**BABEŞ-BOLYAI UNIVERSITY**

**FACULTY OF PSYCHOLOGY AND EDUCATIONAL SCIENCES**

**DOCTORAL SCHOOL "EVIDENCE-BASED ASSESSMENT AND PSYCHOLOGICAL INTERVENTIONS"**

**Ph.D. THESIS**

# BORDERLINE PERSONALITY DISORDER: RISK FACTORS, MEASUREMENT, EMOTION REGULATION, AND EVERYDAY FUNCTIONING

**AUTHOR: Ph.D. CANDIDATE: SAMUEL BUD**

**SCIENTIFIC ADVISOR: PROFESSOR Ph.D. AURORA SZENTAGOTAI-TĂTAR**

**Cluj-Napoca**

**2024**

ACKNOWLEDGMENTS

Embarking on a PhD journey as a naive graduate seems almost foolish in retrospect. Right now, the biggest perk that I see in completing the PhD is that whenever a package arrives, or whenever I want an ice cream I can say, 'Ah, just what the doctor ordered!'. While I am confident that I will eventually reap the benefits of all my hard work, for now, I am simply grateful to have finished. This journey has been much more difficult than it needed to be.

I would like to express my gratitude for this achievement to my scientific advisor, Professor Aurora Szentágotai-Tătar for all the scientific input. I would also like to acknowledge the support I received from my colleagues and friends in the Doctoral School of "Evidence-based Psychological Assessment and Interventions" and all members of the Department of Clinical Psychology and Psychotherapy at Babeş-Bolyai University. I would like to thank Diana Nechita for her encouraging words and for pushing me to take charge and own my work. To Stelian Florean and Liviu Fodor, I owe gratitude in providing statistical analysis help and guidance when needed. On a more personal note, I know that all this effort has not been possible without the sacrifices my parents made to provide me with a love of learning and encouraging me to be better in all I do.

Above all, my deepest and most heartfelt gratitude goes to my wife, Ela. She's seen me at my worst, full of hopelessness and sadness, and continued to love me, hold my hand and structure my thoughts and actions. Her patience, kindness and discipline have been my anchor through the toughest times. She gracefully believed for both of us when I didn't. I love you!

I can't wait to continue living my life to the fullest, maybe start with a long vacation, cook the best focaccia one can think of, play the piano, or finally learn how to master sourdough. After all, all these are doctor recommended (by me!).

*Notes*_____

(1) This is to certify by Samuel BUD that:

(a) The thesis includes the original research work of Samuel Bud (author) towards the Ph.D.;

(b) Parts of the thesis have been accepted for publication or presented as conference papers; appropriate citations for these publications were included in the thesis. Other co-authors have been included in the publications, if they contributed to the exposition of the published text, data interpretation etc. (their contribution was clearly explained in the footnotes of the thesis);

(c) The thesis was written according to the academic writing standards. All the text of the thesis and its summary was written by Samuel Bud who assumes all the responsibility for the academic writing; also:

- A software was used to check for the academic writing (https://www.turnitin.com/); the thesis has passed the critical test;
- A copy of the research project was delivered at the Department/Graduate School.

(d) All the Tables and Figures are numbered within the corresponding chapter or subchapter of the thesis.

Table of Contents

# CHAPTER I. INTRODUCTION

## 1.1. Main Challenges in studying Borderline Personality Disorder (BPD)

Borderline Personality Disorder (BPD) presents itself as an intricate tapestry of emotional, cognitive, behavioral, personal, and interpersonal challenges (APA, 2013). While significant advances in the study of BPD have been made over the last years, there are still some major difficulties that researchers and practitioners face in dealing with BPD. Theoretical challenges include the ongoing need for a more precise conceptualization of BPD. Researchers often question the etiology of the disorder, debating the distinctiveness of BPD compared to other personality disorders or conditions like bipolar disorder, which complicates the efforts to establish clear symptom boundaries (Chanen & Kaess, 2012; Frías et al., 2016), in addition to cultural variations and characteristics like help-seeking behaviors (Witt et al., 2017). Methodologically, researchers and clinicians face challenges in selecting appropriate measurement tools that accurately capture the diverse symptomatology of BPD. The dynamic nature of BPD symptoms, which can fluctuate over time, requires innovative research designs such as longitudinal or ecological-momentary assessment methods to capture real-time variations (Santangelo et al., 2014).

The purpose of this thesis is to assess and build upon some of these theoretical and methodological challenges. Therefore, this thesis aims to contribute to the advancement of emotional dysregulation in the BPD field. This will be achieved by providing a critical perspective on the current status of research in this domain, quantitatively synthesizing the existing research, and investigating emotional regulation strategies and related concepts in community adolescent and adult samples. It will also tackle the need for valid instruments by investigating the measurement invariance and factor structure of a promising scale for BPD assessment in youth.

Another study of the thesis also investigates emotion regulation strategies as a potential mediator between childhood environment and BPD features. Moreover, building upon the methodological challenges, this thesis will also investigate emotions, emotion regulation, and related BPD constructs in a clinical sample of adults, through the ecological momentary assessment framework.

## 1.2. Theoretical foundations and review of the literature

### 1.2.1. Borderline Personality Disorder

BPD has evolved significantly through a complex history that reflects changing perspectives on mental health in general. While initially BPD was characterized mostly through disrupted cognitive processes, individuals labeled as borderline were later reclassified under schizotypal personality disorder. The formal acknowledgement in the DSM-III (APA, 1980) solidified BPD as a distinct disorder, prompting more research into its etiology and treatment. Today, BPD is characterized by instability in affect regulation, troublesome personal relationships, disrupted self-image, and difficulties in impulse control, leading to significant personal and societal costs (APA, 2013; Lieb et al., 2014). Psychological interventions, such as Dialectical Behavior Therapy (DBT), have revolutionized BPD treatment by integrating cognitive-behavioral and mindfulness strategies. Across different validated forms of interventions, such as DBT (Linehan, 1987), Mentalization-Based Treatment (MBT; Bateman & Fonagy, 2004), or Schema-Focused Therapy (SFT; Kellog & Young, 2006), emotion regulation emerges as a critical mechanism in symptom management and improving overall functioning, highlighting its crucial role in BPD. Research into the factor analysis and measurement for BPD has revealed mixed results, challenging the understanding of its underlying structure across adolescence and adulthood (Sharp et al., 2015). For example, theoretical frameworks range from viewing BPD as a unified

construct, integrating various symptoms under a common vulnerability, to more nuanced models that differentiate between affective instability, identify disturbance, negative relationships and impulsive behaviors, including non-suicidal self-injury.

### 1.2.2. Emotion Regulation

Throughout history, the role of emotions in human experience and psychological well-being has been a central and recurring topic. Early theories by James-Lange (James, 1884), Cannon (1927), and Schachter & Singer (1962) laid the foundations for understanding the interplay between arousal, appraisal, and experience. Contemporary theories emphasize emotion regulation as a crucial role for well-being as well, with Gross's process model (Gross, 1998) highlighting the dynamic relations between emotions and regulation strategies. Adaptive emotion regulation is crucial in managing BPD, especially considering the heavy toll on how emotional dysregulation impacts daily life (e.g., mood swings, impulsive behaviours, self-harm). Emotional dysregulation is central to several BPD models. Probably the most influential, Linehan's biosocial model (Linehan, 1993) links emotion dysregulation to all BPD symptoms. The extended biosocial model (Crowell et al., 2009) further emphasizes the influence of adverse experiences (such as invalidating environment or childhood maltreatment) across lifetime on BPD development, highlighting the need for continuous research on early environment or emotion regulation.

Recent research highlights the significant associations between emotion regulation strategies and BPD. Two recent meta-analyses by Daros & Williams (2019) and Bud et al., (2023) reveal that individuals with BPD use less effective emotion regulation strategies, such as cognitive reappraisal and acceptance, and more frequent ineffective strategies like suppression, rumination, and avoidance. Reappraisal, an effective strategy, is less frequently used by those with BPD, who

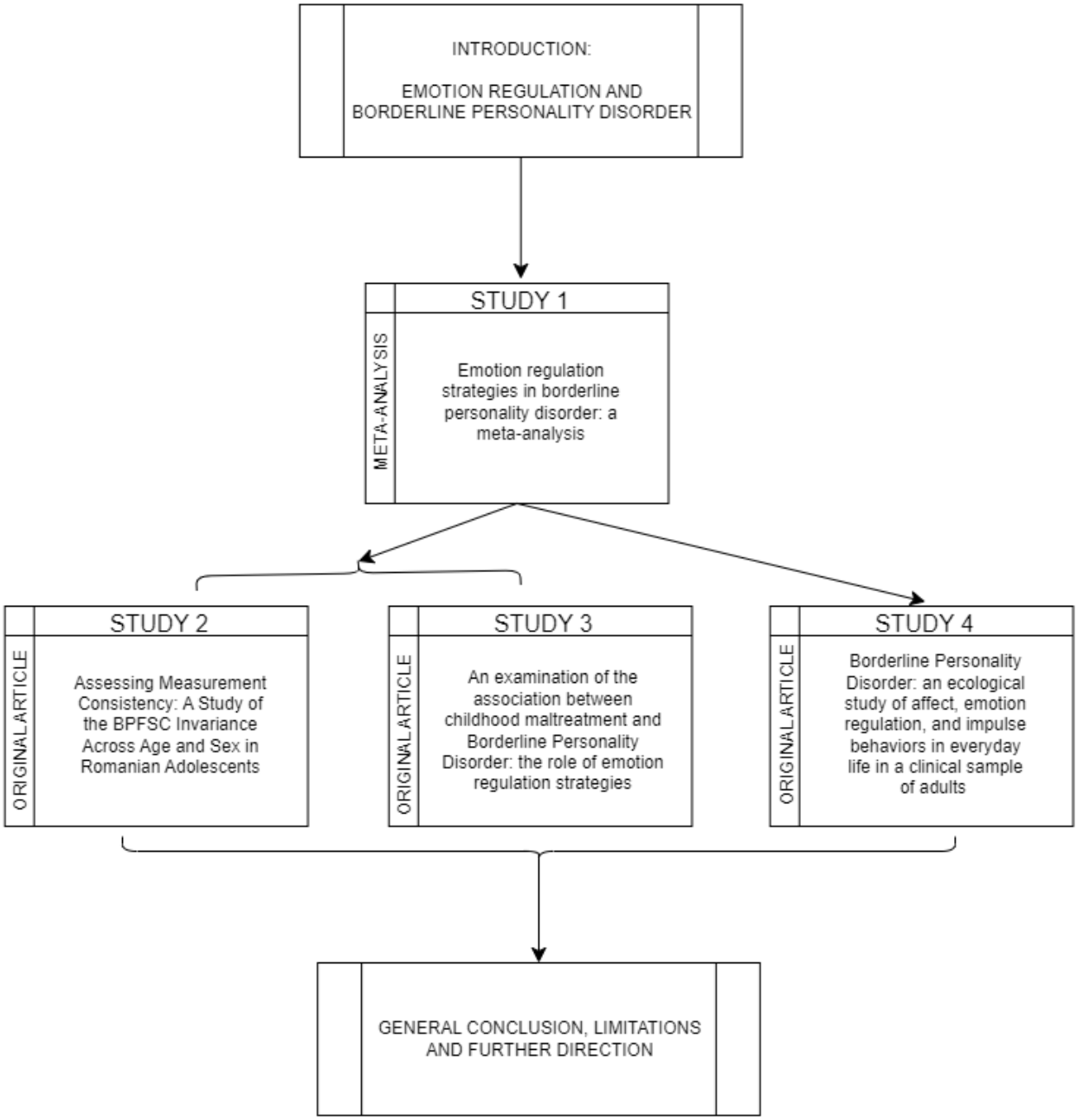
also report lower proficiency in it compared to healthy controls (Beblo et al., 2013). Rumination is strongly linked to BPD symptoms, intensifying emotional and behavioral dysregulation (Selby & Joiner, 2009). Suppression, commonly used by individuals with BPD, also correlates with symptom severity and mediates the relationship between negative affect and BPD symptoms (Gratz et al., 2006). Avoidance presents mixed results; while it offers temporary relief, it ultimately correlates with heightened BPD severiy over time (Chapman et al., 2017). Distraction is often used to manage high-intensity stimuli, and is also associated with BPD symptom severity, suggesting its role in managing emotional situations (Sauer et al., 2016). Acceptance is particularly challenging for individuals with BPD, who require more guidance to implement it effectively (Chapman et al., 2017). Similary, mindfulness, often linked to acceptance, shows a negative correlation with BPD symptomatology (Wupperman et al., 2013).

## CHAPTER II. RESEARCH AIMS AND GENERAL METHODOLOGY

The present research project containing four original studies aimed to address several of these conceptual and methodological challenges. Some were addressed in individual studies (e.g., quantifying the relationship between emotion regulation strategies and BPD features), while others were addressed across multiple studies (e.g., the specific role of emotion regulation strategies in alleviating or heightening BPD features). The thesis's structure, following the research objectives is presented in Figure 1. We aimed to bridge the gap in understanding how specific emotion regulation strategies relate to BPD symptoms by conducting a comprehensive quantitative meta-analysis and investigating these strategies as mediators between environmental factors (i.e., childhood maltreatment) and BPD. Additionally, we sought to validate the Borderline Feature Scale for Children (BPFSC) in a Romanian adolescent sample and employed ecological

momentary assessment to study real-time dynamics of emotion regulation and affect in individuals with BPD. To explore these research aims, we employed different methodological approaches. We used a meta-analytic approach for our aim to provide a stronger, more conclusive answer between emotion regulation strategies and BPD by combining data from multiple studies. We conducted structural equation modelling (SEM) to investigate relationships between childhood environmental factors, emotion regulation strategies, and BPD. We used multi-group confirmatory factor analysis (MG-CFA) to test for the factor structure and measurement invariance of BPFSC. Nevertheless, we employed mixed-effects models to explore concurrent and lagged relationships between emotion regulation strategies and both negative and positive affect, as well as the perceived effectiveness and difficulty of these strategies

*Figure 3*. Graphical representation of the overall structure of the thesis. Each study will be described in full in Chapter III.


INTRODUCTION:
EMOTION REGULATION AND BORDERLINE PERSONALITY DISORDER
STUDY 1
META-ANALYSIS
Emotion regulation strategies in borderline personality disorder: a meta-analysis
STUDY 2
ORIGINAL ARTICLE
Assessing Measurement Consistency: A Study of the BPFSC Invariance Across Age and Sex in Romanian Adolescents
STUDY 3
ORIGINAL ARTICLE
An examination of the association between childhood maltreatment and Borderline Personality Disorder: the role of emotion regulation strategies
STUDY 4
ORIGINAL ARTICLE
Borderline Personality Disorder: an ecological study of affect, emotion regulation, and impulse behaviors in everyday life in a clinical sample of adults
GENERAL CONCLUSION, LIMITATIONS AND FURTHER DIRECTION

.

# CHAPTER III: ORIGINAL RESEARCH

## Study 1. 3.1. Emotion Regulation Strategies in Borderline Personality Disorder: A Meta-Analysis[1]

### Introduction

Borderline Personality Disorder (BPD) is characterized by significant challenges in emotion regulation (ER), which play a central role in both the development and maintenance of the disorder (Lieb et al., 2004). Emotional dysregulation in BPD, encompassing affective instability and intense anger, is central to BPD diagnostic criteria (APA, 2013). ER involves multifaceted processes to modulate emotional experiences, with significant implications for understanding BPD and its treatment (Gratz & Roemer, 2004). Individuals with BPD often struggle to employ adaptive strategies effectively, often choosing strategies that provide short-term relief but exacerbate long-term symptoms (Kuo et al., 2018). Studies consistently link high levels of suppression, rumination, and avoidance with increased BPD symptoms, whereas effective use of acceptance and reappraisal correlates with symptom reduction (Daros & Williams, 2019). Each ER strategy has unique implications. Acceptance involves engaging with distressing emotions, which individuals with BPD find challenging in daily life, despite potential benefits (Chapman et al., 2017). Avoidance, the reluctance to confront emotional pain, is prevalent in BPD and impedes

[1] This study has been published.
Bud, S., Nechita, D., & Szentagotai Tatar, A. (2023). Emotion regulation strategies in borderline personality disorder: a meta-analysis. *Clinical Psychologist*, *27*(2), 142-159.

The authors contributed to the article as follows: Bud, S: study design, conducting the study, data analysis and interpretation, writing the manuscript; Nechita, D: study design, data analysis and interpretation, writing the manuscript. Szentagotai, A: study design, interpretation of data and manuscript writing.

recovery (Chapman et al., 2017). Distraction, shifting attention from emotional stimuli, reflects a coping mechanism for emotional intensity in BPD (Sauer et al., 2016). Reappraisal, altering emotional responses by reframing situations, is underutilized by individuals with BPD, despite research showing the potential to alleviate symptoms (Beblo et al., 2013). Rumination, dwelling on negative emotions, significantly predicts BPD severity, influencing the emotional intensity and behavioral dysregulation (Selby & Joiner, 2009). Suppression, an attempt to suppress unwanted emotions, correlates with heightened BPD symptoms and contributes to emotional distress (Rosenthal et al., 2008). Despite advances in understanding ER in BPD, research gaps remain regarding comprehensive aggregation and synthesis of findings across studies (Daros & Williams, 2019).

This study aims to update previous research on the associations between BPD and ER strategies using meta-analytic techniques. Unlike past studies, this study differentiates between acceptance and mindfulness, while also examining how various theoretical (e.g., clinical status), methodological (e.g., study quality), and demographic (e.g., sex) factors influence these associations.

## Method

Systematic searches were conducted in five databases (PsychINFO, PubMed, Web of Science, SCOPUS, Cochrane) up to September 2020 to identify studies on the association between ER strategies and BPD. Studies included were published in English or German, peer-reviewed, and reported data on ER and BPD symptoms. Data extracted included study details, outcomes, demographics, and effect sizes. Quality was assessed using the NHLBI tool (NHLBI, 2014), with

two independent researchers evaluating each study. Pearson's correlation was primary used as coefficients, with effect sizes calculated using random-effects model due to expected heterogeneity (Higgins et al., 2003). Publication bias was assessed using funnel plots, the trim-and-fill procedure (Duval & Tweedie, 2000). Comprehensive Meta-Analysis (CMA) software was used to organize, analyze, and report the data (CMA; Borenstein et al., 2005).

## Results

The systematic search identified 9,848 potentially relevant studies. After removing duplicates, 6,921 studies remained. Screening for eligibility criteria resulted in the exclusion of 6,740 studies. The full texts of the remaining 181 studies were assessed, leading to the exclusion of 107 studies. Thus, 74 studies met the inclusion criteria and were included in the meta-analysis.

The pooled effect sizes indicated a strong negative association between BPD and adaptive ER strategies: acceptance (r = -0.558), mindfulness (r = -0.581), and reappraisal (r = -0.303). Combined, these adaptive strategies yield an overall effect size of r = -0.539, suggesting that individuals with BPD tend to experience improved emotion regulation when employing these strategies. Conversely, maladaptive ER strategies showed a strong positive association with BPD: avoidance (r = 0.528), suppression (r = 0.449), rumination (r = 0.551), and distraction (r = 0.336). These strategies, when combined, yield an overall effect of r = 0.510, indicating that these maladaptive strategies, when used by individuals with BPD, may lead to exacerbating their symptoms. Table 1 summarizes the main effects.

Table 1.

*Correlations between BPD and ER strategies*

| Strategy | n | Effect size (r) | CI (95%) lower limit | CI (95%) upper limit | Z | p | k | Q-statistics p | $I^2$ |
|---|---|---|---|---|---|---|---|---|---|
| Acceptance | 30 | **-.558** | -.634 | -.472 | -10.738 | <.001 | 32 | <.001 | 95.088 |
| Mindfulness | 13 | **-.581** | -.725 | -.387 | -5.095 | <.001 | 13 | <.001 | 98.448 |
| Reappraisal | 17 | **-.303** | -.372 | -231 | -7.900 | <.001 | 17 | <.001 | 86.325 |
| Avoidance | 12 | **.528** | .442 | .604 | 10.205 | <.001 | 12 | <.001 | 86.816 |
| Distraction | *3* | **-.336** | -.471 | -.186 | -4.252 | <.001 | 3 | <.001 | 52.716 |
| Rumination | 23 | **.551** | .488 | .608 | 14.083 | <.001 | 23 | <.001 | 92.959 |
| Suppression | 20 | **.449** | .364 | .527 | 9.264 | <.001 | 20 | <.001 | 93.035 |

The analysis for subgroup differences revealed that clinical status significantly moderated the relationship between acceptance and reappraisal strategies with BPD symptoms, showing stronger effects in clinical samples compared to non-clinical samples. Similarly, for reappraisal, effect sizes were larger when outcomes were clinician-reported rather than self-reported. Non-student populations also exhibited stronger associations between reappraisal and BPD symptoms compared to student populations. Regarding sex composition, a higher percentage of females predicted stronger associations between acceptance and reappraisal strategies with BPD. For suppression, clinical status played a significant moderating role, showing larger effect sizes in clinical samples. Similarly, clinician-reported outcomes for suppression yielded stronger associations compared to self-reported outcomes. Non-student populations also showed stronger

associations between suppression and BPD symptoms compared to student populations. However, neither age nor sex significantly predicted the strength of associations for avoidance and rumination strategies with BPD.

The analysis was also sensitive to potential publication bias, though the symmetric distribution of data points in funnel plots and further statistical tests suggested minimal impact on the robustness of the findings.

## Discussion

The meta-analysis focuses on the relationships between ER strategies and BPD. It integrates findings from various studies investigating acceptance, mindfulness, reappraisal, distraction, avoidance, suppression, and rumination, and their associations with BPD symptoms. Adaptive ER strategies (acceptance, mindfulness, reappraisal) show significant negative associations with BPD, indicating their potential role in managing emotional dysregulation (Daros & Williams, 2019). However, reappraisal exhibits a smaller effect size compared to the other adaptive ER strategies. This can be explained possibly due to its cognitive demands and cognitive resource depletion (Carpenter & Trull, 2013). Conversely, maladaptive strategies (avoidance, suppression, rumination, distraction) exhibit significant positive associations with BPD symptoms, suggesting their contribution in exacerbating emotional dysregulation (Daros & Williams, 2019). Variations in the effects of ER strategies are also influenced by other factors, such as method of reporting, type of population, or clinical status. This highlights the importance of context in understanding ER-BPD relationships (Haas & Miller, 2015). Limitations of the analysis include the predominantly cross-sectional nature of the studies, which limits drawing causal conclusions. High heterogeneity across studies underscores the complexity in measuring ER strategies and BPD

symptoms. Future studies should adopt longitudinal designs to better understand temporal relationships and further elucidate how different ER strategies influence the development and course of BPD symptomatology.

Clinically, the findings underscore the importance of promoting ER interventions that address individual ER and personal context within BPD treatment protocols (Linehan & Wilks, 2015). Understanding the reasons behind the selection and implementation of specific ER strategies by individuals with BPD is crucial for developing effective therapeutic approaches. Continued research into ER mechanisms and contextual influences promise to refine therapeutic strategies and deepen our understanding of BPD psychopathology (Daros & Williams, 2019)

### 3.2. Study 2. Assessing measurement consistency: A study of the BPFSC invariance across age and sex in Romanian adolescents[2]

## Introduction

Borderline Personality Disorder (BPD) is characterized by chronic affect regulation difficulties, cognitive dysfunctions, impulsivity, and unstable interpersonal relationships (Lieb et al., 2004). The measurement and diagnostic of BPD, particularly in adolescents, is challenging due to its connotation of severity and non-malleability, which can negatively impact adolescent development (Laurenssen et al., 2013. However, avoiding measurement and diagnostic can lead to significant financial and societal costs, as delayed diagnosis could result in more severe psychiatric symptoms and functional impairments that are costlier to treat and manage later on (Van Asselt et al., 2007). Studies show that the prevalence of BPD in adolescents is similar to adults, with symptoms emerging around the age of 13–14. Early detection of BPD symptoms can lead to better functional outcomes and reduce long-term costs (Chanen et al., 2020).

Accurate assessment of BPD in adolescents is crucial, and reliable diagnostic tools like the Child Interview for Borderline Personality Disorder (CI-BPD) and the Borderline Personality Features Scale for Children (BPFSC) have been developed. CI-BPD, though comprehensive, is time-consuming and requires specialist administration (Sharp et al., 2011). BPFSC, a self-report measure, effectively assesses BPD features and track symptom variability over time (Sharp et al.,

[2] This study has been published.
Bud, S., & Szentágotai-Tătar, A. (2024). Assessing Measurement Consistency: A Study of the BPFSC Invariance Across Age and Sex in Romanian Adolescents. *Psychological Reports*, 0(0) 1–23

The authors contributed to the article as follows: Bud, S: study design, conducting the study, data analysis and interpretation, writing the manuscript; Nechita, D: study design, data analysis and interpretation, writing the manuscript. Szentagotai, A.: study design, interpretation of data and manuscript writing.

2014). BPFSC is based on the four-factor Borderline scale from the Personality Assessment Inventory (PAI-BOR), which includes affective instability, identity problems, negative relationships, and self-harm (Morey, 1991). The BPFSC has been translated into various languages and validated in multiple studies, demonstrating its reliability across different cultures (e.g., Calvo et al., 2023; Carreiras et al., 2020). Factor analyses have shown mixed results, with some supporting the original four-factor structure, while others favouring a single or bi-factor model (e.g., Ensink et al., 2020; Haltigan & Vaillancourt, 2016). This divergence reflects ongoing debates about the conceptualization of BPD, suggesting a need for multidimensional models to capture its complexity (Hallquist & Pilkonis, 2012). In Romania, little progress has been made in translating and validating BPD assessment tools, which is essential given the historical stigma around mental health, especially in Eastern Europe (e.g., Dlouhy, 2014). Ensuring measurement invariance across sex and age is crucial to avoid misleading results due to measurement artefacts (Guenole & Brown, 2014).

The primary goal of this study was to translate and validate the Romanian version of the 24-item BPFSC and investigate measurement invariance. The study explored the factor structure, sex and age invariance, and the relationship between BPFSC factors and other psychopathologies. The 24-item version aligns with the biosocial model of BPD and supports its multidimensional nature, offering insights for both research and clinical practice (e.g., Crowell et al., 2019).

## Methods

Participants in this study were 634 adolescents (68% female) from six high schools across four Romanian counties, with a response rate of 96%. They came from lower to middle-class

backgrounds, with 53% living in rural areas and 47% in urban areas. The ethnic composition was primarily Romanian (92%), with a small percentage of Hungarians (5%), Germans (2%), and others (<1%). Besides a general demographics questionnaire, participants also completed the Borderline Personality Feature Scale for Children (BPFSC-24) and the Youth Self Report (YSR). Both measures have demonstrated good reliability and validity (Crick et al., 2005; Achenbach et al., 2001). The BPFSC-24 was translated into Romanian by clinical psychologists and researchers, with a back-translation ensuring accuracy.

The study tested the four-factor model of the BPFSC-24. Normality assumptions were checked using Skewness and Kurtosis for univariate data and Mardia Skewness and Kurtosis for multivariate date. Reliability was assessed using ordinal Cronbach's alpha (Revelle, 2020). Measurement invariance was evaluated using the multi-group confirmatory factor analysis (MG-CFA) with Diagonally Weighted Least Squares (DWLS) as the estimator. Four steps were followed: configural equivalence (equal loadings and intercepts), and residual equivalence (equal loadings, intercepts, and residuals) (Putnick & Bornstein, 2016). Model fit was assessed using RMSEA, SRMR, CFI, and TLI, with literature based specific thresholds indicating acceptable fit (Petscher et al., 2013). Changes in model fit indices (ΔRMSEA, ΔSRMR, ΔCFI, ΔTL) were used to compare invariance models (Chen, 2007), and latent mean differences across sex and age groups were analysed.

## Results

All BPFSC items showed acceptable Skewness and Kurtosis values (-2 to 2), though Mardia Skewness and Kurtosis indicated a lack of multivariate normality ($p < .01$). Missing data was minimal, with less than 1% missing for all items. The initial model (24 items) had fit indices of $X^2 = 795.98$, df = 246, RMSEA = 0.06, SRMR = 0.070, CFI = 0.836, TLI = 0.929. After removing five items with low factor loadings, the revised model showed improved fit indices: $X^2 = 316.81$, df = 146, RMSEA = 0.043, SRMR = 0.057, CFI = 0.979, TLI = 0.974. Standardized loadings ranged from 0.46 to 0.73 across factors, with inter-factor correlations between 0.77 and 0.90. Details on factor loadings, latent covariances, and observed correlations can be found in Figure 1 and Table 1. Ordinal Cronbach's alpha values were: Affect Instability (0.69), Identity Problems (0.66), Negative Relationships (0.66), and Self-Harm (0.76), with an overall scale reliability of 0.88.

Measurement invariance was tested across groups using a 4-step approach (Putnick & Bornstein, 2016), showing excellent fit indices (RMSEA 0.032 – 0.044, SRMR = 0.059 – 0.068, CFI ≥ 0.974, TLI ≥ 0.973). Detailed fit indices are provided in Table 2. Welch's t-test revealed significant differences between sexes in affect instability ($t(389.04) = 3.97$, $p < .01$), identity problems ($t(405.60) = 5.59$, $p < .01$), and negative relationships ($t(409.9) = 3.58$, $p < .01$), with females scoring higher. No significant sex differences were found in self-harm. More details for latent mean differences and effect size can be seen in Table 3. Pearson correlation showed moderate correlations between BPD factors and affective problems (r =0.45 – 0.58), and anxiety problems (r = 0.32 – 0.50). More details can be seen in Figure 2.

Figure 1. *Factor loading and latent inter-factor correlations (polychoric)*

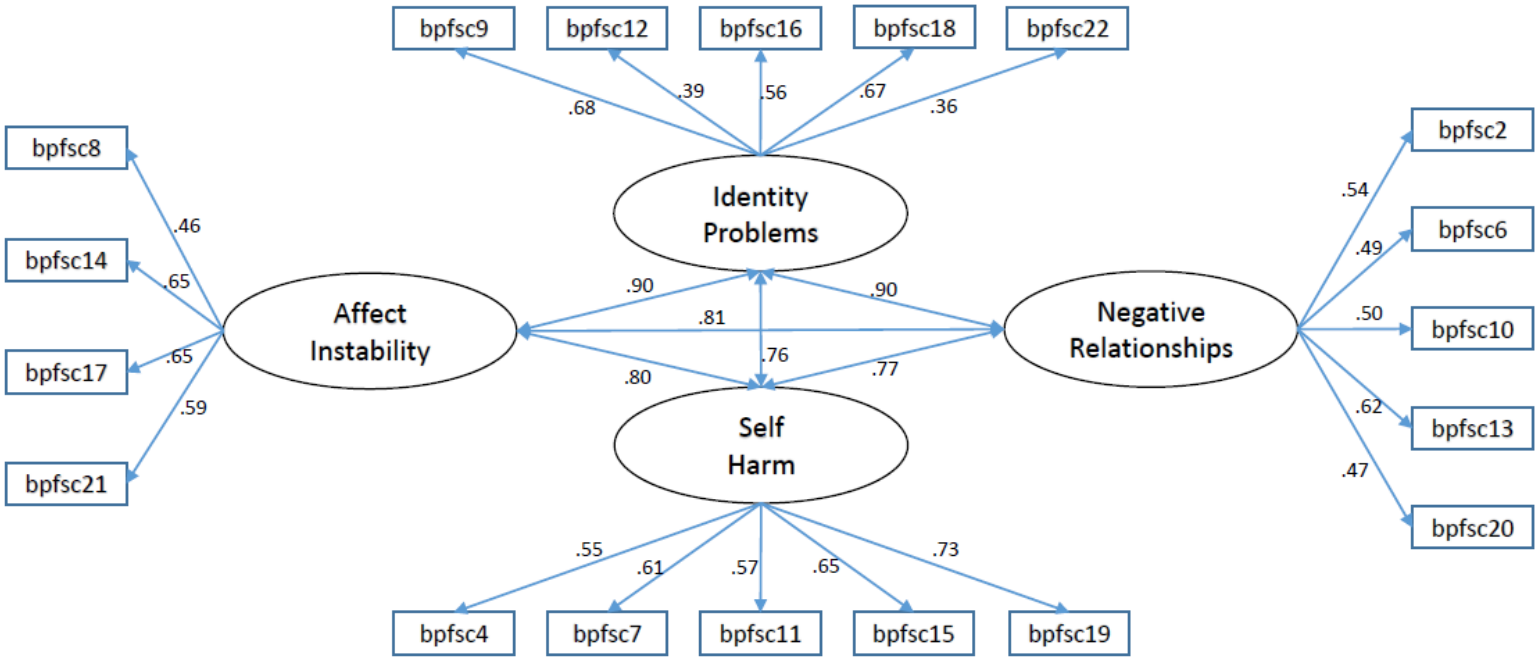


Table 1

*Means, standard deviations, and Pearson correlations with confidence intervals.*

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| 1. AFFECTIVE INSTABILITY | 10.52 | 3.45 | 1 | - | - | - |
| 2. IDENTITY PROBLEMS | 13.97 | 4.10 | .61** [.56, .66] | 1 | - | - |
| 3. NEGATIVE RELATIONS | 12.06 | 3.71 | .55** [.49, .60] | .61** [.56, .66] | 1 | - |
| 4. SELF-HARM | 11.36 | 3.92 | .58** [.53, .63] | .56** [.50, .61] | .56** [.51, .61] | 1 |

*Note. M* and *SD* are used to represent mean and standard deviation, respectively.
Values in square brackets indicate the 95% confidence interval for each correlation.
* indicates $p < .05$. ** indicates $p < .01$.

Table 2

*BPFSC fit indices for the configural, metric, scalar and residual models.*

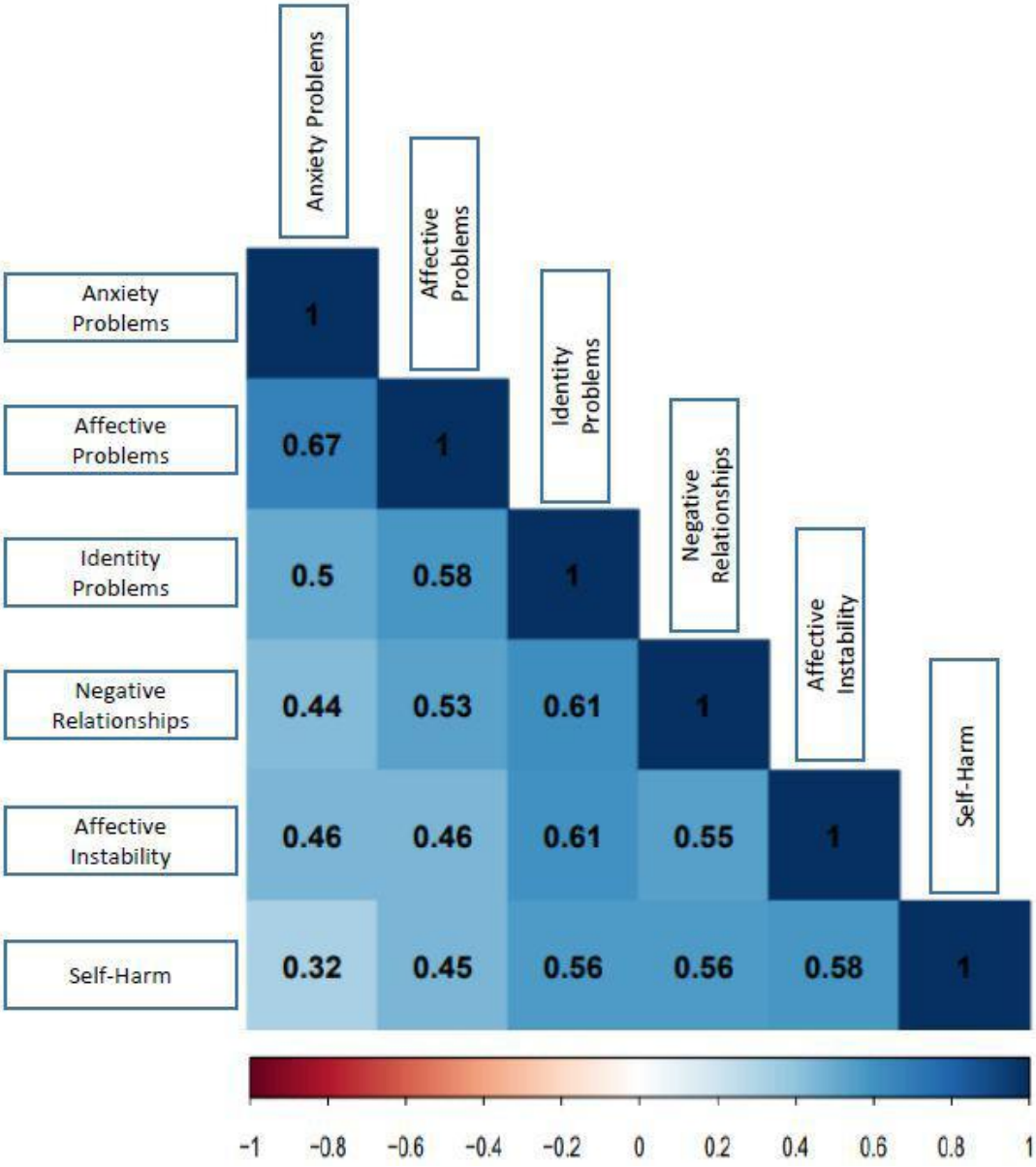
| Measurement Invariance | | $X^2$ | df | RMSEA | SRMR | CFI | TLI | $\Delta X^2$ | ΔRMSEA | ΔSRMR | ΔCFI | ΔTLI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Configural Model | Sex | 396.92 | 292 | 0.034 | 0.059 | 0.986 | 0.984 | - | - | - | - | - |
| | Age | 387.74 | 292 | 0.032 | 0.059 | 0.988 | 0.986 | - | - | - | - | - |
| Metric Model | Sex | 465.31 | 307 | 0.041 | 0.064 | 0979 | 0.977 | 68.39* | 0.007 | 0.005 | -0.007 | -0.007 |
| | Age | 492.44 | 307 | 0.036 | 0.062 | 0.984 | 0.982 | 41.69* | 0.004 | 0.003 | -0.004 | -0.004 |
| Scalar Model | Sex | 518.19 | 322 | 0.044 | 0.067 | 0.974 | 0.973 | 52.87* | 0.004 | 0.003 | -0.005 | -0.003 |
| | Age | 441.31 | 322 | 0.034 | 0.063 | 0.985 | 0.987 | 11.87 | -0.002 | 0.001 | 0.001 | 0.002 |
| Residual Model | Sex | 536.07 | 341 | 0.043 | 0.068 | 0.974 | 0.974 | 17.88 | -0.001 | 0.001 | 0 | 0.002 |
| | Age | 453.38 | 341 | 0.032 | 0.064 | 0.986 | 0.986 | 12.07 | -0.002 | 0.001 | 0.001 | -0.001 |

*Note.* df = degrees of freedom; RMSEA = root mean square error of approximation; SRMR = standardized root-mean-square residual; CFI = comparative fit index; TLI = Tucker−Lewis index; $\Delta X^2$ = change in $\chi^2$ from previous model; ΔRMSEA = change in root mean square error of approximation from previous model; ΔSRMR = change in standardized root-mean-square residual from previous model; ΔCFI = change in comparative fit index from previous model; ΔTLI = change in Tucker−Lewis index from previous model.
The sample for comprises 431 females and 203 males. Regarding age, 246 were ≤16 and 385 were ≥17.

*$p < 0.05$

Figure 2.

*Correlation matrix and estimated significance levels between BPD factors, Anxiety Problems and Affective Problems*



## Discussion

BPD has significant costs across various areas of life and typically emerges in adolescence (Chanen et al., 2020). Early identification and intervention are crucial to mitigate its impact. The BPFSC showed adequate reliability, with Cronbach's alphas for the subscales and for the total scale similar to previous studies (e.g., Carreiras et al., 2020). The final model, after removing five items, demonstrated improved fit indices. Females scored higher in affect instability, identity problems, and negative relationships than males, consistent with previous research (e.g., Haltigan & Vaillancourt, 2016). No significant age differences were found, supporting the validity of BPD in both early/ middle and late adolescence (Carreiras et al., 2020). BPD features correlated positively with affective and anxiety problems, supporting the instrument's convergent validity. Further studies should ponder pilot testing and refining the scale, as this study observed some item reduction to have the optimal model fit. Limitations include the community sample's lack of generalizability to clinical populations and the sex imbalance. Future studies should include clinical samples and investigate cross-cultural measurement invariance, as this could provide more insights into specific factors that contribute to BPD development. Longitudinal studies could also explore the stability and evolution of BPD features over time and provide significant information that can be used to tailor better prevention programs. In conclusion, the BPFSC-24 is a reliable tool for assessing BPD features in adolescents across age and sex. Early recognition and intervention are essential for better outcomes, and future studies should explore cross-cultural and longitudinal invariance.

### 3.3. Study 3. An examination of the association between childhood maltreatment and Borderline Personality Disorder features: the role of emotion regulation strategies

#### Introduction

Adolescence is a pivotal period characterized by susceptibility to emotional disorders, including personality disorders such as Borderline Personality Disorder (BPD) (Shiner, 2009). Healthy caregiver-child interactions are critical during this time for optimal emotional, and social development (Newham & Janca, 2014). Adverse experiences like abuse and maltreatment can disrupt normal development, increasing the risk of disorders like BPD, depression, and anxiety (Bick & Nelson, 2016; Infurna et al., 2016; Porter et al., 2020). Linehan's theory of the invalidating environment suggests that children in environments where their emotional experiences are neglected or invalidated are at higher risk for developing BPD (Linehan, 1993). This persistent invalidation leads to emotional dysregulation and identity confusion, particularly when combined with biological emotional sensitivity (Crowell et al., 2009). However, the concept of invalidation is measured inconsistently across studies, focusing mainly on various forms of childhood maltreatment, which are key characteristics of invalidating environments. Adolescence also sees the emergence or intensification of depression and anxiety, besides BPD. This might be influenced by neurobiological changes, such as prefrontal cortex development and hormonal fluctuations (Sheth et al., 2017). Psychological factors, including cognitive distortions and maladaptive emotion regulation strategies like rumination or suppression, further exacerbate these conditions (e.g., Yapan et al., 2022). Research consistently links childhood trauma with BPD symptoms, showing a high prevalence of abuse and neglect among those with BPD (Martin-Blanco et al., 2014). Emotional abuse and neglect have the most significant impact on BPD development (Porter et al., 2020), with similar links for both depression and anxiety. Emotion regulation is crucial in

understanding psychopathology, and is strongly related to childhood maltreatment (Dvir et al., 2014). Children also learn emotion regulation from their parents, and parents' poor emotion regulation correlates with difficulties in their children (Osborne et al., 2021). The process model of emotion regulation describes how individuals can modify their emotions by altering antecedents or outcomes (Gross, 1998b). Identifying specific emotion regulation strategies used by adolescents with BPD can help develop better and more efficient interventions (Schuppert et al., 2012). For instance, reliance on suppression or avoidance can lead to internalized turmoil and impulsive behavior, while overuse of cognitive reappraisal can dismiss valid emotion, particularly problematic for individuals with BPD (Ford & Troy, 2019)

Understanding the role of emotion regulation in mediating the relationship between environmental factors and disorders like BPD, depression, and anxiety is crucial. This study aims to investigate the relationship between childhood neglect and abuse, dysfunctional emotion regulation strategies, and BPD in adolescents. Additionally, it explores these relationships with other forms of psychopathology, like depression and anxiety symptoms in adolescents.

## Method

Six hundred and forty adolescents participated in this study. Most identified as middle class and the sample consisted of 68.23% females and 31.77% males with age ranging from 13 to 19 (M = 16.72, SD = 1.48). Participants were selected from different high schools across Romania, based on existing collaboration and school's interest. Members from the research team presented the study during regular school hours, addressing any student concerns. Interested students received questionnaires and were instructed to return them with signed parental consent.

Participation was optional, with a response rate of approximately 97%. Teachers were given access to study results, and students could enter a raffle for electronic devices or other items as incentive for participation. Participants completed a demographics questionnaire. Alongside, participants completed The Childhood Trauma Questionnaire – Short Form (CTQ-SF; Bernstein et al., 1994) to assess for childhood maltreatment such as emotional abuse, physical abuse, emotional neglect, physical neglect, and sexual abuse, also The Regulation of Emotion System Survey (RESS; De France & Hollenstein, 2017) to assess for emotion regulation strategies such as rumination, suppression, and distraction, The Borderline Personality Feature Scale for Children (BPFSC-24; Crick et al., 2005) to assess the BPD features, and The Youth Self-Report (YSR; Achenbach et al., 2011) to assess for depression and anxiety.

Data analysis was conducted using jamovi and a structural equation modeling (SEM) using SEMLj module was performed. Maximum Likelihood (ML) was used as estimator. The hypothesized model included three exogenous variables: childhood sexual abuse, physical abuse and neglect, and emotional abuse and neglect. Dysfunctional emotion regulation strategies (suppression, rumination, distraction) formed one latent construct. Three endogenous variables – Borderline features, depression, and anxiety served as outcomes. Fit indices such as chi-square tests, RMSEA, SRMR, CFI, and TLI were used to evaluate model fit, following the criteria of Hu & Bentler (1999) and recent literature recommendations (e.g., Petscher et al., 2013).

## Results

SEM analysis was evaluated for its fit to the data. SRMR was 0.047 and RMSEA was 0.072. Additionally, CFI was 0.951 and TLI was 0.925, suggesting that the SEM model adequately represents the relationships among the investigated variables. Beta coefficients between study variables can be seen in Figure 1.

The SEM revealed significant paths between childhood maltreatment and dysfunctional emotion regulation strategies, as well as between dysfunctional emotion regulation strategies and mental health outcomes. Emotional neglect and abuse significantly predicted dysfunctional emotion regulation strategies (beta = 0.923, $p < .001$), which in turn significantly predicted all three endogenous variables (for BPD, beta = 0.798, $p < .001$, for Depression, beta = 0.774, $p < .001$, and for Anxiety, beta = 0.664, $p < .001$). Emotional maltreatment was conceptualized as a latent construct encompassing emotional neglect and emotional abuse. The observed variables had robust $\beta$ values of 0.920 and 0.734, respectively ($p < .001$). Similarly, physical maltreatment was operationalized as a latent construct incorporating physical abuse and physical neglect. The observed variables have a $\beta$ value of 0.83 and 0.473, respectively ($p < .001$). Additionally, dysfunctional emotion regulation was assessed from the examination of rumination, suppression, and distraction. Rumination yielded $\beta = 0.589$ ($p < .001$), suppression yielded $\beta = 0.417$ ($p < .001$) and distraction yielded $\beta = 0.151$ ($p < .001$).

A Correlation Matrix (Table 1) was computed which demonstrated significant associations between measures of childhood maltreatment and psychopathology. All forms of childhood maltreatment were significantly correlated with BPD, in line with our hypothesis. Moreover, significant correlations were observed between dysfunctional emotion regulation strategies and both childhood maltreatment and psychopathology.

Figure 1.

*Beta coefficients between study variables.*

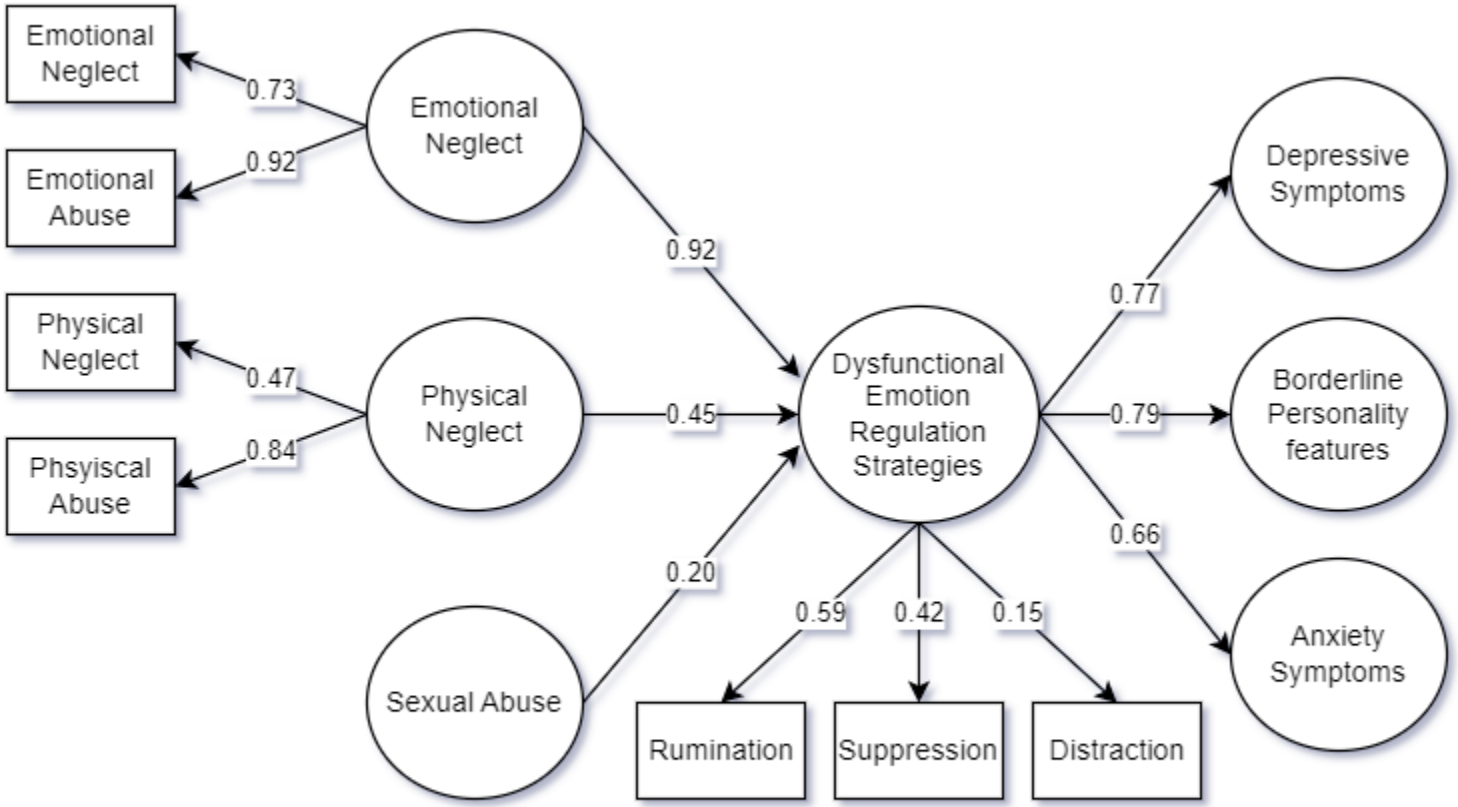


**Table 1**

*Correlation Matrix*

| | Borderline Features | Depression | Anxiety | Emotional Abuse | Emotional Neglect | Physical Abuse | Physical Neglect | Sexual Abuse | Rumination | Suppression | Distraction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Borderline Features | - | | | | | | | | | | |
| Depression | 0.599*** | - | | | | | | | | | |
| Anxiety | 0.514*** | 0.667*** | - | | | | | | | | |
| Emotional Abuse | 0.483*** | 0.504*** | .385*** | - | | | | | | | |
| Emotional Neglect | -0.358*** | -0.388*** | -.246*** | -.660*** | - | | | | | | |
| Physical Abuse | 0.279*** | 0.289*** | 0.194*** | .554*** | -.482*** | - | | | | | |
| Physical Neglect | 0.198*** | 0.104* | 0.013 | .257*** | -.340*** | .358*** | - | | | | |
| Sexual Abuse | 0.220*** | 0.136*** | 0.093* | .305*** | -.293*** | .566*** | .345*** | - | | | |
| Rumination | 0.491*** | 0.439*** | .462*** | .296*** | -.145*** | .123** | -.004 | .095* | - | | |
| Suppression | 0.313*** | 0.312*** | .226*** | .261*** | -.186*** | .070 | .015 | .080* | .319*** | - | |
| Distraction | 0.127** | 0.054 | .078 | .055 | .003 | .029 | -.026 | .028 | .187*** | .280*** | - |

*Note.* *** p < .001, ** p <. 005, * p < .05

## Discussion

This study investigated the relationships between childhood maltreatment, dysfunctional emotion regulation strategies, and mental health outcomes, focusing particularly on BPD. Findings underscored the mediating role of dysfunctional emotion regulation strategies, such as rumination, suppression, and distraction, in linking childhood maltreatment to BPD, depression, and anxiety in adolescence. The proposed structural equation model demonstrated robust fit indices. Specifically, emotional neglect and abuse significantly predicted dysfunctional emtoion regulation strategies, which, in turn, predicted heightened BPD features, depression, and anxiety. These findings highlight the critical need to address maladaptive emotion regulation early in individuals with histories of childhood emotional maltreatment to mitigate the risk for more severe outcomes. Distinct patterns emerged regarding specific emotion regulation strategies: while neglect and abuse correlated significantly with rumination and suppression, no such association was found with distraction. This nuanced understanding suggests that distraction, unlike rumination or suppression, may serve as a temporary coping mechanism. This study also integrated rumination, suppression, and distraction into a single variable in the analyzed model. This approach aimed to reduce statistical complexity and enhance interpretability while ackowledging the co-occurance and interaction of different emotion regulation strategies in response to varying emotional challenges. Limitations included the use of a convenience sample from community-based, self-report students, which may limit generalizability to broader populations. Future studies should consider longitudinal designs and diverse samples, including clinical populations, to validate these findings across different contexts and developmental stages. In conclusion, the study advances the understanding of complex pathways linking childhood adversity to psychopathology, emphasizing dysfunctional emotion regulation as a central mechanism.

## 3.4. Study 4. Borderline Personality Disorder: an ecological study of affect and emotion regulation in everyday life in a clinical sample of adults

### Introduction

Borderline Personality Disorder (BPD) is a complex mental health condition characterized by profound instability in affect, self-image, interpersonal relationships, and behavioral dysregulation, often leading to significant impairment (/Lieb et al., 2004). Individuals with BPD frequently experience intense emotional distress and struggle with effective emotion regulation strategies, exacerbating their symptoms and reducing their overall quality of life (Bohus et al., 2021). As a central component to BPD, emotional dysregulation is characterized by heightened emotional reactivity and difficulty returning to emotional baseline after arousal. Research underscored that individuals with BPD exhibit greater emotional instability compared to control subjects, manifesting as intense mood variability and heightened emotional intensity (Henry et al., 2001). Emotional dysregulation is closely intertwined with maladaptive behaviors, such as non-suicidal self-injury, substance abuse, and risky sexual behaviors, which individuals employ as strategies to manage overwhelming emotional distress (e.g., Chapman et al., 2017). These behaviors temporarily alleviate negative affect but perpetuate a cycle of dysfunction and suffering (e.g., McKenzie & Gross, 2014). Studies highlight the importance of understanding how emotion regulation strategies contribute to BPD symptomatology. Individuals with BPD tend to employ less effective strategies like suppression, rumination, and avoidance, while strategies such as acceptance and reappraisal, which are considered to be more adaptive, are underutilized (Bud et al., 2023; Daros & Williams, 2019). While most research has focused on emotion regulation in controlled laboratory settings, the dynamic nature of affective instability in BPD necessitates a shift towards real-world assessments. Ecological momentary assessment (EMA) offers a

promising approach by capturing real-time fluctuations in affect, emotion regulation strategies, and maladaptive behaviors in natural settings (Davanzo et al., 2023). Unlike retrospective methods, often prone to recall biases, EMA provides a more detailed understanding of how individuals with BPD experience and regulate emotions in daily life, offering insights into personalized interventions tailored to individual needs.

In this study, we aim to explore the intricate relationships between emotion regulation strategies and affect using EMA. By examining real-time data, we plan to investigate the concurrent and lagged relationships between affect and emotion regulation strategies, as well as understand how these strategies influence individuals' perceived success and difficulty in managing daily life changes.

## Method

Final sample of participants included 19 individuals clinically diagnosed with BPD, with an average age of 22.94 years and predominantly female (79%). All participants resided in urban areas and identified as Caucasian. The study adhered to ethical guidelines, ensuring anonymity and voluntary participation in accordance with the Declaration of Helsinki. The study had three phases. Initially, 208 participants completed screening questionnaires covering demographics, the Personality Assessment Inventory – Borderline Scale (PAI-BOR), and the Borderline Symptom List-23 (BSL-23). Phase two involved clinical assessment using the Structured Clinical Interview for DSM-5 (SCID-5), identifying 21 participants meeting the clinical BPD criteria. In the final phase, participants installed the PIEL Survey app for Ecological Momentary Assessment (EMA), receiving daily prompts over 14 days to report emotional experiences, employed emotional

regulation strategies, and assess their perceived effectiveness. The EMA protocol included seven daily notifications sent at quasi-random intervals, prompting participants to rate the intensity of 10 emotions and describe preceding event and regulation strategies used. Emotion regulation strategies assessed included suppression, distraction, acceptance, reappraisal, rumination, interpersonal strategies, and avoidance. Participants also rated the perceived difficulty and efficiency of these strategies on a scale from 0 to 10.

Data analysis employed mixed-effects models to explore concurrent and lagged relationships between emotion regulation strategies and both positive and negative affect. These models accounted for daily fluctuations and individual differences, elucidating how specific strategies influenced affect in real-time and over time. The choice of mixed-effects models was considered appropriate given the nested structure of the data, with repeated measures nested within days and individuals.

## Results

The study examined real-time relationships between emotion regulation strategies, affect and the perceived difficulty and effectiveness of these strategies in individuals with BPD. Participants completed 1128 out of 1862 possible EMA entries, a 60.58% response rate. Looking at the concurrent relationships between emotion regulation strategies and affect, the study found that rumination had the strongest positive association with increased negative affect, followed by interpersonal emotion regulation and distraction. Conversely, acceptance was negatively associated with negative affect, while suppression showed no significant association. For positive affect, acceptance increased it, while distraction and interpersonal strategies decreased it. Most of

the variation in affect and perception of strategies was within-subject. Table 1 summarizes the concurrent relationships between emotion regulation strategies and affect, while Table 2 summarizes their perceived difficulty and effectiveness.

**Table 1**

*Concurrent relationships between emotion regulation strategies and affect*

| | Negative Affect | | | | Positive Affect | | |
|---|---|---|---|---|---|---|---|
| Strategy | Estimates | C.I. | p | Strategy | Estimates | C.I. | p |
| Rumination | 0.82 | 0.58 - 1.05 | <.001* | Rumination | -0.10 | -0.23 – 0.03 | .133 |
| Interpersonal | 0.81 | 0.60 - 1.02 | <.001* | Interpersonal | -0.19 | -0.30 - -0.07 | .001** |
| Distraction | 0.51 | 0.31 - 0.71 | <.001* | Distraction | -0.19 | -0.29 - -0.08 | .001** |
| Avoidance | 0.46 | 0.20 - 0.73 | .001** | Avoidance | -0.05 | -0.20 – 0.09 | .461 |
| Reappraisal | 0.33 | 0.11 - 0.56 | .003** | Reappraisal | 0.01 | -.011 – 0.13 | .872 |
| Acceptance | -0.26 | -0.44 - -0.07 | .007** | Acceptance | 0.25 | 0.16 – 0.35 | <.001* |
| Suppression | 0.18 | -0.05 – 0.42 | .127 | Suppression | -0.11 | -0.23 – 0.02 | .093 |

Note. * significant at p <.001, ** significant at p <.01

**Table 2**

*Concurrent relationships between emotion regulation strategies and their perceived difficulty and effectiveness*

| Perceived Difficulty | | | | Perceived Effectiveness | | | |
|---|---|---|---|---|---|---|---|
| Strategy | Estimates | C.I. | p | Strategy | Estimates | C.I. | p |
| Rumination | 0.25 | 0.19 – 0.31 | <.001* | Rumination | -0.09 | -0.15 - -0.03 | .004** |
| Interpersonal | 0.20 | 0.15 – 0.26 | <.001* | Interpersonal | 0.01 | -0.04 – 0.07 | .615 |
| Distraction | 0.18 | 0.13 – 0.24 | <.001* | Distraction | 0.02 | -0.03 – 0.07 | .437 |
| Avoidance | 0.13 | 0.06 – 0.20 | <.001* | Avoidance | -0.02 | -0.09 – 0.04 | 0.519 |
| Reappraisal | 0.02 | -0.04 – 0.08 | .477 | Reappraisal | 0.13 | 0.08 – 0.19 | <.001* |
| Acceptance | 0.03 | -0.02 – 0.08 | .207 | Acceptance | 0.33 | 0.29 – 0.38 | <.001* |
| Suppression | 0.06 | 0.00 – 0.13 | .053 | Suppression | -0.01 | -0.07 – 0.05 | 0.766 |

Note. * significant at p <.001, ** significant at p <.01.

Lagged effects of emotion regulation strategies on affect showed that distraction and rumination were linked to increases in negative affect at subsequent time points, while other strategies, including suppression, acceptance, reappraisal, interpersonal strategies and avoidance showed no significant lagged effects. For positive affect, avoidance was significantly associated with decreases at subsequent time points, while other strategies showed no significant lagged associations. Table 3 summarizes the lagged relationships between emotion regulation strategies and affect, while Table 4 summarizes their perceived difficulty and effectiveness.

**Table 3**

*Lagged relationships between emotion regulation strategies and affect*

| | Negative Affect | | | | Positive Affect | | |
|---|---|---|---|---|---|---|---|
| Strategy | Estimates | C.I. | p | Strategy | Estimates | C.I. | p |
| Rumination | 0.82 | 0.46 – 1.17 | <.001* | Rumination | 0.07 | -0.10 – 0.24 | .418 |
| Interpersonal | -0.02 | -0.33 – 0.29 | .914 | Interpersonal | 0.00 | -0.15 – 0.15 | .973 |
| Distraction | 0.39 | 0.11 – 0.68 | .007** | Distraction | -0.04 | -0.18 – 0.09 | .524 |
| Avoidance | 0.06 | -0.33 – 0.46 | .751 | Avoidance | -0.25 | -0.44 – 0.06 | .010 |
| Reappraisal | -0.04 | -.0.35 – 0.27 | .807 | Reappraisal | -0.03 | -0.18 – 0.12 | .702 |
| Acceptance | -0.19 | -0.45 – 0.07 | .153 | Acceptance | 0.06 | -0.07 – 0.19 | .362 |
| Suppression | -0.01 | -0.35 – 0.34 | 0.973 | Suppression | 0.06 | -.011 – 0.22 | .505 |

Note. Lagged relationships between emotion regulation strategies at t0 and negative and positive affect at t1.

* significant at p <.001, ** significant at p <.01.

**Table 4**

*Lagged relationships between emotion regulation strategies and their perceived difficulty and effectiveness*

| | Perceived Difficulty | | | | Perceived Effectiveness | | |
|---|---|---|---|---|---|---|---|
| Strategy | Estimates | C.I. | p | Strategy | Estimates | C.I. | p |
| Rumination | 0.08 | -0.01 – 0.18 | .086 | Rumination | 0.01 | -0.08 – 0.10 | .849 |
| Interpersonal | -0.01 | -0.09 – 0.07 | .798 | Interpersonal | -0.06 | -0.14 – 0.02 | .121 |
| Distraction | 0.12 | 0.04 – 0.20 | .003* | Distraction | 0.00 | -0.07 – 0.07 | .928 |
| Avoidance | 0.03 | -0.08 – 0.13 | .623 | Avoidance | -0.04 | -0.14 – 0.06 | .392 |

| Perceived Difficulty | | | | Perceived Effectiveness | | | |
|---|---|---|---|---|---|---|---|
| Strategy | Estimates | C.I. | p | Strategy | Estimates | C.I. | p |
| Reappraisal | -0.05 | -.013 – 0.04 | .284 | Reappraisal | -0.02 | -0.10 – 0.05 | .541 |
| Acceptance | -0.01 | -0.08 – 0.06 | .086 | Acceptance | 0.09 | 0.03 – 0.16 | .007* |
| Suppression | 0.02 | -0.07 – 0.11 | .664 | Suppression | 0.00 | -0.09 – 0.08 | .928 |

Note. Lagged relationships between emotion regulation strategies at t0 and perceived difficulty and effectives at t1.

* significant at p <.001, ** significant at p <.01

The variance among the mixed level analysis revealed that the highest amount of variation for negative and positive affect, perceived effectiveness, and perceived difficulty was at within-subject level, similar to the concurrent relationships analysis. For negative affect, 42.39% of the variation was within-subject, 41.85% was between-subjects, and 15.76% was between days. For positive affect, 42.86% of the variation was within-subject, 42.86% was between-subject, and 14.29% was between days. For perceived effectiveness 71.43% of the variation was within-subjects, 14.29% was between-subjects, and 14.29% was between days. For perceived difficulty, 60% of variation was within-subject, 25% was between-subject, and 15% was between days.

## Discussion

The discussion of the study's findings highlights several key points regarding the relationships between emotion regulation strategies and affect in individuals with BPD. Rumination was strongly associated with increased negative affect, supporting literature that

suggests rumination exacerbates negative emotions by prolonging distressing thoughts (Selby & Joiner, 2009). Interpersonal emotion regulation and distraction were also linked to higher negative affect, possibly due to unmet expectations in social interactions and the short-term relief provided by distraction without addressing underlying emotional distress. Conversely, acceptance was found to reduce negative affect, aligning with previous studies that emphasize its role in managing negative emotions without judgement. Interestingly, reappraisal, typically seen as adaptive, was associated with increased negative affect, suggesting its effectiveness may vary with the context and intensity of emotions. Regarding positive affect, acceptance was again beneficial, enhancing positive emotions. In contrast, distraction and interpersonal emotion regulation were linked to decreased positive affect, potentially detracting from positive experiences. Suppression, rumination, avoidance, and reappraisal showed no significant associations with positive affect, indicating more complex factors at play. The study also explored the perceived effectiveness and difficulty of different emotion regulation strategies. Acceptance and reappraisal were seen as effective, while rumination was least effective and most difficult to manage. This highlights the cognitive load involved in strategies like rumination and distraction, which require sustained mental effort. Examining lagged relationships, distraction and rumination were linked to increased negative affect over time, confirming their detrimental long-term effects. Avoidance was the only strategy significantly associated with changes in positive affect, suggesting a potential area for further research. Despite significant insights, the study has some limitations, including a small sample size and lack of contextual factors. Future studies should include larger samples, consider contextual factors variables, and explore the impact of comorbid conditions. Investigating the interaction effects between different emotion regulation strategies could also provide valuable insights. In conclusion, this study advances our understanding of the concurrent and lagged

relationships between emotion regulation strategies and affect in individuals with BPD. Key findings indicate that rumination and distraction are linked to increased negative affect, while acceptance reduces negative affect and enhances positive affect. The perceived effectiveness and difficulty of these strategies suggest a complex interaction that warrants further exploration.

## CHAPTER IV: GENERAL CONCLUSIONS AND IMPLICATIONS

BPD is characterized by emotional dysregulation, a key factor in its etiology and maintenance. This thesis investigated the relationships between emotion regulation and BPD through four studies. The first study, a meta-analysis, confirms that BPD is associated with lower adaptive and higher maladaptive emotion regulation strategies. The second study evaluates a novel scale to measure BPD features in adolescents (BPFSC), demonstrating through measurement invariance across age and sex its reliability and validity. The third study explores the relationships between childhood maltreatment, emotion regulation, and BPD, highlighting how maladaptive strategies exacerbate BPD symptoms. The fourth study uses ecological momentary assessment to examine the real-time contemporaneous and lagged dynamics of affect, and regulation strategies in daily life. The thesis had significant theoretical, conceptual, and clinical implications. Theoretically, it advanced our understanding of emotion regulation strategies as a crucial factor in BPD. Studies 1 and 3 showed that emotion regulation strategies can influence BPD symptoms, suggesting that difficulties in managing emotions may contribute to the disorder. Methodologically, it employed robust analyses like meta-analysis and structural equation modelling, and provided reliable assessment tools, such as the validation of the BPFSC for

adolescents in Romania. Clinically, the findings highlight the importance of emotion regulation skills training in BPD treatment, focusing on early intervention, and using real-time data to tailor the intervention. Despite these advancements, several limitations of the thesis include sample representativeness, and sex imbalance. Future research should include diverse populations, balance sex representation, and use longitudinal and objective assessment tools. Nonetheless, this research project underscores the importance of targeting emotion regulation in BPD interventions.

The main conclusions that can be drawn from the thesis are these:

(1) Emotion regulation strategies are significantly related to BPD symptoms. What are usually called adaptive strategies (e.g., reappraisal, acceptance, mindfulness) have a negative correlation with BPD symptoms, while the usually called maladaptive strategies (e.g., rumination, suppression, distraction, avoidance) have a positive correlation with BPD symptoms. This means that individuals with BPD symptoms who rely more on adaptive emotion regulation strategies tend to experience fewer or less intense BPD symptoms, while individuals who rely on maladaptive emotion regulation strategies tend to experience more or more intense BPD symptoms.

(2) BPD is a valid diagnosis in adolescents and having reliable instruments is crucial for early detection and intervention. As such, the Borderline Personality Feature Scale for Children (BPFSC) is a reliable instrument that shows measurement invariance to the strictest levels across age and sex in Romanian adolescents. BPFSC can be used to accurately assess BPD symptoms in adolescence, to track changes in BPD symptoms over time, or to compare BPD symptoms to different adolescent populations, making it a valuable tool for clinicians and researchers working with adolescents suspected of having BPD features in Romania.

(3) Early adverse childhood experiences, such as sexual, physical, and emotional abuse, or physical, and emotional neglect can potentially contribute to BPD and other mental health issues, such as depression or anxiety through the lens of maladaptive emotion regulation strategies, such as rumination, suppression, or distraction. This conclusion highlights the need for helping individuals with BPD develop context-appropriate emotion regulation skills.

(4) BPD is a complex disorder with specific intertwining between context, personal, and social variables. Individuals with clinical features BPD show both immediate and delayed effects between positive and negative emotions and emotion regulation strategies. Adaptive emotion regulation strategies lower the intense emotional experience and impact impulsive behaviors by reducing them, while maladaptive emotion regulation strategies seem to heighten the negative emotional experience.

REFERENCES

Achenbach, T. M., Dumenci, L., & Rescorla, L. A. (2001). Ratings of relations between DSM-IV diagnostic categories and items of the CBCL/6-18, TRF, and YSR. *Burlington, VT: University of Vermont*, 1-9.

American Psychiatric Association. (1980) Diagnostic and statistical manual of mental disorders (3rd Edition) (DSM-III). American Psychiatric Association.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Bateman, A. W., & Fonagy, P. (2004). Mentalization-Based Treatment of BPD. *Journal of Personality Disorders, 18*(1), 36-51. https://doi.org/10.1521/pedi.18.1.36.32772

Beblo, T., Fernando, S., Kamper, P., Griepenstroh, J., Aschenbrenner, S., Pastuszak, A., Schlosser, N., & Driessen, M. (2013). Increased attempts to suppress negative and positive emotions in Borderline Personality Disorder. *Psychiatry Research, 210*(2), 505-509. https://doi.org/10.1016/j.psychres.2013.06.036

Borenstein, M., Hedges, L., Higgins, J., & Rothstein, H. (2005). Comprehensive meta analysis (Version 2) [Computer software]. Biostat. https://www.meta-analysis.com

Cannon, W. B. (1927). The James-Lange Theory of Emotions: A Critical Examination and an Alternative Theory. *The American Journal of Psychology, 39*(1/4), 106. https://doi.org/10.2307/1415404

Bud, S., Nechita, D., & Szentagotai Tatar, A. (2023). Emotion regulation strategies in borderline personality disorder: a meta-analysis. *Clinical Psychologist, 27*(2), 142-159. https://doi.org/10.1080/13284207.2022.2152668

Calvo, N., Marin, J. L., Vidal, R., Sharp, C., Duque, J. D., Ramos-Quiroga, J.-A., & Ferrer, M. (2023). Discrimination of Borderline Personality Disorder (BPD) and Attention-Deficit/Hyperactivity Disorder (ADHD) in adolescents: Spanish version of the Borderline Personality Features Scale for Children-11 Self-Report (BPFSC-11) Preliminary results. *Borderline Personality Disorder and Emotion Dysregulation, 10*(1). https://doi.org/10.1186/s40479-023-00223-2

Carpenter, R. W., & Trull, T. J. (2013). Components of Emotion Dysregulation in Borderline Personality Disorder: A Review. *Current Psychiatry Reports, 15*(1). https://doi.org/10.1007/s11920-012-0335-2

Carreiras, D., Loureiro, M., Cunha, M., Sharp, C., & Castilho, P. (2020). Validation of the Borderline Personality Features Scale for Children (BPFS-C) and for Parents (BPFS-P) for the Portuguese Population. *Journal of Child and Family Studies, 29*(11), 3265-3275. https://doi.org/10.1007/s10826-020-01800-7

Chanen, A. M., & Kaess, M. (2012). Developmental Pathways to Borderline Personality Disorder. *Current Psychiatry Reports, 14*(1), 45-53. https://doi.org/10.1007/s11920-011-0242-y

Chanen, A. M., Nicol, K., Betts, J. K., & Thompson, K. N. (2020). Diagnosis and Treatment of Borderline Personality Disorder in Young People. *Current Psychiatry Reports, 22*(5). https://doi.org/10.1007/s11920-020-01144-5

Chapman, A. L., Rosenthal, M. Z., Dixon-Gordon, K. L., Turner, B. J., & Kuppens, P. (2017). Borderline Personality Disorder and the Effects of Instructed Emotional Avoidance or Acceptance in Daily Life. *Journal of Personality Disorders, 31*(4), 483-502. https://doi.org/10.1521/pedi_2016_30_264

Chen, F. F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(3), 464-504. https://doi.org/10.1080/10705510701301834

Crick, N. R., Murray-Close, D., Woods, K. (2005). Borderline personality features in childhood: A short-term longitudinal study. *Development and psychopathology, 17*(04), 1051–1070. https://doi.org/10.1017/S0954579405050492

Crowell, S. E., Beauchaine, T. P., & Linehan, M. M. (2009). A biosocial developmental model of borderline personality: Elaborating and extending linehan's theory. *Psychological Bulletin, 135*(3), 495-510. https://doi.org/10.1037/a0015616

Daros, A. R., & Williams, G. E. (2019). A Meta-analysis and Systematic Review of Emotion-Regulation Strategies in Borderline Personality Disorder. *Harvard Review of Psychiatry, 27*(4), 217-232. https://doi.org/10.1097/hrp.0000000000000212

Dlouhy, M. (2014). Mental health policy in Eastern Europe: a comparative analysis of seven mental health systems. *BMC Health Services Research, 14*(1). https://doi.org/10.1186/1472-6963-14-42

Duval, S., & Tweedie, R. (2000). Trim and Fill: A Simple Funnel-Plot-Based Method of Testing and Adjusting for Publication Bias in Meta-Analysis. *Biometrics, 56*(2), 455-463. https://doi.org/10.1111/j.0006-341x.2000.00455.x

Ensink, K., Bégin, M., Kotiuga, J., Sharp, C., & Normandin, L. (2020). Psychometric Properties of the French Version of the Borderline Personality Features Scale for Children and Adolescents. *Adolescent Psychiatry, 10*(1), 48-58. https://doi.org/10.2174/2210676609666190820145256

Frías, Á., Baltasar, I., & Birmaher, B. (2016). Comorbidity between bipolar disorder and borderline personality disorder: Prevalence, explanatory theories, and clinical impact. *Journal of Affective Disorders, 202*, 210-219. https://doi.org/10.1016/j.jad.2016.05.048

Gratz, K. L., & Roemer, L. (2004). Multidimensional Assessment of Emotion Regulation and Dysregulation: Development, Factor Structure, and Initial Validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26*(1), 41-54. https://doi.org/10.1023/b:joba.0000007455.08539.94

Gratz, K. L., Rosenthal, M. Z., Tull, M. T., Lejuez, C. W., & Gunderson, J. G. (2006). An experimental investigation of emotion dysregulation in borderline personality disorder. *Journal of Abnormal Psychology, 115*(4), 850-855. https://doi.org/10.1037/0021-843x.115.4.850

Gross, J. J. (1998). The Emerging Field of Emotion Regulation: An Integrative Review. *Review of General Psychology, 2*(3), 271-299. https://doi.org/10.1037/1089-2680.2.3.271

Guenole, N., & Brown, A. (2014). The consequences of ignoring measurement invariance for path coefficients in structural equation models. *Frontiers in Psychology, 5*. https://doi.org/10.3389/fpsyg.2014.00980

Haas, B. W., & Miller, J. D. (2015). Borderline personality traits and brain activity during emotional perspective taking. *Personality Disorders: Theory, Research, and Treatment, 6*(4), 315-320. https://doi.org/10.1037/per0000130

Haltigan, J. D., & Vaillancourt, T. (2016). Identifying Trajectories of Borderline Personality Features in Adolescence: *Antecedent and Interactive Risk Factors. The Canadian Journal of Psychiatry, 61*(3), 166-175. https://doi.org/10.1177/0706743715625953

Higgins, J. P., Thompson, S. G., Deeks, J. J., & Altman, D. G. (2003). Measuring inconsistency in meta-analyses. *BMJ: British Medical Journal, 327*(7414), 557–560. https://doi.org/10.1136/bmj.327.7414.557

James, W. (1884). What is an Emotion? *Mind, 9*(34), 188–205. https://doi.org/10.1093/mind/os-ix.34.188

Kellogg, S. H., & Young, J. E. (2006). Schema therapy for borderline personality disorder. *Journal of Clinical Psychology, 62*(4), 445-458. https://doi.org/10.1002/jclp.20240

Kuo, J. R., Fitzpatrick, S., Krantz, L. H., & Zeifman, R. J. (2018). How do you choose and how well does it work?: the selection and effectiveness of emotion regulation strategies and their relationship with borderline personality disorder feature severity. *Cognition and Emotion, 32*(3), 632-640. https://doi.org/10.1080/02699931.2017.1330254

Laurenssen, E. M. P., Hutsebaut, J., Feenstra, D. J., Van Busschbach, J. J., & Luyten, P. (2013). Diagnosis of personality disorders in adolescents: a study among psychologists. *Child and Adolescent Psychiatry and Mental Health*, *7*(1), 3. https://doi.org/10.1186/1753-2000-7-3

Lieb, K., Zanarini, M. C., Schmahl, C., Linehan, M. M., & Bohus, M. (2004). Borderline personality disorder. *The Lancet*, *364*(9432), 453-461. https://doi.org/10.1016/s0140-6736(04)16770-6

Linehan, M. M. (1987). Dialectical behavior therapy for borderline personality disorder: Theory and Method. *Bulletin of the Menninger Clinic*, *51*(3), 261. https://doi.org/10.1111/j.1600-0447.1994.tb05820.x

Linehan, M. M. (1993). Dialectical Behavior Therapy for Treatment of Borderline Personality Disorder: Implications for the Treatment of Substance Abuse. PsycEXTRA Dataset. https://doi.org/10.1037/e495912006-012

Morey L. C. (1991). The personality assessment inventory professional manual. Psychological Assessment Resources.

NIH. (2018). Quality assessment tool for observational cohort and cross-sectional studies. Retrieved from: https://www.nhlbi.nih.gov/healthtopics/study-quality-assessment-tools

Petscher Y., Schatschneider C., Compton D. L. (2013). Applied quantitative analysis in education and the social sciences. Routledge.

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental Review, 41*, 71-90. https://doi.org/10.1016/j.dr.2016.06.004

Revelle, W. (2007). psych: Procedures for Psychological, Psychometric, and Personality Research. CRAN: Contributed Packages. https://doi.org/10.32614/cran.package.psych

Rosenthal, M. Z., Gratz, K. L., Kosson, D. S., Cheavens, J. S., Lejuez, C. W., & Lynch, T. R. (2008). Borderline personality disorder and emotional responding: A review of the research literature. *Clinical Psychology Review, 28*(1), 75-91. https://doi.org/10.1016/j.cpr.2007.04.001

Santangelo, P., Bohus, M., & Ebner-Priemer, U. W. (2014). Ecological Momentary Assessment in Borderline Personality Disorder: A Review of Recent Findings and Methodological Challenges. *Journal of Personality Disorders, 28*(4), 555-576. https://doi.org/10.1521/pedi_2012_26_067

Sauer, C., Sheppes, G., Lackner, H. K., Arens, E. A., Tarrasch, R., & Barnow, S. (2016). Emotion regulation choice in female patients with borderline personality disorder: Findings from self-reports and experimental measures. *Psychiatry Research, 242*, 375-384. https://doi.org/10.1016/j.psychres.2016.04.113

Schachter, S., & Singer, J. (1962). Cognitive, social, and physiological determinants of emotional state. *Psychological Review, 69*(5), 379-399. https://doi.org/10.1037/h0046234

Sharp, C., Mosko, O., Chang, B., & Ha, C. (2011). The cross-informant concordance and concurrent validity of the Borderline Personality Features Scale for Children in a community

sample of boys. Clinical Child Psychology and Psychiatry, 16(3), 335-349. https://doi.org/10.1177/1359104510366279

Sharp, C., Steinberg, L., Temple, J., & Newlin, E. (2014). An 11-item measure to assess borderline traits in adolescents: Refinement of the BPFSC using IRT. *Personality Disorders: Theory, Research, and Treatment, 5*(1), 70-78. https://doi.org/10.1037/per0000057

Sharp, C., & Fonagy, P. (2015). Practitioner Review: Borderline personality disorder in adolescence - recent conceptualization, intervention, and implications for clinical practice. *Journal of Child Psychology and Psychiatry, 56*(12), 1266-1288. https://doi.org/10.1111/jcpp.12449

Selby, E. A., & Joiner, T. E., Jr. (2009). Cascades of Emotion: The Emergence of Borderline Personality Disorder from Emotional and Behavioral Dysregulation. Review of General Psychology, 13(3), 219-229. https://doi.org/10.1037/a0015687

van Asselt, A. D. I., Dirksen, C. D., Arntz, A., & Severens, J. L. (2007). The cost of borderline personality disorder: societal cost of illness in BPD-patients. *European Psychiatry, 22*(6), 354-361. https://doi.org/10.1016/j.eurpsy.2007.04.001

Witt, S. H., Streit, F., Jungkunz, M., Frank, J., Awasthi, S., Reinbold, C. S., Treutlein, J., Degenhardt, F., Forstner, A. J., Heilmann-Heimbach, S., Dietl, L., Schwarze, C. E., Schendel, D., Strohmaier, J., Abdellaoui, A., Adolfsson, R., Air, T. M., Akil, H., Alda, M., … Schizophrenia Working Group of the Psychiatric Genomics Consortium. (2017). Genome-wide association study of borderline personality disorder reveals genetic overlap with bipolar disorder, major depression and schizophrenia. *Translational Psychiatry, 7*(6), e1155-e1155. https://doi.org/10.1038/tp.2017.115

Wupperman, P., Fickling, M., Klemanski, D. H., Berking, M., & Whitman, J. B. (2013). Borderline Personality Features and Harmful Dysregulated Behavior: The Mediational Effect of Mindfulness. *Journal of Clinical Psychology*, *69*(9), 903-911. https://doi.org/10.1002/jclp.21969