	<i>SD</i>	2	3	4	5	6	7	8	9
1. Emot. Neg. (CTQ)	18.0	4.8	.30*	.51**	.45**	.28*	.65**	.62**	-.68**	-.04
2. SO failure	8.3	2.7	–	.51**	-.03	.55**	.52**	.35*	-.33*	-.04
3. Depression (BDI)	26.6	11.8		–	.34*	.50**	.61**	.62**	-.65**	.24
4. Suicide attempts	1.9	1.6			–	.22	.41**	.42**	-.52**	.28*
5. SO decision	8.6	2.7				–	.39**	.31*	-.35**	-.05
6. Demands (stress)	8.1	2.1					–	.60**	-.63**	.06
7. Self-harm Beh.	12.1	3.7						–	-.62**	.25*
8. Reasons for living	126.8	38.9							–	-.22
9. Gender	–	–								–

Note: Emotional neglect CTQ (Childhood Trauma Questionnaire), SO failure = state orientation after failure; BDI = Beck's depression inventory, SO decision = state orientation after decision, self-harm behaviour (total score), reasons for living inventory (total score). Gender includes 48 women and 16 men (higher scores coded for women).

* $p < .05$.

** $p < 0.01$.

*** $p < 0.001$ (2-tailed).

Table 2 Path coefficients and confidence intervals (CI) of the serial multiple mediation model from emotional neglect in childhood to suicide attempts in borderline patients ($N = 64$).

Path estimates	Coefficient (SE)	Lower limit CI	Upper limit CI
(a1) EN > SOF	0.17 (0.07)*	0.03	0.31
(a2) EN > DEP	0.96 (0.26)***	0.45	1.48
(a3) SOF > DEP	1.71 (0.45)***	0.81	2.61
(b1) SOF > SUIC	-0.18 (0.08)*	-0.33	-0.03
(b2) DEP > SUIC	0.05 (0.02)**	0.002	0.08
(c1) EN > SUIC	0.16 (0.04)***	0.08	0.23
(c1') EN > (SOF) > (DEP) > SUIC	0.13 (0.04)**	0.04	0.22
Indirect effects	Effect (SE)	Lower limit CI	Upper limit CI
Total	0.02 (0.03)	-0.04	0.07
(M1) EN > SOF > SUIC	-0.03 (0.02)†	-0.08	-0.003
(M2) EN > SOF > DEP > SUIC	0.02 (0.01)†	0.001	0.04
(M3) EN > DEP > SUIC	0.04 (0.02)†	0.001	0.09

Note: 95% confidence intervals are shown. They are based on 5000 bootstrap resamples. If both lower limit CI and upper limit CI do not include 0, the effect is significant. SE = standard error, EN = emotional neglect in childhood, SOF = state orientation after failure; DEP = depression (BDI), SUIC = suicide attempts. M1 to M3 = indirect mediation effects.

† Significant indirect effect.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

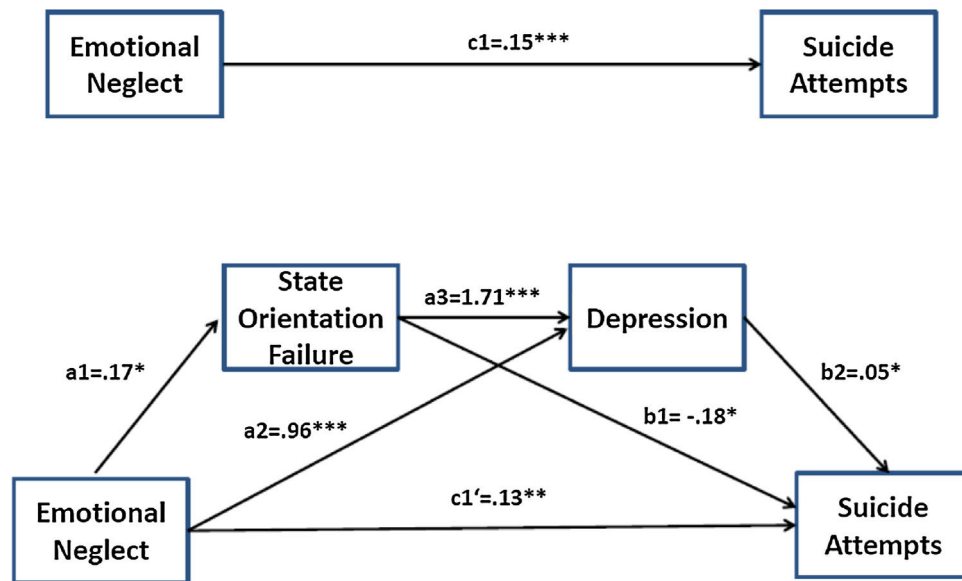


Figure 1 Associations between emotional neglect in childhood, state orientation after failure, depression (BDI), and suicide attempts in borderline patients. The direct effect from emotional neglect to self-harm behaviour (c_1) is significant. The indirect effect in the serial multiple mediation analysis chaining all variables is significant (see “M2” in Table 2), indicating that both state orientation after failure and depression serve as partial mediators of the relationship between emotional neglect and suicide attempts. * $p < .05$, ** $p < .01$, *** $p < .001$.

Results of the first serial multiple mediation model with emotional neglect (EN) as predictor, state orientation after failure (SOF) and depression (DEP) as mediators, and number of suicide attempts (SUIC) as outcome are shown in Table 2 and Fig. 1. The results listed in Table 2 revealed a significant direct effect of EN on SUIC (c_1). Most importantly, the indirect effect involving all four variables (M2) was significant (i.e., the lower – and upper limit CI do not include zero).

This means that both SOF and DEP serve as partial mediators of the relationship between EN and SUIC, in that order. This is in line with the serial chain postulated in the first hypothesis. The other indirect effects (M1) and (M3) were also significant (see Table 2). Noteworthy in Fig. 1 is that the sign of the path from SOF to SUIC is negative ($b_1 = -0.18$), which means that SOF (without depression) relates negatively to number of suicide attempts, as a protection factor,

Table 3 Path coefficients and confidence intervals (CI) of the serial multiple mediation model from emotional neglect in childhood to self-harm behaviour in borderline patients ($N=64$).

Path estimates	Coefficient (SE)	Lower limit CI	Upper limit CI
(a1) EN > SOD	0.16 (0.07)*	0.02	0.30
(a2) EN > DEM	0.34 (0.06)***	0.23	0.45
(a3) SOD > DEM	0.23 (0.10)*	0.03	0.43
(b1) SOD > SH	0.09 (0.14)	-0.19	0.38
(b2) DEM > SH	0.42 (0.18)*	0.07	0.77
(c1) EN > SH	0.48 (0.08)***	0.32	0.63
(c1') EN > (SOD) > (DEM) > SH	0.30 (0.10)**	0.11	0.50
Indirect effects	Effect (SE)	Lower limit CI	Upper limit CI
Total	0.18 (0.10) [†]	0.03	0.40
(M1) EN > SOD > SUIC	0.02 (0.03)	-0.02	0.10
(M2) EN > SOD > DEM > SH	0.02 (0.01) [†]	0.001	0.06
(M3) EN > DEM > SH	0.14 (0.08) [†]	0.02	0.33

Note: 95% Confidence intervals are shown. They are based on bootstrap 5000 resamples. If both lower limit CI and upper limit CI do not include 0, the effect is significant. SE=standard error, EN=emotional neglect in childhood, SOD=state orientation after decision; DEM=demand stress, SH=self-harm behaviour (total score). M1 to M3=indirect mediation effects.

[†] Significant indirect effect.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

whereas SOF has the opposite sign in the indirect model involving depression as a mediating step. This result will be interpreted in the discussion.

Results of the second serial multiple mediation model with emotional neglect (EN) as predictor, state orientation after decision (SOD) and demand stress (DEM) as mediators, and self-harm behaviour (SH) as outcome are shown in Table 3 and Fig. 2. The results listed in Table 3 revealed a significant direct effect of EN on SH (c1). Consistent with model 2 the indirect effect involving all four variables (M2) was significant (i.e., the lower – and upper limit CI do not include zero). This means that both SOD and DEM serve as partial mediators of the relationship between EN and SH, in that order. This confirms the serial chain postulated in our second hypothesis. One other indirect effect (M3) was significant (see Table 3). That is, demand stress directly predicts self-harm behaviour (b2 = 0.42), whereas SOD does not (see Fig. 2).

Although the results are consistent with our expectations we investigated exploratively whether other scales of the CTQ used as predictors would produce equivalent results. There were two additional scales which yielded significant results in predicting either suicide attempts or self-harm behaviour in our BPD patients.

- (a) The *Sexual abuse* (SA) scale of the CTQ, with state orientation after failure and depression as mediators, also predicted Suicide Attempts (cf. Table 2 and Fig. 1). In the serial multiple mediation model the direct path from SA > SUIC was significant (c1 = .06, $p < .05$). In addition, the indirect path with two mediators SA > SOF > DEP > SUIC was significant (lower limit CI = .0001, upper limit CI = .0346) as well as the indirect path with one mediator: SA > DEP > SUIC (lower

limit CI = .0133, upper limit CI = .1041). The correlation between Sexual Abuse and Gender was $r(62) = .21$, $p > .10$ (n.s.).

- (b) The *Physical abuse* (PA) scale of the CTQ, with state orientation after decision and demand stress as mediators, also predicted Self-Harm Behaviour (cf. Table 3 and Fig. 2). In the serial multiple mediation model, the direct path from SA > SUIC was significant (C1 = .32, $p < .001$). In addition, the indirect path with two mediators PA > SOD > DEM > SH was significant (lower limit CI = .0043, upper limit CI = .1152) as well as the indirect path with one mediator: PA > DEM > SH (lower limit CI = .0176, upper limit CI = .2051). The correlation between Physical Abuse and Gender was $r(62) = .04$ (n.s.).

Finally, it should be mentioned that exchanging the mediators to predict suicide attempts (i.e., SOD and DEM) or self-harm behaviour (i.e., SOF and DEP), respectively, did not yield significant results with any CTQ scale (EN, SA or PA) used as predictor in the serial multiple mediator models.

Discussion

The study confirmed our main hypothesis concerning different pathways towards suicide attempts and self-harm behaviours in persons diagnosed with borderline personality disorder. This is the main finding of the study. It is not consistent with the idea that self-harm behaviour and suicide attempts would be part of a single self-injury tendency of the patients. Instead the results suggest that each of the two possible outcomes associated with BPD is mediated by distinct variables. We hypothesized that the two models should start with a common predictor, that is

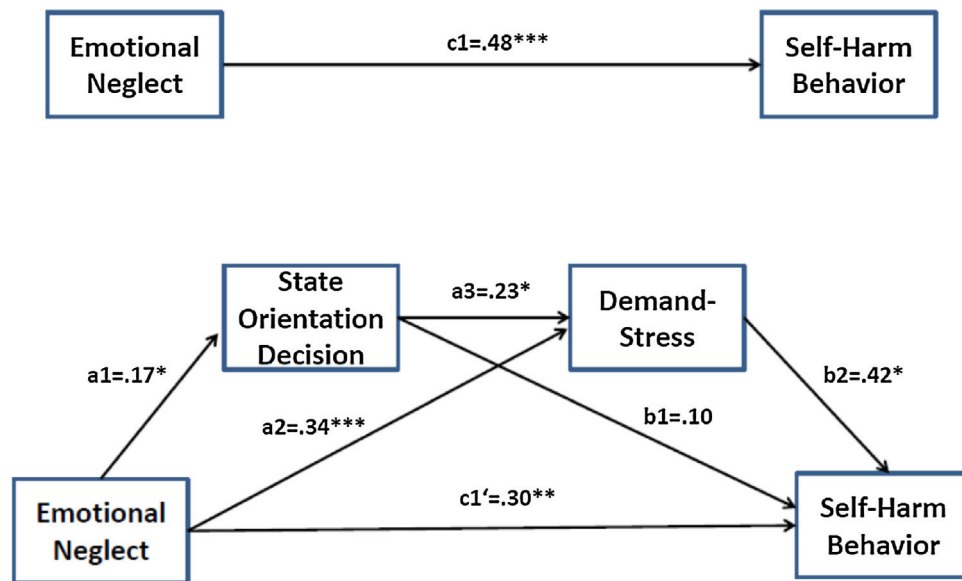


Figure 2 Associations between emotional neglect in childhood, state orientation after decision, demand stress, and self-harm behaviour in borderline patients. The direct effect from emotional neglect to self-harm behaviour (c_1) is significant. The indirect effect in the serial multiple mediation analysis chaining all variables is significant (see “M2” in Table 3), indicating that both state orientation after decision and demand stress serve as partial mediators of the relationship between emotional neglect and self-harm behaviour. $*p < .05$, $**p < .01$, $***p < .001$.

emotional neglect in childhood, as measured by the CTQ. Because the results were consonant with our hypothesis, this finding supports the assumption that there are certain childhood events, such as emotional neglect, that are critical for the development of psychopathology, the borderline personality disorder in particular.²⁰ In addition, emotional neglect significantly predicted deficits in self-regulation of emotion under stress, as measured by SOF (related to negative affect) and by SOD (related to low levels of positive affect), as shown in the models depicted in Figs. 1 and 2, respectively. This result is consistent with the “systems conditioning” model postulated by PSI theory.^{19,20} The systems conditioning model proposes that self-regulatory skills are developed when self-expressions of the infant are timely and adequately (in terms of content) responded to by the caregiver (“responsiveness”). Lack of appropriate responsiveness can lead to self-regulatory deficits. Many authors¹ assume that persons diagnosed with the borderline personality disorder have not received adequate responsiveness in childhood. The prediction of early maladaptive schemas for suicidal ideation associated with depression was confirmed in another study.⁴⁷

In our first model the two mediator variables leading to *suicide attempts* were state orientation after failure and depression. These two variables served as partial mediators of the effect, as shown in Table 2 and Fig. 1. Noteworthy is the significant negative direct path between SOF and suicide attempts. That is, without taking depression into account, SOF who are characterized by uncontrollable ruminations about negative events seem to be protected against suicide. Only when the rumination is associated with depressive mood there is a risk of suicide associated with state orientation. This is a remarkable finding that can have practical implications in the therapy of borderline patients.

Apparently, with regard to suicidal risk in BPD patients, there is a positive and a negative side of ruminative state orientation, the latter being associated with depression and an increased risk of suicide. What might be the positive side of rumination? We propose that rumination can protect from suicide as long as it can be utilized in a constructive way, for example, as a means towards problem-solving.^{48,49} Rumination and other forms of focusing on painful emotional experience can be a first step towards self-growth, provided the negative experience can eventually be integrated into a coherent experiential network (cf. the concepts of the “integrated self”,³⁷ Kuhl et al., 2015, and posttraumatic growth,⁵⁰ Tedeschi et al., 2015). However, in combination with depression some forms of rumination may lose their potential to sensitize the individual for possible solutions to his or her problems. To the extent that depression is associated with extreme hopelessness⁵¹ and reduced self-access,³⁷ it is expected to thwart any constructive component of rumination.

In consonance with our second model, the two mediator variables leading to *self-harm behaviour* were prospective (decision-related) state orientation and demand-related stress. These two variables served as partial mediators of the effect, as shown in Table 3 and Fig. 2. The direct path between SOD and SH behaviour was not significant, which means that the disposition towards procrastination and indecisiveness (SOD) does not suffice to engage in self-harm behaviour. Only when this disposition makes contact with a high level of demand-related stress (i.e., “motivational load”: things that have to be done) engage the BPD patients in self-harm behaviour. What happens when prospective state orientation (SOD) makes contact with demand-related stress? Koole and Jostmann³⁹ (2004, Experiment 1) found high SOD to be associated with high levels of perseverating

feelings of tension in an experimental condition involving “motivational load” in terms of a challenging task to be completed later in the experiment. This finding is consistent with a long theoretical tradition in motivational psychology. Lewin⁴¹ described uncompleted intentions in terms “tension systems” that maintain them in an active state until completion. In PSI theory tense feeling presumably derive from the inhibition of positive affect supposedly associated with any activation of intention memory to inhibit premature action (“volitional inhibition”^{52,23,19,53}). This theoretical interpretation of model 2 is consistent with a clinical interpretation of self-harm as an attempt to relieve tension. Our empirical confirmation of model 2 reveals at least one possible source of the tension that some borderline patients strive to overcome with their self-harm behaviour: The disposition towards prospective state orientation (i.e., towards indecisiveness and procrastination) in combination with demand-related stress. According to this view, borderline patients characterized by the combination of SOD and motivational load suffer from an inability to generate the motivational energy to enact their intentions. Presumably, the tension caused by this impairment increases with each additional uncompleted intention.

Note that according to PSI theory volitional inhibition applies to intended (i.e., self-generated) behaviour only. It does not exclude impulsive or automatized behaviour. To the contrary, to the extent that self-generated and consciously intended behaviour is inhibited the threshold for impulsive behaviour should be lowered. However, a limitation of this analysis remains: Why do borderline patients “choose” self-harm from the variety of impulsive behaviours available to them? One possible explanation may be a shift between affective systems accomplished by self-harm. Low positive and negative affect seem to relate to orthogonal affective dimensions⁵⁴ having distinct neurobiological foundations^{55,56} and empirically separable effects on mood and self-regulation.^{57,19} When demand-related stress inhibits the affective basis of behavioural enactment in SOD patients (e.g., positive affect or the “reward system”) a shift into the “punishment system” (i.e., into negative affect) may be a way out of the inhibited reward system and the tense feelings cumulating with each additional uncompleted intention.

In addition to our two postulated models we found through further serial mediation analyses *sexual abuse* in childhood, as measured by the CTQ, to generate similar effects as emotional neglect on suicide attempts (cf. Fig. 1), that is effects that are mediated by state orientation after failure and depression. Although we did not predict this result, one can plausibly argue that sexual abuse can be regarded as a personal trauma, because it is an assault on self-esteem, inner security, and self-determination at a deeply personal level. Defensive inhibition of self-access may be a way to avoid self-confrontation with the trauma experienced in childhood which would explain why sexual abuse may launch a similar chain of effects as observed for the emotional neglect-suicide relationship (Fig. 1): Inhibition of self-access (presumably resulting from coping efforts associated with sexual abuse) is often associated with an impairment to self-regulate negative affect in state-oriented individuals (SOF) and the unproductive and abstract

form of rumination, which is related to depression,^{48,49} which in turn increases the risk of suicide attempts.

With additional analyses we found *physical abuse* in childhood, as measured by the CTQ, to generate similar effects as emotional neglect on self-harm behaviour (cf. Fig. 2), that is effects that are mediated by impaired counter-regulation of low positive affect (i.e., demand-related state orientation (SOD)) and demand-related stress. The direct relationship between physical abuse and self-harm behaviour might be interpreted in terms of a tendency to internalize early behavioural patterns of a caretaker transforming external into internal punishment. However, the significant *indirect* dual mediation effect through impaired self-motivation (SOD) and demand-related stress suggests that the relationship between abuse and self-harm may, at least in part, be attributable to a dampening of self-motivation. To the extent that physical abuse destroys a child’s courage to initiate self-determined action it should lead to the emotional regulation problem that we discussed in the context of self-harm as a way to provide relief from emotional tension. According to this view, the combined effect of low self-motivation (i.e., decision-related state orientation) and demand-related stress resulting from it increases the patients’ tendency to engage in self-harm behaviour to release the accumulated tension, as we suggested in a previous paragraph.

One practical implication of our findings can be seen in the early assessment of individual differences in the two forms of emotion regulation distinguished here (i.e., threat- vs. demand-related state orientation) to inform therapists about the relative risks of suicidal or self-harm behaviour in their patients, respectively. Moreover, our findings suggest a different focus of intervention depending on which of the two pathways apply to an individual borderline patient undergoing therapy: Threat-related state orientation suggests focusing on strengthening the ability to downregulate negative (i.e., self-relaxation) whereas demand-related (prospective) state orientation suggests intervention focusing on developing the ability to upregulate positive affect when confronted with demanding daily tasks (i.e., development of self-motivation).

The present results, although consistent with our main predictions, have some limitations. First, the models that we hypothesized are not exclusive. Two other scales of the CTQ also proved to significantly predict either suicide attempts (Sexual abuse) or self-harm behaviour (Physical abuse), with the mediators shown in Figs. 1 and 2. Second, the data that we report are based on a cross-sectional design. Further investigations involving sequential multiple mediation models leading to self-harm behaviour or suicidal attempts, respectively, should use when possible a longitudinal design. On the other hand, because the predictors of the models are proposed to have been established in childhood and the symptoms of the BPD manifest themselves in adolescence or adulthood, a longitudinal design would require a much higher investment of time and resources. Third, emotional neglect and the other scales of the CTQ are based on self-report about events that happened in childhood. Those reports may be susceptible to biases. It would be recommendable for future studies to have a third-person perspective (e.g., relatives or friends) or other

objective measures of emotional neglect, physical abuse, or sexual abuse of the patients during childhood to examine the degree of agreement with the subjective report of the patients. For future studies, it would be desirable to replicate the results of the mediation analyzes with a more balanced (women and men) sample and a large number of BPD participants. Finally, the results were obtained with a particular sample of BPD patients. Before one can claim universality of the findings, future studies on borderline patients should be carried out in different countries to examine the transcultural validity of the serial multiple mediation models examined.

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Conflict of interest

The authors state that there is no conflict of interest.

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