INVESTIGATING THE RELATIONSHIP BETWEEN DEFENSE MECHANISMS AND THE THERAPEUTIC ALLIANCE IN DIALECTICAL BEHAVIOUR THERAPY FOR BORDERLINE PERSONALITY DISORDER

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Abstract

Defenses play an important role in psychotherapy, as clients' overall defensive functioning (ODF) predicts treatment outcomes. Defensive functioning may influence the relationship between the therapeutic alliance and outcome; however, findings are mixed. This study examined the relationship between defensive functioning, alliance rupture and repair, and outcomes in dialectical behaviour therapy (DBT) for borderline personality disorder (BPD), using secondary data from the FASTER study. In a subsample of 60 participants, observers coded session 6 using the Defense Mechanism Rating Scale (DMRS) and Rupture Resolution Rating System (3RS). Post-treatment outcomes were measured using the Borderline Symptom List (BSL-23) and Symptom Checklist-90-Revised (SCL-90-R). Partial correlations showed lower ODF was associated with greater rupture salience, specifically withdrawal ruptures. Regression analyses revealed ODF moderated the relationship between rupture salience and repair effectiveness, and mature defenses moderated the relationship between rupture salience and outcomes. Findings suggest, without mature defenses, therapists may struggle to resolve ruptures effectively.

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Table of Contents

List of Tables

List of Figures

Investigating the Relationship Between Defense Mechanisms and the Therapeutic Alliance in Dialectical Behaviour Therapy for Borderline Personality Disorder

Borderline personality disorder (BPD) is characterized by a pervasive pattern of affective instability, identity disturbance, impulsivity, and interpersonal dysfunction (APA, 2013; Lieb et al., 2004). Pervasive emotion dysregulation is considered a core problem underlying BPD (Linehan, 1993) and refers to the tendency to experience intense, prolonged, and often highly aversive emotions across many contexts (Cicchetti et al., 1995). According to Linehan's (1993) biosocial theory of BPD, emotion dysregulation develops from the transaction between a person's biological vulnerability to emotion (i.e., emotional sensitivity, emotional reactivity, and a slow return to baseline) and an invalidating social environment (i.e., one that pathologizes emotional experiences and reinforces aversive reactions). A consequence of this transaction over time is that the individual does not learn how to understand or regulate their emotions, such as effectively managing emotion-driven impulses and appropriately engaging in interpersonal relationships. Indeed, BPD is associated with the use of maladaptive strategies or defense mechanisms to manage excessive anxiety and other distressing emotions (Vaillant, 1994) and protect the self from perceived internal or external threat (Cooper, 1998).

Defense mechanisms are automatic processes that typically operate outside of the awareness and volition of the individual. Defense mechanisms are categorized hierarchically based on their general level of adaptiveness (Perry, 1993; Perry & Bond, 2017; Vaillant, 1971). This hierarchy includes three overarching defensive categories: (1) Mature defense mechanisms that include, for example, sublimation, altruism, anticipation, and humor; (2) Neurotic defense mechanisms that include intellectualization, undoing, isolation of affect, reaction formation, displacement, and repression; and (3) Immature defense mechanisms that include, for example,

acting-out, splitting, projection, projective identification, idealization, devaluation, denial, passive-aggression, and help-rejecting complaining (Perry & Bond, 2017). One significant differentiation between the defensive categories is that mature defenses do not threaten interpersonal relationships or distort reality in the way that neurotic or immature defense mechanisms do. Past research has shown that clients with BPD typically use immature defenses (e.g., acting out, projection, splitting; Zanarini et al., 2009).

In psychotherapy, a client's defense style can impact the therapeutic process and treatment response. For example, research suggests that lower overall defensive functioning (ODF) – reflecting a defensive profile weighted more heavily toward lower-order (i.e., immature) defenses – is associated with higher levels of symptoms, problematic behaviours, and psychopathology (e.g., Drapeau et al., 2003; Kramer et al., 2013). Additionally, client ODF at intake has been shown to predict psychotherapy outcome in a range of disorders (e.g., anxiety, depression, and personality disorders), with lower ODF predicting poorer treatment outcomes (Bond & Perry, 2004). Defensive functioning is also hypothesized to impact the development of a strong therapeutic alliance (i.e., the collaborative bond between therapist and client; Bond & Perry, 2004; Despland et al., 2001; Kramer et al., 2009a, 2009b) and contribute to alliance ruptures (i.e., tension or breakdowns in collaboration; Gerostathos et al., 2014). Individuals with immature defensive styles may have a distorted perception of reality, which hinders their ability to maintain honest communication and trust, both of which are critical for building and maintaining a strong alliance. This distortion can lead to misunderstandings or tension that disrupt collaboration between the client and therapist.

Despite the potential contribution of defensive functioning to alliance negotiation, there is limited research in this area and it has yielded mixed results: some studies have found a positive

association between defensive functioning and the alliance (Bond & Perry, 2004; Kramer et al., 2009b), whereas others have found no association between these processes (Despland et al., 2001; Kramer et al., 2009a). Therefore, the interplay between defenses, the therapeutic alliance, and outcome remains unclear. Investigating how defenses might impede the development of a strong alliance and contribute to alliance ruptures is imperative, given that alliance quality is predictive of outcome in BPD treatments (Barnicot et al., 2012; Spinhoven et al., 2007). Accordingly, the purpose of the present study is to investigate the relationship between defensive functioning, alliance rupture and repair, and treatment outcomes in BPD treatment.

The following section reviews the literature on: (i) defenses in BPD and in psychotherapy; (ii) the therapeutic alliance, including alliance rupture and repair in BPD treatments; and (iii) the relationship between defenses and the alliance.

Defense Mechanisms

Origins, Conceptualization, and Measurement

Defense mechanisms were initially conceptualized by Sigmund Freud in the late 19th century (Freud, 1894) and further developed by Anna Freud (1936). In Freud's psychoanalytic model of personality, he posited that defense mechanisms perform a suppressive or repressive role in regulating unconscious drives and impulses. That is, defenses are unconscious processes of the ego that mediate conflicts between the id, ego, and superego, while preventing distressing emotions from reaching conscious awareness (Freud, 1923, 1926). Over time, this construct has evolved beyond intrapersonal regulation to include the navigation of conflict and anxiety that arises from interpersonal dynamics (Kramer, 2009b). Despite fluctuations in scholarly interest over the years, they remain a central focus in psychoanalytic theory (Cramer, 1998). As such, the American Psychiatric Association (APA; 1994) included the Defensive Functioning Scale in the

DSM-IV as an “axis for further study” to promote psychodynamic formulations in diagnostic practice.

As previously noted, defenses are organized hierarchically based on their level of maturity or adaptiveness (Vaillant, 1971). Although these two terms are often conflated in contemporary literature, they originate from distinct perspectives. The term “maturity” is derived from a developmental lens, whereby early-life defenses are often less complex in comparison to later-life defenses (Paulhus et al., 1997; Cramer, 2015). For instance, the use of denial tends to precede projection as the latter requires the development of a theory of mind (Paulhus et al., 1997). In contrast, “adaptiveness” refers to the degree to which a defense effectively mitigates anxiety in response to a perceived threat, while preserving an accurate or realistic understanding of the threat (i.e., without distorting reality; Bond et al., 1983). As maturity and adaptiveness are closely linked (i.e., more mature defenses are typically more effective in managing anxiety), the observed conflation between terms is justified and allows for a unified approach to understanding and measuring defenses.

Measuring defenses is complex: when conceptualized as an unconscious process, defenses are difficult to empirically assess and quantify. One way this issue has been addressed is by focusing on observable defensive behaviours (Cramer, 2000, 2001). By focusing on these observable manifestations of defense mechanisms, researchers have been able to systematically assess and quantify defenses using various psychological tools. There are three primary methods used to measure defense mechanisms: projective techniques, self-report questionnaires, and observer-rater methods. Projective techniques, such as the Defense Mechanism Inventory (DMI; Gleser & Ihilevich, 1969), involve presenting individuals with ambiguous stimuli (e.g., brief stories) to uncover unconscious defense mechanisms through their responses, making them

indirect and reliant on interpretation. Self-report questionnaires, such as the Defense Style Questionnaire (DSQ; Bond, 1992), require individuals to consciously assess their own defensive behaviours using structured questions, but are potentially subjected to self-awareness biases. In contrast, observer-rater methods, such as the Defense Mechanism Rating Scale (DMRS; Perry, 1990), rely on trained coders to review video recordings or transcripts of psychotherapy sessions to identify defenses. The benefit of observer-rated measures is that they bypass social desirability and self-awareness biases that impact self-report measures.

Defenses in BPD

According to psychoanalytic models of personality, every individual possesses a characteristic set of defense mechanisms that determine how they respond to internal and external conflict and engage with the world around them (McWilliams, 2011). The defenses one uses are a product of (1) their biological temperament, (2) early environmental experiences and stressors, (3) the defenses modeled by caregivers, and (4) the reinforcement or punishment of specific defenses based on the consequence associated with their use (McWilliams, 2011). A number of studies have demonstrated a relationship between defenses and psychopathology, particularly in BPD. Zanarini et al. (2009) found that borderline clients exhibited significantly higher scores on four immature defenses (acting out, emotional hypochondriasis, passive aggression, and projection), two image-distorting or borderline defenses (projective identification and splitting), and one neurotic defense (undoing). They also scored lower on the mature defense of suppression compared to personality disorder (DSM-IV-Axis II) comparison subjects. In accordance with this, borderline traits such as affective instability have been shown to correlate with the defenses: acting out, passive aggression, projection, splitting, undoing, and schizoid fantasy (Koenigsberg et al., 2001). More broadly, borderline clients scored significantly

higher in the self-sacrificing, maladaptive action, and image-distorting defense styles, assessed by the DSQ (Zanarini et al., 2009). To summarize, research suggests that BPD is characterized by an immature defensive style (Bond, 1990; Bond et al., 1994; Perry & Cooper, 1986).

Defensive functioning has been shown to play a significant role in DBT treatments for BPD. For example, Euler et al. (2019) found that clients with BPD who received 20 weeks of DBT skills training, as an adjunct to treatment as usual (TAU), showed increases in ODF (i.e., a defensive profile that is more heavily weighted toward mature defenses) and reductions in major image-distorting (borderline) defenses compared to those receiving only TAU. However, changes in ODF from intake to discharge did not predict post-treatment borderline symptoms or distress in either condition. Despite this, more recent work found that lower ODF at intake was associated with smaller reductions in self-harm across both 6 and 12 months of DBT (Euler et al., 2025). Taken together, these findings indicate that the relationship between defensive functioning and treatment outcomes in DBT for BPD needs further exploration.

Role of Defenses in Psychotherapy

Clinicians, whether they adopt a psychoanalytic approach or an alternative therapeutic modality, frequently encounter defenses in their work with clients, particularly those with personality disorders (Perry & Bond, 2005). Although practitioners from non-psychoanalytic frameworks may use different terminology (e.g., resistance, acting out, lack of awareness), these terms often refer to the same underlying phenomenon of defenses (Perry & Bond, 2005). Therefore, an examination of the nature and properties of defenses is considered to be relevant across all forms of psychotherapy. In therapeutic contexts, defenses can be conceptualized both as a client factor that affects the unfolding process of therapy, and potentially as a measure of outcome. For example, research suggests that therapists who actively address defenses and adapt

their intervention to match their clients' defensive styles observe a decreased use of maladaptive defenses and improved treatment outcomes (Winston et al. 1994). As therapy progresses, individuals tend to use fewer immature defenses and more mature defenses over time (Bond & Perry, 2004; Drapeau et al., 2003; Kramer et al., 2010, Perry & Bond, 2012). Shifting from immature to mature defense use has also been positively correlated with symptom reduction (Cramer, 2015; Johanssen et al., 2011; Perry & Bond, 2012). Although, the directionality of the relationship between defenses and symptomology is unclear, the two are intertwined (Cramer, 2015). This suggests that whether explicitly working on defenses (e.g., in psychoanalytic therapies) or taking a responsive approach that indirectly addresses defenses (e.g., by adapting interventions to the client's defensive maturity), clinicians are likely to benefit across various therapeutic modalities (Perry & Bond, 2005).

Alliance

Origins, Conceptualization, and Measurement

The therapeutic alliance describes the collaborative relationship between the therapist and the client. The concept is rooted in psychoanalytic theory and traces back to Freud's conceptualization of transference (Freud, 1912). Although Freud initially viewed transference as a negative process, he later acknowledged that the attachment between the client and therapist can yield positive outcomes (Ardito & Rabellino, 2011). Over the years, many psychologists have expanded his ideas (Greenson, 1965; Rogers, 1951; Zetzel, 1956), culminating in Bordin's (1979) transtheoretical formulation of the working alliance, which includes three components: agreement on goals, consensus on tasks, and the development of an emotional bond between the therapist and client. This formulation sparked the first generation of alliance research, which focused on understanding how the quality of the alliance and patterns of alliance development

over the course of therapy are related to treatment outcomes (Muran, 2022). Subsequent research, known as second-generation alliance research, has shifted focus to the dynamic processes of alliance negotiation – specifically, exploring real-time actions that impact the alliance and outcome (Muran, 2022).

Measuring the alliance can be achieved through three primary methods: direct self-report, indirect self-report, and observer-rated assessments (Eubanks-Carter et al., 2010; Eubanks et al., 2018). Direct self-report methods, such as the Working Alliance Inventory (WAI; Horvath & Greenberg, 1989) involve soliciting client's perception of their relationship with their therapist using questionnaires. Indirect self-report methods infer alliance ruptures and repairs from V-shaped patterns (i.e., a decrease followed by an increase) in alliance scores across multiple sessions. However, research indicates that alliance measures often reveal a discrepancy between client and therapist alliance scores. Clients tend to rate the alliance more favorably than their therapist, suggesting an overestimation of the alliance quality (Eubanks et al., 2018; Tryon et al., 2007). Observer-rated methods, such as the Rupture Resolution Rating System (3RS; Eubanks et al., 2015) rely on trained coders to review video recordings of psychotherapy sessions to identify alliance rupture and repair based on key process markers.

Alliance Research

In contemporary psychotherapy research, the therapeutic alliance stands out as one of the most powerful predictors of positive treatment outcomes (Horvath et al., 2011), across many diagnoses including BPD (Barnicot et al., 2012). The impact of the alliance on treatment outcomes is most pronounced when assessing alliance quality during the earliest and latest stages of therapy (Flückiger et al., 2018; Horvath et al., 2011). Notably, alliance quality accounts for a

greater proportion of the variance in outcome than treatment modality or technique (Flückiger et al., 2012; Horvath et al., 2011).

The alliance is not a static construct but rather a dynamic process that changes over time in response to positive or negative interactions in the therapeutic context. Consequently, a substantial body of research has explored patterns of alliance development, identifying four distinct patterns: stable (i.e., alliance remains consistent throughout treatment), linear strengthening (i.e., alliance improves steadily over the course of treatment), V-shaped (i.e., the quality of the alliance decreases and then rebounds), and declining (i.e., the alliance deteriorates over the course of treatment) (Kivlighan & Shaughnessy, 2000; Stiles et al., 2004). V-shaped rupture-repair sequences were most associated with positive outcomes (Stiles et al., 2004).

Alliance in BPD Treatments

Alliance formation and maintenance with BPD clients is challenging due to the nature of the disorder itself. Clients with BPD frequently exhibit intense emotional fluctuations, fear of abandonment, and a sensitivity towards criticism, which can contribute to breakdowns in collaboration between the client and therapist (Gunderson, 2011; Stanley & Siever, 2010). Consistent with the broader alliance research, early alliance quality has been shown to predict dropout in BPD treatments, with weaker alliances correlating with an increased risk of dropout (Sharf et al., 2010; Steuwe et al., 2023). However, intense fluctuations in emotional states within and between sessions can make single-session measurements of the alliance less reliable (Spinhoven et al., 2007) and complicate alliance-outcome measurements. Accordingly, Guimond et al. (2022) found that alliance measurements over time are better predictors of outcome compared to measurements made at a single time point in BPD samples.

Findings from a recent meta-analysis suggested that a personality disorder diagnosis did not moderate the relationship between alliance and outcome (i.e., this relationship was comparable to other clinical populations) (Flückiger et al., 2018). However, when the authors further disaggregated the data by specific personality disorder, alliance-outcome effects were most variable within BPD populations, suggesting other client-specific factors (e.g., defenses) may play a role in moderating this relationship in BPD. Accordingly, measuring the alliance in BPD is complex and drawing conclusions about the factors influencing alliance and outcome continues to be an important focus of investigation.

Alliance Rupture and Repair

The alliance has been proposed as one of the core mechanisms of change that contributes to symptom reduction in BPD treatments (Rudge et al., 2020). Understanding how the quality of the alliance is negotiated in real-time has become the predominant focus of alliance research. A breakdown in the therapeutic alliance, commonly referred to as a rupture, occurs when there is a deviation in one or more of the three components of the working alliance i.e., there is a decline in collaboration between the client and therapist concerning treatment tasks or goals, or a deterioration of the emotional bond (Eubanks-Carter et al., 2010). An alliance rupture can be categorized into two subtypes: withdrawals and confrontations (Harper, 1989a, 1989b; Safran & Muran, 2000). Withdrawal ruptures occur when the client or therapist moves away from the other party or the therapeutic work in response to difficulties in the therapeutic relationship. This includes shutting down (i.e., denying a feeling state, providing minimal responses, or giving up), avoidance (i.e., using abstract communication, shifting topics, or engaging in avoidant storytelling), or masking their internal experiences (i.e., deferential or appeasing behaviors, or displaying affect that is incongruent with their narrative). In contrast, confrontation ruptures

describe the client or therapist moving against the other party or the therapeutic work when feeling threatened. This includes criticizing the therapist or a component of the treatment, pushing back, or attempting to control or pressure the therapist (Eubanks et al., 2015; Eubanks & Muran, 2022).

In the event of a rupture, resolution strategies are typically used to recover or repair the therapeutic alliance. Immediate repair strategies focus on restoring collaboration between the client and therapist (e.g., modifying the task), whereas expressive repair strategies attempt to explore the rupture to address the client's underlying needs (Eubanks et al., 2018). Therapists may decide to address ruptures either by directly addressing them through open dialogue with the client or by adopting an indirect approach, where the rupture is resolved without the client being overtly aware of it (Eubanks et al., 2018). Rupture repair episodes have been significantly associated with positive treatment outcomes compared to clients who did not experience ruptures and those with unrepaired ruptures (Eubanks et al., 2018). In contrast, unresolved ruptures have been associated with higher rates of premature termination and less favourable treatment outcomes (Safran et al., 2011). One explanation for these findings is that ruptures in psychotherapy provide the client and therapist with an opportunity to understand, explore, and modify interpersonal dynamics that mirror those that occur outside of therapy (Safran & Segal, 1996). As clients work through ruptures with their therapist, they become better equipped to navigate interpersonal difficulties in the real world. Conversely, unresolved ruptures are considered to contribute to negative outcomes because they allow for problematic interpersonal patterns to persist.

Research has demonstrated that personality disorders are associated with greater difficulties in forming an alliance (Forster et al., 2014), and with a higher frequency of alliance

ruptures compared to clients with depression or anxiety disorders (Coutinho et al., 2014a). Additionally, symptoms associated with BPD, including high impulsivity, dysregulation, and lability were linked to greater rupture intensity (Tufekcioglu et al., 2013). For clients with BPD, ruptures are a frequent occurrence in psychotherapy (Bender, 2005; Cash et al., 2013), and effective repair of these ruptures is predictive of symptom reduction and treatment completion (Muran et al., 2005; Strauss et al., 2006). However, not all clients benefit equally from rupture repair; for example, a study comparing recovered and unrecovered BPD clients in DBT found that unrecovered clients exhibited a higher frequency of withdrawal ruptures and were less responsive to the degree of repair in the preceding session (Boritz et al., 2018). Therefore, understanding what contributes to or impedes effective rupture repair is critical for maximizing the effectiveness of treatment.

Defenses and the Alliance

Given that the alliance is a positive predictor of treatment outcome, any client or therapist characteristic that adversely impacts the alliance is likely to undermine the alliance-outcome effect (Cramer, 2015). In the context of BPD, client contributions to the alliance have been found to be stronger predictors of treatment outcomes than therapist contributions (Guimond et al., 2022). Therefore, it is important to direct our efforts towards investigating client factors that contribute to alliance formation and maintenance, including defensive functioning. Indeed, mature defensive styles have been linked to a greater tendency for connection, personal accountability, and alignment with therapeutic tasks, all of which are indicative of a positive therapeutic alliance (Bond & Perry, 2004). In contrast, the use of immature defenses distorts reality, which can hinder the client's ability to engage in the tasks of therapy or maintain the

emotional bond. Consequently, these maladaptive defenses may manifest in the form of alliance ruptures, as collaboration between the client and therapist deteriorates.

Some studies suggest that working with defenses can have beneficial effects on the alliance, particularly in navigating and repairing ruptures. For example, a greater frequency of therapist interventions that address defenses, specifically neurotic defenses, were found in sessions in which rupture repairs occurred, whereas sessions that observed a decline in the alliance (i.e., rupture sessions) involved fewer therapist interventions addressing defenses (Gerostathos et al., 2014). Additionally, Despland et al. (2001) found that congruence between a client's defensive style and the type of intervention applied (e.g., supportive interventions for immature defenses and exploratory interventions for mature defenses) was predictive of alliance development. Therefore, it may be critical for therapists not only to address defenses, but to do so in a way that is responsive to the client's level of defense maturity. This approach may help prevent alliance ruptures or facilitate rupture repair, both of which have been linked with symptom reduction in BPD (Nadel et al., 2025).

Aims of the Study

The primary objective of the proposed study is to examine the relationship between defensive functioning, the therapeutic alliance, and outcome in dialectical behaviour therapy (DBT) for BPD. Specifically, we aim to investigate how the use of mature and immature defenses impacts the salience of alliance ruptures (i.e., the frequency and intensity of ruptures) and determine if this differs between withdrawal and confrontation ruptures. We will also evaluate whether there is a link between defensive functioning and the effectiveness of rupture repair. Lastly, we will explore if defensive functioning moderates the relationship between

rupture salience, repair effectiveness, and treatment outcome. In accordance with our primary objective, we predict:

- Hypothesis 1a: Lower overall defensive functioning (i.e., a defensive profile that is more heavily weighted toward immature defenses) will be associated with a higher salience of alliance ruptures for clients.
- Hypothesis 1b: The relationship between overall defensive functioning and alliance rupture salience in clients will be stronger for withdrawal ruptures versus confrontation ruptures.
- Hypothesis 2: Higher overall defensive functioning (i.e., a defensive profile that is more heavily weighted toward mature defenses) will be associated with greater effectiveness of rupture repair.
- Hypothesis 3: Overall defensive functioning will moderate the relationship between client rupture salience and repair effectiveness, whereby lower defensive functioning will be associated with a stronger negative association between rupture salience and repair effectiveness.
- Hypothesis 4a: Overall defensive functioning will moderate the relationship between alliance rupture salience for clients and post-treatment outcomes, whereby higher defensive functioning will be associated with a stronger negative association between rupture salience and borderline symptoms or distress.
- Hypothesis 4b: Overall defensive functioning will moderate the relationship between repair effectiveness and post-treatment outcomes, whereby higher defensive functioning will be associated with a stronger negative association between repair effectiveness and borderline symptoms or distress.

Method

Study Design

This study is a secondary analysis of the Feasibility of a Shorter Treatment and Evaluating Responses (FASTER) study, a single-blind, two-arm, randomized controlled trial comparing the effectiveness of 6- versus 12-months of DBT for outpatients diagnosed with BPD, (McMain et al., 2022). The inclusion criteria of the parent study included participants aged between 18 and 60 years who were diagnosed with borderline personality disorder (BPD) according to the Diagnostic and Statistical Manual Version IV (DSM-IV; APA, 1994); experienced two or more suicide attempts or episodes of nonsuicidal self-injury (NSSI) in the past five years (including at least one in the past two months); English proficiency; and valid provincial health insurance. Exclusion criteria were a DSM-IV diagnosis of bipolar I disorder, a psychotic disorder, and/or dementia; anticipated hospitalization due to a serious physical health condition; an IQ of 70 or less; receiving eight or more weeks of DBT in the past year; and plans to leave the province during the clinical trial. Participants were randomized in a 1:1 ratio between the DBT-6 and DBT-12 arms, with study assessors blinded to the treatment allocation.

Study Sample

This study consists of a subsample (n = 60) of the 240 participants from the Toronto site of the parent study (DBT-6: n = 30, DBT-12: n = 30). The selected participants were the first patients randomized to each arm of the study. Four eligible participants were eliminated and replaced with the next participant assigned to the respective arm. One participant was excluded for switching therapists twice in the early phase, two produced poor-quality audio and video recordings, and one withdrew consent. The sample consisted of 48 women, 10 men, and two

individuals who self-identified as “other”. The mean age was 30 years (range = 18-47). Comprehensive demographic details are provided in Table 1.

Diagnostic Procedures

The BPD diagnosis was confirmed using the International Personality Disorder Examination (IPDE; Loranger et al., 1995). Intraclass correlation coefficient (ICC) for BPD diagnoses using the IPDE was .99, indicating excellent reliability. Additional diagnoses were assessed using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I; First et al., 1995) and the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II; First et al, 1997).

Interventions

Participants received dialectical behaviour therapy (DBT), an evidence-based treatment for BPD that integrates cognitive-behavioural therapy with acceptance-based approaches. This intervention consists of weekly individual therapy sessions, weekly skills groups, 24/7 access to telephone coaching, and weekly therapist consultations, consistent with Linehan’s (1993) standard DBT model. The treatment arms, DBT-6 and DBT-12, diverged only in length.

Measures

Process Measures

Defense Mechanisms. The Defense Mechanism Rating Scale (DMRS-5th edition; Perry, 1990) was used to assess defensive functioning using session transcripts. This observer-rated measure identifies 30 individual defense mechanisms organized into a hierarchy of seven levels and three categories (see Table 2). Higher-order defenses are considered more mature or adaptive, and each defense mechanism is assigned a score corresponding to the level to which it belongs. For example, high adaptive level defenses are assigned a score of seven, whereas action

level defenses are assigned a score of one. Three superordinate scores can be calculated using this scoring system: individual defense scores represent the number of instances that an individual defense mechanism was identified as a proportion of the total number of defenses. Defense level scores represent the proportion of total defenses classified within a particular defense level. Overall defensive functioning (ODF) is a summary score ranging from 1 (lowest) to 7 (highest), calculated by taking the weighted average of all the defenses identified as a function of their defensive level. High interrater reliability was demonstrated for ODF (ICC > .80) and defense levels (0.795); however, this was slightly lower for the individual defenses (Perry & Henry, 2004).

Alliance Rupture and Repair. The Rupture Resolution Rating System (3RS v2022; Eubanks & Muran, 2022) is an observer-rated measure used to assess alliance rupture and repair based on clinical markers established by Harper (1989a, 1989b) and Safran and Muran (2000). The 3RS is applied to five-minute segments. Each segment is rated for withdrawal rupture salience, confrontation rupture salience, repair strategy salience, and repair effectiveness ratings. Mean rupture salience and mean repair effectiveness scores were calculated by taking an average across all segments in the session. Additionally, a session-level rating was made for rupture salience and repair effectiveness, indicating a global impression of these processes for the whole session.

Withdrawal ruptures refer to a breakdown in the therapeutic relationship in which the client moves away from the therapist or the therapeutic work, whereas confrontation ruptures refer to instances in therapy in which the client moves against the therapist. Rupture ratings used a five-point Likert scale to measure rupture salience, capturing both frequency and intensity (1 = “Not salient,” 3 = “Somewhat salient,” and 5 = “Very salient”). In contrast, the repair

effectiveness ratings used a five-point Likert scale to measure the extent to which ruptures were successfully repaired (1 = “Ruptures were not successfully repaired and the alliance worsened”, 2 = “Ruptures were not successfully repaired but the alliance did not worsen”, 3 = “Ruptures may have been repaired a little”, 4 = “Ruptures were somewhat repaired”, and 5 = “Ruptures were repaired a good amount”). Segments that did not contain any ruptures or repairs were assigned a rating of “N/A.” Interrater reliability for the revised version of the 3RS is currently being explored; however, the previous edition (Eubanks et al., 2015) achieved high interrater reliability (ICC = .73–.98; Coutinho et al., 2014b; Eubanks et al., 2019).

Outcome Measures

Borderline Symptoms. The Borderline Symptom List (BSL-23; Bohus et al., 2009) was used to assess BPD symptom severity, based on diagnostic criteria from the DSM and other empirical borderline features (e.g., self-criticism, shame). It was administered at baseline and every three months afterward until the termination of the study at 24 months. This self-report measure consists of 23 items rated on a five-point Likert scale (0 = “Not at all”, 1 = “A little”, 2 = “Rather”, 3 = “Much”, 4 = “Very strong”). Larger mean scores denote greater impairment. Bohus et al. (2009) demonstrated that the BSL-23 has high internal consistency (Cronbach’s α = .97), high 1-week test-retest reliability (.82), as well as convergent validity with the SCL-90-R GSI (r = .89).

General Symptom Distress. The Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1992) is a 90-item self-report questionnaire that was used to assess for general psychiatric symptomology across nine scales: Somatization, Obsessive-Compulsiveness, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. It was administered at baseline and every three months afterward until the

termination of the study at 24 months. Each item is rated on a five-point Likert scale (0 = “Not at all”, 1 = “A little bit”, 2 = “Moderately”, 3 = “Quite a bit”, 4 = “Extremely”). Three global indices can be generated that provide measures of the level of broad symptom disclosure and intensity disclosures: the Global Severity Index (GSI), the Positive Symptom Total (PST), and the Positive Symptom Distress Index (PSDI). The GSI represents the mean score and serves as an overall measure of psychological distress, with higher scores indicating greater impairment. The PST reflects the number of items with non-zero responses, representing the total count of self-reported symptoms. The PSDI is the average score of all items with non-zero responses, measuring the intensity of the reported symptoms. The SCL-90-R measure has demonstrated ‘good’ to ‘excellent’ one-week test-retest reliability (.80 - .90) and internal consistency (.77 - .90; Derogatis, n.d.).

Coding Procedures

For each dyad, trained observers coded one early treatment session (session 6). Video recordings of the session were utilized to code the 3RS, while transcriptions of the sessions were used to code the DMRS. In three cases, session 6 was not suitable for coding (e.g., family member present for session, therapist was on vacation and a substitute therapist was providing coverage). Therefore, the subsequent session (i.e., session 7) was utilized. In two cases, videotapes of therapy sessions were not available, so audio recordings of sessions were transcribed and coded with both process measures.

The DMRS was coded by one Master’s-level psychology student and one postdoctoral student. Both coders had previously undergone intensive rater training, which included the coding of nine session transcripts, averaging 26 pages each, and participation in 34 hours of consensus meetings. This data was initially collected as part of a separate study examining the

relationship between defense mechanisms and the frequency of self-harm episodes over 6 versus 12 months of DBT for BPD (Euler et al., 2025). Reliability coefficients were established between raters using 20% (n = 12) of sessions. Interrater reliability was 'acceptable' to 'good' (ICC[2,1] = .51 - .88; Euler et al., 2025; Shrout, 1998).

The 3RS was coded by two graduate-level clinical psychology students. Both coders had approximately 25 hours of 3RS training, including consultation and supervision with the developer of the 3RS (C. F. Eubanks). The coders were blind to patient outcome. Each therapy session was rated by both coders, with ratings averaged across time bins. Interrater reliability was evaluated using Cohen's Kappa for segment-level ratings and intraclass correlation coefficients for session-level ratings. Session-level ratings demonstrated 'excellent' reliability (0.80–0.91), while segment-level ratings showed 'fair' to 'good' reliability (0.56–0.62; Cicchetti, 1994; Smith et al., 2025).

Data Analyses

All analyses were conducted using R version 4.3.2 (R Core Team, 2023), with an alpha level of .05 set for statistical significance. As this study is a secondary analysis of a dataset in which participants received either 6 or 12 months of DBT, treatment length was controlled for in all analyses. Given the theorized bidirectional relationship between alliance rupture, repair, and defensive functioning, correlation analyses were used to examine associations among these variables. A series of partial correlations were conducted between mean rupture salience, mean repair effectiveness, and overall defensive functioning (ODF) to account for potential confounding from the remaining variable. Specifically, we examined (H1a) the relationship between ODF and rupture salience, controlling for repair effectiveness and treatment length; (H1b) the relationship between ODF and rupture salience, analyzed separately by rupture type

(withdrawal and confrontation), while controlling for repair effectiveness and treatment length; and (H2) the relationship between ODF and repair effectiveness, controlling for rupture salience and treatment length. Multiple linear regression models were used to determine whether defensive functioning moderated the relationship between: (H3) rupture salience and repair effectiveness; (H4a) rupture salience and treatment outcomes; and (H4b) repair effectiveness and treatment outcomes.

Results

Descriptive statistics for all study variables are presented in Table 3, including the mean, standard deviation, minimum, maximum, skewness, and kurtosis. Notably, all variables had near normal distributions.

Sample Characteristics

Given that half of the participants received 6 months of DBT while the other half received 12 months, it was important to assess for differences in symptomology and distress across the two conditions at both baseline and post-treatment. Independent samples *t*-tests were conducted to compare baseline scores on three outcome variables (BSL-23, GSI, and PSDI). A Wilcoxon rank-sum test was used to compare baseline PST scores, as the data for the 6-month group violated the normality assumption, as indicated by the Shapiro-Wilk test ($W = 0.92$, $p = 0.020$), which is to be expected given that the PST is a symptom count variable. To assess post-treatment differences across conditions, independent samples *t*-tests were conducted for BSL-23 and PSDI, whereas Wilcoxon rank-sum tests were used for GSI and PST due to violations of normality in the 12-month group for GSI (Shapiro-Wilk: $W = 0.92$, $p = 0.040$) and in the 6-month group for PST (Shapiro-Wilk: $W = 0.92$, $p = 0.033$). The results showed that there were no significant differences between the 6-month and 12-month treatment conditions in borderline

symptoms, psychological distress, total symptom count, and intensity of reported symptoms at baseline or post-treatment (see Table 4).

Paired samples *t*-tests were used to compare changes in symptomology and distress in the overall sample (i.e., across both treatment conditions) from baseline to post-treatment (see Table 4). There was a significant decrease in borderline symptoms from baseline ($M = 2.28$, $SD = 0.77$) to post-treatment ($M = 1.60$, $SD = 0.91$), $t\ (54) = -4.94$, $p < .001$. This reflects a shift on the BSL-23 from high to moderate symptom severity (Kleindienst et al., 2020). Additionally, there was a significant decrease in general psychological distress from baseline ($M = 1.75$, $SD = 0.63$) to post-treatment ($M = 1.33$, $SD = 0.76$), $t\ (54) = -3.51$, $p < .001$. This reflects a shift on the GSI from moderate to mild levels of distress. The intensity of reported symptoms also significantly decreased from baseline ($M = 2.26$, $SD = 0.50$) to post-treatment ($M = 1.95$, $SD = 0.64$), $t\ (55) = -3.27$, $p = .0019$. Although there was an observed decrease on PSDI scores, they remained in the moderate range of symptom intensity. Due to violations of normality (Shapiro-Wilk: $W = 0.92$, $p = .0014$), the Wilcoxon signed-rank test was used to compare changes in total symptom count (PST) from baseline ($M = 67.80$, $SD = 12.60$) to post-treatment ($M = 58.00$, $SD = 19.43$). Results revealed a significant decrease in total symptom count, $W = 386$, $p = .0022$. Overall, these shifts in symptomology and distress suggest that the sample should be considered partially recovered, rather than fully recovered.

Defensive Functioning and Rupture Salience

To examine the relationship between ODF and mean rupture salience, partial correlations were conducted while controlling for mean repair effectiveness and treatment length. The results indicated a significant negative correlation between ODF and rupture salience, whereby lower

ODF (i.e., a defensive profile that is more heavily weighted toward immature defenses) was associated with higher rupture salience (r = -.39, p = .0022, see Table 5).

To explore whether the relationship between ODF and mean rupture salience differed between withdrawal and confrontation ruptures, partial correlations were conducted separately for each rupture type, while holding mean repair effectiveness and treatment length constant. Results indicated that mean withdrawal rupture salience was significantly and negatively correlated with ODF (r = -.39, p = .0025), whereas the negative association between mean confrontation rupture salience and ODF was marginally significant (r = -.24, p = .064, see Table 5). This suggests that ODF was more strongly associated with withdrawal rupture salience versus confrontation rupture salience.

Defensive Functioning and Repair Effectiveness

To investigate whether higher ODF (i.e., a defensive profile that is more heavily weighted toward mature defenses) was associated with more effective rupture repair, partial correlations were conducted between ODF and mean repair effectiveness, controlling for mean rupture salience and treatment length. Results revealed a positive but non-significant correlation between ODF and mean repair effectiveness (r = .14, p = .30).

Defensive Functioning as a Moderator of the Relationship Between Rupture Salience and Repair Effectiveness

A multiple linear regression model was conducted to explore whether ODF moderated the relationship between mean rupture salience and mean repair effectiveness, while controlling for treatment length. The regression model was statistically significant (F [4, 55] = 4.72, p = .0024), accounting for 25.56% of the variance in mean repair effectiveness (R^2 = .26). Findings are presented in Table 6. Mean rupture salience (b = -1.10, p = .0054) and ODF (b = -0.51, p

= .043) significantly predicted mean repair effectiveness. The interaction between mean rupture salience and ODF was also significant (b = 0.21, p = .019), indicating a moderation effect. A simple slopes analysis was conducted to elucidate the interaction (See Table 7 and Figure 1). This revealed that when ODF was one standard deviation below the sample mean, there was a significant negative effect between mean rupture salience and mean repair effectiveness (b = -0.33, p = .0017). In contrast, at the average level of ODF (b = -0.14, p = .11) or one standard deviation above the sample mean (b = 0.05, p = .72), no significant relationship was found between mean rupture salience and mean repair effectiveness. Overall, these findings suggest that greater rupture salience is associated with poorer rupture repair only when ODF is low (i.e., when a client's defensive profile is more heavily weighted toward immature defenses). However, the negative relationship between rupture salience and repair effectiveness disappears when ODF is at or above the sample mean, suggesting that a more adaptive defensive profile buffers against the negative effect of rupture salience on repair effectiveness.

Defensive Functioning, Rupture Salience, Repair Effectiveness, and Treatment Outcome

To examine whether defensive functioning moderated the relationships between mean rupture salience and treatment outcomes, and between mean repair effectiveness and treatment outcomes, a series of multiple linear regression models were conducted. Treatment outcomes were assessed across four variables: borderline symptoms (BSL-23), psychological distress (GSI), total symptom count (PST), and intensity of reported symptoms (PSDI), each measured at post-treatment. Post-treatment was measured at 6 or 12 months, depending on the study arm to which the participant was assigned. Each regression model included treatment length as a covariate, along with the baseline value of the corresponding outcome variable to account for initial symptom severity or distress. Four defense mechanism scores were independently

examined as potential moderators: ODF, frequency of mature defenses, frequency of neurotic defenses, and frequency of immature defenses. Interaction terms were included between the defense mechanism variable and mean rupture salience, as well as the defense mechanism variable and mean repair effectiveness in each model.

ODF, Rupture Salience, Repair Effectiveness, and Treatment Outcomes

There was no significant interaction effect between ODF and mean rupture salience on borderline symptoms (BSL-23), psychological distress (GSI), total symptom count (PST), or symptom intensity (PSDI) at post-treatment, after controlling for treatment length and baseline scores. Similarly, there was no significant interaction effect between ODF and mean repair effectiveness on any of the four outcome variables at post-treatment, controlling for treatment length and baseline scores (see Table 8). These findings suggest that ODF did not moderate the relationship between rupture salience and post-treatment outcomes or between repair effectiveness and post-treatment outcomes.

Mature Defenses, Rupture Salience, Repair Effectiveness, and Treatment Outcomes

Mature defenses significantly moderated the relationship between mean rupture salience and post-treatment borderline symptoms, after controlling for treatment length and baseline scores (b = -0.11, p = .010, see Table 9). A simple slopes analysis was conducted to elucidate the interaction (see Table 10 and Figure 2). No significant effect was found between mean rupture salience and post-treatment symptoms when the frequency of mature defenses was at the mean level (b = -0.15, p = .48) or one standard deviation below the sample mean (b = 0.41, p = .14). However, there was a significant negative association between mean rupture salience and post-treatment symptoms when the frequency of mature defenses was one standard deviation above the mean (b = -0.70, p = .03). These findings suggest that higher rupture salience is associated

with fewer post-treatment borderline symptoms only when the frequency of mature defenses is high.

Additionally, mature defenses significantly moderated the relationship between mean rupture salience and post-treatment psychological distress, after controlling for treatment length and baseline scores (b = -0.07, p = .036, see Table 9). A simple slopes analysis revealed that the association between mean rupture salience and post-treatment distress was not significant when the frequency of mature defenses was one standard deviation below (b = 0.31, p = .19), at (b = -0.07, p = .68), and one standard deviation above (b = -0.45, p = .09) the sample mean (see Table 11 and Figure 3). This suggests that there is no specific level of mature defenses that moderates this relationship; instead, it reflects a general moderation, whereby a higher frequency of mature defenses strengthens the negative association between mean rupture salience and post-treatment distress.

Moreover, mature defenses significantly moderated the relationship between mean rupture salience and the intensity of reported symptoms at post-treatment, after controlling for treatment length and baseline scores (b = -0.07, p = .012, see Table 9). A simple slopes analysis was conducted to further elucidate this interaction (see Table 12 and Figure 4). No significant effect was found between mean rupture salience and the intensity of reported symptoms post-treatment when the frequency of mature defenses was at the mean level (b = -0.10, p = .50) or one standard deviation below the sample mean (b = 0.28, p = .15). However, a significant negative association was found between mean rupture salience and post-treatment symptom intensity when the frequency of mature defenses was one standard deviation above the mean (b = -0.47, p = .03). These findings suggest that higher rupture salience is associated with less intense symptoms only when the frequency of mature defenses is high.

No significant interaction effects were found between mean rupture salience and mature defenses on the total symptom count, after controlling for treatment length and baseline scores (b = -1.07, p = .25, see Table 9). Additionally, no significant interaction effects were found between mean repair effectiveness and mature defenses on borderline symptoms (BSL-23), psychological distress (GSI), total symptom count (PST), or intensity of reported symptoms (PSDI) at post-treatment, after controlling for treatment length and baseline scores (see Table 9).

Neurotic Defenses, Rupture Salience, Repair Effectiveness, and Treatment Outcomes

After controlling for treatment length and baseline scores, the frequency of neurotic defenses did not have a significant moderating effect on the relationship between mean rupture salience and any post-treatment outcome variable investigated. Likewise, it did not have a significant moderating effect on mean repair effectiveness and post-treatment outcomes (see Table 13). Therefore, the frequency of neurotic defenses did not moderate the relationship between rupture salience and post-treatment outcomes or between repair effectiveness and post-treatment outcomes.

Immature Defenses, Rupture Salience, Repair Effectiveness, and Treatment Outcomes

The frequency of immature defenses did not significantly interact with mean rupture salience in predicting any post-treatment outcome variable investigated, controlling for treatment length and baseline scores. Similarly, no significant interaction was found between mean repair effectiveness and immature defenses on post-treatment outcomes (see Table 14). Therefore, the frequency of immature defenses did not moderate the relationship between rupture salience and post-treatment outcomes or between repair effectiveness and post-treatment outcomes.

Discussion

Despite the growing body of literature exploring the role of defensive functioning in psychotherapy process, its influence on alliance negotiation remains mixed (Bond & Perry, 2004; Despland et al., 2001; Kramer et al., 2009a, 2009b). Therefore, the primary aim of this study was to investigate the relationship between defensive functioning, alliance rupture and repair, and post-treatment outcomes in DBT for BPD. Our results provided partial support for our hypotheses. Notably, the study sample reflects a partially recovered group of treated BPD patients who demonstrated some degree of treatment response, but did not completely recover by the end of treatment.

The first question we sought to address was whether overall defensive functioning (i.e., the average adaptiveness of defenses) was associated with alliance rupture salience in session. Our findings showed that defensive profiles more heavily weighted toward immature defenses were associated with more frequent and intense alliance ruptures. This finding directly reflects the characteristic nature of immature defenses to compromise interpersonal relationships and distort reality, which can disrupt collaboration between the client and therapist and weaken the therapeutic bond in response to tension in session. As expected, the negative association between ODF and rupture salience was stronger for withdrawal ruptures than for confrontation ruptures. This finding suggests that withdrawal ruptures may be more closely associated with immature defenses and are therefore, more difficult to work with in therapy. This is consistent with previous research that found that unrecovered clients exhibited a higher frequency of withdrawal ruptures versus recovered clients (Boritz et al., 2018).

The second question we sought to address was whether overall defensive functioning was associated with rupture repair effectiveness. Surprisingly, no relationship was found between ODF and repair effectiveness. However, when we examined whether ODF moderated the

relationship between rupture salience and repair effectiveness, our results indicated that greater rupture salience was associated with poorer repair effectiveness only when ODF was low relative to the sample mean. These findings suggest that ODF may not directly influence rupture repair effectiveness for all clients but may account for some of the relationship difficulties experienced by clients with lower defensive functioning (i.e., a defensive profile that is more heavily weighted toward immature defenses). Specifically, for these individuals, when ruptures are more salient, effectively addressing them may become more challenging.

We also examined whether defensive functioning moderated the relationship between rupture salience and post-treatment outcomes across four domains: borderline symptoms, psychological distress, total symptom count, and intensity of reported symptoms. Although ODF, neurotic defenses, and immature defenses did not moderate the relationship between rupture salience and post-treatment outcomes, mature defenses emerged as a key moderator in this process. Specifically, at higher frequencies of mature defenses, greater rupture salience was associated with both fewer borderline symptoms and lower symptom intensity at post-treatment. Additionally, as the use of mature defenses increased, the negative relationship between rupture salience and psychological distress was strengthened; however, no interaction effect was found on total symptom count. In summary, the presence of mature defenses appears to support positive therapeutic outcomes following alliance ruptures.

Our findings converge with those of Euler et al. (2025), who demonstrated that client defensive functioning can impact treatment outcomes in DBT for BPD. However, the findings diverge in terms of the specificity of defenses that predicted outcomes. Euler et al. (2025) found that higher ODF (i.e., the weighted average of defenses based on their maturity) early in treatment facilitated greater reductions in self-harm post-treatment. Higher ODF could reflect

either an increased frequency of higher-order (i.e., mature) defenses or a decreased frequency of lower-order (i.e., immature) defenses; however, it is unclear which pattern is driving this effect. Our study addressed this limitation by elucidating the individual effects of each defensive category (i.e., mature, neurotic, and immature defenses) on our outcome measures of interest (i.e., borderline symptoms, psychological distress, and symptom intensity post-treatment). Our findings show that the presence of mature defenses, rather than the absence of immature defenses, accounts for the positive association between rupture salience and improved treatment outcomes. This highlights the importance of considering all three defensive categories and their contributory roles to alliance rupture, repair, and outcome.

Lastly, we sought to address whether defensive functioning moderated the relationship between repair effectiveness and post-treatment outcomes across the same four domains. No significant interactions were found between ODF or any of the defensive categories (i.e., mature, neurotic, and immature defenses) and repair effectiveness on outcomes. Although we expected that greater use of mature defenses would strengthen the relationship between repair and outcome, it is likely that repair processes that occurred over multiple sessions were once again overlooked in these analyses.

Clinical Implications

The findings from this study highlight the critical role that defensive functioning plays in shaping treatment outcomes following alliance rupture and repair processes. Ruptures within the therapeutic relationship present opportunities for corrective emotional experiences (Safran, 1993); however, our results suggest that this benefit may be contingent upon the client's use of more adaptive defense mechanisms. As noted, client contributions to the alliance are stronger predictors of outcome in BPD treatments (Guimond et al., 2022). Therefore, clients with more

mature defensive styles may be better equipped to engage in constructive rupture repair during sessions, even in the face of interpersonal dysregulation, a core feature of BPD. These new relational experiences challenge maladaptive interpersonal patterns, resulting in improved therapeutic outcomes post-treatment.

Consequently, clinicians working with BPD clients should assess and address deficits in defensive functioning to maximize potential gains from corrective emotional experiences via alliance rupture and repair. Understanding a client's defensive profile can guide the selection of therapeutic interventions that fosters alliance formation. For example, there is some research that suggests clients with more immature defenses tend to develop stronger alliances when supportive interventions are applied, whereas those with mature defenses benefit more from exploratory or interpretive approaches (Despland et al., 2001). In addition to being attuned to a client's defensive functioning to individualize treatments, therapists should model mature defenses in session, particularly in the early stages of treatment, to encourage clients to adopt these more adaptive strategies. A preliminary case study found that clients tended to mirror their therapist's defense mechanisms in the initial phases of therapy, whereas in the later stages, clients demonstrated more mature defenses independent of the therapist (Di Giuseppe et al., 2024). Therefore, a therapist's defensive functioning may potentially promote the development of more mature defenses in the client, ultimately strengthening the therapeutic alliance and improving treatment outcomes.

Limitations and Future Directions

This study has several limitations that should be considered. Firstly, the sample size was relatively small, consisting of only 60 client-therapist dyads. Additionally, this study primarily focused on client contributions (i.e., defensive functioning of the client) to alliance ruptures,

ignoring therapist contributions (i.e., defensive functioning of the therapist). Given the findings of Di Giuseppe et al. (2024), future research should increase the sample size and incorporate therapist measurements of defensive functioning to elucidate the dyadic interactions between the client and therapist that impact the alliance. Another limitation is that the frequencies of mature, neurotic, and immature defenses were examined independently rather than in relation to one another. Investigating the three defensive categories simultaneously would provide a more nuanced understanding of their combined effect on alliance rupture and repair. Furthermore, this study only examined a single session, as opposed to measuring changes in defensive functioning and alliance development across multiple sessions. As our data captures only a single session, our analyses account only for rupture repair processes that are resolved within that session. As repair processes can unfold across multiple sessions (Eubanks et al., 2018), it is possible that our findings do not account for the longitudinal course of rupture and repair for BPD clients. Future research should adopt longitudinal designs that assess these processes over the course of treatment. This is important for two reasons: (1) the DMRS was designed to capture the effect of changes in defensive functioning over time on outcomes; and (2) Guimond et al. (2022) found that time-varying alliance is a better predictor of outcomes in BPD, which may explain our null findings related to repair effectiveness, as these processes can occur over multiple sessions. Finally, it may be helpful to disaggregate recovered and unrecovered clients to determine whether there are distinct patterns in the relationship between defenses and rupture-repair processes that may contribute to differences in these two outcome groups.

Conclusion

This study aimed to extend the literature on the relationship between defensive functioning, alliance rupture and repair, and treatment outcomes in DBT for BPD. Defensive

profiles that are more heavily weighted toward immature defenses were associated with increased rupture intensity and frequency, particularly for withdrawal ruptures. Furthermore, when ODF was low, greater rupture salience was linked to poorer rupture repair. In contrast, when mature defenses were high, greater rupture salience was associated with fewer borderline symptoms, decreased symptom intensity, and lower psychological distress. No significant associations were found between defensive functioning, repair effectiveness, and outcome. Future research should explore how defensive functioning influences alliance rupture and repair over time and elucidate the role of the therapist's defensive functioning in this process.

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Tables

Table 1

Patient Demographics

Variable	*n*	%
Gender		
Female	48	81.4
Male	10	16.9
Other	2	3.39
Marital Status		
Single, Never Married	43	72.9
Married/Common Law	9	15.3
Separated	4	6.78
Divorced	3	5.10
Education		
Did Not Complete Highschool	2	3.39
Highschool Diploma	7	11.9
Some Post-Secondary	20	33.9
College or Trade Certification	13	22.0
University Degree	12	20.3
Master's/Doctoral Degree	5	8.47
Income		
Less than $5000	14	23.7
$5000 - $9 999	7	11.9
$10 000 – $14 999	7	11.9
$15 000 - $19 999	5	8.47
$20 000 - $24 999	2	3.39
$25 000 - $29 999	2	3.39
$30 000 - $49 999	10	16.9
$50 000 or Greater	10	16.9
	M	*SD*
Age	30.4	7.94
Comorbid Disorders		
Number of Lifetime Axis 1 Comorbid Disorders	4.54	2.15
Number of Current Axis 1 Comorbid Disorders	2.53	1.47
BPD Criteria Met		
At Baseline	7.22	1.00

Table 2

DMRS Hierarchy of Defenses

Category	Defense Levels		Individual Defense Mechanisms
Mature Defenses	7	High Adaptive	Affiliation; altruism; anticipation; humor; self-assertion; self-observation; sublimation; suppression
Neurotic Defenses	6	Obsessional	Isolation of affect; intellectualization; undoing
	5a	Hysterical	Dissociation; repression
	5b	Other neurotic	Displacement; reaction formation
Immature Defenses	4	Minor image-distorting (narcissistic)	Devaluation of self or object images; idealization of self or object images; omnipotence
	3	Disavowal	Denial; projection; rationalization; autistic fantasy*
	2	Major image-distorting (borderline)	Projective identification; splitting of self-images; splitting of other's images
	1	Action	Acting out; help-rejecting complaining; passive aggression

Note. DMRS = Defense Mechanism Rating Scale. Psychotic defense level (level 0) was omitted. *Autistic fantasy is scored as a level 3 defense despite not being classified as a disavowal defense. Adapted from Perry and Bond (2012).

Table 3

Descriptive Statistics of Study Variables

	M	*SD*	Min	Max	Skewness	Kurtosis
Rupture Salience	2.70	0.66	1.50	4.27	0.40	-0.27
Withdrawal Rupture Salience	3.12	0.74	1.46	4.85	-0.02	0.05
Confrontation Rupture Salience	2.29	0.88	1.14	4.62	0.78	-0.11
Repair Effectiveness	2.79	0.42	1.46	3.58	-0.94	1.07
ODF	4.48	0.90	2.18	6.50	-0.11	-0.12
Mature Defenses	8.70	5.15	0.00	23.00	0.53	0.03
Neurotic Defenses	7.12	4.72	1.00	24.00	1.19	1.77
Immature Defenses	11.78	6.45	0.00	30.00	0.87	0.91

Note. Min = Minimum; Max = Maximum; ODF = Overall Defensive Functioning. Rupture salience and repair effectiveness scores range from 1 to 5. ODF scores range from 1 to 7.

Table 4

Baseline and Post-Treatment Symptom Comparisons

	Baseline					Post-Treatment					Overall				
	6-Month		12-Month		6-Month vs 12-Month	6-Month		12-Month		6-Month vs 12-Month	Baseline		Post-Treatment		Baseline vs Post-Treatment
	M	*SD*	*M*	*SD*	*p*	*M*	*SD*	*M*	*SD*	*p*	*M*	*SD*	*M*	*SD*	*p*
BSL-23	2.28	0.82	2.27	0.74	.94	1.70	0.89	1.50	0.94	.43	2.28	0.77	1.60	0.91	< .001
GSI	1.78	0.65	1.72	0.62	.74	1.38	0.73	1.28	0.79	.47	1.75	0.63	1.33	0.76	< .001
PST	68.07	13.03	67.53	12.38	.69	59.85	20.72	56.28	18.34	.34	67.80	12.60	58.00	19.43	.0022
PSDI	2.29	0.53	2.23	0.48	.61	2.01	0.64	1.89	0.65	.48	2.26	0.50	1.95	0.64	.0019

Note. BSL-23 = Borderline Symptom List; GSI = Global Severity Index; PST = Positive Symptom Total; PSDI = Positive Symptom Distress Index. Independent samples *t*-tests were conducted to compare BSL-23, GSI, and PSDI at baseline, as well as BSL-23 and PSDI at post-treatment, across 6-month and 12-month conditions. Wilcoxon rank-sum tests were used to compare PST at baseline and GSI and PST at post-treatment across treatment conditions due to normality violations. Paired samples *t*-tests were conducted to compare changes from baseline to post-treatment in the overall sample for BSL-23, GSI, and PSDI. A Wilcoxon signed-rank test was used to compare changes from baseline to post-treatment in the overall sample for PST due to normality violations.

Table 5

Partial Correlation Matrix of ODF, Rupture Salience, and Repair Effectiveness

	ODF
Rupture Salience	-.39**
Withdrawal Rupture Salience	-.39**
Confrontation Rupture Salience	-.24
Repair Effectiveness	.14

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ODF = Overall Defensive Functioning. In cells analyzing the relationship between rupture salience and ODF, mean repair effectiveness and treatment length is partialled out. In the cell analyzing the relationship between repair effectiveness and ODF, mean rupture salience and treatment length is partialled out.

Table 6

Regression Analysis of Rupture Salience and ODF on Repair Effectiveness

Predictor	*b* [95% CI]	*SE*	*t*
Intercept	5.52 [3.31, 7.73]	1.10	5.00***
Treatment Length	-0.01 [-0.21, 0.19]	0.10	-0.11
Rupture Salience	-1.10 [-1.85, -0.34]	0.38	-2.90**
ODF	-0.51 [-1.00, -0.02]	0.25	-2.08*
ODF x Rupture Salience	0.21 [0.04, 0.39]	0.09	2.43*
F	4.72**		
R^2	.26		
Adjusted R^2	.20		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ODF = Overall Defensive Functioning.

Table 7

Simple Slopes Analysis: Conditional Effects of Rupture Salience on Repair Effectiveness at Various levels of ODF

	b [95% CI]	*SE*	*t*
Low (-1 SD)	-0.33 [-0.54, -0.13]	0.10	-3.30**
Average	-0.14 [-0.32, 0.03]	0.09	-1.62
High (+1 SD)	0.05 [-0.22, 0.32]	0.13	0.37

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ODF = Overall Defensive Functioning.

Table 8

Regression Analysis of Rupture Salience and Repair Effectiveness on Treatment Outcomes with ODF as a Moderator

	Model 1A: BSL-23			**Model 1B: GSI**			**Model 1C: PST**			**Model 1D: PSDI**		
	b [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*
Intercept	-8.34 [-22.55, 5.88]	7.07	-1.18	-4.84 [-16.98, 7.31]	6.04	-0.80	-143.94 [-458.05, 170.16]	156.22	-0.92	-3.11 [-13.28, 7.06]	5.06	-0.62
Treatment Length	0.18 [-0.29, 0.65]	0.23	0.77	0.07 [-0.33, 0.47]	0.20	0.36	2.81 [-7.38, 13.01]	5.07	0.56	0.08 [-0.25, 0.41]	0.16	0.51
Baseline	0.44 [0.13, 0.75]	0.15	2.89**	0.46 [0.14, 0.78]	0.16	2.86**	0.43 [0.03, 0.82]	0.20	2.17*	0.58 [0.24, 0.93]	0.17	3.43**
Rupture Salience	1.81 [-0.42, 4.03]	1.11	1.63	1.17 [-0.74, 3.07]	0.95	1.23	27.73 [-21.44, 76.91]	24.46	1.13	1.03 [-0.56, 2.62]	0.79	1.30
Repair Effectiveness	1.80 [-2.01, 5.61]	1.89	0.95	1.08 [-2.20, 4.36]	1.63	0.66	44.72 [-39.70, 129.14]	41.99	1.07	0.48 [-2.26, 3.23]	1.37	0.35
ODF	2.13 [-0.85, 5.11]	1.48	1.44	1.27 [-1.28, 3.83]	1.27	1.00	42.78 [-23.24, 108.79]	32.83	1.30	0.85 [-1.29, 2.99]	1.06	0.80
Rupture Salience x ODF	-0.44 [-0.93, 0.05]	0.24	-1.82	-0.28 [-0.70, 0.13]	0.21	-1.38	-6.75 [-17.48, 3.98]	5.34	-1.27	-0.25 [-0.60, 0.10]	0.17	-1.46
Repair Effectiveness x ODF	-0.43 [-1.26, 0.41]	0.41	-1.03	-0.25 [-0.97, 0.47]	0.36	-0.70	-11.05 [-29.52, 7.41]	9.18	-1.20	-0.10 [-0.70, 0.50]	0.30	-0.33
F	2.67*			2.13			2.00			2.41*		
R^2	.28			.24			.23			.26		
Adjusted R^2	.18			.13			.11			.15		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ODF = Overall Defensive Functioning; BSL-23 = Borderline Symptom List; GSI = Global Severity Index; PST = Positive Symptom Total; PSDI = Positive Symptom Distress Index.

Table 9

Regression Analysis of Rupture Salience and Repair Effectiveness on Treatment Outcomes with Mature Defenses as a Moderator

	Model 2A: BSL-23			**Model 2B: GSI**			**Model 2C: PST**			**Model 2D: PSDI**		
	b [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*T*
Intercept	-2.96 [-8.08, 2.16]	2.54	-1.16	-2.05 [-6.38, 2.27]	2.15	-0.96	-7.52 [-128.17, 113.13]	60.00	-0.13	-1.70 [-5.23, 1.83]	1.76	-0.97
Treatment Length	0.30 [-0.18, 0.77]	0.24	1.26	0.14 [-0.26, 0.55]	0.20	0.72	3.06 [-7.68, 13.79]	5.34	0.57	0.16 [-0.17, 0.49]	0.16	0.99
Baseline	0.53 [0.22, 0.84]	0.16	3.42**	0.50 [0.19, 0.82]	0.16	3.21**	0.49 [0.09, 0.90]	0.20	2.44*	0.58 [0.25, 0.91]	0.16	3.57***
Rupture Salience	0.80 [0.03, 1.57]	0.38	2.08*	0.58 [-0.08, 1.24]	0.33	1.76	8.63 [-9.24, 26.51]	8.89	0.97	0.54 [0.01, 1.08]	0.27	2.03*
Repair Effectiveness	0.43 [-0.82, 1.69]	0.63	0.69	0.37 [-0.71, 1.45]	0.53	0.69	4.85 [-24.06, 33.76]	14.38	0.34	0.31 [-0.57, 1.19]	0.44	0.71
Mature Defenses	0.42 [0.00, 0.84]	0.21	2.02*	0.29 [-0.06, 0.64]	0.17	1.65	5.32 [-4.15, 14.78]	4.71	1.13	0.25 [-0.04, 0.53]	0.14	1.74
Rupture Salience x Mature Defenses	-0.11 [-0.18, -0.03]	0.04	-2.68*	-0.07 [-0.14, -0.01]	0.03	-2.16*	-1.07 [-2.90, 0.76]	0.91	-1.17	-0.07 [-0.13, -0.02]	0.03	-2.61*
Repair Effectiveness x Mature Defenses	-0.06 [-0.17, 0.06]	0.06	-1.01	-0.04 [-0.14, 0.05]	0.05	-0.86	-1.12 [-3.69, 1.45]	1.28	-0.88	-0.02 [-0.10, 0.05]	0.04	-0.61
F	3.13**			2.48*			1.64			3.22**		
R^2	.32			.27			.19			.32		
Adjusted R^2	.22			.16			.08			.22		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. BSL-23 = Borderline Symptom List; GSI = Global Severity Index; PST = Positive Symptom Total; PSDI = Positive Symptom Distress Index.

Table 10

Simple Slopes Analysis: Conditional Effects of Rupture Salience on Post-treatment Borderline Symptoms at Various levels of Mature Defenses

	b [95% CI]	*SE*	*t*
Low (-1 SD)	0.41 [-0.14, 0.95]	0.27	1.51
Average	-0.15 [-0.55, 0.26]	0.20	-0.72
High (+1 SD)	-0.70 [-1.32, -0.08]	0.31	-2.28*

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 11

Simple Slopes Analysis: Conditional Effects of Rupture Salience on Post-treatment Psychological Distress at Various levels of Mature Defenses

	b [95% CI]	*SE*	*t*
Low (-1 SD)	0.31 [-0.16, 0.78]	0.23	1.34
Average	-0.07 [-0.42, 0.28]	0.17	-0.41
High (+1 SD)	-0.45 [-0.98, 0.07]	0.26	-1.73

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 12

Simple Slopes Analysis: Conditional Effects of Rupture Salience on Post-treatment Symptom Intensity at Various levels of Mature Defenses

	b [95% CI]	*SE*	*t*
Low (-1 SD)	0.28 [-0.10, 0.65]	0.19	1.46
Average	-0.10 [-0.38, 0.19]	0.14	-0.68
High (+1 SD)	-0.47 [-0.90, -0.04]	0.21	-2.20*

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 13

Regression Analysis of Rupture Salience and Repair Effectiveness on Treatment Outcomes with Neurotic Defenses as a Moderator

	Model 3A: BSL-23			**Model 3B: GSI**			**Model 3C: PST**			**Model 3D: PSDI**		
	b [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*
Intercept	4.71 [-0.31, 9.73]	2.50	1.89	3.39 [-0.90, 7.68]	2.13	1.59	128.89 [15.16, 242.63]	56.57	2.28*	2.61 [-1.03, 6.25]	1.81	1.44
Treatment Length	0.19 [-0.29, 0.66]	0.24	0.78	0.10 [-0.31, 0.50]	0.20	0.49	3.27 [-7.09, 13.63]	5.15	0.63	0.10 [-0.23, 0.44]	0.17	0.62
Baseline	0.46 [0.15, 0.77]	0.16	2.95**	0.45 [0.12, 0.79]	0.16	2.76**	0.47 [0.06, 0.87]	0.20	2.31*	0.57 [0.22, 0.91]	0.17	3.26**
Rupture Salience	-0.16 [-1.01, 0.69]	0.42	-0.38	-0.18 [-0.91, 0.54]	0.36	-0.51	-7.36 [-26.02, 11.30]	9.28	-0.79	-0.11 [-0.71, 0.49]	0.30	-0.38
Repair Effectiveness	-1.28 [-2.61, 0.05]	0.66	-1.93	-0.81 [-1.94, 0.33]	0.56	-1.43	-30.05 [-59.40, -0.70]	14.60	-2.06*	-0.58 [-1.52, 0.37]	0.47	-1.23
Neurotic Defenses	-0.44 [-1.04, 0.16]	0.30	-1.46	-0.33 [-0.84, 0.18]	0.25	-1.29	-10.23 [-23.37, 2.90]	6.53	-1.57	-0.21 [-0.64, 0.22]	0.21	-0.99
Rupture Salience x Neurotic Defenses	0.02 [-0.08, 0.13]	0.05	0.45	0.03 [-0.06, 0.12]	0.05	0.68	1.02 [-1.34, 3.38]	1.17	0.87	0.01 [-0.06, 0.09]	0.04	0.35
Repair Effectiveness x Neurotic Defenses	0.12 [-0.02, 0.26]	0.07	1.70	0.08 [-0.04, 0.20]	0.06	1.33	2.65 [-0.49, 5.78]	1.56	1.70	0.06 [-0.04, 0.16]	0.05	1.18
F	2.17			1.73			1.63			2.10		
R^2	.24			.21			.19			.23		
Adjusted R^2	.13			.09			.07			.12		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. BSL-23 = Borderline Symptom List; GSI = Global Severity Index; PST = Positive Symptom Total; PSDI = Positive Symptom Distress Index.

Table 14

Regression Analysis of Rupture Salience and Repair Effectiveness on Treatment Outcomes with Immature Defenses as a Moderator

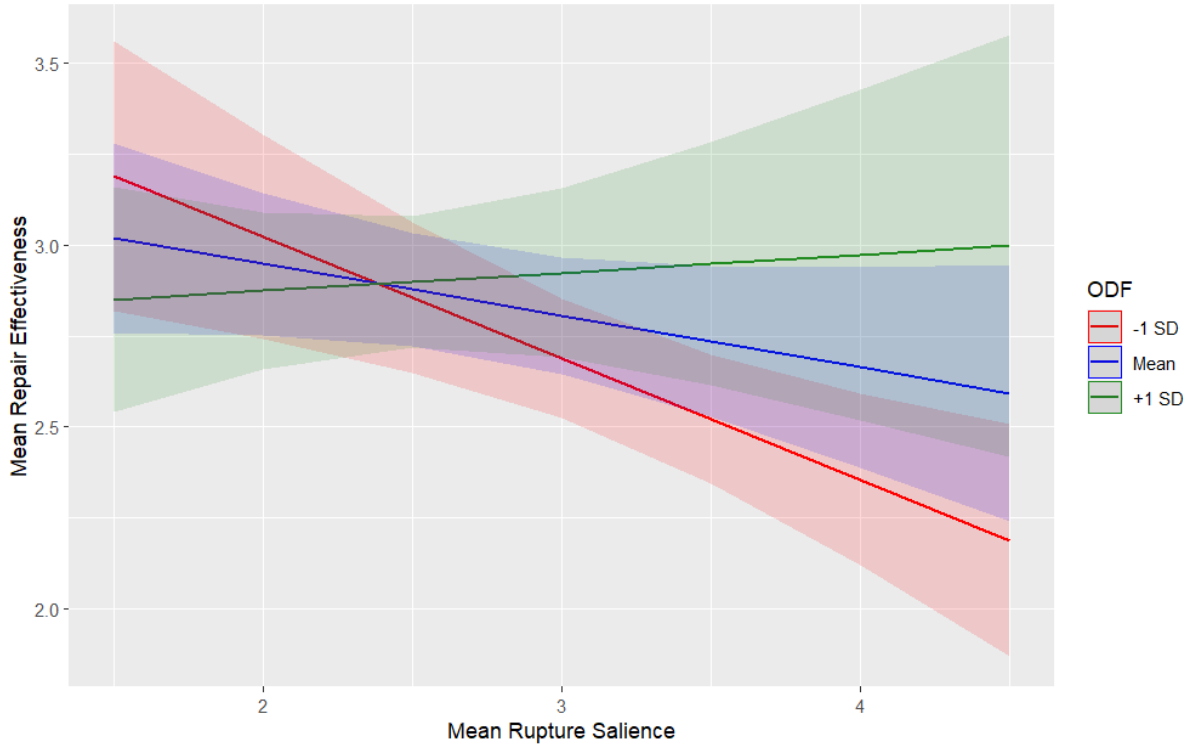
	Model 4A: BSL-23			**Model 4B: GSI**			**Model 4C: PST**			**Model 4D: PSDI**		
	b [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*	*b* [95% CI]	*SE*	*t*
Intercept	0.96 [-4.53, 6.45]	2.73	0.35	-0.41 [-5.06, 4.25]	2.31	-0.18	74.29 [-52.53, 201.12]	63.08	1.18	-0.91 [-4.75, 2.93]	1.91	-0.48
Treatment Length	0.25 [-0.24, 0.74]	0.24	1.03	0.13 [-0.28, 0.54]	0.20	0.62	3.24 [-7.39, 13.87]	5.29	0.61	0.13 [-0.20, 0.46]	0.17	0.80
Baseline	0.51 [0.18, 0.85]	0.16	3.11**	0.52 [0.18, 0.87]	0.17	3.07**	0.46 [0.03, 0.88]	0.21	2.16*	0.64 [0.28, 1.00]	0.18	3.60***
Rupture Salience	0.20 [-0.70, 1.10]	0.45	0.45	0.24 [-0.51, 0.99]	0.37	0.65	-1.34 [-21.12, 18.44]	9.84	-0.14	0.25 [-0.36, 0.86]	0.30	0.83
Repair Effectiveness	-0.44 [-1.88, 1.00]	0.72	-0.62	0.05 [-1.18, 1.28]	0.61	0.08	-16.82 [-48.76, 15.13]	15.89	-1.06	0.25 [-0.75, 1.25]	0.50	0.50
Immature Defenses	0.09 [-0.35, 0.53]	0.22	0.43	0.13 [-0.23, 0.50]	0.18	0.73	-1.61 [-11.19, 7.97]	4.76	-0.34	0.17 [-0.13, 0.47]	0.15	1.15
Rupture Salience x Immature Defenses	-0.03 [-0.10, 0.05]	0.04	-0.70	-0.02 [-0.08, 0.04]	0.03	-0.74	0.08 [-1.55, 1.71]	0.81	0.10	-0.03 [-0.08, 0.02]	0.02	-1.09
Repair Effectiveness x Immature Defenses	-0.00 [-0.10, 0.09]	0.05	-0.09	-0.02 [-0.11, 0.06]	0.04	-0.59	0.57 [-1.57, 2.71]	1.06	0.54	-0.03 [-0.10, 0.03]	0.03	-0.98
F	1.71			1.51			1.15			2.11		
R^2	.20			.18			.14			.24		
Adjusted R^2	.08			.06			.02			.12		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. BSL-23 = Borderline Symptom List; GSI = Global Severity Index; PST = Positive Symptom Total; PSDI = Positive Symptom Distress Index.

Figures

Figure 1

Simple Slopes of Rupture Salience on Repair Effectiveness at Various Levels of ODF



Note. ODF = Overall Defensive Functioning.

Figure 2

Simple Slopes of Rupture Salience on Post-treatment Borderline Symptoms at Various Levels of Mature Defenses

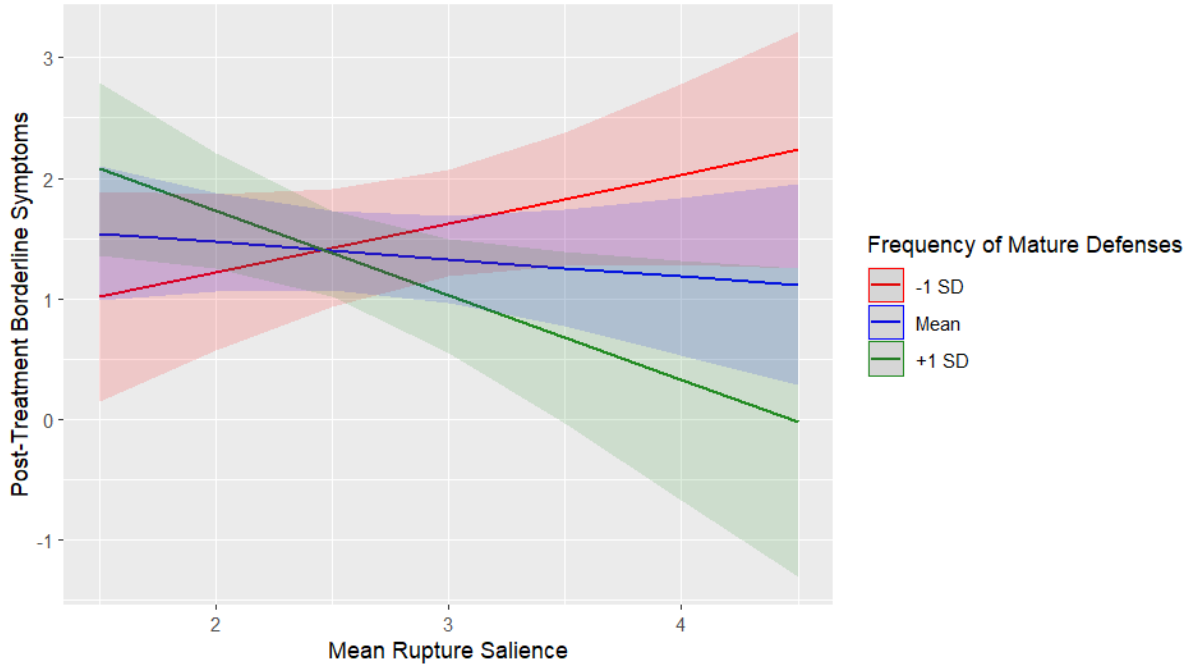


Figure 3

Simple Slopes of Rupture Salience on Post-treatment Psychological Distress at Various Levels of Mature Defenses

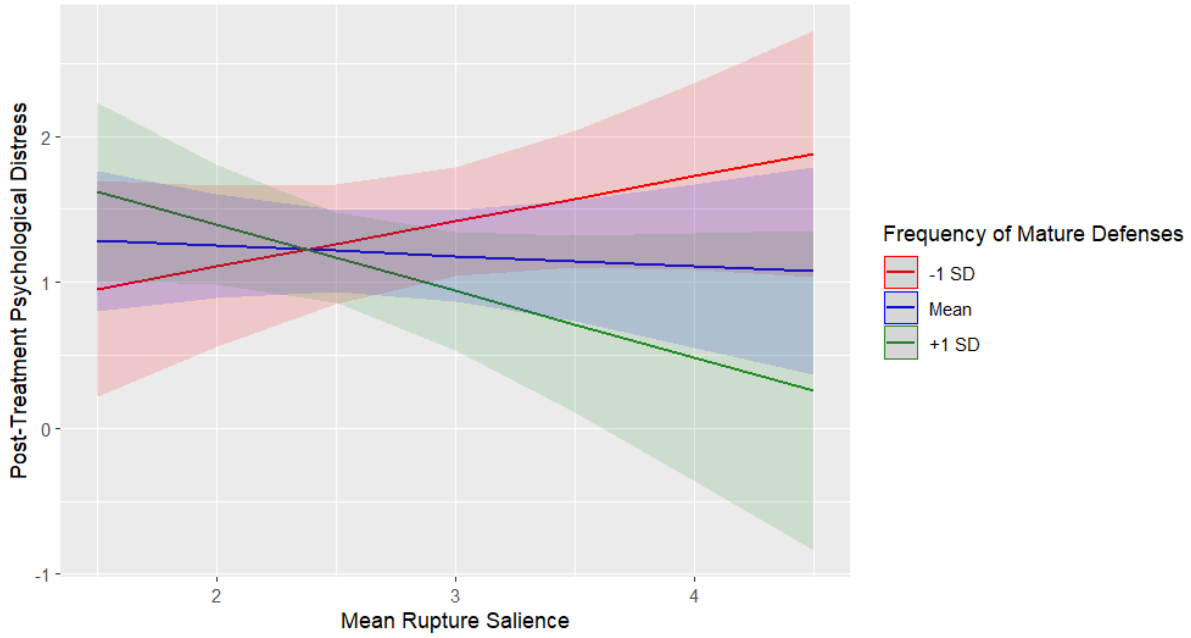


Figure 4

Simple Slopes of Rupture Salience on Post-treatment Symptom Intensity at Various Levels of Mature Defenses