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The Urge to Fill the Void: Emptiness, Impulsivity, and Mentalizing in the Daily Life of Individuals With Borderline Personality Disorder

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Emptiness is central to borderline personality disorder (BPD), significantly impacts quality of life, and is associated with increased impulsivity. Nevertheless, studies of emptiness in daily life are scarce and little is known about factors that may mitigate the emptiness–impulsivity association in BPD, such as mentalizing (Mz), the capacity to understand mental states. The current study examined whether emptiness predicts impulsive behaviors in daily life and whether this association is moderated by disorder or by Mz. The study utilized data from an existing data set (Berenson et al., 2011) of 153 participants (57 with a BPD diagnosis, 43 with avoidant personality disorder [APD], and 53 serving as healthy controls [HC]). Following a baseline lab assessment of Mz (Baron-Cohen et al., 2001), participants completed 3 weeks of ecological momentary assessment (EMA) with five daily prompts, including self-reported measures of emptiness and impulsivity. EMA data were analyzed using multilevel modeling. Both the BPD and APD groups reported higher levels of momentary emptiness compared to the HC group. The BPD group exhibited higher levels of impulsivity in daily life compared to the HC and APD groups. There were no group differences in Mz. Interestingly, emptiness significantly predicted impulsivity and was positively associated with impulsivity in both the BPD and HC groups but not in the APD group. Finally, Mz did not moderate the emptiness–impulsivity association. Emptiness seems central to impulsivity in daily life. More ecological and emptiness-specific measures of Mz may have better potential to mitigate the negative consequences of emptiness.

Keywords: borderline personality disorder, emptiness, mentalizing, impulsivity, ecological momentary assessments

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Borderline personality disorder (BPD) is a severe disorder characterized by pervasive instability of self-concept, relationships, emotions, and behavior (American Psychiatric Association [APA], 2013). It is a chronic condition with an estimated lifetime prevalence rate of 0.7%–2.7% in the general population, 11%–12% in psychiatric outpatients, and 22% in psychiatric inpatients (Eaton & Greene, 2018; Ellison et al., 2018). BPD is a life-threatening condition associated with elevated risk of suicidality, self-harm, and impulsivity (APA, 2013), highlighting the need to examine the mechanisms underlying these harmful behaviors.

One of the prominent criteria for BPD (APA, 2013) is a feeling of emptiness, which can be defined as the experience of profound hollowness and disconnection from self and others, a lack of fulfillment and an absence of meaning (D'Agostino et al., 2020; Price et al., 2022). Considerable variations exist in the definition of emptiness with clinicians and researchers conceptualizing it as either an emotion/feeling, a coping mechanism, or an existential state tied to identity diffusion (Lancer, 2019; Peteet, 2011). Consistent with this notion, when describing their emptiness, some individuals highlight existential aspects (e.g., "a sense of purposelessness") while others provide a somatic account of it (e.g., "feeling a hole inside"; Elsner et al., 2018). Over the years, emptiness has been shown to be distinct from other similar constructs such as boredom, depression, hopelessness, and loneliness (Miller et al., 2020).

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Emptiness is commonly associated with BPD, but it is prevalent across various clinical conditions (e.g., grief: APA, 2013; anxiety disorders: Yates, 2015; schizophrenia spectrum disorders: Zandersen & Parnas, 2019) and among nonclinical samples as well (Didonna & Gonzalez, 2009; Konjusha et al., 2021). However, emptiness is far more prevalent among those suffering from BPD, affecting around 71%–75% of patients, versus 26%–34% of non-BPD psychiatric patients (Grilo et al., 2001; Johansen et al., 2004; Klonsky, 2008), and 10% of healthy samples (e.g., Martin & Levy, 2022). In addition, some studies suggest that emptiness in BPD also differs qualitatively from emptiness in other disorders (Westen et al., 1992; Reviewed in Köhling et al., 2015). Avoidant personality disorder (APD) is another condition that warrants consideration when examining emptiness dynamics and its psychological consequences. APD is characterized by pervasive patterns of social inhibition, feelings of inadequacy, and hypersensitivity to criticism (APA, 2013). Millon (2016) highlighted how individuals with APD often experience significant internal and inhibited distress, including constrained inner feelings and a profound sense of insecurity and inferiority in relationships. Although emptiness is not a hallmark of APD and one of its defining criteria (APA, 2013), according to Millon (2011), there may be a deficiency in APD in the capacity to experience the pleasure of life. Life tends to be experienced as uneventful, with periods of passive solitude interspersed with feelings of emptiness, alienated self-image, and aloneness.

Emptiness in BPD is referred to as chronic to emphasize its long-lasting and pervasive nature. However, the high prevalence does not necessarily imply that it is static over time. As S. T. Levy (1984) elaborates on his theoretical work, emptiness is a complex and multifaceted mental state that varies across individuals and can fluctuate dynamically over time, appearing as fleeting, periodic, or pervasive, particularly in borderline and narcissistic personality structures. The variability in emptiness highlights its role not only as a static symptom but also as a dynamic state that evolves in response to unconscious and interpersonal processes.

Negative Effects of Emptiness

Emptiness is a robust predictor of depression and suicidal ideation, as shown in a study examining both a clinical sample of young adults with a prominent feature of BPD and a large nonclinical sample (Klonsky, 2008). It also uniquely distinguishes between individuals with and without suicidality, based on findings from Orbach et al. (2003), which compared suicidal inpatients, nonsuicidal psychiatric inpatients, and nonclinical controls. Indeed, some researchers who seek to identify individual differences related to suicide risk consider emptiness as one of the most significant personality items associated with suicide risk, including both suicide attempts (Blasco-Fontecilla et al., 2012, 2013) and urges (Fulham et al., 2023). Blasco-Fontecilla et al. (2012) further argued that impulsive behaviors are often reactions to intense emotional experiences, with feelings such as emptiness, unhappiness, and dependency needs identified as central to suicide risk. Emptiness stands out due to its intrinsic link to problematic interpersonal relationships and an inability to regulate distress, distinguishing it from transient or situational emotions like sadness or anger (Blasco-Fontecilla et al., 2012). These distinctions inform our hypothesis that emptiness may uniquely drive impulsive behaviors. Emptiness also predicts a lifetime history of nonsuicidal self-injury (NSSI; Brickman et al., 2014; Kleindienst et al., 2008; Rallis et al., 2012), compulsive sexual behavior (Lloyd et al., 2007), and alcohol consumption urges (Roos et al., 2015). Moreover, of all BPD symptoms, emptiness has one of the lower rates of remission and higher rates of recurrence, suggesting it may be among the more persistent and challenging symptoms to treat (Zanarini et al., 2016). This aligns with theories that propose that individuals with BPD may engage in impulsive behaviors as a maladaptive attempt to cope with the distressing experience of emptiness (Lancer, 2019). These findings converge to suggest that the feeling of emptiness within BPD tends to be chronic and prevalent, though, as discussed earlier, can also fluctuate dynamically at some levels and is associated with greater severity of BPD and significant negative consequences.

Unlike the externalizing behaviors often associated with BPD (APA, 2013), emptiness in APD may manifest differently, given their tendency toward introversion, inhibition, and self-restraining (APA, 2013; Millon, 2016). To avoid this emptiness and psychic pain, individuals with APD tend to employ more passive coping strategies, such as avoidance and withdrawal from relationships or social situations unless they feel certain they will not face rejection or criticism (APA, 2013; Millon, 2016), and overconcern and preoccupation with daily life activities (Millon, 2016). This distinction underscores the importance of exploring how different disorders may uniquely shape the emptiness–impulsiveness association.

Previous research on emptiness has typically relied on single, static measurements, often using one item from broader diagnostic tools or interviews designed to assess BPD (e.g., "I feel empty inside"; Blasco-Fontecilla et al., 2012; Ellison et al., 2016; Klonsky, 2008). While straightforward, these methods fail to capture emptiness's dynamic, context-dependent nature, limiting our understanding of its fluctuations and interactions with other psychological processes over time. This underscores the need for innovative methodologies with a more nuanced, temporal perspective. As Kaurin et al. (2023) highlighted, ecological momentary assessment (EMA) addresses these limitations by capturing repeated, real-time measurements of thoughts, emotions, and behaviors in natural environments several times a day during several consecutive days. EMA reduces retrospective biases, enhances ecological validity, and enables dynamic measurement of both emptiness and impulsivity. In line with this, Santangelo et al. (2014) emphasizes the need for more EMA studies on BPD populations to better understand the temporal dynamics of symptoms like emptiness and gain deeper insights into the lived experiences of individuals with BPD.

Mentalizing (Mz) Deficits

One notable characteristic of BPD patients that may exacerbate the negative effects of emptiness is impaired Mz ability (also referred to as reflective functioning). Some authors believe that impairments in Mz play a critical role in the development, maintenance, and treatment of BPD (Fonagy & Luyten, 2009; K. N. Levy et al., 2006). Mz is the capacity to consider mental states (e.g., emotions, intentions, thoughts, and beliefs), particularly those underlying others' or one's behavior (Fonagy et al., 1991, Fonagy & Luyten, 2009). Mz is an important human capacity that has been hypothesized to enable social learning and self-organization as it allows one to correctly infer the intentions of others, making the world more predictable and meaningful (Premack & Woodruff, 1978), and promoting mutual understanding in relationships (Luyten et al., 2020). Mz is considered one of the building blocks of emotion regulation, as it allows coping with intense emotional experiences (Fonagy, 2001).

A recent meta-analysis demonstrated that a better capacity for Mz predicts positive outcomes across various domains, including psychopathology, functioning, personality, affect, and attachment security (Kivity et al., 2024). Furthermore, Mz has been linked to improved caregiving quality, enhanced job performance, and greater psychological well-being (Camoirano, 2017; Zeegers et al., 2017).

We would expect Mz to be negatively associated with emptiness. Suppose emptiness serves as a way to avoid experiencing intolerable emotions. In that case, Mz can help deal with these emotions in more adaptive ways—precisely ways that aid in managing and regulating feelings of emptiness. Indeed, Amianto et al. (2011) compared the efficacy of supervised team management (STM) and STM plus sequential brief Adlerian psychodynamic psychotherapy (SB-APP) in BPD treatment. The authors speculated that SB-APP might help address emptiness by promoting Mz skills, decreasing polarized views of self and others, and increasing tolerance for ambivalence. Moreover, emptiness might blur emotional experiences (Lancer, 2019; Peteet, 2011), thus impairing the capacity of Mz. Consequently, deficient Mz may heighten susceptibility to the negative outcomes of emptiness, especially among individuals with BPD.

Since impaired Mz ability has been linked to difficulties in emotion regulation and identity formation, we suggest that these challenges may be connected to feelings of emptiness and their destructive effects. One's understanding of the antecedents, concomitants, and consequences of their own emptiness can help buffer against the otherwise impulsive behaviors that follow emptiness by helping one tolerate this feeling until it subsides or by guiding one toward more adaptive ways of coping with it. For example, Mz could help a person who typically experiences their emptiness as coming "out of the blue" identify its source (say, insecurity in their relationships evoked when their partner fails to reply to a text message). Knowing the cause of their emptiness, understanding that the emptiness is likely to naturally subside over time, and remembering that in the past their partner ultimately responded might help the person tolerate the emptiness and cope with it more adaptively—for example, calmly bringing it up to their partner at a later point, rather than engaging in self-harm or lashing out at him.

A recent qualitative study supporting this possibility found that emptiness was experienced as distressing, and participants attempted to prevent or alleviate this feeling (Miller et al., 2021). It was also found that participants who, upon entering the study, did not recognize or acknowledge the link between emptiness and impulsive behaviors often attempted to relieve emptiness by engaging in maladaptive and impulsive coping strategies (Miller et al., 2021). Thus, we see Mz as a moderating factor in the association between emptiness and impulsive behavior. Therefore, the proposed study will empirically examine whether emptiness is tied to impulsivity and whether this association is moderated by Mz. In other words, we hypothesize that higher Mz has a buffering effect on the link between emptiness and impulsivity.

Research Aims and Hypotheses

Emptiness is a key feature of BPD, commonly encountered in clinical practice but relatively understudied and poorly understood. This study aims to fill this lacuna by examining emptiness and its negative consequences in the daily lives of individuals with BPD, compared to healthy controls (HC) and individuals with APD, using EMA methodology. Few studies to date have explored the association between emptiness and impulsive behaviors other than suicide or self-harm. This study also aims to expand previous findings by examining additional impulsive behaviors (e.g., excessive spending, disordered eating, unsafe or unplanned sexual behaviors, and substance use) beyond suicidal and NSSI behaviors. Another aim is to identify factors, such as Mz, that may attenuate the negative consequences of emptiness.[1]

The study will examine the following hypotheses:

1. Emptiness in daily life will be highest among participants in the BPD group, followed by the APD group, and lowest among the HC group.
2. Mz abilities, assessed in a lab setting, will be lowest among participants in the BPD group, followed by the APD group, and lowest among the HC group.[2]
3. Participants in the BPD group will be highest on impulsivity, followed by the APD group, and lowest among the HC group.
4. Greater emptiness in daily life will be tied to greater impulsivity, and this association will be strongest among participants in the BPD group, followed by the APD group, and lowest among the HC group.
5. The association between emptiness and impulsivity will be stronger when Mz is low.
6. Emptiness will be more prevalent prior to impulsive thoughts, urges, or behaviors, relative to other precipitating feelings.

Method

Participants and Recruitment

This study was part of a larger project for which participant recruitment procedures have been previously published (Berenson et al., 2011). This secondary analysis was preregistered (https://aspredicted.org/KM5_3CT). Briefly, following a phone screen, adults from the New York City area were invited through ads, flyers, and online forums for a study of personality and mood in daily life. Participants who were considered potentially eligible for one of the study groups (BPD, APD, or HC) were invited to the lab for a diagnostic interview that included the Structured Interview for the Diagnosis of Personality Disorders (Pfohl et al., 1997) and the Structured Clinical Interview for *Diagnostic and Statistical Manual of Mental Disorders-IV* (*DSM-IV*) Axis I Disorders (SCID-I) (First et al., 1996). All interviews were videotaped to later examine reliability. All participants provided written informed consent. Exclusion criteria for all groups were evidence of a primary psychotic disorder, current substance intoxication or withdrawal,

[1] It is important to note that Snir et al. (2015) conducted their study on the same data set but focused on NSSI rather than impulsivity more broadly. Additionally, Berenson et al. (2016) used the same database but focused on baseline impulsivity in lab (as well as other variables such as rejection sensitivity and reactions to stressors), rather than impulsivity in daily life.

[2] This is simply a replication of the Berenson et al.'s (2018) analysis, which was conducted on a slightly different sample. While Berenson et al. (2018) included all participants who completed the lab measures ($N = 173$), our analysis focused on participants who completed all study components, including the EMA assessments, resulting in a slightly smaller sample ($N = 153$). Notably, the findings from both samples are consistent, and no significant differences emerged between the results of the two analyses.

cognitive impairment, or illiteracy. The HC group met no more than two criteria for any personality disorder (PD) (and no more than 10 in total), had no Axis-I diagnoses for at least 1 year before the date of the interview, and had a high Global Assessment of Functioning score of 79 (APA, 2000). Given the high comorbidity of BPD and APD with other disorders in actual patient populations (e.g., Skodol et al., 2002), relatively few exclusion criteria were used for the BPD or APD group. Participants from either PD group were not excluded from the use of psychotropic medication. The final study sample consisted of 153 individuals. The BPD group included 57 participants (female: $N = 46$), and 15 of them met the criteria for APD as well. The APD group included 43 participants (without BPD) (female: $N = 23$), and the HC group comprised 53 participants (female: $N = 39$). Those meeting the criteria for both BPD and APD were included in the BPD group given the evidence that in cases of BPD and APD comorbidity, BPD is usually the more robust and salient disorder of the two (McGlashan et al., 2000).[3] The APD group had a significantly greater percentage of male participants than the other two groups, $\chi^2(2, N = 153) = 8.47$, $p < .05$. Participants were ages 18–76 years ($M = 33.51$, $SD = 11.4$). They identified as White (47.1%), Black (22.6%), Asian (13.6%), and other/multiple backgrounds (16.7%). There were no between-group differences in age or race/ethnicity. Participants had completed between 10 and 20 years of education ($M = 16.3$, $SD = 2.6$).

Procedure

Following a diagnostic interview, eligible individuals returned for a second lab session, in which they were trained to use the EMA platform to complete the experience-sampling diary. The EMA protocol utilized a signal-contingent design implemented via handheld Zire21 personal digital assistants, configured with the Intel adaptation of Barrett and Barrett's (2001) experience sampling program. Participants were prompted 5 times daily at random intervals within evenly divided waking-hour blocks over 21 days. Prompts, signaled by an audible beep, were repeated every 15 s for up to 10 min until a response was recorded. Each diary entry took approximately 5–10 min to complete, with responses automatically time-stamped. The protocol allowed for a maximum of 105 entries, and participants with 27 completed entries or less were removed from analyses ($N = 9$). Weekly reminders from research staff helped maintain participant compliance. Participants attended lab sessions before and after the EMA period, where they were trained on the platform, completed additional cognitive tasks such as the Reading the Mind in the Eyes Test (RMET; Baron-Cohen et al., 2001) in the second lab visit, and received compensation of up to $100 based on the number of completed entries. This protocol balanced density (five prompts daily), depth (detailed assessments of affect including feelings of emptiness and behaviors including impulsive behaviors, and duration (21 days), aligning with recommendations for optimizing EMA studies on personality pathology (Kaurin et al., 2023).

Measures

Lab Measures

Structured Interview for *DSM-IV* Personality (SID-P; Pfohl et al., 1997). A reliable and valid clinician-administered semistructured interview for PDs. The interview includes 79 questions regarding PD criteria organized by theme (e.g., interpersonal functioning, self-perception, identity, etc.). Each criterion is rated on a 0 (*absent*) to 3 (*strongly present*) scale. A score of 2 or higher indicates that the criterion was met. The SID-P generates binary (whether full criteria were met) and dimensional (global severity) scores for each PD.

SCID-I (First et al., 1996). A semistructured interview for *DSM-IV* Axis I disorders (APA, 1994). The interview includes standardized diagnostic questions arranged in modules corresponding to *DSM-IV* Axis I disorders.

We calculated interrater reliability for both diagnostic interview measures using the following procedure: The diagnostic interview coordinator randomly selected five videotaped interview sessions, encompassing both SID-P and SCID-I interviews. This coordinator is a doctoral-level clinical psychologist with extensive experience in diagnostic interviewing. These videotaped sessions were then blindly coded by all other study interviewers, who consisted of doctoral-level clinical psychologists and graduate students in clinical psychology. The interviewers' ratings were compared to the diagnostic interview coordinator's ratings to calculate kappa coefficients. The interviews demonstrated good interrater reliability (average $\kappa = .83$ for PDs and $\kappa = .86$ for all SCID-I diagnoses).

RMET (Baron-Cohen et al., 2001). To assess the identification of others' mental states, the revised version of the RMET was used. In the RMET, participants select which of four words best describes what the person in the photo is thinking or feeling (one target and three foils), depicting a wide range of positive, negative, and neutral mental states. There are 36 black-and-white photographs of the eye region of the face of different actors, one at a time. Photographs represent equal numbers of male and female faces. The RMET has shown good test–retest reliability (intraclass correlation = .83) in previous research (Vellante et al., 2013). The RMET trials were presented in randomized order, and the total number of correct responses was computed. It is important to note that the RMET has faced critiques regarding its construct validity as a comprehensive measure of Mz (Higgins et al., 2023, 2024). This limitation is addressed further in the discussion.

Daily Life Measures

Daily variations such as emotions, interpersonal experiences, and behaviors were assessed using a computerized EMA diary with five daily prompts. Here, we only focus on items relevant to the proposed study. The study used a single item (out of 30 questions about emotions) about the extent to which the participant felt empty on a 5-point Likert scale (*not at all* to *extreme*), rescaled to 0–4 so that the value 0 represents an absence of emptiness. In addition, the study used single items to indicate whether the participant performed, had the urge to perform, or thought about performing a checkbox list of five impulsive behaviors since the last diary was selected: spending too much money, binging on food, engaging in unsafe or unplanned sex, using substances, and engaging in direct self-injury. These behaviors were categorized as impulsive based

[3] Nonetheless, we performed sensitivity analyses by removing 15 participants with both BPD and APD diagnoses and refitting all the models. Those analyses yielded consistent findings, which are available on request from the corresponding author. These results suggest that including these participants does not compromise the validity of the findings and supports our decision to classify them under the BPD group.

on DSM definition of impulsivity in BPD (APA, 2013). In addition, a conditional item about the way they felt before the action/urge/thought (tense, happy, grounded, calm, sad, unreal, angry, rejected, like the body does not belong to me, guilty, out of control, and empty inside) was collected for the following: self-harm acts, self-harm urges, the one most significant act according to the participant report (other than the self-harm act, if existed), and the one most significant urge (other than the self-harm urge, if existed). Impulsivity was calculated as the sum of reported impulsive acts across diary entries by participants, to maintain consistency with previous work that was conducted on this data set (Coifman et al., 2012).[4]

Data Preparation and Data Analytic Approach

Data were first screened for unexpected distributions and outliers. We found a single outlier regarding impulsivity in daily life in the BPD group (6.38 *SD*s higher than the group mean). Following the recommendations of Aguinis et al. (2013), after confirming that there was no error in the participant data, we performed sensitivity analyses by removing the participant and refitting all the models that included impulsivity in daily life. The findings, which are available upon request from the corresponding author, did not change and therefore are robust to the outlier participant. Thus, we chose to only report the models with the full data.

To examine group differences in emptiness in daily life (Hypothesis 1 [H1]), we fitted a multilevel model with EMA entries nested within participants, with momentary emptiness as dependent variable (DV) and group as a Level 2 predictor, implemented in RStudio Version 3.1-157, package "nlme" (Pinheiro et al., 2012). The equations for all multilevel models are provided in the Section 1 in the online supplemental materials. The analyses used a restricted maximum likelihood estimation method, which incorporates all available data and is robust to missing data under the missing-at-random assumption (Bolger et al., 2003). This approach also accounts for the nonindependence of day-level data and helps prevent effect inflation. Multilevel modeling included assessments (Level 1) repeated within individuals (Level 2). The model included a homogenous first-order autoregressive covariance structure at Level 1 (which controls for autoregressive effects in the DV) and an unrestricted covariance structure at Level 2 (which was simplified using deviance tests when convergence or estimation problems occurred). To examine group differences in Mz in the lab (Hypothesis 2 [H2]), we conducted analyses of variance (ANOVAs) with group as a between-subject factor (BPD, APD, and HC) to evaluate the differences in the means across three group categories. To examine group differences in impulsivity in daily life (Hypothesis 3 [H3]), we fitted a multilevel model with EMA entries nested within participants, with momentary impulsivity as DV and group as a Level 2 predictor. To examine whether momentary emptiness predicts momentary impulsivity and whether this relation is moderated by group (Hypothesis 4 [H4]) we first fitted a multilevel model with momentary impulsivity as the DV and momentary emptiness as a Level 1 predictor. We chose to predict impulsivity at the same time point rather than in the subsequent one because we assumed that the time lag between EMA entries ($\sim$ 2 hr) would be too long to show significant associations. Consistent with the recommendations of Wang and Maxwell (2015), momentary emptiness was person-mean centered to arrive at a pure within-person effect. Then, as a second step, we added group as a Level 2 predictor of both the intercept and the effect of emptiness, which allows us to examine whether group predicts the levels of impulsivity or the strength of the emptiness–impulsivity relations, respectively. The linear effect of time on momentary emptiness was not significant in any of the groups ($b = .00$, $ps = .44$–$.91$); in contrast, a linear effect of time was significant for momentary impulsivity in the BPD group ($b = -.001, p < .001$) though not in the APD/HC groups ($b = .00$, $ps = .10$–$.14$). Therefore, per Wang and Maxwell (2015) we conducted a sensitivity analysis that examined whether detrending the linear effect has any impact on our findings. This was done by including linear time (grand-mean centered) as a fixed effect. As the findings remain similar in this sensitivity analysis, we only report the nondetrended findings for ease of interpretation. The full findings are available upon request. To examine whether the association between momentary emptiness and momentary impulsivity is moderated by Mz (Hypothesis 5 [H5]), we first fitted a multilevel model with momentary impulsivity as the DV and momentary emptiness as a Level 1 predictor. Mz (grand-mean centered) and its interaction with emptiness were added as a Level 2 predictor and a cross-level interaction, respectively. The main effect of Mz examined whether Mz predicted impulsivity whereas the cross-level interaction examined whether the emptiness–impulsivity association is different at varying levels of Mz. Finally, to examine differences between precipitating feelings before impulsive thoughts, urges, or behaviors (Hypothesis 6 [H6]), we fitted a two-way ANOVAs with group as a between-subject factor and feeling as a within-subject factor, one for each of the four types of urge/act: separately for self-harm acts, self-harm urges, the most significant act (other than the self-harm act, if existed), and the most significant urge (other than the self-harm urge, if existed). Each significant effect was followed up with Tukey-adjusted pairwise comparisons (for more information see Section 2 in the online supplemental materials).

Given the complexity of the models, multilevel models were built in stages to verify that any modeling step did not substantially change the findings. Effect sizes for multilevel effects were calculated as semipartial r (r_s; Jaeger et al., 2017; Nakagawa & Schielzeth, 2013) using package "r2glmm" in R. These effect sizes represent the unique contribution of the predictor above and beyond the contribution of all other predictors in the model and are presented in absolute values. Effect sizes were interpreted using Cohen (1992) for ANOVA and group differences. In lieu of established guidelines for interpreting effect sizes in longitudinal multilevel modeling, we interpreted the effect sizes using the guidelines established empirically by Orth et al. (2024) in the context of cross-lagged panel models. Based on their findings, .03 was

[4] We initially considered several ways to aggregate the items, including a weighted average that gives a higher weight to increasingly severe types of impulsivity (i.e., thoughts vs. urges vs. behaviors within each impulsive act) and also the sum of impulsive acts reported across diary entries. This consideration was done a priori, before testing the hypotheses of the study. Ultimately, we chose to use the sum of impulsive acts, because this measure was more normally distributed at the within-person level than the other measure. Also, this measure was also used in previous work using this data set (Coifman et al., 2012), which helped make our findings comparable to those of Coifman et al. (2012).

considered a small effect, .07 was considered a medium effect, and .12 was considered a large effect.[5]

Results

The mean number of completed entries for the entire sample was $M = 74.97$ ($SD = 18.90$, range 28–105) with no significant group differences in the completed number of entries. One participant's RMET data were unavailable for technical reasons, and they were therefore omitted from analyses involving RMET. A detailed summary of hypotheses, analyses, and findings is provided in Table S3 in the online supplemental materials (Section 4).

H1: Group Differences in Emptiness (in Daily Life)

Estimated fixed and random effects from the multilevel model examining group differences in emptiness in daily life are reported in Table S1 in the online supplemental materials. The fixed effects in the model indicated that the estimated level of emptiness was 1.40 ($SE = 0.12$) for the BPD group, 1.31 ($SE = 0.13$) for the APD group, and 0.08 ($SE = 0.12$) for the healthy control (HC) group; thus, consistent with our hypothesis, the BPD and APD group showed a greater than zero level of emptiness, whereas the HC group did not. In terms of group differences, the model revealed a significant main effect of group, $F(2, 150) = 37.21$, $p < .001$. Follow-up pairwise comparisons showed that both the BPD and APD groups had higher levels of emptiness than the HC group—BPD: $t(150) = 7.90$, $p < .001$, $r_s = .45$ (.43, .46); APD: $t(150) = 6.84$, $p < .001$, $r_s = .40$ (.38, .41). However, contrary to our hypothesis, they did not significantly differ from one another, $t(150) = 0.51$, $p = .61$, $r_s = .03$ (.01, .05).

H2: Group Differences in Mz (in the Lab)

For Mz assessed in the lab, a one-way ANOVA revealed no significant main effect of group category, $F(2, 150) = 1.88$, $p = .16$, suggesting that contrary to our hypothesis, all the groups shared similar levels of Mz (HC: $M = 28.20$, $SE = 0.55$; BPD: $M = 26.80$, $SE = 0.53$; APD: $M = 26.80$, $SE = 0.60$).

H3: Group Differences in Impulsivity (in Daily Life)

Estimated fixed and random effects from the multilevel model examining group differences in impulsivity in daily life are reported in Table S1 in the online supplemental materials. The fixed effects in the model indicated that the estimated level of impulsivity was 0.20 ($SE = 0.03$) for the BPD group, 0.11 ($SE = 0.03$) for the APD group, and 0.07 ($SE = 0.03$) for the HC group; thus, consistent with our hypothesis, only the BPD group showed a larger than zero impulsivity. In terms of group differences, the model revealed a significant main effect of group, $F(2, 150) = 6.25$, $p = .003$. Follow-up pairwise comparisons indicated that consistent with our hypothesis, the BPD group exhibited a significantly higher level of impulsivity compared to the HC and APD groups, HC: $t(150) = 3.49$, $p < .001$, $r_s = .13$ (.12, .15); APD: $t(150) = 2.09$, $p = .04$, $r_s = .08$ (.06, .10), whereas the APD and HC groups did not significantly differ from one another, $t(150) = 1.19$, $p = .24$, $r_s = .05$ (.03, .06).

H4: The Moderating Role of the Group in the Association Between Emptiness and Impulsivity in Daily Life

Estimated fixed and random effects from the multilevel model examining the moderating role of the group in the association between emptiness and impulsivity in daily life are reported in Table 1 and Figure 1, below. As Figure 1 shows, the association between emptiness and impulsivity was positive and significant in the BPD, $b = .03$, $t(11,312) = 2.75$, $p = .006$, $r_s = .05$ (.03, .07), and the HC, $b = .08$, $t(11,312) = 3.28$, $p = .001$, $r_s = .04$ (.02, .06), groups but not in the APD group, $b = .02$, $t(11,312) = 1.01$, $p = .31$, $r_s = .01$ (.00, .03).Thus, consistent with our hypotheses, when individuals with BPD or HC reported greater levels of emptiness relative to their baseline, they also tended to report greater levels of impulsivity. When comparing groups in the strength of the association between emptiness and impulsivity, we found that the HC group showed a significantly stronger association than the APD group, $t(11,312) = 2.31$, $p = .02$, $r_s = .03$ (.01, .05). In contrast, the BPD group did not differ from the other groups—BPD vs. APD: $t(11,312) = 0.96$, $p = .34$, $r_s = .01$ (.00, .03); BPD vs. HC: $t(11,312) = 1.75$, $p = .08$, $r_s = .02$ (.00, .04). To conclude, in contrast to hypotheses, the emptiness–impulsivity association was not significant in the APD group and in addition, group differences in these associations were not in the expected direction.

H5: The Moderating Role of Mz in the Association Between Emptiness and Impulsivity in Daily Life

Estimated fixed and random effects from the multilevel model examining the moderating role of Mz in the association between emptiness and impulsivity in daily life are reported in Table S2 in the online supplemental materials. The fitted model revealed that, as mentioned above, emptiness significantly predicted impulsivity, $b = .03$, $t(11,220) = 3.47$, $p < .001$, $r_s = .05$ (.03, .07), such that greater emptiness predicted more impulsive behaviors. We also found that Mz did not predict impulsivity, $b = -.01$, $t(150) = -1.51$, $p = .13$, $r_s = .06$ (.04, .08), and that, in contrast to our hypotheses, Mz did not moderate the association between emptiness and impulsivity, $b = .00$, $t(11,220) = 1.21$, $p = .23$, $r_s = .02$ (.00, .04). That is, individuals with higher levels of Mz did not show a stronger (or weaker) association between emptiness and impulsive behaviors, compared to those with lower levels of Mz.

H6: The Prevalence of Emptiness in Daily Life Before Impulsive Thoughts, Urges, or Behaviors, Relative to Other Feelings

Figure S1 in the online supplemental materials shows the average levels of each feeling before impulsive urges and acts, separately for each group. As the figure shows, descriptively, emptiness appears to be one of the most prevalent precipitants of impulsivity (albeit not the most prevalent one). Furthermore, the figure shows that the level of emptiness was especially high before self-harm urges or

[5] It should be noted that these effect sizes are calculated based on changes in goodness-of-fit indices and, therefore, occasionally discrepancies between these effects and significance tests can arise. In these cases, the significance of an effect was determined based on the significance test rather than on the size of the effect.

Table 1

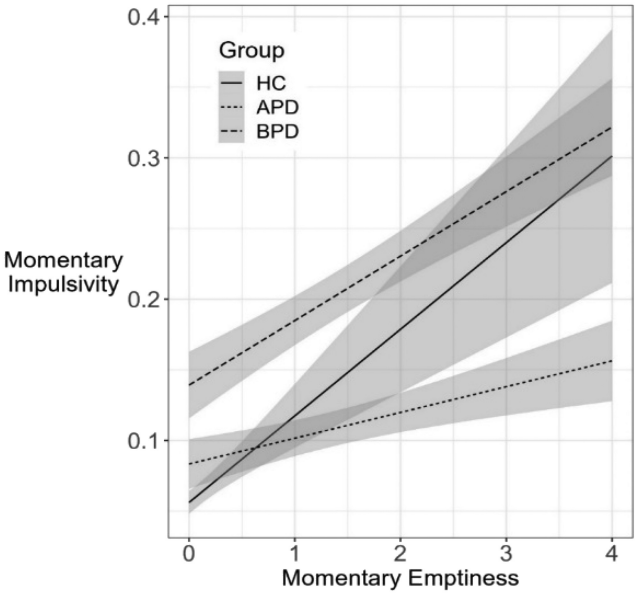
Estimated Fixed and Random Effects From Multilevel Models Examining the Moderating Role of Group on the Relationship Between Emptiness and Impulsivity in Daily Life

Intercept and slope	Fixed effects
Intercept	
HC	.07** (.03)
BPD	.20*** (.03)
APD	.11*** (.03)
BPD vs HC	.13*** (.04)
APD vs HC	.05 (.04)
BPD vs APD	.08* (.04)
Slope of emptiness	
HC	.08** (.03)
BPD	.03** (.01)
APD	.02 (.02)
BPD vs HC	.05 (.03)
APD vs HC	.07* (.03)
BPD vs APD	.02 (.02)
Intercept and slope	**Random effects**
Level 1, residual	.13
Level 1, autoregressive effect	.08
Level 2, intercept	.04
Level 2, slope	.01
Level 2, intercept and slope (covariance)	.01

Note. HC = healthy controls; BPD = borderline personality disorder; APD = avoidant personality disorder.

Figure 1

Correlations Between Momentary Emptiness and Momentary Impulsivity Among HC and Participants With APD and BPD



Note. Higher scores indicate higher levels of emptiness and impulsivity. HC = healthy controls; APD = avoidant personality disorder; BPD = borderline personality disorder.

acts, compared to other impulsive urges or behaviors. Full results of the analyses comparing differences in the prevalence of various feelings by feeling type and group are reported in Section 3 in the online supplemental materials. Despite the visual impression mentioned above, and contrary to our hypothesis, the ANOVAs and the follow-up pairwise comparisons revealed that emptiness was not uniquely associated with impulsivity, relative to other prevalent feelings such as "angry" and "unreal," either in the BPD group or in the control groups.

Discussion

The study aimed to examine the association between emptiness, impulsivity, and Mz in individuals with BPD compared to individuals with APD and HC. The BPD and APD groups reported higher levels of emptiness compared to the HC group. Additionally, the BPD group exhibited higher levels of impulsivity compared to the HC and APD groups. Greater emptiness significantly predicted higher impulsivity in daily life in the BPD and HC groups but not in the APD group. However, there were no group differences in Mz, and Mz did not moderate the association between emptiness and impulsivity. Below, we discuss these findings in detail.

Group Differences in Emptiness, Impulsivity, and Mz

As we expected, the BPD and APD groups reported higher levels of emptiness compared to the HC group in daily life. These findings support the notion that emptiness is more prevalent and pronounced in individuals with BPD or other psychiatric disorders relative to nonclinical populations (Grilo et al., 2001; Zanarini et al., 2016) and may play a unique role in psychopathology, or at least within PDs. Contrary to our hypothesis, although emptiness is a defining criterion in BPD but not in APD (APA, 2013), there was no significant difference in emptiness levels between the two groups. This unexpected similarity may reflect shared features between these disorders, such as heightened rejection sensitivity and insecurity in close relationships (Berenson et al., 2016; Romero-Canyas et al., 2010), as well as comorbidities with internalizing problems that may amplify this experience across both groups. Further research comparing the phenomenology of emptiness across BPD, APD, and other psychiatric conditions, including non-PDs, is essential to further elucidate its role and variability in psychopathology.

The BPD group exhibited higher levels of impulsivity in daily life compared to the HC and APD groups, with no significant differences observed between the latter two. This aligns with previous findings from the same sample using different impulsivity measures (Berenson et al., 2016), reinforcing the centrality of impulsive behaviors in BPD. Unlike emptiness, which appears as a shared feature across both PDs, impulsivity emerges as a distinguishing characteristic of BPD, and it seems that the manifestation and coping mechanisms of those two differ due to distinct personality dynamics. In BPD, emptiness is particularly intense and overwhelming, often driving impulsive and maladaptive behaviors like self-harm or substance use as attempts to escape or manage distress (APA, 2013; Lancer, 2019). Conversely, APD is marked by a quieter, persistent sense of alienation, loneliness, and detachment, characterized by constrained emotions, inhibited connections, and withdrawal into solitude to minimize psychic pain (Millon, 2011, 2016). These distinctions highlight how emptiness interacts with different PDs, shaping both emotional experiences and behavioral responses. Given the harmful effects of impulsivity (Coifman et al., 2012), future studies

could focus on identifying key triggers, as well as protective factors that may buffer against its negative outcomes.

Contrary to our hypothesis, we found no group differences in Mz abilities. This null finding contrasts with several studies showing Mz impairments in BPD (Fonagy & Luyten, 2009; K. N. Levy et al., 2006). However, other studies utilizing the RMET as an index of Mz have shown conflicting results with some even reporting superior RMET performance in BPD (See Bora, 2021; Fertuck et al., 2009; Johnson et al., 2022). Therefore, our study adds another null result to a mixed literature regarding between-group differences in this task, which should caution us regarding the use of the RMET for this purpose. Indeed, a growing number of authors have argued that the RMET should be seen less as an index of Mz per se and more as an emotion perception measure (Kittel et al., 2022). Others have raised concerns regarding the uncertain validity of several RMET items (Higgins et al., 2023, 2024). On the other hand, proponents have emphasized its substantial external validity and cautioned against overly negative conclusions regarding its utility (Murphy & Hall, 2024). Taking together, despite this instrument's popularity and ease of administration, other measures, such as the Reflective-Functioning Scale (RFS; Fonagy et al., 1998), may be better suited for studying Mz in BPD. Also, to truly explore the role of Mz in BPD, it is important to examine it in daily life and not only in lab. For example, a recent study utilized the RFS to code narrative data collected in an EMA study (Steinberg et al., 2024). Such assessment allows examining group differences in both levels of Mz and fluctuations in it (e.g., in the degree to which Mz abilities are stable across time). Indeed, Steinberg et al. (2024) found that greater fluctuations in Mz may be particularly associated with greater BPD features.

The Association Between Emptiness and Impulsivity With Group as a Moderator

To our knowledge, this is the first study to examine emptiness in daily life using EMAs, especially concerning impulsivity. We found that emptiness was positively associated with impulsivity in both the BPD and HC groups but not in the APD group. Thus, consistent with our hypotheses, when individuals with BPD or HC reported greater levels of emptiness relative to their baseline, they also tended to report greater levels of impulsivity. Our findings support the possible detrimental effects of emptiness in daily life and extend previous findings showing that emptiness in BPD is associated with depression, self-harm, and other impulsive behaviors (Brickman et al., 2014; Lloyd et al., 2007; Roos et al., 2015). The study by Snir et al. (2015) elaborates on this by examining the explicit and inferred motives behind NSSI, a form of impulsive behavior, revealing that internally directed motives are predominant. This suggests that the experience of emptiness may indeed trigger impulsive acts like NSSI as a coping mechanism. Moreover, Snir et al. (2015) observed that both affective and interpersonal distress decreased following NSSI urges, even in the absence of an act, indicating that the urge itself—possibly driven by emptiness—may temporarily mitigate distress. This underscores the complex relationship between emptiness, impulsivity, and NSSI. Similarly, Lancer's (2019) review highlights how distractions, addictions, and externalizing behaviors provide only fleeting relief from emptiness, often leading to heightened alienation and a return of loneliness, emptiness, and depression, perpetuating a vicious cycle. To better establish the time order of the emptiness–impulsivity association, future studies can utilize more intensive data collection designs, measuring emptiness and impulsivity in shorter time intervals between assessments. Additionally, dynamic modeling approaches (Hamaker et al., 2018) could explore bidirectional associations (i.e., a vicious cycle model) between emptiness and impulsivity.

Our group-based analyses revealed that even when emptiness is less prevalent, as in the HC group, it can still be linked to impulsivity. This supports the conceptualization of emptiness as a trans-diagnostic risk factor (Konjusha et al., 2021). However, this perspective must address the surprising finding of a null association between emptiness and impulsivity in the APD group. Combining the observation that individuals with APD exhibit lower overall impulsivity compared to those with BPD, with our finding that some APD individuals experience high levels of emptiness without it being linked to impulsivity, suggests a broader application of this trans-diagnostic perspective. This pattern may reflect their strong aforementioned inhibitory control and tendency to internalize rather than externalize distress (Millon, 2011, 2016). In essence, while emptiness may trigger impulsivity in some cases, factors like strong inhibitory control in APD could moderate this link. This underscores the importance of further investigating moderating factors to develop more targeted and effective interventions.

Mz as a Moderator of the Association Between Emptiness and Impulsivity

In contrast to our hypotheses, the moderating role of Mz in the emptiness–impulsivity association was not supported by the findings. Specifically, the association between emptiness and impulsivity was not weaker among individuals with higher levels of Mz. This challenges the view of Mz as a buffer for intense emotions and maladaptive consequences (Fonagy & Bateman, 2016; Fonagy & Luyten, 2009). It also contrasts with a study by Miller et al. (2021), which found that individuals unaware of a link between emptiness and impulsivity were more likely to engage in maladaptive coping strategies to relieve emptiness. This study highlighted how most participants found chronic emptiness distressing and sought to alleviate it through either maladaptive or, when aware of the link, adaptive coping strategies. These findings suggest the need for interventions fostering this awareness, such as mentalization-based therapy (MBT; Daubney & Bateman, 2015). MBT helps individuals recognize, process, and regulate emotional states and has shown to yield significant effect sizes in reducing symptoms of BPD, as highlighted in meta-analyses and systematic reviews (Hajek Gross et al., 2024; Stoffers-Winterling et al., 2022; Vogt & Norman, 2019), including impulsivity, self-harm, and suicidality (e.g., $g = -.82$ in for self-harm; Hajek Gross et al., 2024). These findings underscore the therapeutic value of improving Mz capacities to mitigate those symptoms associated with BPD.

The lack of a moderating effect of Mz may be attributable to our use of RMET as a measure of Mz. As noted, the RMET has uncertain validity (Higgins et al., 2023, 2024), and does not capture fluctuations in Mz in naturalistic settings. For recent naturalistic assessments of Mz see Kivity et al. (2021) and Steinberg et al. (2024). It is also worth noting that although theoretically the claim that Mz moderates the association between emptiness and impulsivity may be true, in practice participants may not be able to recognize that

they feel emptiness or to link the impulsivity to this feeling, as such awareness requires adequate Mz capacities.

It is also possible that general Mz abilities are not directly responsible for the buffering effect on emptiness–impulsivity dynamics; instead, it may be that one's capacity to specifically mentalize their experience of emptiness would serve as such a buffer. This idea aligns with growing evidence that Mz tends to vary by symptom or disorder (e.g., depression: Ekeblad et al., 2016; panic: Rudden et al., 2006; posttraumatic disorder: Berthelot et al., 2015; Milrod et al., 2020). Emptiness-specific Mz involves an individual's ability to understand the nature of their emptiness, what it stems from, how it unfolds over time, and what effects it has on other symptoms. The construct may be more relevant for examining how Mz reduces negative behaviors linked to emptiness. For instance, recognizing emptiness as transient could reduce the urge to engage in extreme measures in order to avoid it.

The Relative Prevalence of Emptiness Prior to Impulsivity in Daily Life

Descriptively, we found that emptiness was a prevalent trigger for impulsivity, particularly before self-harm urges or acts. Contrary to our hypothesis, the pairwise comparisons revealed that emptiness was not uniquely prevalent before impulsivity compared to other feelings such as anger, feeling grounded, or feeling unreal. The lack of specificity of emptiness before self-harm is partly in line with previous research, which found that, in terms of emotional states preceding NSSI, patients gave the highest ratings to strong tension and pressure, followed by emptiness, loneliness, guilt, depression, dejection, and sadness (Kleindienst et al., 2008). In line with the conceptualization of emptiness as an absence of feeling or purpose (Price et al., 2022), emptiness can be understood in two ways: as an aversive state that people want to escape from, or as a dissociative state of low arousal that people may want to intensify (Blasco-Fontecilla et al., 2012; Price et al., 2022). These two motivations not to feel empty may explain the appearance of impulsive behaviors. Interestingly, we did not find a significant difference in the prevalence of emptiness before impulsivity between the BPD group and controls[6], suggesting the need for future research to explore a range of emotions and their link to impulsivity in short timeframes. Given its persistence and centrality in BPD (Zanarini et al., 2016), further research could examine whether emptiness functions differently in chronic versus acute contexts of impulsivity. Additionally, feelings related to dissociation, such as feeling unreal or disconnection from one's body, emerged as potentially significant in predicting impulsivity and warrant further investigation.

Limitations and Future Directions

Several limitations should be considered when interpreting the findings of the current study. First, the small size of our APD group limited the statistical power to detect differences between this group and the BPD and HC groups. Second, it remains unclear whether our findings generalize to a clinical sample of individuals with a psychiatric diagnosis that does not involve PD (e.g., depressive and anxiety disorders). Third, the RMET's narrow conceptual scope and its potential lack of ecological validity may have restricted its ability to capture subtler individual differences in Mz. To address this limitation, future research should consider employing more comprehensive tools that assess broader aspects of Mz. Additionally, focusing on emptiness-specific Mz (in addition to general Mz) or momentary fluctuations in Mz could provide a more nuanced understanding of the interplay between emptiness and impulsivity. Fourth, the study's reliance on single-item measures of emptiness may have oversimplified a multifaceted construct. To deepen our understanding, future research should incorporate multiitem scales for assessing emptiness (e.g., Price et al., 2022). Lastly, future research could exam a broader array of self-destructive behaviors such as reckless driving, temper outbursts, or destruction of property, offering a more comprehensive examination of the association between emptiness and impulsive and maladaptive behaviors.

Implications and Concluding Comments

This study advances understanding of the interplay between emptiness, impulsivity, and Mz in the daily lives of individuals with BPD compared to controls. It highlights the centrality of emptiness in BPD and its strong associations with impulsivity, aligning with existing literature. To our knowledge, this is the first study to examine this relationship using EMA rather than cross-sectional methods, a key distinction given the hypothesized dynamic nature of these associations. As Santangelo et al. (2014) emphasized, additional EMA research on BPD symptomatology, including emptiness, is essential for capturing how these symptoms unfold over time in real-world contexts. By operationalizing the dynamic nature of emptiness in daily life, our findings address a critical theoretical and empirical gap, shedding light on its antecedents and consequences in BPD. While less common in nonpsychiatric populations, emptiness is still linked to impulsive and maladaptive behaviors, supporting its transdiagnostic relevance beyond BPD and personality pathology. Clinically, these findings underscore the need for interventions targeting emptiness specifically, promoting adaptive coping strategies and reducing negative outcomes such as self-harm and risky behaviors.

[6] It is noteworthy that the precipitant feelings were assessed conditionally and were only assessed after self-reported impulsive urges and acts. Such a conditional assessment could have impacted our ability to identify differences between feelings and between groups prior to impulsivity. For example, the lack of group differences in emptiness prior to impulsivity could be due to different thresholds in each group for impulsivity. The HC group may have a relatively high threshold that requires a high level of emptiness, that is, the occurrence of impulsivity in the HC group is relatively rare and requires a high level of emptiness to occur—thus canceling out any baseline group differences in emptiness.

References

Aguinis, H., Gottfredson, R. K., & Joo, H. (2013). Best-practice recommendations for defining, identifying, and handling outliers. *Organizational Research Methods*, *16*(2), 270–301. https://doi.org/10.1177/1094428112470848

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.).

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

American Psychiatric Association. (2000). *Diagnostic and statistical man ual of mental disorders* (4th ed., text rev).

Amianto, F., Ferrero, A., Pierò, A., Cairo, E., Rocca, G., Simonelli, B., Fassina, S., Abbate-Daga, G., & Fassino, S. (2011). Supervised team

management, with or without structured psychotherapy, in heavy users of a mental health service with borderline personality disorder: A two-year follow-up preliminary randomized study. *BMC Psychiatry*, *11*(1), Article 181. https://doi.org/10.1186/1471-244X-11-181

Baron-Cohen, S., Wheelwright, S., Hill, J., Raste, Y., & Plumb, I. (2001). The "Reading the Mind in the Eyes" Test revised version: A study with normal adults, and adults with Asperger syndrome or high-functioning autism. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, *42*(2), 241–251. https://doi.org/10.1111/1469-7610.00715

Barrett, L. F., & Barrett, D. J. (2001). An introduction to computerized experience sampling in psychology. *Social Science Computer Review*, *19*(2), 175–185. https://doi.org/10.1177/089443930101900204

Berenson, K. R., Dochat, C., Martin, C. G., Yang, X., Rafaeli, E., & Downey, G. (2018). Identification of mental states and interpersonal functioning in borderline personality disorder. *Personality Disorders: Theory, Research, and Treatment*, *9*(2), 172–181. https://doi.org/10.1037/per0000228

Berenson, K. R., Downey, G., Rafaeli, E., Coifman, K. G., & Paquin, N. L. (2011). The rejection–rage contingency in borderline personality disorder. *Journal of Abnormal Psychology*, *120*(3), 681–690. https://doi.org/10.1037/a0023335

Berenson, K. R., Gregory, W. E., Glaser, E., Romirowsky, A., Rafaeli, E., Yang, X., & Downey, G. (2016). Impulsivity, rejection sensitivity, and reactions to stressors in borderline personality disorder. *Cognitive Therapy and Research*, *40*(4), 510–521. https://doi.org/10.1007/s10608-015-9752-y

Berthelot, N., Ensink, K., Bernazzani, O., Normandin, L., Luyten, P., & Fonagy, P. (2015). Intergenerational transmission of attachment in abused and neglected mothers: The role of trauma-specific reflective functioning. *Infant Mental Health Journal*, *36*(2), 200–212. https://doi.org/10.1002/imhj.21499

Blasco-Fontecilla, H., de León-Martínez, V., Delgado-Gomez, D., Giner, L., Guillaume, S., & Courtet, P. (2013). Emptiness and suicidal behavior: An exploratory review. *Suicidol Online*, *4*(4), 21–32.

Blasco-Fontecilla, H., Delgado-Gomez, D., Ruiz-Hernandez, D., Aguado, D., Baca-Garcia, E., & Lopez-Castroman, J. (2012). Combining scales to assess suicide risk. *Journal of Psychiatric Research*, *46*(10), 1272–1277. https://doi.org/10.1016/j.jpsychires.2012.06.013

Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, *54*(1), 579–616. https://doi.org/10.1146/annurev.psych.54.101601.145030

Bora, E. (2021). A meta-analysis of theory of mind and "mentalization" in borderline personality disorder: A true neuro-social-cognitive or meta-social-cognitive impairment? *Psychological Medicine*, *51*(15), 2541–2551. https://doi.org/10.1017/S0033291721003718

Brickman, L. J., Ammerman, B. A., Look, A. E., Berman, M. E., & McCloskey, M. S. (2014). The relationship between non-suicidal self-injury and borderline personality disorder symptoms in a college sample. *Borderline Personality Disorder and Emotion Dysregulation*, *1*(1), Article 14. https://doi.org/10.1186/2051-6673-1-14

Camoirano, A. (2017). Mentalizing makes parenting work: A review about parental reflective functioning and clinical interventions to improve it. *Frontiers in Psychology*, *8*, Article 14. https://doi.org/10.3389/fpsyg.2017.00014

Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science*, *1*(3), 98–101. https://doi.org/10.1111/1467-8721.ep10768783

Coifman, K. G., Berenson, K. R., Rafaeli, E., & Downey, G. (2012). From negative to positive and back again: Polarized affective and relational experience in borderline personality disorder. *Journal of Abnormal Psychology*, *121*(3), 668–679. https://doi.org/10.1037/a0028502

D'Agostino, A., Pepi, R., Monti, M. R., & Starcevic, V. (2020). The feeling of emptiness: A review of a complex subjective experience. *Harvard Review of Psychiatry*, *28*(5), 287–295. https://doi.org/10.1097/HRP.0000000000000269

Daubney, M., & Bateman, A. (2015). Mentalization-based therapy (MBT): An overview. *Australasian Psychiatry*, *23*(2), 132–135. https://doi.org/10.1177/1039856214566830

Didonna, F., & Gonzalez, Y. R. (2009). Mindfulness and feelings of emptiness. In F. Didonna (Ed.), *Clinical handbook of mindfulness* (pp. 125–151). Springer. https://doi.org/10.1007/978-0-387-09593-6_9

Eaton, N. R., & Greene, A. L. (2018). Personality disorders: Community prevalence and socio-demographic correlates. *Current Opinion in Psychology*, *21*, 28–32. https://doi.org/10.1016/j.copsyc.2017.09.001

Ekeblad, A., Falkenström, F., & Holmqvist, R. (2016). Reflective functioning as predictor of working alliance and outcome in the treatment of depression. *Journal of Consulting and Clinical Psychology*, *84*(1), 67–78. https://doi.org/10.1037/ccp0000055

Ellison, W. D., Rosenstein, L., Chelminski, I., Dalrymple, K., & Zimmerman, M. (2016). The clinical significance of single features of borderline personality disorder: Anger, affective instability, impulsivity, and chronic emptiness in psychiatric outpatients. *Journal of Personality Disorders*, *30*(2), 261–270. https://doi.org/10.1521/pedi_2015_29_193

Ellison, W. D., Rosenstein, L. K., Morgan, T. A., & Zimmerman, M. (2018). Community and clinical epidemiology of borderline personality disorder. *Psychiatric Clinics*, *41*(4), 561–573. https://doi.org/10.1016/j.psc.2018.07.008

Elsner, D., Broadbear, J. H., & Rao, S. (2018). What is the clinical significance of chronic emptiness in borderline personality disorder? *Australasian Psychiatry*, *26*(1), 88–91. https://doi.org/10.1177/1039856217734674

Fertuck, E. A., Jekal, A., Song, I., Wyman, B., Morris, M. C., Wilson, S. T., Brodsky, B. S., & Stanley, B. (2009). Enhanced "Reading the Mind in the Eyes" in borderline personality disorder compared to healthy controls. *Psychological Medicine*, *39*(12), 1979–1988. https://doi.org/10.1017/S003329170900600X

First, M. B., Spitzer, R. L., Gibbon, M., & Williams, J. B. W. (1996). *Structured Clinical Interview for DSM-IV Axis I Disorders, research version (SCID-I)*. Biometrics Research, New York State Psychiatric Institute.

Fonagy, P. (2001). The human genome and the representational world: The role of early mother-infant interaction in creating an interpersonal interpretive mechanism. *Bulletin of the Menninger Clinic*, *65*(3), 427–48. https://doi.org/10.1521/bumc.65.3.427.19844

Fonagy, P., & Bateman, A. W. (2016). Adversity, attachment, and mentalizing. *Comprehensive Psychiatry*, *64*, 59–66. https://doi.org/10.1016/j.comppsych.2015.11.006

Fonagy, P., & Luyten, P. (2009). A developmental, mentalization-based approach to the understanding and treatment of borderline personality disorder. *Development and Psychopathology*, *21*(4), 1355–1381. https://doi.org/10.1017/S0954579409990198

Fonagy, P., Steele, M., Steele, H., Moran, G. S., & Higgitt, A. C. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal*, *12*(3), 201–218. https://doi.org/10.1002/1097-0355(199123)12:3<201::AID-IMHJ2280120307>3.0.CO;2-7

Fonagy, P., Target, M., Steele, H., & Steele, M. (1998). *Reflective-functioning manual, Version 5.0, for application to adult attachment interviews* (pp. 161–162). University College London.

Fulham, L., Forsythe, J., & Fitzpatrick, S. (2023). The relationship between emptiness and suicide and self-injury urges in borderline personality disorder. *Suicide and Life-Threatening Behavior*, *53*(3), 362–371. https://doi.org/10.1111/sltb.12949

Grilo, C. M., McGlashan, T. H., Morey, L. C., Gunderson, J. G., Skodol, A. E., Shea, M. T., Sanislow, C. A., Zanarini, M. C., Bender, D., Oldham, J. M., Dyck, I., & Stout, R. L. (2001). Internal consistency, intercriterion overlap and diagnostic efficiency of criteria sets for DSM-IV schizotypal, borderline, avoidant and obsessive-compulsive personality disorders. *Acta Psychiatrica Scandinavica*, *104*(4), 264–272. https://doi.org/10.1111/j.1600-0447.2001.00436.x

Hajek Gross, C., Oehlke, S. M., Prillinger, K., Goreis, A., Plener, P. L., & Kothgassner, O. D. (2024). Efficacy of mentalization-based therapy in treating self-harm: A systematic review and meta-analysis. *Suicide and Life-Threatening Behavior*, *54*(2), 317–337. https://doi.org/10.1111/sltb.13044

Hamaker, E. L., Asparouhov, T., Brose, A., Schmiedek, F., & Muthén, B. (2018). At the frontiers of modeling intensive longitudinal data: Dynamic structural equation models for the affective measurements from the COGITO study. *Multivariate Behavioral Research*, *53*(6), 820–841. https://doi.org/10.1080/00273171.2018.1446819

Higgins, W. C., Kaplan, D. M., Deschrijver, E., & Ross, R. M. (2024). Construct validity evidence reporting practices for the Reading the Mind in the Eyes test: A systematic scoping review. *Clinical Psychology Review*, *108*, Article 102378. https://doi.org/10.1016/j.cpr.2023.102378

Higgins, W. C., Ross, R. M., Langdon, R., & Polito, V. (2023). The "Reading the Mind in the Eyes" test shows poor psychometric properties in a large, demographically representative US sample. *Assessment*, *30*(6), 1777–1789. https://doi.org/10.1177/10731911221124342.

Hopwood, C. J., & Gjorgjieva, J. (2024). *The place of subjective emptiness in the structure of personality*.

Jaeger, B. C., Edwards, L. J., Das, K., & Sen, P. K. (2017). An R 2 statistic for fixed effects in the generalized linear mixed model. *Journal of Applied Statistics*, *44*(6), 1086–1105. https://doi.org/10.1080/02664763.2016.1193725

Johansen, M., Karterud, S., Pedersen, G., Gude, T., & Falkum, E. (2004). An investigation of the prototype validity of the borderline DSM-IV construct. *Acta Psychiatrica Scandinavica*, *109*(4), 289–298. https://doi.org/10.1046/j.1600-0447.2003.00268.x

Johnson, B. N., Kivity, Y., Rosenstein, L. K., LeBreton, J. M., & Levy, K. N. (2022). The association between mentalizing and psychopathology: A meta-analysis of the reading the mind in the eyes task across psychiatric disorders. *Clinical Psychology: Science and Practice*, *29*(4), 423–439. https://doi.org/10.1037/cps0000105

Kaurin, A., King, K. M., & Wright, A. G. (2023). Studying personality pathology with ecological momentary assessment: Harmonizing theory and method. *Personality Disorders: Theory, Research, and Treatment*, *14*(1), 62–72. https://doi.org/10.1037/per0000596

Kittel, A. F. D., Olderbak, S., & Wilhelm, O. (2022). Sty in the mind's eye: A meta-analytic investigation of the nomological network and internal consistency of the "Reading the Mind in the Eyes" test. *Assessment*, *29*(5), 872–895. https://doi.org/10.1177/1073191121996469

Kivity, Y., Levy, K. N., Johnson, B. N., Rosenstein, L. K., & LeBreton, J. M. (2024). Mentalizing in and out of awareness: A meta-analytic review of implicit and explicit mentalizing. *Clinical Psychology Review*, *108*, Article 102395. https://doi.org/10.1016/j.cpr.2024.102395

Kivity, Y., Levy, K. N., Kelly, K. M., & Clarkin, J. F. (2021). In-session reflective functioning in psychotherapies for borderline personality disorder: The emotion regulatory role of reflective functioning. *Journal of Consulting and Clinical Psychology*, *89*(9), 751–761. https://doi.org/10.1037/ccp0000674

Kleindienst, N., Bohus, M., Ludäscher, P., Limberger, M. F., Kuenkele, K., Ebner-Priemer, U. W., Chapman, A. L., Reicherzer, M., Stieglitz, R. D., & Schmahl, C. (2008). Motives for nonsuicidal self-injury among women with borderline personality disorder. *The Journal of Nervous and Mental Disease*, *196*(3), 230–236. https://doi.org/10.1097/NMD.0b013e3181663026

Klonsky, E. D. (2008). What is emptiness? Clarifying the 7th criterion for borderline personality disorder. *Journal of Personality Disorders*, *22*(4), 418–426. https://doi.org/10.1521/pedi.2008.22.4.418

Köhling, J., Ehrenthal, J. C., Levy, K. N., Schauenburg, H., & Dinger, U. (2015). Quality and severity of depression in borderline personality disorder: A systematic review and meta-analysis. *Clinical Psychology Review*, *37*, 13–25. https://doi.org/10.1016/j.cpr.2015.02.002

Konjusha, A., Hopwood, C. J., Price, A. L., Masuhr, O., & Zimmermann, J. (2021). Investigating the transdiagnostic value of subjective emptiness. *Journal of Personality Disorders*, *35*(5), 788–800. https://doi.org/10.1521/pedi_2021_35_510

Lancer, D. (2019). Perspectives of emptiness. *Psychology and Behavioral Science International Journal*, *12*(4), 1–9. 10.19080/PBSIJ.2019.12.555844.

Levy, K. N., Clarkin, J. F., Yeomans, F. E., Scott, L. N., Wasserman, R. H., & Kernberg, O. F. (2006). The mechanisms of change in the treatment of borderline personality disorder with transference focused psychotherapy. *Journal of Clinical Psychology*, *62*(4), 481–501. https://doi.org/10.1002/jclp.20239

Levy, S. T. (1984). Psychoanalytic perspectives on emptiness. *Journal of the American Psychoanalytic Association*, *32*(2), 387–404. https://doi.org/10.1177/000306518403200207

Lloyd, M., Raymond, N. C., Miner, M. H., & Coleman, E. (2007). Borderline personality traits in individuals with compulsive sexual behavior. *Sexual Addiction & Compulsivity*, *14*(3), 187–206. https://doi.org/10.1080/10720160701480337

Luyten, P., Campbell, C., Allison, E., & Fonagy, P. (2020). The mentalizing approach to psychopathology: State of the art and future directions. *Annual Review of Clinical Psychology*, *16*(1), 297–325. https://doi.org/10.1146/annurev-clinpsy-071919-015355

Martin, J. A., & Levy, K. N. (2022). Chronic feelings of emptiness in a large undergraduate sample: Starting to fill the void. *Personality and Mental Health*, *16*(3), 190–203. https://doi.org/10.1002/pmh.1531

McGlashan, T. H., Grilo, C. M., Skodol, A. E., Gunderson, J. G., Shea, M. T., Morey, L. C., Zanarini, M. C., & Stout, R. L. (2000). The collaborative longitudinal personality disorders study: Baseline axis I/II and II/II diagnostic co-occurrence. *Acta Psychiatrica Scandinavica*, *102*(4), 256–264. https://doi.org/10.1034/j.1600-0447.2000.102004256.x

Miller, C. E., Townsend, M. L., Day, N. J., & Grenyer, B. F. (2020). Measuring the shadows: A systematic review of chronic emptiness in borderline personality disorder. *PLoS ONE*, *15*(7), Article e0233970. https://doi.org/10.1371/journal.pone.0233970

Miller, C. E., Townsend, M. L., & Grenyer, B. F. (2021). Understanding chronic feelings of emptiness in borderline personality disorder: A qualitative study. *Borderline Personality Disorder and Emotion Dysregulation*, *8*(1), Article 24. https://doi.org/10.1186/s40479-021-00164-8

Millon, T. (2011). *Disorders of personality: Introducing a DSM/ICD spectrum from normal to abnormal* (Vol. 208). John Wiley & Sons.

Millon, T. (2016). What is a personality disorder? *Journal of Personality Disorders*, *30*(3), 289–306. https://doi.org/10.1521/pedi.2016.30.3.289

Milrod, B., Keefe, J. R., Choo, T. H., Arnon, S., Such, S., Lowell, A., Neria, Y., & Markowitz, J. C. (2020). Separation anxiety in PTSD: A pilot study of mechanisms in patients undergoing IPT. *Depression and Anxiety*, *37*(4), 386–395. https://doi.org/10.1002/da.23003

Murphy, B. A., & Hall, J. A. (2024). How a strong measurement validity review can go astray: A look at and recommendations for future measurement-focused reviews. *Clinical Psychology Review*, *114*, Article 102506. https://doi.org/10.1016/j.cpr.2024.102506

Nakagawa, S., & Schielzeth, H. (2013). A general and simple method for obtaining R2 from generalized linear mixed-effects models. *Methods in Ecology and Evolution*, *4*(2), 133–142. https://doi.org/10.1111/j.2041-210x.2012.00261.x

Orbach, I., Mikulincer, M., Gilboa-Schechtman, E., & Sirota, P. (2003). Mental pain and its relationship to suicidality and life meaning. *Suicide and Life-Threatening Behavior*, *33*(3), 231–241. https://doi.org/10.1521/suli.33.3.231.23213

Orth, U., Meier, L. L., Bühler, J. L., Dapp, L. C., Krauss, S., Messerli, D., & Robins, R. W. (2024). Effect size guidelines for cross-lagged effects. *Psychological Methods*, *29*(2), 421–433. https://doi.org/10.1037/met0000499

Peteet, J. R. (2011). Approaching emptiness: Subjective, objective and existential dimensions. *Journal of Religion and Health*, *50*(3), 558–563. https://doi.org/10.1007/s10943-010-9443-7

Pfohl, B., Blum, N., & Zimmerman, M. (1997). *Structured interview for DSM-IV personality: SIDP-IV.* American Psychiatric Press.

Pinheiro, J. C., Bates, D. M., DebRoy, S., & Sakar, D. (2012). *Development core team: Nlme: Linear and nonlinear mixed effects models* (R package version 3.1-104).

Premack, D., & Woodruff, G. (1978). Does the chimpanzee have a theory of mind? *Behavioral and Brain Sciences*, *1*(4), 515–26. https://doi.org/10.1017/S0140525X00076512

Price, A. L., Mahler, H. I., & Hopwood, C. J. (2022). Construction and validation of a self-report subjective emptiness scale. *Assessment*, *29*(3), 397–409. https://doi.org/10.1177/1073191120968275

Rallis, B. A., Deming, C. A., Glenn, J. J., & Nock, M. K. (2012). What is the role of dissociation and emptiness in the occurrence of nonsuicidal self-injury? *Journal of Cognitive Psychotherapy*, *26*(4), 287–298. https://doi.org/10.1891/0889-8391.26.4.287

Romero-Canyas, R., Downey, G., Berenson, K., Ayduk, O., & Kang, N. J. (2010). Rejection sensitivity and the rejection–hostility link in romantic relationships. *Journal of Personality*, *78*(1), 119–148. https://doi.org/10.1111/j.1467-6494.2009.00611.x

Roos, C. R., Kirouac, M., Pearson, M. R., Fink, B. C., & Witkiewitz, K. (2015). Examining temptation to drink from an existential perspective: Associations among temptation, purpose in life, and drinking outcomes. *Psychology of Addictive Behaviors*, *29*(3), 716–724. https://doi.org/10.1037/adb0000063

Rudden, M. G., Milrod, B., Target, M., Ackerman, S., & Graf, E. (2006). Reflective functioning in panic disorder patients: A pilot study. *Journal of the American Psychoanalytic Association*, *54*(4), 1339–1343. https://doi.org/10.1177/00030651060540040109

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

Skodol, A. E., Gunderson, J. G., Pfohl, B., Widiger, T. A., Livesley, W. J., & Siever, L. J. (2002). The borderline diagnosis I: Psychopathology, comorbidity, and personality structure. *Biological Psychiatry*, *51*(12), 936–950. https://doi.org/10.1016/S0006-3223(02)01324-0

Snir, A., Rafaeli, E., Gadassi, R., Berenson, K., & Downey, G. (2015). Explicit and inferred motives for nonsuicidal self-injurious acts and urges in borderline and avoidant personality disorders. *Personality Disorders: Theory, Research, and Treatment*, *6*(3), 267–277. https://doi.org/10.1037/per0000104

Steinberg, N., Moshe-Cohen, R., Sheena, L., & Kivity, Y. (2024). Capturing a mentalized moment: A pilot study of the psychometric properties of a novel assessment method of mentalizing in daily life. *Current Psychology*, 43(8), 7596–7611. https://doi.org/10.1007/s12144-023-04963-w

Stoffers-Winterling, J. M., Storebø, O. J., Kongerslev, M. T., Faltinsen, E., Todorovac, A., Sedoc Jørgensen, M., Sales, C. P., Edemann Callesen, H., Pereira Ribeiro, J., Völlm, B. A., Lieb, K., & Simonsen, E. (2022). Psychotherapies for borderline personality disorder: A focused systematic review and meta-analysis. *The British Journal of Psychiatry*, *221*(3), 538–552. https://doi.org/10.1192/bjp.2021.204

Vellante, M., Baron-Cohen, S., Melis, M., Marrone, M., Petretto, D. R., Masala, C., & Preti, A. (2013). The "Reading the Mind in the Eyes" test: Systematic review of psychometric properties and a validation study in Italy. *Cognitive Neuropsychiatry*, *18*(4), 326–354. https://doi.org/10.1080/13546805.2012.721728

Vogt, K. S., & Norman, P. (2019). Is mentalization-based therapy effective in treating the symptoms of borderline personality disorder? A systematic review. *Psychology and Psychotherapy: Theory, Research and Practice*, *92*(4), 441–464. https://doi.org/10.1111/papt.12194

Wang, L. P., & Maxwell, S. E. (2015). On disaggregating between-person and within-person effects with longitudinal data using multilevel models. *Psychological Methods*, *20*(1), 63–83. https://doi.org/10.1037/met0000030

Westen, D., Moses, M. J., Silk, K. R., Lohr, N. E., Cohen, R., & Segal, H. (1992). Quality of depressive experience in borderline personality disorder and major depression: When depression is not just depression. *Journal of Personality Disorders*, *6*(4), 382–393. https://doi.org/10.1521/pedi.1992.6.4.382

Yates, S. L. (2015). *Agoraphobia and emptiness: Theoretical considerations from a psychoanalytic perspective* [Electronic thesis and Dissertation repository]. 2699. https://ir.lib.uwo.ca/etd/2699

Zanarini, M. C., Frankenburg, F. R., Reich, D. B., & Fitzmaurice, G. M. (2016). Fluidity of the subsyndromal phenomenology of borderline personality disorder over 16 years of prospective follow-up. *American Journal of Psychiatry*, *173*(7), 688–694. https://doi.org/10.1176/appi.ajp.2015.15081045

Zandersen, M., & Parnas, J. (2019). Identity disturbance, feelings of emptiness, and the boundaries of the schizophrenia spectrum. *Schizophrenia Bulletin*, *45*(1), 106–113. https://doi.org/10.1093/schbul/sbx183

Zeegers, M. A., Colonnesi, C., Stams, G. J. J., & Meins, E. (2017). Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant–parent attachment. *Psychological Bulletin*, *143*(12), 1245–1272. https://doi.org/10.1037/bul0000114