

# Emotional Regulation and Affects in Patients With Borderline Personality Disorder

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## Research article

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# Abstract

**Background:** The regulation of emotions and affective strategies have been shown to be relevant in the clinic of borderline personality disorder (BPD), however, the studies carried out are still not conclusive on the influencing role of these two variables on the course of the TLP. The need for empirical evidence on the relationship between the internal components of these manifestations is faced: cognitive reappraisal, expressive suppression, positive affect and negative affect.

**Result:** The results indicate that the psychological variables studied present more dysfunctional values in patients with BPD. The symptomatic of BPD does not moderate the relationship between cognitive reappraisal and negative affect; and cognitive reappraisal together with positive affect are associated with fewer BPD symptoms.

**Conclusion:** The results obtained offer different clinical implications in the affective and emotional context of BPD, however, it would be necessary to use alternative measures of the emotional pattern, such as physiological methodologies to have more defining results.

## Introduction

Borderline personality disorder (BPD) is a persistent pattern characterized by marked emotional instability and lack of impulse control that significantly affects interpersonal relationships. The age of onset of symptoms is usually at the beginning of adulthood, at which time the subjects manifest behaviors such as: repeated efforts to avoid situations of abandonment (real or imagined), unstable behavior in social relationships, alterations self-identity (both in terms of self-image and sense of self), impulsive behaviors (which can become reckless), affective instability with sudden mood swings, chronic thoughts and feelings of emptiness, difficulties to control emotions, and even paranoid ideation associated with states of stress and / or severe dissociative symptoms (American Psychiatric Association, APA, 2013).

In relation to the prevalence and incidence data, epidemiology places frequency rates within the range 0.2–1.8% in the general population of developed countries (APA, 2013). It is also known that BPD is the cause of hospital admission in a high percentage of patients, and that in psychiatric care units this disorder can be identified in almost 50% of admitted patients. Available data also indicate that this disorder occurs more frequently in women, with a ratio that can reach 3: 1 (APA, 2013; Skodol & Bender, 2003). This differentiation by sex should, however, be taken with caution, since some professionals indicate that the real incidence in men may be underestimated due to their greater resistance to receiving psychological care (Briscoe, 1987; Labrador, Estupiñá & Vera, 2010).

Different studies have observed a close association of BPD with various psychological manifestations, such as alterations in emotional regulation [evidenced by various cognitive biases and difficulties in emotional expression (Carvalho Fernando et al., 2014; Gratz & Gunderson, 2006)], and dysfunctional emotional states [disturbances in both positive and negative affect (Coifman et al., 2012; Sadikaj et al., 2010)]. In fact, the available empirical evidence indicates that emotional (de) regulation constitutes a

fundamental characteristic in the phenotype of the disorder (Chapman, 2019; Daros et al., 2018; Van Zutphen et al., 2015).

Emotional regulation is a complex construct that includes internal and external mechanisms responsible for identifying, analyzing, and modifying emotional reactions according to contextual demands, in order to provide optimal responses and satisfactorily meet the proposed goals (Thompson 1994). It involves cognitive, physiological and behavioral aspects (Gross & Jazaieri, 2014; Scherer, Schorr & Johnstone, 2001). Gross's model of emotional regulation maintains that regulation strategies can be explained based on two basic mechanisms: cognitive reappraisal (referring to the mental construction of the situation, focused on the "antecedent" of the emotion) and Expressive suppression (referred to the modulation of the response, focused on the inhibition of the expressive behavior of the current emotion) (Gross, 2002; Gross & John, 2003).

It has been found that, in comparison with healthy controls, patients with BPD tend to show differences in the degree of cognitive reappraisal they perform of situations. Specifically, the presence of this disorder causes a poorer expression of cognitive elaboration, which would be the basis for the subsequent expression of more dysfunctional responses in emotional regulation (Koenigsberg et al., 2019). But these results may not be specific, since relevant differences have not always been observed when BPD is compared with other psychiatric disorders (attention deficit disorder; major depressive disorder; post-traumatic stress disorder and bipolar disorder) (Cavelti et al., 2019; Daros et al., 2018; Schulze et al., 2019).

Regarding the emotional states of BPD, there is a large number of studies in this area that relate the disorder with affectation in two dominant dimensions: positive affect and negative affect (Conklin, Bradley & Westen, 2006; Jacob et al., 2011; Sadikaj et al., 2010). Positive affect refers to the experience of characteristics related to satisfaction, good humor, security, or enthusiasm (generators of pleasant states). Negative affect refers to aversive emotional characteristics, such as nervousness, fear, disgust, guilt or anger (generators of emotional distress). In global terms, it is known that people with BPD tend to present instability in affect (Trull et al., 2008; Zittel-Conklin & Westen, 2005), probably as a consequence of difficulties in recognizing, differentiating and processing their own emotions. Ultimately, the consequences of this instability are usually impulsive actions that can become self-injurious and / or heterolesive (Berlin, Rolls & Iversen, 2005; Westen, 1991).

In healthy people, aspects of emotional regulation, cognitive reappraisal and expressive suppression have been related to positive and negative affects (Gross & John, 2003). On the other hand, in patients with LPD, the psychological aspects of negative affect and expressive suppression have been investigated (Salsman & Linehan, 2012), highlighting important interrelations between the characteristics of BPD, emotional regulation and negative affective intensity. Specifically, considering that, in healthy people, the regular use of cognitive reappraisal strategies has been related to greater positive affect, better interpersonal functioning and greater well-being in general, and that, on the contrary, expressive suppression is It has been associated with a greater presence of negative affect, that is, a greater number

of depressive symptoms and less success in recovering mood (Gross & John, 2003; Haga, Kraft & Corby, 2009). It is unknown if this relationship is stable in the clinical population due to BPD, because it maintains a variant model in both affects and different personality disorders (Pérez-Nieto, González-Ordi & Redondo, 2007).

The present study arises from the need to have empirical evidence on the psychological manifestations and characteristic symptoms of BPD. The knowledge about the development of these psychological characteristics attached to the emotional and affective determinant, will make it possible to support the direct and predictive effects, as well as the interrelationships that involve the discernment of BPD. Previous studies in this area have been limited by their inability to use comprehensive measures among these psychological manifestations. Therefore, the main objective of this study is to compare measures of cognitive (re) evaluation, expressive suppression, positive affect and negative affect between patients with a diagnosis of BPD and controls. Based on the data published in the available literature, it is hypothesized that: H1) BPD symptoms moderate the relationship between (re) evaluation and negative affect; and H2) cognitive reappraisal has less relationship on the symptoms of BPD, when positive affect is controlled.

The results obtained in the study have an implication in the field of evaluation and intervention in patients with BPD. Knowing better what the interrelationships are between these aspects will help to design measuring instruments with greater discriminatory capacity and more precise treatment programs between these dimensions.

## Method

### Participants

The study sample included a total of  $n = 70$  participants who voluntarily agreed to take part in the research. A part of the subjects ( $n = 35$ , 31 (88.57%) women and 4 (11.43%) men) were patients diagnosed with BPD from the *Mental Health Center of the Ministry of Public Health of Ecuador in Cuenca*. This group of patients had ages ranging from 20 to 58 years of age (Mean = 35.01; Standard deviation (SD) = 9.01), and educational levels in the following groups: 1 (2.56%) participant of basic general education, 8 (22.86%) participants of polyvalent unified high school or secondary education, and 26 (74.26%) participants of professional training. The remaining participants formed a control group (who did not meet clinical criteria for BPD), whose size was  $n = 35$ , 27 (77.14%) women and 8 (22.86%) men), with ages between 18 and 57 years of age (Mean = 34.09; SD = 10.19), and educational levels distributed in 1 (2.56%) participant in basic general education, 5 (14.26%) participants in secondary education, and 29 (82.86%) participants in professional training.

Three relevant characteristics were considered as inclusion criteria for the BPD and control group: a) being over 18 years of age; b) know how to read; c) have a normal vision or corrected to normal. For its

part, only the BPD group took into account two more characteristics: meeting DSM-5 criteria for BPD and not presenting an acute psychotic episode.

## Instruments

*Positive Affectivity and Negative Scale (PANAS)* by Watson, Clark & Tellegen (1988), Spanish Version by Sandín et al., (1995). It consists of 20 words that describe different feelings and emotions, and where the evaluated person must indicate using a scale of five values to what extent they experience each of these emotions (active, strong, inspired, for example). The scale is structured in two subscales that measure positive affect and negative affect. In this study made up of the Ecuadorian population, it has adequate psychometric indices, with a reliability of 0.90 for positive affect and 0.93 for negative affect (Cronbach's alpha coefficients).

*Emotion Regulation Questionnaire (ERQ)* by Gross & John, (2003). Spanish version of Cabello et al., (2013). It is a questionnaire with a self-report format that assesses two emotion regulation strategies: cognitive reappraisal (6 items) and expressive suppression (4 items). The scale consists of 10 items that are measured with a 7-point Likert-type scale (1 = strongly disagree, 7 = strongly agree). In the study population it has a reliability of: 0.78 for cognitive reappraisal and 0.79 expressive suppression (Cronbach's alpha coefficients).

*Borderline Symptom List (BSL-23)* by Bohus et al. (2009), Spanish version Soler et al., (2013). Scale with a self-report format that assesses the level of BPD symptoms. It includes a total of 23 items evaluated on a 5-point Likert scale, ranging from 0 (none) to 4 (very strong). Provides a one-dimensional total score (within the range of 0 to 92 points). Higher scores indicate a higher level of severity for borderline symptoms. The present study has a reliability of 0.95 (Cronbach's alpha coefficient).

In addition to the previous questionnaires, three questions referring to sociodemographic information were collected: sex, chronological age and educational level (primary, secondary and professional).

## Procedure

The research had bioethical authorization for the investigation by the *Ministry of Public Health of Ecuador*. The study was carried out using a non-experimental cross-sectional design.

The data collection was carried out by the research group of the *Laboratory of Basic Psychology, Behavior Analysis and Programmatic Development of the Catholic University of Cuenca*. The research was carried out following the principles of the *Declaration of Helsinki* and the APA research code (APA, 2002, Barnett & Johnson, 2008; Behnke, 2006). The participants gave their informed consent in writing for their data to be part of the research.

For data collection, the patients underwent the session at the hospital center and the controls at home or in the laboratory facilities. The procedure included the signing of the informed consent, the collection of demographic data, the retrieval of data from the medical history (patients only), the social perception task, and the filling in of the scales.

# Analysis of data

In the development of the study objective, the T-Test was used, which allows to compare means obtained in independent samples and the Pearson r correlation analysis that allows to see the degree of association between variables. Multiple linear regression models were applied to test the two hypotheses (H1 and H2). All the models reported in this work fulfill the assumptions of linearity, independence, homoscedasticity, normality and non-collinearity.

The computer programs to calculate the database were: R software version 3.6.1 (Ihaka & Gentleman, 1996) and JASP software version 9.2.0. (Love et al., 2018).

## Results

### Description of the participants

Table 1 presents the distribution of the sociodemographic variables of the study in each group, as well as their statistical comparison. These data indicate that there are no statistically significant differences between the sociodemographic variables and the study groups.

Table 1  
*Comparison of sociodemographic variables between groups.*

	Control		BPD				
	<i>n</i> = 35		<i>n</i> = 35				
Biological gender	<i>n</i>	%	<i>n</i>	%	$\chi^2$	<i>df</i>	<i>p</i>
Males	8	22.86	4	11.43	1.61	1	0.205
Women	27	77.14	31	88.57			
	<i>n</i>	%	<i>n</i>	%	FET	<i>df</i>	<i>p</i>
Education							
Basic-primary	1	2.86	1	2.86			
Bachelor-secondary	5	14.29	8	22.86	1.1		0.766
Vocational training	29	82.86	26	74.29			
Chronological age	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	T	<i>df</i>	<i>p</i>
	33.72	8.91	38.50	11.88	-1.32	13.67	0.209

**Note.** BPD: borderline personality disorder. SD: standard deviation. gl: degrees of freedom. FET: Fisher's exact test.

### Comparison of the groups in clinical variables.

Table 2 presents the distribution of the psychological variables of the study in each group, as well as their statistical comparison. These data indicate that there are statistically significant differences between both groups in the dimensions of: BPD symptomatology, cognitive (re) evaluation, expressive suppression, positive affect and negative affect.

Table 2  
*Comparison of clinical variables between groups.*

	Control		BPD				
	<i>n = 35</i>		<i>n = 35</i>				
	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>p</i>
Symptoms of BPD	28.54	6.74	62.71	22.58	-8.58	40.01	< 0.001
Cognitive reappraisal	30.31	6.50	23.51	8.60	3.73	68	< 0.001
Expressive suppression	10.91	4.88	15.06	6.20	-3.11	68	0.003
Positive affect	34.31	4.88	25.14	7.37	6.14	58.97	< 0.001
Negative affect	20.31	5.18	31.20	8.80	-6.31	55.03	< 0.001

**Note.** BPD: borderline personality disorder. SD: standard deviation. gl: degrees of freedom.

## Association between the clinical variables of the study

Table 3 contains the correlation matrix for the study variables, stratified by the diagnostic group (the upper part presents the R coefficients for the BPD group and the lower part for the control group). In patients with BPD, it is observed that: a) higher values in BPD symptomatology are associated with lower values in cognitive reappraisal and positive affect, but with higher values in negative affect; b) higher values in cognitive reappraisal are associated with lower values in negative affect; c) high level of expressive suppression is associated with lower values in positive affect; and d) high values of positive affect are associated with low values of negative affect. In the control group it is observed that: a) higher values of BPD symptoms are associated with lower values in positive affect and higher values in negative affect; and b) high values of positive affect are associated with low values of negative affect.

Table 3  
*Association between the clinical variables of the study: Pearson's correlation*

	1	2	3	4	5
1 Symptoms of BPD	—	-0.42*	0.29	-0.35*	0.66**
2 Cognitive reappraisal	-0.15	—	-0.09	0.21	-0.56**
3 Expressive suppression	0.01	0.09	—	-0.45**	0.23
4 Positive affect	-0.60**	0.21	-0.12	—	-0.37*
5 Negative affect	0.60**	-0.16	0.32	-0.54**	—
Note: * Significant correlation $p < 0.05$ ; ** Significant correlation $p < 0.01$ .					
Top: correlations obtained in the TLP group.					
Bottom: correlations obtained in the control group.					

## Analysis of moderation of BPD symptoms in the relationship between cognitive reappraisal and negative affect

As can be seen from the data of the model that includes the interaction parameter (Model 1) that appear in Table 4, cognitive reappraisal is not significantly associated with negative affect, however, the symptoms of BPD are on the other hand, the interaction parameter is not statistically significant ( $B = 0.001$ ,  $p = 0.959$ ), therefore it is excluded from the analysis. According to the model without interaction (Model 2), increasing cognitive reappraisal by one point implies a decrease of between 0.417 and 0.052 in negative affect; For its part, although the symptoms of BPD do not moderate this relationship, it acts as a significant predictor, indicating that increasing the symptoms of BPD by one point implies an increase between 0.191 and 0.318 in negative affect.

Table 4  
*Linear regression with and without interaction parameter.*

Model 1	B	SE	<i>p</i>	CI 95%
Constant	21.259	5.326	< 0.001	10.625–31.894
Cognitive reappraisal (CR)	-0.267	0.182	0.210	-0.631–0.097
Symptoms of BPD (sBPD) Interacción: CR × sBPD	0.239	0.084	< 0.01	0.072–0.406
	0.001	0.003	0.959	-0.006–0.007
Model 2	B	SE	<i>p</i>	CI 95%
Constant	20.430	3.507	< 0.001	13.429–27.430
Cognitive reappraisal (CR)	-0.234	0.092	< 0.05	-0.417 - -0.052
Symptoms of BPD (sBPD)	0.255	0.032	< 0.001	0.191–0.318

Note. SE: standard error. CI: confidence interval.

## Study between cognitive reappraisal and BPD symptoms adjusted for positive affect

Table 5 presents the linear regression model that measures the degree to which positive affect may be acting as a confounding variable between the relationship between cognitive reappraisal (independent variable) and BPD symptoms (dependent variable). The results of the initial model (block 1) and the model with the control variable (block 2) are presented. The initial step indicates that the relationship between the cognitive reappraisal and the symptoms of BPD is significant. The results of adding in the second step of positive affect indicate that the adjusted contribution of the cognitive reappraisal is  $B = -0.904$ , an effect that continues to be significant ( $p < 0.01$ ). Since the difference between the adjusted and the unadjusted parameter is greater than 10%, we consider that the contribution of the model with the control variable of the results correctly reflects the contribution of the cognitive reappraisal.

Table 5  
*Linear Regression with Control-Fit Variable*

	B	SE	<i>p</i>	CI 95%
Block 1				
Constant	85.678	8.393	< 0.001	68.930–102.426
Cognitive reappraisal (CR)	-1.488	0.298	< 0.001	-2.083 - -0.893
Block 2				
Constant	116.770	9.155	< 0.001	98.495–135.044
Cognitive reappraisal (CR)	-0.904	0.274	< 0.01	-1.451 - -0.358
Positive affect	-1.574	0.294	< 0.001	-2.161 - -0.987

Note. SE: standard error. CI: confidence interval.

## Discussion

The present study proposed as a general objective to obtain new empirical evidence on the development of the psychological manifestations of BPD, in aspects related to emotional regulation [cognitive reappraisal and expressive suppression] and affects. Specifically, its purpose was to examine potential relationships between cognitive (re) evaluation, expressive suppression, positive affect, negative affect and the symptoms of BPD.

Regarding the study objective, the BPD group presented differences in the study variables, with clearly more dysfunctional values in clinical patients compared with healthy subjects, which is consistent with the results obtained in previous studies (Carpenter & Trull, 2013; Cheavens & Heiy, 2011; Gross & Jazaieri, 2014; Navarro-Haro et al., 2015; Salsman & Linehan, 2012; Wrege et al., 2019; Zittel, Conklin & Westen, 2005).

Regarding the first hypothesis, the results reveal that the symptoms of BPD do not moderate the relationship between cognitive reappraisal and negative affect. The data indicate that the higher the cognitive (re) evaluation, the lower the negative affect. This relationship is similar to the results described by Gross and John (2003) in healthy people; Likewise, it is congruent with what was found in several studies, where they state that the use of cognitive reappraisal strategies is associated with greater positive affect and less negative affect, better interpersonal functioning and greater well-being in general (King & dela Rosa, 2019; Krafft, Haeger & Levin, 2019; Schwerdtfeger, Heene & Messner, 2019); and that, on the contrary, expressive suppression correlates with a greater presence of negative affect (greater severity of depressive symptoms and less success in recovering mood) (Daros & Williams, 2019; Gross & Cassidy, 2019; Gross & John, 2003; Herpertz et al., 2018; Lopez & Denny, 2019). Although the symptoms of BPD do not moderate this relationship because the relational model of these variables does not change depending on the personality disorder, it is considered that this is due to the fact that there is a solid relationship between these components (Gross & John, 2003) that a disorder does not influence them, however it acts as a significant predictor of negative affect, something that is consistent with the determination of this variable as it is considered an important aspect in the BPD clinic (Daros et al., 2018; King & de la Rosa, 2019; Koenigsberg et al., 2019; Krafft, Haeger & Levin, 2019; Schwerdtfeger, Heene & Messner, 2019).

Regarding the second hypothesis, cognitive reappraisal is significantly related to the symptoms of BPD when positive affect is controlled, specifically: positive affect acts as a confounding variable between the relationship of these variables, indicating that the The effect of the cognitive reappraisal decreases when controlling for positive affect, indicating this decrease is sufficiently relevant to justify the report based on the adjusted effect of the cognitive (re) evaluation. This result is consistent with the studies that mention the significant role of emotional regulation strategies on the disorder (Carpenter & Trull, 2013; Gratz et al., 2006; Moukhtarian et al., 2018), and especially where the influencing role that carries positive affect (better interpersonal functioning and greater well-being in general) on this variable (Cavelti et al., 2019; Hart et al., 2013; Rosenstein et al., 2018). Therefore, this result supports that cognitive reappraisal in

conjunction with positive affect can be denoted as characteristics associated with less BPD symptoms. Important data because it strengthens information, since in this study both positive affect and cognitive reappraisal were considered simultaneously, appreciable characteristics in the disorder (Conklin, Bradley & Westen, 2006; Sadikaj et al., 2010; Trull et al., 2008).

## Limitations

The results of this study should be interpreted considering a set of limitations. First, all variables in the study were assessed using self-report measures. The use of behavioral and physiological measures in future research can help to further expand the knowledge of the relationships between these variables by having a measurement from an observable organic value. In addition, this study worked with cross-sectional data. Longitudinal data can help clarify the relationships between these variables from an evolutionary perspective, specifically the data collected from repeated measurements over long periods of time, will allow contrasting the changes and provide a deep explanation of the proposed hypotheses, especially in the function moderator of BPD symptomatology and the confounding role of positive affect, as well as the comparison of measures between both study groups. In particular, ambulatory monitoring, as well as laboratory studies, can be used to examine real-time data on affects, emotion regulation, and the characteristics of BPD. On the other hand, despite the fact that the statistical calculation of the second hypothesis was carried out with caution (e.g. compliance with assumptions), in this study the sample size or post hoc power was not calculated to calculate the effect of cognitive (re) evaluation, which would encourage future research to do so. Finally, despite the fact that the sample size of several studies is similar to the present one (Bortolla et al., 2019; Cavelti et al., 2019; Sinke et al., 2017), it is considered that the sample of participants limits the generalization of the findings, referring to a population context. Future studies could examine more diverse characteristics that involve comorbid psychiatric diagnoses on the specificity of the emotional and affective component, and study them using a structural model to know their direct and indirect effects.

## Implications

The results obtained have different clinical implications. On the one hand, they provide knowledge about the characteristics of BPD and its explanatory mechanisms. Knowledge about the emotional and affective performance of the disorder can be used as a theoretical-empirical basis for the development of ad hoc assessment instruments that facilitate efficient diagnostic screening, and for the development of psychotherapeutic intervention plans focused on the specific needs of the course of the disorder, with the purpose of improving the functionality and quality of life of the patient. On the other hand, the mixed sample (control-BPD) apart from being advantageous in the study for representing a complete range of values marking group differences, makes it possible to have a solid representation of these psychological manifestations in the clinical diagnosis, because it provides a basis to elucidate the affective and emotional substrates of BPD that contribute to the explicit determination of the disorder.

## Conclusions

In global terms, the results of this study deepen efforts to investigate the role of the elements of emotional regulation in conjunction with the affects (positive and negative) denoted as central characteristics of BPD. The psychological variables studied presented clearly marked more dysfunctional values in BPD patients; on the other hand, the symptoms from BPD do not moderate the relationship between cognitive reappraisal and negative affect, which had been previously described in healthy people; and, finally, the cognitive reappraisal in conjunction with positive affect can be denoted as relevant characteristics in the decrease in the symptoms of BPD.

## **Declarations**

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### **Authors 'contributions**

GGRO was responsible for the study design, data collection, and data analysis. DOIA was responsible for the literature review and development of the introduction. Both authors contributed to the analysis and discussion of the findings. Both authors read and approved the final manuscript.

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### **Availability of data and materials**

Please contact GGRO for data request.

### **Ethical approval and consent to participate**

The research project was approved by the Research Ethics Committee of the Catholic University of Cuenca (Po-INV-R00865: reference 2020) and with bioethical authorization for the research by the Ministry of Public Health of Ecuador (Of. No. 18B53). The research was carried out following the principles of the Declaration of Helsinki and the APA research code. The participants gave their informed consent in writing for their data to be part of the research.

### **Consent for publication**

Not applicable.

### **Competing interests**

The authors declare that they have no competing interests.

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