THE ROLE OF OUT-OF-SESSION SKILLS USE IN SAGE, A COUPLE-BASED INTERVENTION: ENHANCING BORDERLINE PERSONALITY DISORDER RECOVERY AND RELATIONSHIP QUALITY

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Abstract

Borderline Personality Disorder (BPD) is characterized by emotional and interpersonal difficulties, particularly in romantic relationships. Sage is a 12-session conjoint intervention developed to improve BPD and relationship functioning by learning and practicing skills outside of therapy sessions (out-of-session skills use). This study examined whether couples (N = 21) increased out-of-session skills use across Sage and whether skills use predicted improvements in BPD and relationship outcomes. Generalized Estimating Equations revealed that individuals with BPD and romantic partners increased general skills use, while skills use during conflict decreased. Greater between-person and within-person skills use predicted improvements in BPD symptom severity, emotion dysregulation, and suicidal ideation. However, skills use did not predict most relationship outcomes, and higher between-person skills use predicted reduced relationship satisfaction in romantic partners over time. Findings highlight the importance of out-of-session skills use in conjoint BPD treatment and the potential significance of contextual and methodological factors on this relationship.

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Table of Contents

List of Tables

Introduction

Borderline Personality Disorder (BPD) is a serious and debilitating mental health condition characterized by emotion dysregulation (i.e., disruptions in emotional processes and the ability to regulate them), self-destructive behaviors, and significant interpersonal relationship problems (American Psychiatric Association; APA, 2022). Affecting approximately 1.7% of the general population and up to 28% of psychiatric patients (Gunderson et al., 2018), BPD is linked with high rates of suicide attempts and self-injury (Goodman et al., 2017; Pompili et al., 2005; Soloff et al., 2002; Soloff & Chiappetta, 2012; Turner et al., 2015), as well as suicide deaths (Paris & Zweig-Frank, 2001). While many individuals with BPD experience improvements or full recovery following intervention, treatment response rates are inconsistent and a considerable number of BPD patients experience suboptimal outcomes (e.g., profound and chronic disruption in social functioning, poor psychosocial outcomes, chronic comorbidity with other mental disorders, symptom recurrence; Gunderson et al., 2011; Soloff & Chiappetta, 2017; Zanarini et al., 2010; 2012). Indeed, up to 46% of individuals do not respond to first line BPD treatments (Woodbridge et al., 2022). Moreover, treatment dropout rates in this population are high, averaging around 26% across studies (Woodbridge et al., 2022). The variability in response rates underscores a critical need for enhanced therapeutic strategies to improve BPD treatment efficacy. Well-established individual BPD treatments emphasize the importance of clients with BPD developing skillful behavior outside of sessions to alleviate symptoms and improve treatment outcomes (e.g., Linehan, 1993; 2015; Probst et al., 2018). This thesis will examine the impact of therapeutic skills practiced outside of therapy sessions (i.e., out-of-session skills use) on BPD and relational outcomes following participation in Sage, a novel 12-week couple intervention for individuals with BPD and their romantic partners.

The Centrality of Relationship Dysfunction in BPD

Relationship dysfunction, which refers to difficulties in forming and maintaining stable relationships and the issues that arise from these difficulties (e.g., conflict; anger; hostility; Haliczer et al., 2021; Lazarus et al., 2014; Ociskova et al., 2023), is considered a hallmark characteristic of BPD (Gunderson, 2007; Lazarus et al., 2014). There is evidence that this may be especially pronounced in romantic relationships (Hill et al., 2008). These relationships are often characterized by frequent, intense conflicts, heightened relationship distress, and reduced relationship satisfaction (Bouchard et al., 2009; Bouchard & Sabourin, 2009; Hill et al., 2011; Javaras et al., 2017; Navarro-Gómez et al., 2017). Additionally, when compared to those without personality disorders, individuals with BPD are more likely to report intimate partner violence, problematic communication patterns, and romantic relationship instability, evidenced by cyclical patterns of break ups and reunions, complete relationship dissolution, and having more romantic partners overall (Bouchard et al., 2009; Bouchard & Sabourin, 2009; Clifton et al., 2007; Hill et al., 2011; Zanarini et al., 1999). These findings collectively suggest that romantic relationships are especially important contexts for examining the relationship dysfunction characteristic of BPD.

There is good reason to believe that BPD pathology significantly contributes to relationship dysfunction. For example, individuals with BPD often demonstrate poor conflict resolution and communication skills, impacting their relationships (Bouchard et al., 2009; de Montigny-Malenfant et al., 2013; Miano et al., 2017). Additionally, they also often experience negative emotions and cognitions (e.g., heightened confusion, ambivalence) in response to social interactions with relational partners they are close with, such as romantic partners and family members (Stepp et al., 2009). Moreover, BPD is characterized by impaired trust and cooperation

in interactions that require appropriately identifying and responding to the intentions and actions of others (King-Casas et al., 2008; Unoka et al., 2009).

In the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-5), each of the core diagnostic BPD symptom criteria describe either dysfunctional features of relationships or characteristics that could hinder healthy interpersonal relationships (APA, 2022). Symptom criteria such as unstable interpersonal relationships and frantic efforts to avoid abandonment explicitly describe aspects of relationship dysfunction and problematic ways of approaching interpersonal interactions (APA, 2022; Drapeau et al., 2012; Lazarus et al., 2014; Linehan, 1993; Ociskova et al., 2023; Russell et al., 2007; Selby et al., 2008). Similarly, diagnostic criteria such as difficulties controlling anger and impulsive self-damaging behaviors, while not specific to interpersonal relationships, tend to be highly disruptive to relationships (APA, 2022 Kuhlken et al., 2014; Martino et al., 2018). For instance, studies have shown that anger in BPD can lead to prolonged emotional distress and aggressive behaviors, which can cause substantial relationship dysfunction (e.g., conflict, intimate partner violence; Oliva et al., 2023; Siever, 2008). Additionally, impulsive self-damaging behaviors such as deliberate self-harm or reckless spending can place a high level of burden and stress on significant others and caregivers, causing strain in these relationships (Ekdahl et al., 2011; Giffin, 2008). These findings underscore that relationship problems are not only symptomatic of BPD but also arise as a consequence of other aspects of its pathology.

Relationship dysfunction can also contribute to or maintain BPD pathology. Prominent theories hold that emotion dysregulation, referring to disruptions in emotional processes and the ability to regulate them, is fundamental to BPD pathology (Linehan, 1993; Sauer-Zavala & Barlow, 2014). These theories suggest that emotion dysregulation and the BPD pathology it

elicits occurs across various contexts, including both intrapersonal (e.g., feeling stressed about an upcoming test) and interpersonal (e.g., a relationship breakup) stressors (Linehan, 1993; Sauer-Zavala & Barlow, 2014). While there is a wealth of empirical evidence establishing the presence of emotion dysregulation in BPD (see Carpenter & Trull, 2013, for a review), research supporting its pervasiveness across contexts has been inconsistent (e.g., Chapman et al., 2009; Jacob et al., 2009; Kuo & Linehan, 2009; Lang et al., 2012; see Dixon-Gordon et al., 2017, for a review). Some theorists argue that BPD symptoms, including some components of emotion dysregulation (e.g., emotional reactivity), are elicited specifically in response to interpersonal stimuli (Fitzpatrick et al., 2021). Indeed, individuals with BPD exhibit significantly higher levels of negative emotional responses (e.g., rage, distress) and maladaptive or dysfunctional emotion regulatory behaviors (e.g., rumination, worry, self-harm) to interpersonal versus non-interpersonal stressors (Berenson et al., 2016; Dixon-Gordon et al., 2021; Yaroslavsky et al., 2019). Moreover, research indicates that individuals with elevated BPD traits tend to experience stronger and longer-lasting negative emotional reactions (i.e., increased emotional reactivity and prolonged recovery to emotional baseline) when facing stressors that involve other people, as opposed to those that do not (Yaroslavsky et al., 2019). These findings suggest that interpersonal stressors play a crucial role in eliciting or driving BPD symptoms.

With respect to BPD symptoms elicited in the interpersonal context of romantic relationships, Miano et al. (2017) found that women with BPD exhibit significantly greater stress reactivity in response to personally- or relationship-threatening conversations (i.e., personal failure or separation, respectively) with their romantic partners than women without BPD. Furthermore, their results indicated that individuals with BPD are more sensitive to rejection cues compared to those without the disorder, often responding with heightened emotion

dysregulation (e.g., emotional reactivity, intense anger, hostility, negative affect) in response to rejection stimuli (Berenson et al., 2011; Chapman et al., 2015; Renneberg et al., 2011; Sadikaj et al., 2010; Staebler et al., 2011). Notably, there is evidence that the heightened negative responses to perceived rejection observed individuals with BPD, such as hostility, are significantly more pronounced in interactions with romantic partners than in those with non-romantic partners (Lazarus et al., 2018). This further underscores that romantic relationships may be particularly critical contexts that are disrupted by, and can disrupt, BPD pathology.

Conversely, improvements in relationship dysfunction (e.g., higher relationship satisfaction) may mitigate the severity of certain aspects of BPD pathology (e.g., anger expression; Kuhlken et al., 2014), and there is evidence suggesting that well-functioning intimate relationships can predict a greater likelihood of remission in BPD over time (Zanarini et al., 2005). Research suggests that other elements of BPD pathology may be uniquely elicited by interpersonal stressors as well. For example, research indicates that up to 73% percent of suicide attempts in BPD are preceded by a stressful interpersonal interaction (Brodsky et al., 2006), and interpersonal variables (e.g., experiencing conflict or rejection, feeling abandoned) significantly predict suicide threats (Wedig et al., 2013) and non-suicidal self-injurious behaviors (Kehrer & Linehan, 1996). Overall, these findings suggest that BPD symptoms may not only lead to, but may also be perpetuated by, relationship dysfunction, and that improvements in either area can positively impact the other.

Romantic Partner Behaviors, Relationship Dysfunction, and BPD Pathology

Fully understanding the relational context that informs and is informed by BPD requires not only identifying the relevant behaviors of people with BPD, but also their interaction partners (e.g., romantic partners). In romantic relationships wherein one member has BPD, research

indicates that *both* partners tend to engage in problematic communication behaviors that may perpetuate relationship dysfunction. For example, a study by de Montigny-Malenfant et al. (2013) demonstrated that, in couples wherein one member has BPD, both partners exhibit more stubbornness and resistance to altering their view during conflict discussions than control couples without a member with BPD. Additionally, where partners with BPD have exhibited high levels of criticizing communication behaviors, their romantic partners have exhibited elevated levels of defensive and evasive ones (Beeney at al., 2019). Thus, problematic communication behaviors from *both* partners can contribute to key components of relationship dysfunction (e.g., negative interaction and conflict resolution patterns; de Montigny-Malenfant et al., 2013), which, in turn, theoretically contributes to key aspects of BPD pathology (e.g., emotional dysregulation; Fitzpatrick et al., 2021; Fruzzetti et al., 2005).

Romantic partner behaviors and communication may also contribute to the maintenance of BPD pathology. For instance, romantic partner behaviors can reinforce the use of maladaptive, destructive behaviors that are characteristic of BPD, such as suicide and self-injury. Suicidal and non-suicidal self-injurious behaviors have been associated with both intrapersonal (e.g., reducing negative affect) and interpersonal regulatory functions (e.g., increasing support or reducing socially aversive stressors; Nock & Prinstein, 2004; see Nock, 2010 for a review). Theoretically, over time, the individual with BPD may unknowingly associate suicidal and non-suicidal self-injurious behaviors with desirable responses from their romantic partners (e.g., care rather than avoidance) or ameliorating stressful interpersonal situations (e.g., reduction or removal of aversive stimuli, such as conflict; Nock & Prinstein, 2004; Fitzpatrick et al., 2021). This is reflected in the findings of a study by Brown et al. (2002). The authors collected self-report data from sample of women with BPD who endorse chronic and recent suicidal and non-suicidal self-

injury. A common reason for engaging in self-injurious behaviors, regardless of suicidal intent, was interpersonal influence, including communicating distress and a need for help or greater understanding (Brown et al., 2002). Hence, romantic partners have the potential to inadvertently reinforce (or extinguish) BPD-related self-destructive behaviors. Overall, this suggests that romantic partner behaviors and communication may contribute to both relationship dysfunction and the exacerbation of BPD symptoms. Therefore, targeting romantic partner behaviors alongside that of people with BPD could, in turn, facilitate BPD recovery.

Sage: A Conjoint Intervention for BPD

The Sage treatment program was developed as a 12-session conjoint psychotherapy intervention for individuals with BPD and their romantic partner in light of the aforementioned findings. Sage targets BPD pathology, relationship dysfunction, and overall mental health of both partners simultaneously (Fitzpatrick et al., 2023; 2025). Preliminary findings provide promising support for the efficacy of Sage (Fitzpatrick et al., 2023); A case series of Sage revealed reliable improvements in BPD severity, suicidal ideation, and other mental health symptoms in individuals with BPD. The case series also revealed a generally positive impact on romantic partner mental health symptoms, including emotion dysregulation, negative emotions, and anger (Fitzpatrick et al., 2024). Additionally, findings of an uncontrolled trial of Sage (Fitzpatrick et al., 2025), demonstrate significant improvements in primary outcomes, including BPD severity, suicidal ideation, and emotion dysregulation, with large effect sizes. No improvements were found on measures of relationship dysfunction (i.e., relationship conflict and satisfaction). However, this may be due to ceiling effects, as a considerable portion of the sample reported relationship satisfaction scores that were within the non-distressed range at baseline. Overall, conjoint interventions such as Sage may have the potential to optimize BPD recovery by

targeting both BPD pathology and relationship dysfunction directly and expanding outcomes to include romantic partner mental health. However, the factors contributing to Sage's efficacy remain unclear. Given that Sage is still in the early stages of development and testing, identifying ways to optimize its outcomes and implementation is critical.

The Importance of Out-of-Session Skills Use

A primary focus of current first-line therapeutic approaches for BPD, including Dialectical Behavior Therapy (DBT), is developing and maintaining the use of skillful (i.e., effective, context-appropriate, aligned with one's goals) behavior to reduce BPD symptoms and navigate interpersonal relationships (Linehan, 2015; Probst et al., 2018). Treatments such as DBT are grounded in a skills deficit model of BPD, which posits that individuals with BPD often lack sufficient adaptive skills to cope with distress and interpersonal difficulties, resulting in the engagement of destructive, maladaptive alternative behaviors such as self-injury (Linehan, 1993; Neacsiu et al., 2010a). These maladaptive behaviors are theorized to hinder the development of adaptive skills, thereby reinforcing destructive behavior and, consequently, BPD over time (Linehan, 1993; Neacsiu et al., 2010a). Research supports this notion, suggesting that individuals with higher BPD features exhibit greater use of maladaptive strategies and poorer implementation of adaptive means of regulating emotion compared those with lower BPD features (Dixon-Gordon et al., 2011; Sorgi-Wilson & McCloskey, 2022; Southward et al., 2020). Therefore, clients in DBT learn skills to serve as adaptive alternatives to problematic behaviors for managing interpersonal and emotional difficulties more effectively (Linehan, 1993; 2015).

A key assumption of skills-deficit models is that skills *acquisition, strengthening* (i.e., increasing effectiveness and consistency with repeated practice), and *generalization* (i.e., using skills adaptively across a wide range of situations), both within and outside of psychotherapy

sessions, is critical to optimizing treatment outcomes (Linehan, 1993; 2015; Lynch et al., 2006). Regular use of skills between sessions is expected to help participants apply what they've learned in real situations, making the skills more effective and easier to use over time (Dattilio, 2005). Consequently, increasing out-of-session skills use is a higher-order treatment target of skills-based BPD treatments (e.g., DBT; Linehan, 1993, 2015; Neacsiu et al., 2010a). For example, research by Neacsiu and colleagues (2010b) examined the frequency and effectiveness of using DBT skills in predicting treatment outcomes. To examine this, the authors employed a measure (i.e., The Dialectical Behavior Therapy Ways of Coping Checklist; DBT-WCCL; Neacsiu et al., 2010a) designed to assess whether and to what extent individuals used DBT skills in response to stressful events, including those that occurred outside of therapy sessions (i.e., out-of-sessions skills use). Their results revealed that increases in skills use fully mediated the relationship between time in treatment and both reductions in suicide attempts and increases in anger control over time, and also partially mediated decreases in non-suicidal self-injury (Neacsiu et al., 2010b). In another study, Neacsiu et al. (2014) found that DBT skills use also mediated improvements in broader affective domains such as emotion dysregulation and anxiety in a transdiagnostic sample with high emotion dysregulation. Additionally, research by Stepp et al. (2008) demonstrated that greater DBT skills use was associated with greater improvements in BPD symptoms, including affective instability and identity disturbance, as well as greater improvements in difficulties associated with unstable interpersonal relationships. Overall, these results suggest that acquiring and increasing the use of skills, both within and outside of psychotherapy sessions, is a key mechanism of change for symptom improvement in skill-based BPD treatments.

Out-of-Session Skills Use in Sage

Similar to other BPD treatments, Sage emphasizes the importance of skills training, acquisition, and strengthening to improve treatment efficacy (Fitzpatrick et al., 2023). Indeed, Sage skills were informed by pre-existing skills-based treatments, such as DBT (Linehan 1993, 2015) and Cognitive Behavioral Conjoint Therapy (CBCT) for PTSD (Monson & Fredman, 2012). Clients are assigned out-of-session skills use practice after each session (Fitzpatrick et al., 2023). Sage treatment outcomes may therefore be similarly optimized via out-of-session skills use. However, unlike DBT and other individual BPD treatments, Sage skills are applied within weekly *conjoint* therapy sessions involving romantic partners, with an emphasis on couples learning and practicing skills *together* in everyday interactions. In doing so, Sage provides skills both to manage difficult emotions, as well as enhance communication and manage conflict effectively, in order to promote long-term BPD recovery and enhance relationship functioning. Considering the central role of relationship dysfunction and romantic partner behavior in the maintenance of BPD, it may be crucial for *both partners* to practice skills to effectively improve both BPD pathology and relationship dysfunction (Fitzpatrick et al., 2021; see Fitzpatrick et al., 2019, for a review of BPD treatments that incorporate significant others). However, it remains unclear whether and the extent to which couples use their Sage skills outside of therapy sessions and what impact this has on treatment outcomes.

In addition to teaching skills for improving BPD treatment outcomes generally (i.e., general skills use), Sage teaches couples skills specifically aimed at mitigating conflict (i.e., conflict skills use) early in the intervention and reinforces their use through out-of-session practice assignments. To be effective in managing relationship conflicts in the fraught and distressing moments in which they occur, skills must be remembered and used with a certain degree of confidence or ease (Choudhary & Thapa, 2012; Edwards et al., 2021; Lynch et al.,

2006; Neacsiu et al., 2010; Swales & Dunkley, 2020). Additionally, research suggests promoting confidence in partners' perception of each other's responses to conflict (e.g., exhibiting positive versus negative communication behaviors) may be important for contributing to improvements in relational outcomes, such as relationship satisfaction (Marigold & Anderson, 2016). Therefore, strengthening and generalizing skills for mitigating conflict dyadically through engaging in consistent practice may be particularly crucial for improving BPD pathology and relationship dysfunction. However, as with general skills use, it remains unclear the extent to which couples increase their use of Sage skills during conflict interactions across the intervention.

The Present Study

According to both theory and research, relationship dysfunction is a not only a core characteristic of BPD but is also implicated in its maintenance. Given the central role of relationship dysfunction in driving BPD pathology, particularly in the context of romantic relationships, involving romantic partners in BPD treatment may be crucial for optimizing outcomes. Previous research has highlighted the importance of skill acquisition and out-of-session practice in reducing BPD symptom severity. However, as conjoint therapies for BPD are rare, there remains limited understanding of the extent to which couples in such interventions improve their use of out-of-session skills and how this relates to treatment outcomes. Therefore, evaluating whether Sage leads to improvements in out-of-session skills use is essential for determining the protocol's efficacy in promoting skills acquisition and implementation for both individuals with BPD and their romantic partners. Additionally, investigating whether out-of-session skills use predicts treatment outcomes will elucidate their significance in improving BPD symptoms and relationship dysfunction. Understanding this relationship is crucial as it could

help refine conjoint BPD interventions to maximize treatment efficacy, enabling providers to tailor skill-based practices to enhance BPD recovery and improve relationship dysfunction.

The present study therefore examined: 1) whether general and conflict skills use improved over the course of Sage; and 2) whether overall average general skills use (compared to others participants' average) and relative improvements in general skills use (compared to one's own average) predicted treatment outcomes relating to BPD pathology (i.e., overall BPD pathology, suicidal ideation, suicidal and self-injurious behavior, emotion dysregulation) and relationship dysfunction (i.e., relationship satisfaction and relationship conflict). For clarity, the term 'overall average general skills use (compared to other participants' average)' is hereafter referred to as 'overall skills use', and 'relative improvements in general skills use (compared to one's own average)' is referred to as 'relative skills use.' We hypothesized that there would be a significant increase in both general and conflict skills use among individuals with BPD and romantic partners as Sage progressed. Additionally, it was hypothesized that both greater overall skills use and increases in relative skills use over the course of Sage would significantly predict improvements in BPD pathology and relationship dysfunction.

Method

Participants

The sample included 21 adult intimate dyads, each comprising one partner diagnosed with BPD and their romantic partners. These participants were drawn from a case series (N = 5 couples; Fitzpatrick et al., 2024) and an uncontrolled trial (N = 16 couples; Fitzpatrick et al., 2025) of Sage. The present study is a secondary analysis of data collected in these two studies, which generally followed the same protocols with some exceptions. Details on differences in the case series and uncontrolled trial protocols and how they were harmonized for this study are

described in the Measures and Procedures sections below. To participate in the studies, individuals with BPD had to satisfy several inclusion criteria: (1) meet the diagnostic criteria for BPD according to the DSM-5-TR (APA, 2022); (2) demonstrate elevated suicidal ideation, with a minimum score of 15 on the Beck Scale for Suicidal Ideation (Beck, 1988), or show a pattern of chronic and recent suicidal or non-suicidal self-injury, defined as at least two instances in the last five years, with one occurring within the last eight weeks. Couples were also required to (3) be aged between 18 and 70 years old. Exclusion criteria included: (1) severe intimate partner violence (IPV), indicated by reporting significant physical or sexual violence, which has occurred in the past year, on the Revised Conflict Tactics Scale (CTS-2; Straus et al., 1996), or by indicating feeling physically unsafe with their partner; (2) inability to read or write English; (3) not residing in Ontario; (4) clinically-significant psychotic symptoms not better accounted for by BPD; (5) a diagnosis of Bipolar I disorder with a manic episode in the last three months or hospitalization for such an episode within the last year; (6) a severe current substance use disorder; (7) cognitive, intellectual, or medical conditions/impairments that could interfere with participation in the study; or (8) both members of the couple qualifying under inclusion criteria (1) or (2).

The Sage Intervention

Sage is a 12-session, manualized psychotherapy intervention delivered concurrently to individuals with BPD and their romantic partners. The intervention is structured into three distinct phases, with sessions scheduled weekly, although the first two sessions may be conducted within the same week if immediate safety concerns necessitate it. Each session typically lasts 75 minutes, with the initial session extended to 90 minutes to accommodate orientation to the intervention and risk assessment (for a detailed description of the development

of Sage, as well as detailed explanations of the phases, see Fitzpatrick et al., 2023). In Phase 1, couples are provided with an orientation to the intervention and receive psychoeducation on BPD, emotion dysregulation, and relationship dysfunction, with a focus on fostering motivation for change. Additionally, couples collaborate with their Sage clinician to establish BPD-specific and relationship-related goals, with a priority on reducing suicidal and non-suicidal behaviors. Dyads are also taught skills for regulating intense emotions, decreasing the risk of suicide and non-suicidal self-injury, and managing severe conflicts. Phase 2 involves learning skills for both regulating and communicating emotions effectively, as well as skills for enhancing communication. This includes skills such as identifying, tolerating, and expressing one's own difficult emotions, demonstrating an understanding of each other's emotions, as well as determining whether, when, and how to act on emotions. In Phase 3, couples are provided with psychoeducation about beliefs and how they can influence their emotions and communication to maintain BPD, emotion dysregulation, and relationship dysfunction. Subsequently, they are led through exercises and assigned out-of-session assignments to develop skills to help them target inaccurate or unhelpful beliefs as a dyad. Finally, Phase 3 involves intervention termination, including creating maintenance plans for preventing relapse, as well as for supporting continued practice and utilization of Sage skills. Couples are assigned individual or conjoint skills practice assignments each week based on the session's content (see Appendix).

Sage was delivered by licensed clinical psychologists as well as postdoctoral fellows and senior clinical psychology graduate students working under psychologists' supervision. Prior to administration, clinicians who were not familiar with Sage prepared by reviewing the treatment manual and analyzing recorded therapy sessions. Moreover, initial cases for new clinicians were often delivered in a co-therapy format with experienced Sage therapists to ensure mastery in

understanding and application of the Sage protocol. Supervisory meetings occurred on a weekly basis, providing clinicians with an opportunity for individual or group supervision throughout their involvement in the intervention.

Measures

Diagnostic assessment interviews were conducted to evaluate inclusion and exclusion criteria and some study outcomes (See below). These assessments were carried out by graduate students at the Master's and Doctoral levels, all of whom were supervised by a licensed clinical psychologist. Additionally, assessors underwent monthly calibration to maintain alignment with the gold-standard evaluator to ensure consistent agreement with the established standards.

Screening Measures

International Personality Disorders Examination- BPD Module (IPDE-BPD module; Loranger et al., 1994). The assessment of BPD was conducted using the IPDE-BPD. This semi-structured interview is designed to evaluate the DSM diagnostic criteria for BPD, considering symptoms observed over the past five years and those prior to the age of 25. According to the DSM-5-TR criteria for BPD (APA, 2022), a diagnosis is confirmed when at least five out of the nine possible symptoms are present. The IPDE-BPD module is not only highly correlated with self-report measures of BPD (Schroeder et al., 2010) but also demonstrates good to excellent inter-rater reliability and temporal stability (Mann et al., 1999; Carcone et al., 2015).

Diagnostic Assessment Research Tool (DART; McCabe et al., 2017). The DART is a semi-structured interview utilized to evaluate the presence of a variety of psychological conditions, formerly known as "Axis I disorders" (APA, 1994). The DART has a low false negative rate, demonstrating high sensitivity across its separate items (Pawluk et al., 2022). The

DART has also demonstrated strong construct validity and good convergent and discriminant validity for these diagnostic assessment interviews (Pawluk et al., 2022). In this study, the DART was employed specifically to assess psychosis symptoms, and bipolar and related disorders, including hypomanic and manic episodes, bipolar I and II disorders, and cyclothymic disorder. Additionally, it was used to screen for substance use disorders, alcohol use disorder, major and persistent depressive disorders, anxiety disorders (such as panic disorder, agoraphobia, generalized anxiety disorder, and social anxiety disorder), as well as obsessive-compulsive disorder and posttraumatic stress disorder.

Out-of-Session Skills Use Measures:

General Skills Use. General out-of-session skills use was assessed using Ecological Momentary Assessment (EMA) surveys. EMA is a methodological approach, which allows for remote data collection from individuals within their natural, day-to-day environments (Shiffman et al., 2008). EMA captures momentary fluctuations in participants' experiences through repeated, often random, assessment administered over a specified time frame (Shiffman et al., 2008). The EMA surveys in the current study were implemented through an online electronic software called Metricwire and its accompanying mobile application.

The EMA protocol was not administered consistently across all participating dyads: for two out of five couples in the case series, EMA was administered for two weeks each at baseline (after session 1) and mid-intervention (after session 6), and for one week approaching post-intervention (after session 11). For the remaining three couples in the case series, and for all couples in the uncontrolled trial, EMA was administered for one week at each timepoint (baseline, mid-intervention, and post-intervention). To ensure consistency for the present analyses, only the first seven days of EMA data were included for all couples at each assessment

period, so that each participant contributed comparable one-week periods of out-of-session skills data. Once surveys were activated, EMA prompts were delivered at random intervals throughout the day, between 9am to 10pm. Both individuals with BPD and their romantic partners were asked to report the frequency with which they used any skills they had learned in Sage with the following prompt: "Since the last assessment... How many times have you practiced any skills you've learned in Sage?"

Conflict Skills Use. In addition to tracking general out-of-session skills use, the EMA surveys also included items assessing the application of skills specifically during conflict interactions (i.e., conflict skills use). Participants were specifically asked, "Since the last assessment... Did you have conflict with your romantic partner?" Subsequently, participants were asked to report whether they utilized any Sage skills to manage or resolve the conflict by responding *yes* or *no*. Participants were not asked to specify which skills they used, only whether they used any Sage skills during the conflict.

BPD-Related Outcome Measures

Borderline Symptom List (BSL-23; Bohus et al., 2009). Symptoms of BPD were assessed using the Borderline Symptom List (BSL-23), a validated 23-item self-report instrument with strong psychometric properties, including high internal consistency and test-retest reliability (Bohus et al., 2009; Nicastro et al., 2016). Individuals with BPD completed this scale, rating the intensity of their symptoms over the previous week using a five-point Likert scale, which ranges from 0 ("not at all") to 4 ("very strong"). Additionally, romantic partners completed an informant-report version of the BSL-23, adapted specifically for the Sage case series and uncontrolled trial. In this version, romantic partners rated the perceived frequency of the

individual with BPD's BPD symptom severity over the same timeframe using the same response scale.

Beck Scale for Suicidal Ideation (BSSI; Beck et al., 1988). The BSSI is a 19-item self-report instrument that assesses the current intensity of suicidal thoughts, behaviors, and planning. Individuals with BPD completed this self-report measure regarding their own suicidal ideation. Additionally, romantic partners completed an informant-report version of the BSSI, adapted specifically for the Sage case series and uncontrolled trial. In this version, partners reported on the suicidal ideation they observed in the individual with BPD over the same period. The BSSI has been extensively validated and shows good reliability across various samples (Barnhofer et al., 2009; Crane et al., 2014; Hirsch & Conner, 2006). This scale not only correlates well with measures of depression and hopelessness but also provides predictive validity regarding historical and future suicidal behavior (Bisconer & Gross, 2007; Hewitt et al., 1994).

Suicide Attempt Self-Injury Interview (SASII; Linehan et al., 2006). The SASII is a semi-structured clinician-administered interview designed to assess non-fatal suicide attempts and self-injurious behaviors in participants with BPD. This measure was administered as an interview to individuals with BPD only to measure the frequency of suicidal and self-injurious behaviors in the past four weeks. Statistical validation of The SASII has shown very good interrater reliability, with coefficients ranging from 0.87 to 0.98 across various assessor-rated items (Linehan et al., 1991; 2006).

Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). Emotion dysregulation in people with BPD was assessed using the DERS. The DERS is a 36-item self-report measure designed to evaluate various aspects of emotion dysregulation. People with BPD completed this self-report version. Additionally, their romantic partners completed the

Difficulties in Emotion Regulation Scale – Partner Version (DERS-P; Snyder, 2003), an 8-item informant-report measure in which partners reported on the emotion dysregulation they observed in the individual with BPD over the same period. The DERS has demonstrated high internal consistency, excellent test-retest reliability, and strong convergent validity with other measures of emotional functioning (Gratz & Roemer, 2004; Bardeen & Fergus, 2014).

Relationship-Dysfunction-Related Outcome Measures

Couples Satisfaction Index (CSI-32; Funk & Rogge, 2007). Relationship satisfaction was assessed using CSI-32, a 32-item self-report measure designed to evaluate the overall satisfaction within romantic relationships. Both individuals with BPD and their romantic partners completed this measure. The CSI-32 allows for a comprehensive scoring range from 0 to 161, with higher scores indicating greater relationship satisfaction. A score below 104.5 is used to indicate significant dissatisfaction within the relationship. The CSI-32 is noted for its exceptional internal consistency, with a Cronbach's alpha of .98, and demonstrates strong convergent validity with other established relationship satisfaction measures, such as a correlation of .89 with the 32-item Dyadic Adjustment Scale (Funk & Rogge 2007).

Ineffective Arguing Inventory (IAI; Kurdek, 1994). Relationship conflict within dyads was assessed using the IAI, an 8-item self-report measure designed to evaluate participants' ability to handle disagreements and resolve conflicts in their relationships. Both individuals with BPD and their romantic partners completed this measure. Participants responded to statements about their conflict resolution styles on a scale from 1 ("disagree strongly") to 5 ("agree strongly"). Higher scores on the IAI indicate a greater degree of ineffective arguing and communication difficulties. The IAI is known for its strong internal consistency, with reported Cronbach's alpha typically around .90 (Fredman et al., 2017; Kurdek, 1994).

Procedures

All study procedures were approved by relevant institutional research ethics boards. Recruitment for both the case series and the uncontrolled trial involved word of mouth, liaising with professional networks, and online advertisements. For both the case series and the uncontrolled trial, prospective participants with BPD initially completed an online screen to assess potential eligibility. Those who were eligible to continue based on the online screen underwent further psychodiagnostic screening assessments via secure videoconferencing interviews conducted by trained assessors. If the partner with BPD was deemed possibly eligible, their romantic partner was invited to attend a similar interview via videoconferencing to screen for inclusion and exclusion criteria as well. Once both members of a couple were deemed eligible, they were notified of their eligibility as a couple and connected with a Sage clinician to begin treatment.

Questionnaire batteries assessing treatment outcomes and relationship dysfunction were administered to couples at pre-intervention (prior to session 1), mid-intervention (after session 6), and post-intervention (after session 12). Additionally, couples participating in the uncontrolled trial completed questionnaire batteries at a 3-month follow up (couples in the case series did not complete this timepoint). EMA surveys assessing skills use frequency were collected throughout the intervention at baseline (after session 1), mid-intervention (after session 6), and post-intervention (after session 12) time points (see measures section for detailed schedule). Prior to administration, participants with BPD and their romantic partners were trained on how to complete the EMA using the Metricwire mobile phone application. In both the case series and the uncontrolled trial, efforts were made to complete research assessment

components regardless of participants' continuation in the intervention, adhering to an intent-to-treat philosophy (Gupta, 2011; Whitney, 2001).

Data Analytic Strategy

A series of Generalized Estimating Equations (GEE; Burton et al., 1998) were conducted on data from the case series and uncontrolled trial testing the Sage intervention. GEE represents a semi-parametric extension of generalized linear modeling, specifically designed to manage within-subject covariance in longitudinal or repeated measures data that may not follow Gaussian distributions (Wang, 2016). GEE maximizes statistical power by analyzing outcome variables across continuous time spans and accommodating participants with missing data. All analyses were conducted with an intent-to-treat philosophy, whereby data from all participants were included regardless of non-compliance, non-completion, or missed responses (Gupta, 2011; Whitney, 2001). The selection of the most suitable covariance structure (e.g., autoregressive, exchangeable, or unstructured) was determined based on the model's Quasilikelihood under the Independence Model Criterion (QIC) value. For models predicting the frequency of suicidal and self-injurious behaviors (SASII; Linehan et al., 2006), a negative binomial distribution was used to account for the count-based nature of the data and its zero-inflated nature. All analyses were conducted using a significance threshold of $p < .05$.

To address Aim 1, general skills use and conflict skills use were included as dependent variables in two separate GEE models. Models were run separately for individuals with BPD and romantic partners to capture potential differences in skills acquisition and application between partners (i.e., four GEE models total; one focused on general skills use and one focused on conflict skills use for each partner). In these models, assessment period (i.e., baseline, mid-intervention, and post-intervention, as well as follow-up-intervention for the uncontrolled trial)

was included as a predictor variable. Additionally, study day (i.e., days within each 7-day EMA assessment period, numbered 1 through 7) was specified as a predictor to capture score variation within each assessment period. General skills use was operationalized as the total number of times participants reported using their skills per study day during each assessment period.

Due to the structure of the data, conflict skills use was modeled differently than general skills use. Although this variable was initially conceptualized as a proportion (i.e., number of conflict situations in which skills were used divided by the total number of conflict situations reported that day), the data showed limited variability: among participants who reported conflict, most either used skills every time or did not use them at all. This resulted in extreme floor and ceiling effects, violating assumptions required for proportional or continuous modeling. Given this distribution, modelling conflict skills use as binary variable was the most conceptually and statistically appropriate approach. Thus, for each study day, conflict skills use was recoded as either present (1) or absent (0), indicating whether or not participants used any skills during any conflict situations that day. This binary indicator better captured meaningful variation in behavior and allowed for valid statistical modeling. For any given day, if a participant did not report experiencing conflict (and thus had no opportunity for conflict skills use), that day was coded as missing data.

To address Aim 2, a second series of GEE analyses was conducted to investigate whether overall skills use and relative skills use predict Sage treatment outcomes. BPD symptom and relationship dysfunction were specified as outcomes and modeled as dependent variables in their own GEE analyses, resulting in a total of six dependent variables (BPD symptom severity, suicidal ideation, suicidal and self-injurious behaviors, emotion dysregulation, relationship satisfaction, and relationship conflict). Likewise to Aim 1, study day and assessment period were

included as predictor variables. For this aim, the independent variable of general skills use was analyzed at both the between-person and within-person levels by centering the predictor value at the group and individual level, respectively (Curran et al., 2011). Between-person skills use was assessed first by calculating each individual's average skills use across all timepoints. These person-level means were then grand-mean centered by adjusting each individual's overall skills use score (i.e., across all time points) relative to the sample-wide average (i.e., across all participants and time points). Within-person skills use was assessed using individual-mean centering, adjusting each individual's general skills use score at a specific assessment period relative to their own overall average across all timepoints. Thus, by including both grand-mean centered and individual-mean centered predictor values, the analysis addressed two key objectives: a) determining whether, on average, individuals who use more skills overall differ in their treatment responses compared to those who use fewer skills overall (between-person main effects), and b) assessing whether deviations in an individual's skills use relative to their own average predict treatment responses (within-person main effects).

To address the above questions, interaction terms comprising both between-person skills use and within-person skills use with assessment period were included in the model. Between- and within-person skills use were included as predictors of treatment outcomes. Similar to Aim 1, models were run separately for individuals with BPD and romantic partners to capture potential differences in the impact of participants' own, and each other's, skills use on treatment outcomes. To avoid multicollinearity due to the expected correlation between both partners' skills use, models were run separately for people with BPD and romantic partners. For example, to examine how romantic partners' skills use was associated with people with BPD's suicidal ideation, one model included only the romantic partners' between- and within-person skills use

as predictors and people with BPD's suicidal ideation as the outcome. A separate model examined the association between people with BPD's own skills use and their suicidal ideation by including only their own between- and within-person skills use as predictor variables. This resulted in twenty-two GEE models in total. This total includes fourteen GEE models that were run to analyze BPD-related outcomes: Four models examined whether individuals with BPD's skills use predict their own self-reported BPD-related outcomes; three examined whether individuals with BPD's skills use predict informant-reported BPD-related outcomes; four examined whether romantic partners' skills use predict their partner with BPD's self-reported BPD-related outcomes; three assessed whether romantic partners' skills use predict informant-reported BPD-related outcomes.

Additionally, eight GEE models were conducted to analyze relationship-dysfunction-related outcomes: Two examined whether individuals with BPD's skills use predict their own self-reported relationship-dysfunction-related outcomes; two tested whether individuals with BPD's skills use predict their romantic partners' self-reported relationship-dysfunction-related outcomes; two tested whether romantic partners' skills use predict their own self-reported relationship-dysfunction-related outcomes; and two assessed whether romantic partners' skills use predict their partner with BPD's self-reported relationship-dysfunction-related outcomes). Finally, familywise correction procedures were not applied because the analyses were based on a set of theory-driven hypotheses rather than an exploratory approach (O'Keefe, 2003). Some researchers contend that such corrections across a structured set of planned comparisons can unnecessarily reduce statistical power and increase the likelihood of overlooking meaningful effects (Type II error; O'Keefe, 2003; García-Pérez, 2023).

Results

The demographic and clinical characteristics of the sample are presented in Tables 1 and 2, respectively. Descriptive statistics of BPD- and relationship-dysfunction-related outcome variables, as well as skills use predictor variables at each assessment period (e.g., mean, SD) are presented in Tables 3, 4, and 5. Furthermore, summary tables depicting the results of GEE analyses examining the impact of general out-of-session skills use on treatment outcomes for people with BPD and their romantic partners (i.e., Aim 2) are presented in Tables 6 and 7, respectively.

Improvements in General and Conflict Out-of-Session Skills Use

General Skills Use

Results from the GEE analysis revealed that both individuals with BPD and their romantic partners reported statistically significant increases in general skills use as the intervention progressed (see Table 8). Day-to-day fluctuations in general skills use within each assessment period were not statistically significant for individuals with BPD. However, romantic partners showed a small but statistically significant decline in general skills use across study days within each 7-day assessment period indicating that, although overall use increased across the intervention, their daily use slightly decreased from the beginning to end of the first, sixth, and final week.

Conflict Skills Use

GEE analyses revealed that both people with BPD and their romantic partners reported less skills use during conflict over time (see Table 9). Specifically, with each successive timepoint, the odds of using skills during conflict decreased by approximately 32% for people with BPD (OR = 0.68) and 64% for romantic partners (OR = 0.36). There were not statistically significant effects of study day on skills use during conflict for either member of the couple. In

other words, conflict skills use did not fluctuate significantly within each seven-day assessment period, even though the overall likelihood of using these skills declined over the course of the intervention.

The Impact of General Out-of-Session Skills Use on Treatment Outcomes

People with BPD's Skills Use Predicting BPD Symptom Severity

For individuals with BPD, there was a statistically significant interaction of their between-person skills use and assessment period predicting their own self-reported BPD symptom severity such that higher overall skills use in people with BPD predicted weaker reductions in their self-reported BPD symptom severity over time (see Table 10). Additionally, there was a statistically significant interaction of their within-person skills use and assessment period predicting their own self-reported BPD symptom severity such that increases in their relative skills use predicted greater reductions in their self-reported BPD symptom severity over time.

For individuals with BPD, there was not a statistically significant main effect of their between-person skills use, or an interaction of this variable with assessment period, predicting informant-reported BPD symptom severity (see Table 10). However, there was a statistically significant interaction of their within-person skills use and assessment period predicting informant-reported BPD symptom severity such that increases in their relative skills use predicted greater reductions in informant-reported BPD symptom severity over time.

Romantic Partners' Skills Use Predicting BPD Symptom Severity

For romantic partners, there was not a statistically significant main effect of their between-person skills use, or an interaction of this variable with assessment period, predicting people with BPD's self-reported BPD symptom severity (see Table 11). However, there was a

statistically significant interaction of their within-person skills use and assessment period predicting people with BPD's self-reported BPD symptom severity such that increases in their relative skills use predicted greater reductions in people with BPD's self-reported BPD symptom severity over time.

For romantic partners, there was not a statistically significant interaction of their between- or within-person skills use and assessment period predicting people with BPD's informant-reported BPD symptom severity over time (see Table 11). However, there was a statistically significant main effect of their between-person skills use such that higher overall skills use in romantic partners was associated with lower informant-reported BPD symptom severity across time. Lastly, there was a statistically significant main effect of their within-person skills use such that higher relative skills use was associated with higher informant-reported BPD symptom severity across time.

People with BPD's Skills Use Predicting Suicidal Ideation

For individuals with BPD, there was not a statistically significant interaction of their between- or within-person skills use and assessment period predicting their own self-reported suicidal ideation over time (see Table 12). However, there was a statistically significant main effect of their between-person skills use such that higher overall skills use in people with BPD was associated with higher self-reported suicidal ideation across time. Lastly, there was not a statistically significant main effect of their within-person skills use on their own self-reported suicidal ideation.

For individuals with BPD, there was a statistically significant interaction of their between-person skills use and assessment period predicting informant-reported suicidal ideation such that higher overall skills use in people with BPD predicted greater reductions in informant-

reported suicidal ideation over time (see Table 12). However, there was not a statistically significant main effect of their within-person skills use, or an interaction of this variable with assessment period, predicting informant-reported suicidal ideation.

Romantic Partners' Skills Use Predicting Suicidal Ideation

For romantic partners, there was a statistically significant interaction of their between-person skills use and assessment period predicting people with BPD's self-reported suicidal ideation such that higher overall skills use in romantic partners predicted greater reductions in people with BPD's self-reported suicidal ideation over time (see Table 13). Additionally, there was a statistically significant interaction of their within-person skills use and assessment period predicting people with BPD's self-reported suicidal ideation such that increases in their relative skills use predicted weaker reductions in people with BPD's self-reported suicidal ideation over time.

For romantic partners, there was a statistically significant interaction of their between-person skills use and assessment period predicting people with BPD's informant-reported suicidal ideation such that higher overall skills use in romantic partners predicted greater reductions in people with BPD's informant-reported suicidal ideation over time (see Table 13). However, there was not a statistically significant main effect of their within-person skills use, or an interaction of this variable with assessment period, predicting people with BPD's informant-reported suicidal ideation.

People with BPD's Skills Use Predicting Suicidal and Self-Injurious Behaviors

For people with BPD, there was not a statistically significant interaction of their between- or within-person skills use and assessment period predicting their own self-reported suicidal and self-injurious behaviors over time (see Table 14). However, there was a statistically significant

main effect of their between-person skills use such that higher overall skills use in people with BPD was associated with higher self-reported suicidal and self-injurious behaviors across time. Lastly, there was not a statistically significant main effect of their within-person skills use on their own self-reported suicidal and self-injurious behavior.

Romantic Partners' Skills Use Predicting Suicidal and Self-Injurious Behaviors

The model predicting people with BPD's self-reported suicidal and self-injurious behaviors from romantic partners' between- and within-person skills use did not converge, likely due to issues such as data sparsity, high collinearity among predictors, or minimal variability in romantic partner predictors. As a result, the role of romantic partners' skills use in predicting changes in suicidal and self-injurious behaviors was unable to be assessed.

People with BPD's Skills Use Predicting Emotion Dysregulation

For people with BPD, there was a statistically significant interaction of their between-person skills use and assessment period predicting their own self-reported emotion dysregulation such that higher overall skills use in people with BPD predicted weaker reductions in their self-reported emotion dysregulation over time (see Table 15). Additionally, there was a statistically significant interaction of their within-person skills use and assessment period predicting their own self-reported emotion dysregulation such that increases in their relative skills use predicted greater reductions in their self-reported emotion dysregulation over time.

For people with BPD, there was not a statistically significant interaction of their between- or within-person skills use and assessment period predicting informant-reported emotion dysregulation over time (see Table 15). However, there was a statistically significant main effect of their between-person skills use such that higher overall skills use in people with BPD was associated with lower informant-reported emotion dysregulation across time. Additionally, there

was a statistically significant main effect of their within-person skills use such that higher relative skills use was associated with higher informant-reported emotion dysregulation across time.

Romantic Partners' Skills Use Predicting Emotion Dysregulation

For romantic partners, there were not statistically significant main effects of their between- or within-person skills use, or interactions of these variables with assessment period, predicting people with BPD's self-reported emotion dysregulation (see Table 16). Additionally, there was not a statistically significant main effect of their between-person skills use, or an interaction of this variable with assessment period, predicting people with BPD's informant-reported emotion dysregulation (see Table 16). However, there was a statistically significant interaction of romantic partners' within-person skills use and assessment period predicting people with BPD's informant-reported emotion dysregulation such that increases in their relative skills use predicted greater reductions in people with BPD's informant-reported emotion dysregulation over time.

People with BPD's Skills Use Predicting Relationship Satisfaction

For people with BPD, there were not statistically significant main effects of their between- or within-person skills use, or interactions of these variables with assessment period, predicting their own self-reported relationship satisfaction (see Table 17). However, there was a statistically significant interaction of their between-person skills use and assessment period predicting romantic partners' self-reported relationship satisfaction such that higher overall skills use in people with BPD predicted greater reductions in romantic partners' self-reported relationship satisfaction over time (see Table 17). Lastly, there was not a statistically significant

main effect of people with BPD's within-person skills use, or an interaction of this variable with assessment period, predicting romantic partners' self-reported relationship satisfaction.

Romantic Partners' Skills Use Predicting Relationship Satisfaction

For romantic partners, there were not statistically significant main effects of their between- or within-person skills use, or interactions of these variables with assessment period, predicting people with BPD's self-reported relationship satisfaction (see Table 18). However, there was a statistically significant interaction of romantic partners' between-person skills use and assessment period predicting their own self-reported relationship satisfaction such that higher overall skills use in romantic partners predicted greater reductions in their own self-reported relationship satisfaction over time (see Table 18). Lastly, there was not a statistically significant main effect of romantic partners' within-person skills use, or an interaction of this variable with assessment period, predicting their own self-reported relationship satisfaction.

General Skills Use Predicting Relationship Conflict

For both people with BPD and their romantic partners, there were not statistically significant main effects of between- or within-person skills use, or interactions of these variables with assessment period, predicting their own, or each other's, self-reported relationship conflict (see Table 20).

Discussion

Given the inextricable link between BPD pathology and relationship dysfunction, treating BPD in a conjoint framework may enhance BPD recovery. Practicing skills outside of therapy sessions (i.e., out-of-session skills use) is understood as a key mechanism of change in established individual BPD treatments such as DBT (Linehan, 2015; Neacsiu et al., 2010b; Rudge et al., 2020). However, it remains unclear to what extent out-of-session skills use

contributes to improvements in conjoint interventions. To address this gap, this thesis assessed changes in out-of-session skills use among individuals with BPD and their romantic partners over the course of Sage treatment, and whether skills use predicts individual and relational outcomes. Specifically, this study investigated (1) whether the frequency of out-of-session skills use in general (i.e., general skills use), and during conflict (i.e., conflict skills use), changed over the course of Sage and, (2) whether overall average (i.e., between-person), as well as improvements in (i.e., within-person), out-of-session skills use, predicted BPD-related (i.e., overall BPD pathology, suicidal, suicidal and self-injurious behavior, emotion dysregulation) and relationship-dysfunction-related (i.e., relationship conflict and satisfaction) treatment outcomes across the intervention for both partners. It was anticipated that both individuals with BPD and their romantic partners would show significant increases in out-of-session skills use over the course of Sage, both in general and during conflict. Furthermore, it was expected that higher overall average levels of general skills use, as well as increases in skills use relative to one's own average across intervention timepoints, would significantly predict improvements in BPD pathology and relationship dysfunction over time.

Aim 1: Changes in General and Conflict Out-of-Session Skills Use Across Sage

General Skills Use

As hypothesized, results showed that both individuals with BPD and their romantic partners significantly increased their general skills use frequency over the course of the intervention. This finding aligns with prior research indicating that skills use typically increases following individual skills-based treatments (Lindenboim et al., 2007; Stepp et al., 2008) and supports Sage's emphasis on practicing skills outside of therapy to promote generalization to everyday life (Fitzpatrick et al., 2023). Generalization is considered a hallmark of successful

skills-based interventions, as it enables individuals to apply learned strategies flexibly across real-world situations (Smith, 1999; Stokes & Baer, 1977). Researchers have theorized that such increases may reflect not only early skills acquisition, but also the strengthening and refinement of skills through repeated use (Smith, 1999; Stokes & Baer, 1977). In this context, the observed increase in general skills use suggests that participants became more intentional and consistent in applying Sage strategies to a broader range of daily experiences. However, it is also possible that participants simply had more skills available to draw from as the intervention progressed, such that the observed increase reflects the growing number of different skills taught over time, rather than greater strengthening or frequency of their use. Taken together, these findings suggest that Sage may facilitate not only the initial acquisition of therapeutic skills, but also their generalization to everyday contexts and strengthening through repeated use, all of which may be important to long-term recovery.

While overall skills use increased across the intervention, a more nuanced pattern emerged when examining day-to-day fluctuations in general skills use frequency within each assessment period. While romantic partners exhibited a small but statistically significant decrease in skills use as each week progressed, individuals with BPD did not. Several possible explanations may account for this divergence. Individuals with BPD may experience greater emotional intensity and more frequent or negative impacts of interpersonal stressors than romantic partners, creating a stronger need to use skills consistently throughout the week. Conversely, romantic partners may be more reliant on external motivation, such as the momentum generated by weekly sessions, and thus experience a drop-off in skills use as the days progress. Alternatively, individuals with BPD may have started each assessment period with lower levels of skills use than romantic partners, leaving less “room” for noticeable decreases

across the week. It is also possible that individuals with BPD had earlier exposure to skill-based interventions (e.g., DBT), supporting more sustained practice, whereas romantic partners may have had less formal training and needed more reinforcement to maintain skill use. Together, these findings suggest that higher internal motivation and/or greater treatment familiarity may be advantageous for people with BPD's general skills use, while romantic partners may require additional supports (e.g., prompts, reminders) to help sustain skills use consistently throughout the week.

Conflict Skills Use

In addition to learning and applying Sage skills to everyday situations more generally, couples are taught skills for navigating conflict specifically. Contrary to hypotheses, both partners reported a decrease in their conflict skills use as the intervention progressed. It is possible that, as conflict skills became more internalized, their use may have felt more automatic or habitual and therefore went unreported (i.e., reflecting automatic skillful behavior rather than deliberate skills application). Alternatively, this pattern may reflect reporting fatigue (Mathiowetz et al., 1994; Porter et al., 2004), especially given the structure of the survey wherein, if participants indicated that no conflict occurred, they were not required to answer follow-up questions. Over time, participants may have learned that responding "no" to questions about skills use reduced survey burden (Mathiowetz et al., 1994; Porter et al., 2004). Additionally, it is possible that the nature of conflict itself changed over time, such as becoming less intense, more manageable, or occurring less frequently. As such, participants may have felt less need to use, or report using, formal conflict skills. Lastly, the data showed limited variability in conflict skills use across timepoints and a relatively high rate of missed responses, which may indicate floor or ceiling effects or reduced engagement with these items (Egleston et al., 2011).

For example, among people with BPD, only 21.8% of conflict skills use items were completed at baseline, indicating that they only responded (i.e., *yes* or *no*) to the initial conflict skills EMA prompt (i.e., "Since the last assessment... Did you have conflict with your romantic partner?") 21.8% of the time. By the final assessment period, this percentage had dropped to 13.6%. Together, these patterns suggest the need for future research to examine not just the frequency of reported conflict skills use, but also the quality of skills use, the context of conflict interactions, as treatment progresses, and possible measurement limitations for assessing this outcome.

Aim 2: The Impact of General Out-of-Session Skills Use on Sage Treatment Outcomes

Increasing the frequency of skills use is not only a central target of skills-based interventions like Sage but is also theorized to be a key mechanism by which such treatments improve BPD pathology and relationship dysfunction (Linehan, 2015; Neacsiu et al., 2010b; Rudge et al., 2020). As such, Aim 2 examined whether general skills use was associated with improvements in individual and relational treatment outcomes.

Between-Person Effects of Skills Use on BPD-Related Outcomes

This section will focus on statistically significant effects of between-person skills use that are consistent with the hypotheses (subsequent sections discuss null findings and those contrary to hypotheses). As expected, higher overall skills use in people with BPD predicted greater reductions in *informant-reported* suicidal ideation over time. Additionally, in line with the hypotheses, higher overall skills use in romantic partners predicted greater reductions in people with BPD's *self- and informant-reported* suicidal ideation over time. The association between higher overall skills use in people with BPD and reductions in informant-reported suicidal ideation suggests that increased application of skills was observable and meaningful to their romantic partners, indicating that these behavioral changes may manifest in ways that others can

reliably detect, thus reinforcing the importance of skills generalization in everyday life. Additionally, the finding that romantic partners' higher overall skills use predicted consistent improvements in both *self-* and *informant-reported* suicidal ideation in people with BPD suggests that partner skills use may function as a relationally protective factor (e.g., reducing invalidation, improving communication, or preventing escalation), thereby reducing suicidal ideation in their partners with BPD over time. Alternatively, romantic partner skills use may act as a proxy for more supportive, healthier relationships, which themselves could contribute to reduced suicidal ideation, rather than skills use being the primary driver of change. This could explain why romantic partner skills use more consistently predicted improvements in suicidal ideation than individuals with BPD's skills use. Overall, these findings suggest that regular skills use by both individuals with BPD and their romantic partners is associated with reduced suicidal ideation in people with BPD, underscoring the potential importance of mutual engagement in skillful behavior for improving clinical outcomes.

Within-Person Effects of Skills Use on BPD-Related Outcomes

As above, this section will focus on significant results of the within-person skills use analyses that correspond with the hypotheses. As expected, increases in people with BPD's relative skills use predicted greater reductions in both *self- and informant-reported* BPD symptom severity, as well as *self-reported* emotion dysregulation over time. This finding aligns with research suggesting that skills use is a meaningful driver of change in overall BPD symptom severity and in emotion dysregulation specifically (Neacsiu et al., 2014; Stepp et al., 2008). The present study's results further suggest that increasing skills use relative to one's usual amount may drive symptom improvement in ways that are noticeable not only to individuals with BPD but also to their romantic partners. As individuals with BPD became more engaged in

applying Sage skills, they may have experienced better emotion regulation capacity and reduced emotional distress. These improvements, in turn, may have contributed to broader BPD symptom relief and observable changes in their romantic partner's perspective.

Additionally, as hypothesized, increases in romantic partners' relative skills use predicted greater reductions in people with BPD's *self-reported* BPD symptom severity and *informant-reported* emotion dysregulation over time. Such increases may have supported symptom improvements in individuals with BPD by enabling romantic partners to respond more effectively to people with BPD's distress. For instance, momentary increases in partner skills use may have disrupted cycles of problematic communication or conflict that are theorized to exacerbate BPD symptoms, functioning as a form of in-the-moment emotion regulatory support (Fruzzetti et al., 2005; Fitzpatrick et al., 2021). Taken together, these findings suggest that using more skills relative to usual, rather than overall skillfulness, may contribute to broader symptom relief that is noticeable both to people with BPD and their romantic partners.

Mixed and Non-Significant Findings for BPD-Related Outcomes

Despite the presence of significant effects for certain outcomes, several hypothesized associations were not supported. Because the GEE models in the current study varied based on type of skills use (i.e., overall or relative), who was using the skills (i.e., people with BPD or romantic partners), and whether outcomes were self- or informant-reported, not every model (i.e., each unique combination of these variables) showed consistent or significant effects. Moreover, a few models revealed associations between skills use and BPD-related outcomes that were contrary to expectations. Tables 6 and 7 visually illustrate these combinations, highlighting which models yielded significant findings and which did not.

Collectively, the non-significant and unexpected significant results point to several overarching patterns that may help clarify the conditions under which skills use is most critical. First, skills use did not consistently predict the same pattern of symptom change across self- and informant-reported outcomes. For instance, while increases in people with BPD's within-person (i.e., relative) skills use predicted improvements in their *self-reported* emotion dysregulation over time, it did not predict changes in *informant-reported* ratings of the same outcome (see Table 6). Similarly, while increases in romantic partners' relative skills use significantly predicted improvements in people with BPD's *self-reported* BPD symptom severity over time, it did not significantly predict changes over time in *informant-reported* ratings of the same outcome (see Table 7). These discrepancies may reflect differences in what self- and informant-report ratings capture. The former may better capture internal experiences, while the latter may better reflect observable behavior. For instance, a person with BPD may feel emotionally unstable (feeling sad and then angry) even if this does not result in externally observable shifts in affect (e.g., crying then yelling). This pattern suggests that skills use may be more effective in improving internal, subjective emotional states (e.g., reductions in emotional intensity) than in altering observable behavioral manifestations (e.g., affective lability), which may remain unchanged or change more slowly. Therefore, improvements in some overt domains of functioning may not be immediately apparent to others, but changes in other covert domains may be.

While higher overall skills use in romantic partners predicted greater reductions in both *self- and informant-reported* suicidal ideation in people with BPD, some findings ran counter to these patterns. For instance, where people with BPD's overall skills use significant predicted greater reductions in *informant-reported* suicidal ideation over time, it did not significantly

predict reductions in their own *self-reported* suicidal ideation over time (i.e., there was not a statistically significant interaction between their overall skills use and assessment period predicting their *self-reported* suicidal ideation). Additionally, a significant main effect indicated that higher overall skills use in people with BPD was associated with *higher self-reported* suicidal ideation and self-injury across the intervention. This suggests the strength and direction of this association may vary depending on several factors, including who is using the skills (person with BPD vs. romantic partner), how outcomes are measured (self vs. informant reports), and how the data are analyzed (between-person vs. within-person model, main vs. interaction effects).

These mixed finding diverge from prior research, such Neacsiu et al., 2010b, who found that skills use in people with BPD fully mediated reductions in self-reported suicide attempts over time and partially mediated reductions in self-reported non-suicidal self-injury across individual skills-based treatment. It is possible that, in some cases, consistently high overall skills use in people with BPD may reflect attempts to manage more severe or chronic emotional distress where skills are possibly used in response to overwhelming emotions or suicidal urges. Thus, elevated use may indicate greater clinical need rather than greater effectiveness in the current sample. This may result in the general association (i.e., main effect) of higher between-person skills use in people with BPD and higher *self-reported* suicidal ideation. At the same time, these same individuals may have also shown greater improvement over time from their romantic partners' perspective (i.e., *informant-reported*) rather than their own because their higher initial suicidal ideation left more room for observable change.

Another possibility is that self- versus informant-reported improvements in suicidal ideation may diverge due to differences in awareness of people with BPD's experience. For

example, romantic partners may notice improvements that individuals with BPD do not report or perceive, particularly if self-assessments are shaped by moment-to-moment internal distress rather than observable change. Romantic partners may be better positioned to detect subtle or gradual improvements in symptoms, particularly given research suggesting informant reports are more accurate at lower levels of BPD symptom severity (Balsis et al., 2018). That said, it is also possible that partners' reports were overly optimistic or influenced by their emotional investment in the intervention's success, or that people with BPD stopped disclosing suicidal ideation to romantic partners as the intervention progressed and partners' skills use increased. Taken together, the between-person findings suggest that regular skills use by both partners may play a role in reducing suicidal ideation in individuals with BPD, but this association may depend on contextual factors, such as who is using the skills and who is observing the outcome.

An additional pattern was observed across several models wherein people with BPD's between-person (i.e., overall) and within-person (i.e., relative) skills use showed different, and at times opposing, relationships to BPD-related outcomes (see Table 6). For instance, higher *overall* skills use in people with BPD predicted weaker reductions in self-reported BPD symptom severity and self-reported emotion dysregulation over time. Conversely, increases in people with BPD's *relative* skills use predicted greater improvements in these same outcomes over time. As previously theorized, higher overall skills use may reflect greater clinical severity or distress, where people with BPD use more skills due to greater need but don't necessarily improve their skills use or exhibit improved outcomes. High overall skills use may also indicate misapplied, habitual, or ineffective skills use, limiting its impact over time despite consistent effort (Swale & Dunkley, 2020). For instance, individuals may apply skills effectively in certain contexts but not others, particularly when interpersonal or high-intensity emotional distress is involved (Dixon-

Gordon et al., 2011, 2017; Berenson et al., 2016; Fitzpatrick et al., 2021; Yaroslavsky et al., 2019). In contrast, increases in relative skills use may reflect the active integration of newly learned strategies, potentially improving in quality or context-appropriateness over time. Such improvement may directly translate to optimized outcomes. Finally, differences in baseline skills use may also account for these discrepancies. People who begin with low skills use and progress to a moderate level may see greater benefits than those who already use skills at a high level and make only minor increases. This pattern may reflect a ceiling effect, where those with prior skills-based treatment training (e.g., DBT; Linehan, 2015) have less potential "room" for further improvement, which could help explain why, in certain models, relative skills use was significant while between-person skills use was not. Taken together, this pattern suggests that simply using skills frequently (i.e., high overall use) may not be sufficient for symptom change if that use is habitual, or ineffective. Instead, actively increasing skills use relative to one's usual amount (potentially reflecting new learning and more intentional practice) may be a more meaningful indicator of therapeutic progress in BPD interventions.

Between- versus within-person results also diverged in the context of romantic partners' skills use (see Table 7). As predicted, higher *overall* (i.e., between-person) skills use among romantic partners predicted reductions in people with BPD's self-reported suicidal ideation over time. However, contrary to predictions, increased *relative* (i.e., within-person) skills use in romantic partners' predicted weaker reductions people with BPD's self-reported suicidal ideation over time. While this might suggest that romantic partners' relative skills use improvements cause worse outcomes, this pattern more likely reflects differences in the function of skills use. For instance, romantic partners may have increased their use of skills in response to momentary increases the person with BPD's distress or in suicidal ideation (i.e., reactive use). It is also

possible that partners were trying to be supportive, but their efforts weren't fully effective. In some cases, skills use may be less impactful, particularly when ideation is tied to more enduring affective states or cognitions (e.g., feeling hopeless or like a burden) rather than immediate situational stressors (e.g., interpersonal events; Selby et al., 2013). Another possibility is that increases in relative skills use reflected romantic partners' efforts to be more assertive or address difficult issues–a key goal of Sage. These changes in romantic partner behavior may have temporarily elevated distress in people with BPD. Conversely, high overall skills use may reflect a relationship that is consistently supportive and effective for people with BPD rather than one where partner behavior is changing in response to people with BPD's distress. Such an environment may be conducive towards recovery for people with BPD.

Overall, these findings support the dyadic theoretical framework of Sage, which emphasizes the role of both partners' behaviors and engagement in optimizing treatment outcomes (Fitzpatrick et al., 2023). Specifically, the results suggest that greater general skills use, both on average overall (i.e., between-person) and relative to one's own average (i.e., within-person), is an important predictor of BPD-related treatment outcomes over the course of Sage. However, mixed findings suggest that the importance of out-of-session skills use may be context-dependent. For example, when people with BPD increased their skills use relative to their own average (within-person), this was associated with greater improvements in self-reported emotion dysregulation. However, higher overall skills use (between-person) did not consistently predict similar improvements, and in some cases was linked with less improvement, possibly because it reflected ongoing distress or a greater need for skills rather than effective application. Taken together, results indicate that the timing, function, and context of skills use (i.e., who is using skills, when, and why), rather than frequency alone, may shape symptom

change, particularly in conjoint treatments where skills are implemented dyadically. Furthermore, conducting both between- and within-person analyses, and including main and interaction effects, may offer more nuanced insight into how skills use relates to treatment outcomes across varying individual and interpersonal contexts.

Mixed and Non-Significant Findings for Relationship-Dysfunction Outcomes

With respect to relationship-dysfunction-related outcomes, and contrary to hypotheses, several analyses did not show significant effects of general skills use on relationship satisfaction or relationship conflict. Neither partners' overall (i.e., between-person) nor relative (i.e., within-person) skills use predicted changes in people with BPD's self-reported relationship satisfaction nor in either partners' self-reported relationship conflict. It is possible that increasing the frequency of skills use alone may not be sufficient to improve couples' perceptions of relationship functioning in the context of BPD. Longstanding patterns of problematic interaction may give rise to deeply entrenched negative beliefs and assumptions held by both partners, not just the individual with BPD (Ociskova et al., 2023). Problematic cognitions may distort how each partner interprets the other's needs and intentions, which could lead to misapplying skills (e.g., using a skill in an inappropriate context or mismatching the need of the situation) or misinterpreting a partner's skill use (e.g., perceiving constructive feedback as rejection; Ociskova et al., 2023). As such, even with increased skills use, longstanding issues in couples' perceptions of each other and their relationship may persist and interfere with the impact of those efforts. Thus, skills-use-related improvements in relationship dysfunction may take longer and require more coordinated, mutual effort than skills-use-related improvements in an individual's BPD symptoms do, particularly for couples with long-standing relationship difficulties.

Alternatively, measurement limitations may have contributed to the lack of significant relational findings. The measure included for assessing relationship conflict, the IAI, primarily assesses whether couples fall into dysfunctional patterns of arguing, rather than capturing how constructively conflict is resolved or whether longstanding, recurrent issues are addressed (Kurdek, 1994). Therefore, while skills use may not have led to measurable reductions in the specific communication pattern components captured by the IAI, it may still have supported improvements in other aspects of conflict management and resolution that are not captured in the IAI (e.g., compromise, negotiation, emotion validation; Kurdek, 1994). Thus, improvements in how couples handled conflict may have occurred in relation to skills use, even if self-reported IAI scores remained unchanged. This interpretation aligns with Sage's goal of helping couples navigate conflict more effectively, rather than eliminating it altogether. Lastly, another possibility is that skills may have been used, after conflict had already begun, rather than proactively to prevent conflict. In such cases, the perceived impact of skills use may have been limited, as the occurrence of conflict may be unchanged although how it unfolds may have improved.

Despite the absence of significant effects in most models, one unexpected significant finding did emerge from the relationship-dysfunction analyses; when both partners reported higher overall skills use, romantic partners self-reported *lower* relationship satisfaction over time. This result may suggest that in some cases, skills use has unintended negative effects on relationship satisfaction. However, an alternative explanation is that couples with persistent dysfunction may need to use more skills to manage ongoing tension or simply to maintain baseline functioning. In these cases, relationship satisfaction may have plateaued or declined because distress was difficult to resolve or progress felt slow despite consistent effort, resulting in some romantic partners feeling "stuck." Relatedly, romantic partners supporting someone with

high BPD severity may experience high caregiver burden, which can lead to emotional exhaustion (Bailey & Grenyer, 2013). Over time, this caregiver burden and emotional exhaustion may negatively affect their own relationship satisfaction, even when both partners are actively using skills. The ongoing effort to manage frequent conflict may be emotionally taxing, and in some cases, high overall skills use may reflect not only effort, but also ineffective application (Swales & Dunkley, 2020). Even with strong engagement, the frequency or intensity of conflict may remain high, making repair feel unrewarding and further limiting satisfaction gains, or even contributing to further decline. Taken together, these possibilities suggest that higher overall skills use may not always contribute to improved relationship satisfaction, particularly when there is persistent conflict, emotional exhaustion, or ineffective application of skills.

Finally, some couples may maintain high skills use without actually improving their skills use frequency or effectiveness over time. While they continue to apply intervention strategies consistently, their lack of skills use improvements may result in their relational outcomes not improving and possibly declining as unresolved issues accumulate. The impact of both possible situations on relationship satisfaction may be more apparent in romantic partners who may struggle to balance their investment in their partner with BPD's recovery with their own personal boundaries and growth in the relationship.

Taken together these findings suggest that skills use alone, even when consistently high or increased relative to one's usual, may not be sufficient to improve relationship outcomes. This may be particularly relevant in couples with higher distress or deeply entrenched relationship dysfunction. Overall, improvements in relationship satisfaction or conflict may depend on additional contextual factors, such as established relationship processes and conflict history, and how efficiently, effectively, and responsively skills are used by both partners.

Clinical Implications

The findings from the current thesis offer several clinical implications. First, given that both individuals with BPD and their romantic partners increased their general skills use across the intervention, therapists should continue to encourage regular practice and normalize that skill mastery takes time and consistency. However, considering that both partners reported using fewer skills during conflict (i.e., conflict skills use) as the intervention progressed, therapists should assess whether this pattern reflects successful internalization of skills or a problematic decline in deliberate skill use (e.g., due to fatigue or avoidance; Swales & Dunkley, 2020). If reductions are due to internalization, this may indicate successful generalization of skills (Swales & Dunkley, 2020; Swales & Heard, 2017). If instead they reflect avoidance or other barriers, therapists may need to provide targeted support to sustain intentional use of skills (Swales & Dunkley, 2020; Swales & Heard, 2017), particularly during conflict. Additionally, as romantic partners showed small declines in skill use across days within each assessment period but people with BPD did not, assessing for differences in motivation behind skill use may be clinically useful. Romantic partners may benefit from additional support or external reinforcement, such as session reminders or behavioral cues, to remain engaged in between-session practice.

Second, the mixed findings on the impact of general skills use on treatment outcomes provide several insights that may be beneficial for optimizing treatment outcomes. Results support a tailored approach to skills coaching based on the specific outcomes being targeted. For example, when suicidal ideation is a primary concern, couples with romantic partners who tend to use fewer skills overall may require additional or augmented interventions to maximize outcomes. When targeting broader BPD symptom severity or emotion dysregulation, helping each partner increase their skills use relative to their own average may be most beneficial.

Moreover where present, clinicians should assess whether unexpected or diverging impacts of skills use reflect couples addressing concerns more adaptively (e.g., altering maladaptive coping strategies, increasing assertiveness), even if distress initially worsens, or whether it may reflect challenges related to effective skills use (e.g., avoidance, burnout, misapplication). In the former case, normalizing that things may feel worse before they improve can be helpful; in the latter, exploring barriers to effective use (or alternative skills) may be necessary. Therapists should also assess whether skills are used proactively or reactively, as understanding the context and timing of skills use may be key to determining their differential impact on BPD and relational outcomes. Overall, optimizing treatment may involve attending not only to the frequency of skills use, but also the purpose, timing, quality, and functional impact of that use.

Research Limitations and Future Directions

While the findings of the current study contribute meaningful insights into the significance of out-of-session skills use in conjoint BPD treatment, several research limitations should be considered. First, many outcomes in the present study rely on self-assessment measures. Self-report data are inherently subjective and vulnerable to various sources of reporting bias (e.g., responding in ways believed to be more socially acceptable; difficulty recalling past events; shifting internal standards over time; An et al., 2022; Bauhoff, 2014; Colombo et al., 2020; Paulhus, 1991). Informant reports, such as those completed by romantic partners, also have key limitations. Informants may lack access to internal states (e.g., emotion dysregulation or suicidal ideation), and their ratings can be shaped by established relationship processes (e.g., caregiver burden, emotional fatigue; An et al., 2022; Balsis et al., 2018), impacting the accuracy of outcome measurement in this study. The study is strengthened by its inclusion of both self- and informant-reports together, which provided a more comprehensive

view of patterns of change across the intervention. However, incorporating clinician-rated assessments could further enhance the validity of studies relying on self- and informant-reports by offering a third, potentially more objective perspective on behaviorally observable indications of symptom change.

Second, there are notable limitations related to the ways in which key predictor variables were measured and analyzed. First, the current study focused on assessing the frequency of skills use, rather than evaluating the quality, timing, purpose, and context of use, which can make it difficult to discern whether skills were used effectively or not (Neacsiu et al., 2010a). Moreover, there was a high rate of missed responses contributing to a lack of variability, particularly in the conflict skills use variable. This further constrained the ability to discern nuanced patterns (i.e., when, where, why) of skills use and their potential impacts on outcomes. High rates of missing responses may reflect a failure to report, potentially due to survey fatigue, or a true absence of conflict experienced on those days (Neacsiu et al., 2010a). However, further research is needed to clarify the cause of missing data. To strengthen future research, studies should incorporate more comprehensive measurement of skills (e.g., quality, contextual appropriateness, mutual responsiveness), particularly in the context of conflict.

Another limitation involves the modeling approach used to evaluate associations between general skills use and treatment outcomes. Skills use as assessed failed to capture individual variability in the timing, function, or motivation for skill use, which may be crucial to assess when evaluating the impact of skills use on treatment outcomes (Swales & Dunkley, 2020; Swales & Heard, 2017). Incorporating qualitative interviews or open-ended diary entries could help provide greater context about why individuals increase or decrease their skills use at

different times, and how motivation, context, or relational factors influence these patterns and their outcomes (Swales & Dunkley, 2020; Unterhitzenberger & Lawrence, 2022).

Finally, there are interpretive challenges associated with the way between- and within-person predictors were modeled simultaneously. These two forms of skills use are likely correlated, and by adjusting for shared variance, the models potentially estimated only narrow residual effects that may not represent real-world behavior (Curran et al., 2011; Curran & Bauer, 2011; Wang & Maxwell, 2015). This could limit both the statistical power and the conceptual clarity of the findings (Wang & Maxwell, 2015). Additionally, interpreting effects that are conditional on the other being held constant may not reflect how skills are used or experienced in daily life (Curran & Bauer, 2011; Wang & Maxwell, 2015). Modeling general and conflict skills use in separate models could avoid overlap between predictors, but that would result in losing the benefit provided by controlling for that overlap (i.e., testing whether one type of skills use predicts an outcome above and beyond what's explained by the other; Neubauer et al., 2023). Thus, each approach has advantages and limitations. Lastly, as changes in certain treatment outcomes (e.g., relationship dysfunction) may take more time to consolidate, future research should include longer follow-up assessment periods.

Conclusions

The findings of this thesis highlight the value of including both individuals with BPD and their romantic partners in out-of-session skills practice within conjoint BPD interventions. First, the results for Aim 1 demonstrated that Sage, a conjoint skills-based intervention, successfully facilitated increases in general skills use for both individuals with BPD and their partners, supporting its feasibility as a mechanism for skill acquisition in conjoint treatment. Second, Aim 2 results indicated that greater overall average (i.e., between-person) and increased relative (i.e.,

within-person) skills use were generally associated with improved BPD outcomes over the course of Sage. This highlights the potential value of dyadic out-of-session skills use in supporting change in conjoint BPD interventions. However, the impact of skills use appears to depend not only on how frequently skills are used, but also on who is using them, when they are used, and why. These effects may further vary based on skill quality, baseline symptom severity, and the emotional or relational context in which skills are used. It is also important to consider the source of the data (i.e., self- vs. informant-report), as well as the analytic approach (i.e., between- versus within-person models) and the specific effects being examined (i.e., interaction vs. main effects). Together, these findings highlight the need for a nuanced approach to measuring and interpreting out-of-session skills use, one that accounts for contextual, relational, and methodological factors, to fully understand its impact on BPD and relationship outcomes in conjoint treatment.

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Tables

Table 1

Participant Demographics

	People with BPD	Romantic Partners
Age [*M* (*SD*)]	29.905 (7.183)	30.762 (7.962)
Gender (%)		
Male	9.524	90.476
Female	76.190	4.762
Trans-Female	4.762	0.000
Non-binary	9.524	4.762
Sexual orientation (%)		
Bisexual	23.810	9.524
Gay or lesbian	4.762	0.000
Heterosexual/straight	57.143	85.714
Other	14.286	4.762
Race/ethnicity (%)		
White/Caucasian/European Origin	71.429	66.667
Aboriginal Canadian/Indigenous/First Nations/Métis/Inuit	4.762	0.000
Chinese or Chinese Canadian	4.762	0.000
South Asian/South Asian Canadian	0.000	9.524

East or Southeast Asian/East or Southeast Asian Canadian	0.000	9.524
West Asian or Middle Eastern/West Asian or Middle Eastern Canadian	0.000	4.762
Other Latinx/Hispanic/Other Latinx/Hispanic Canadian	9.524	0.000
Bi-racial/Multi-racial	9.524	4.762
Other	0.000	4.762
Highest level of education (%)		
Did not complete high school	14.286	4.762
High school diploma	9.524	14.286
Some post-secondary	19.048	9.524
College or trade certification	19.048	33.333
University degree	33.333	28.571
Master's/doctoral degree	4.762	9.524
Currently Employed (% *yes*)	55.000	85.714
Annual income (%)		
Under $9,999	14.282	10.000
$10,000-$24,999	28.572	10.000
$25,000-$49,999	33.334	20.000
$50,000-$99,999	9.524	40.000
$100,000 and over	0.000	15.000

Reported Not Applicable	14.286	5.000
Have Children (% *yes*)	23.810	27.273
Total number of medications taken at baseline [*M* (*SD*)]	3.143 (2.220)	1.000 (1.512)
Relationship status at baseline (%)		
Married	33.333	33.333
Divorced	00.000	4.472
Never married	66.667	57.143
Unknown	00.000	4.762

Note. BPD = borderline personality disorder. *M* = mean. *SD* = standard deviation.

Table 2

Current Comorbid Diagnoses for People with BPD and Romantic Partners

	% (*n*)	
Diagnosis	People with BPD	Romantic Partners
Bipolar I Disorder	14.290 (3)	0.000 (0)
Bipolar II Disorder	4.762 (1)	0.000 (0)
Alcohol Use Disorder	19.048 (4)	0.000 (0)
Substance Use Disorder	14.290 (3)	9.524 (2)
Major Depressive Disorder	52.381 (11)	4.762 (1)
Persistent Depressive Disorder	47.620 (10)	4.762 (1)
Agoraphobia	38.100 (8)	14.290 (3)
Panic Disorder	47.620 (10)	0.000 (0)
Generalized Anxiety Disorder	80.952 (17)	23.810 (5)
Social Anxiety Disorder	71.430 (15)	9.524 (2)

Obsessive-Compulsive Disorder	28.571 (6)	4.762 (1)
Posttraumatic Stress Disorder	52.381 (11)	4.762 (1)

Note. BPD = borderline personality disorder. *n* = sample size.

Table 3

Means and Standard Deviations from Baseline to Post-Intervention, and Three-Month Follow-Up for Study Variables

	Baseline *M* (*SD*)	Mid *M* (*SD*)	Post *M* (*SD*)	FU* *M* (*SD*)
BPD Symptoms (BSL-23)				
Self-Report	2.679 (.715)	2.615 (0.578)	1.849 (1.011)	1.840 (1.083)
Informant-Report	1.857 (0.902)	1.778 (0.818)	1.521 (0.863)	1.411 (1.014)
Suicidal ideation (BSSI)				
Self-Report	16.095 (6.665)	13.579 (7.211)	8.647 (10.083)	7.417 (10.059)
Informant-Report	9.571 (7.305)	9.500 (8.130)	4.647 (7.200)	7.636 (8.016)
Suicidal/Self-Injurious Behaviors Interview (SASII)				
Self-Report	6.429 (20.714)	7.000 (18.434)	4.606 (13.308)	0.833 (2.125)
Emotion Dysregulation (DERS)				
Self-Report	109.524 (52.386)	92.833 (51.286)	88.471 (47.510)	107.667 (23.157)

Informant-Report	28.095	30.063	26.000	27.636
	(6.368)	(6.237)	(5.866)	(7.915)
Relationship Satisfaction (CSI)				
People with BPD	113. 238	111.833	110.412	98.583
	(30.820)	(22.436)	(34.046)	(40.967)
Romantic Partners	109.048	97.813	103.000	96.000
	(34.451)	(34.040)	(35.248)	(45.965)
Relationship Conflict (IAI)				
People with BPD	23.429	22.556	21.353	24.500
	(7.874)	(6.272)	(6.802)	(8.096)
Romantic Partners	21.667	23.437	21.000	22.445
	(6.637)	(5.889)	(6.889)	(8.263)
General Skills Use				
People with BPD	5.994 (3.333)	5.866 (5.373)	14.472	N/A
			(14.416)	
Romantic Partners	5.697 (3.197)	5.801 (2.980)	40.726	N/A
			(71.343)	
Between-Person Skills Use				
People with BPD	-8.356	6.857	12.262	N/A
	(27.757)	(44.945)	(51.420)	
Romantic Partners	-12.670	-2.284	7.814	N/A
	(29.268)	(41.762)	(71.691)	

Within-Person Skills Use				
People with BPD	-7.563 (18.189)	5.067 (25.938)	8.432 (19.505)	N/A
Romantic Partners	-0.551 (17.475)	2.748 (25.880)	9.132 (32.258)	N/A
	Baseline % *yes* (*n yes*)[1]	Mid % *yes* (*n yes*)[1]	Post % *yes* (*n yes*)[1]	FU* % *yes* (*n yes*)[1]
Conflict Skills Use				
People with BPD	50.000 (16)	42.857 (15.000)	25.000 (5)	N/A
Romantic Partners	52.941 (9)	34.615 (9)	5.000 (1)	N/A

Note. BPD = borderline personality disorder. *M* = mean. *SD* = standard deviation. * = only participants from the uncontrolled trial included in follow-up. FU = follow-up. BSL-23 = Borderline Symptom List. BSSI = Beck Scale for Suicidal Ideation. SASII = Suicide Attempt Self Injury Interview. DERS = Difficulties in Emotion Regulation Scale. CSI = Couples Satisfaction Index. IAI = Ineffective Arguing Inventory. N/A = not applicable. % *yes* = percentage of responses where participants reported using Sage skills to manage or resolve conflict. *n yes* = number of times participants responded *yes* to using Sage skills during conflict. [1] % *yes* and *n yes* refer only to study days when participants reported that conflict occurred.

Table 4

Means and Standard Deviations of Frequency of General Skills Use Across Study Days from Baseline to Post-Intervention

	Baseline *M*	Mid *M (SD)*	Post *M (SD)*

	(SD)					
	People with BPD	Romantic Partners	People with BPD	Romantic Partners	People with BPD	Romantic Partners
Study Day						
1	4.800 (8.108)	6.077 (5.664)	18.684 (40.143)	13.353 (27.331)	1.950 (3.649)	3.417 (9.986)
2	8.619 (6.859)	12.105 (16.829)	15.000 (1.414)	4.000 (0.000)	8.150 (22.022)	0.800 (2.462)
3	4.500 (7.910)	3.250 (5.852)	2.118 (3.789)	3.882 (5.988)	16.000 (22.199)	6.615 (10.989)
4	26.071 (51.658)	21.750 (36.891)	8.278 (18.578)	8.850 (17.813)	15.636 (28.549)	10.133 (16.475)
5	24.375 (31.866)	100.455 (87.409)	0.500 (0.707)	10.143 (22.079)	17.950 (25.057)	9.400 (13.621)
6	26.429 (34.486)	2.000 (1.732)	1.750 (1.832)	0.857 (1.864)	0.600 (1.046)	2.900 (8.867)
7	125.700 (44.943)	28.900 (27.053)	1.462 (3.821)	3.417 (9.986)	6.500 (11.563)	4.000 (8.485)

Note. BPD = borderline personality disorder. *M* = mean. *SD* = standard deviation.

Table 5

Frequency of Conflict Skills Use Across Each Study Day from Baseline to Post-Intervention

	Baseline % *yes* (*n yes*)[1]	Mid % *yes* (*n yes*)[1]	Post % *yes* (*n yes*)[1]

	People with BPD	Romantic Partners	People with BPD	Romantic Partners	People with BPD	Romantic Partners
Study Day						
1	100.00 (1)	0.000 (0)	33.333 (4)	42.857 (3)	33.333 (7)	11.111 (1)
2	25.000 (1)	33.333 (1)	42.857 (3)	33.333 (1)	33.333 (4)	0.000 (0)
3	50.000 (3)	0.000 (0)	66.667 (2)	50.000 (2)	45.455 (5)	0.000 (0)
4	40.000 (2)	100.000 (2)	25.000 (1)	25.000 (1)	36.364 (4)	0.000 (0)
5	57.143 (4)	66.667 (2)	100.000 (3)	50.000 (2)	72.727 (8)	0.000 (0)
6	50.000 (2)	66.667 (2)	33.333 (1)	0.000 (0)	44.444 (4)	0.000 (0)
7	60.000 (3)	100.000 (2)	33.333 (1)	0.000 (0)	33.333 (4)	0.000 (0)

Note. BPD = borderline personality disorder. % *yes* = percentage of responses where participants reported using Sage skills to manage or resolve conflict. *n yes* = number of times participants responded *yes* to using Sage skills during conflict. [1] % *yes* and *n yes* refer only to study days when participants reported that conflict occurred.

Table 6

Summary of Results for People with BPD's General Skills Use Predicting Treatment Outcomes

	BPD Symptom Severity (BSL-23)		Suicidal ideation (BSSI)		Suicidal/Self-Injurious Behaviors Interview (SASII)		Emotion Dysregulation (DERS)		Relationship Satisfaction (CSI)		Relationship Conflict (IAI)	
	Self	Inform.	Self	Inform.	Self	Inform.	Self	Inform.	IP	RP	IP	RP
BP Skills Use Main Effect	∅	∅	↑ BP skills use = ↑ SI	-	↑ BP skills use = ↑ SSI	N/A	∅	↑ BP skills use = ↓ ED	∅	∅	∅	∅
WP Skills Use Main Effect	-	-	∅	∅	∅	N/A	∅	↑ WP skills use = ↑ ED	∅	∅	∅	∅

BP Skills Use × Assessment Period	↑ BP skills use = ↑ BPD sever-ity over time	∅	∅	↑ BP skills use = ↓ SI over time	∅	N/A	↑ BP skills use = ↑ ED over time	∅	∅	↑ BP skills use = ↓ satisfa-ction over time	∅	∅
WP Skills Use × Assessment Period	↑ WP skills use = ↓ BPD seve-rity over time	↑ WP skills use = ↓ BPD severi-ty over time	∅	∅	∅	N/A	↑ WP skills use = ↓ ED over time	∅	∅	∅	∅	∅

Note. ∅ = not significant. - = significant main effect in a model where there is also a significant interaction effect. ↑ = higher. ↓ = lower. N/A = not applicable. BP = between-person skills use. WP = within-person skills use. BPD = borderline personality disorder.

SI = suicidal ideation. SSI = suicidal and self-injurious behaviors. ED = emotion dysregulation. IP = identified participant (i.e., person with BPD). RP = romantic partner. Self. = self-report. Inform. = informant-report.

Table 7

Summary of Results for Romantic Partners' General Skills Use Predicting Treatment Outcomes

	BPD Symptom Severity (BSL-23)		Suicidal ideation (BSSI)		Suicidal/Self-Injurious Behaviors Interview (SASII)		Emotion Dysregulation (DERS)		Relationship Satisfaction (CSI)		Relationship Conflict (IAI)	
	Self	Inform.	Self	Inform.	Self	Inform.	Self	Inform.	IP	RP	IP	RP
BP Skills Use Main Effect	∅	↑ BP skills use = ↓ BPD sever-ity	∅	-	N/A	N/A	∅	∅	∅	∅	∅	∅

WP Skills Use Main Effect	-	↑ WP skills use = ↑ BPD sever-ity	∅	∅	N/A	N/A	∅	∅	∅	∅	∅	∅
BP Skills Use × Assessment Period	∅	∅	↑ BP skills use = ↓ SI over time	↑ BP skills use = ↓ SI over time	N/A	N/A	∅	∅	∅	↑ BP skills use = ↓ satisfa-ction over time	∅	∅
WP Skills Use ×	↑ WP skills use = ↓	∅	↑ WP skills use = ↑	∅	N/A	N/A	∅	↑ WP skills use = ↓	∅	∅	∅	∅

Assessment Period	BPD severity over time		SI over time					ED over time				

Note. ∅ = not significant. - = significant main effect in a model where there is also a significant interaction effect. ↑ = higher. ↓ = lower. N/A = not applicable. BP = between-person skills use. WP = within-person skills use. BPD = borderline personality disorder. SI = suicidal ideation. ED = emotion dysregulation. IP = identified participant (i.e., person with BPD). RP = romantic partner. Self. = self-report. Inform. = informant-report.

Table 8

Generalized Estimating Equation Analyses Examining Changes in General Skills Use

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	**2.094**	**0.580**	**13.035**	**1**	**<.001**
Study Day	-0.075	0.098	0.589	1	.443
Assessment Period	**.543**	**0.205**	**7.001**	**1**	**.008**
Romantic Partners					
(Intercept)	**2.444**	**0.532**	**21.154**	**1**	**<.001**
Study Day	**-0.134**	**0.058**	**5.399**	**1**	**.020**
Assessment Period	**0.553**	**0.213**	**6.728**	**1**	**.009**

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 9

Generalized Estimating Equation Analyses Examining Changes in Conflict Skills Use

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	0.229	0.386	0.352	1	.553
Study Day	0.040	0.050	0.630	1	.427
Assessment Period	**-0.385**	**0.164**	**5.508**	**1**	**.019**
Romantic Partners					
(Intercept)	**1.401**	**0.628**	**4.982**	**1**	**.026**

Study Day	-0.033	0.082	0.161	1	.689
Assessment Period	**-1.017**	**0.241**	**17.835**	**1**	**<.001**

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 10

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills on BPD Symptom Severity

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**3.246**	**0.271**	**143.075**	**1**	**<.001**
Study Day	0.001	0.008	0.004	1	.949
Assessment Period	**-.412**	**0.144**	**8.196**	**1**	**.004**
Between-Person Skills Use	0.001	0.003	0.199	1	.655
Within-Person Skills Use	**0.013**	**0.006**	**4.482**	**1**	**.034**
Between-Person Skills Use × Assessment Period	**0.004**	**0.002**	**5.030**	**1**	**.025**
Within-Person Skills Use × Assessment Period	**-0.011**	**0.004**	**9.106**	**1**	**.003**
Informant-Report					
(Intercept)	**2.127**	**0.240**	**78.843**	**1**	**<.001**
Study Day	0.012	0.0105	1.193	1	.275
Assessment Period	**-.246**	**0.010**	**6.105**	**1**	**.013**

Between-Person Skills Use	0.000	0.003	0.007	1	.933
Within-Person Skills Use	**0.015**	**0.007**	**4.155**	**1**	**.042**
Between-Person Skills Use × Assessment Period	0.001	0.002	0.191	1	.662
Within-Person Skills Use × Assessment Period	**-0.006**	**0.003**	**3.978**	**1**	**.046**

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 11

Generalized Estimating Equation Analyses Examining the Impact of Romantic Partners' General Skills Use on BPD Symptom Severity

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**3.170**	**0.217**	**213.336**	**1**	**<.001**
Study Day	0.004	0.008	0.184	1	.668
Assessment Period	**-.361**	**0.136**	**7.024**	**1**	**.008**
Between-Person Skills Use	-0.003	0.003	1.062	1	.303
Within-Person Skills Use	**0.008**	**0.003**	**9.699**	**1**	**.002**
Between-Person Skills Use × Assessment Period	0.000	0.002	0.063	1	.802
Within-Person Skills Use × Assessment Period	**-0.003**	**.0012**	**6.374**	**1**	**.012**

Informant-Report					
(Intercept)	**2.092**	**0.173**	**146.779**	**1**	**<.001**
Study Day	-0.010	0.015	0.424	1	.515
Assessment Period	-0.104	0.113	0.849	1	.357
Between-Person Skills Use	**-0.007**	**0.002**	**13.300**	**1**	**<.001**
Within-Person Skills Use	**0.006**	**0.002**	**7.350**	**1**	**.007**
Between-Person Skills Use × Assessment Period	0.001	0.001	1.035	1	.309
Within-Person Skills Use × Assessment Period	-0.002	0.002	1.406	1	.236

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 12

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills Use on Suicidal Ideation

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**19.992**	**2.409**	**68.901**	**1**	**<.001**
Study Day	0.083	0.103	0.647	1	.421
Assessment Period	**-3.382**	**1.221**	**7.667**	**1**	**.006**
Between-Person Skills Use	**0.076**	**0.032**	**5.601**	**1**	**.018**
Within-Person Skills Use	0.012	0.049	0.060	1	.806

Between-Person Skills Use × Assessment Period	-0.001	0.016	0.003	1	.955
Within-Person Skills Use × Assessment Period	-0.043	0.035	1.554	1	.212
Informant-Report					
(Intercept)	**11.725**	**2.706**	**18.776**	**1**	**<.001**
Study Day	0.067	0.086	0.601	1	.438
Assessment Period	-2.154	1.1734	3.371	1	.066
Between-Person Skills Use	**0.095**	**0.051**	**3.501**	**1**	**.061**
Within-Person Skills Use	-0.012	0.050	0.054	1	.816
Between-Person Skills Use × Assessment Period	**-0.040**	**0.0170**	**5.715**	**1**	**.017**
Within-Person Skills Use × Assessment Period	0.011	0.022	0.263	1	.608

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 13

Generalized Estimating Equation Analyses Examining the Impact of Romantic Partners' General Skills Use on Suicidal Ideation

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**20.637**	**2.001**	**106.343**	**1**	**<.001**

Study Day	0.057	0.066	0.749	1	.387
Assessment Period	**-3.690**	**1.220**	**9.152**	**1**	**.002**
Between-Person Skills Use	0.031	0.026	1.416	1	.234
Within-Person Skills Use	-0.027	0.024	1.274	1	.259
Between-Person Skills Use × Assessment Period	**-0.029**	**0.012**	**5.778**	**1**	**.016**
Within-Person Skills Use × Assessment Period	**0.028**	**0.011**	**5.952**	**1**	**.015**
Informant-Report					
(Intercept)	**14.083**	**2.597**	**29.416**	**1**	**<.001**
Study Day	0.074	0.0703	1.105	1	.293
Assessment Period	**-2.833**	**1.152**	**6.055**	**1**	**.014**
Between-Person Skills Use	**.0165**	**0.038**	**19.288**	**1**	**<.001**
Within-Person Skills Use	-0.069	0.039	3.220	1	.073
Between-Person Skills Use × Assessment Period	**-0.059**	**0.014**	**16.709**	**1**	**<.001**
Within-Person Skills Use × Assessment Period	0.011	0.027	0.162	1	.687

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 14

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills Use on Suicidal and Self-Injurious Behaviors

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**1.035**	**0.449**	**5.310**	**1**	**.021**
Study Day	0.013	0.015	0.707	1	.400
Assessment Period	-0.033	0.242	0.018	1	.892
Between-Person Skills Use	**0.036**	**0.007**	**27.817**	**1**	**<.001**
Within-Person Skills Use	-0.022	0.013	2.953	1	.086
Between-Person Skills Use × Assessment Period	-0.003	0.003	0.829	1	.362
Within-Person Skills Use × Assessment Period	-0.003	0.005	0.338	1	.561

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 15

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills Use on Emotion Dysregulation

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**117.228**	**12.545**	**87.328**	**1**	**<.001**
Study Day	0.217	0.195	1.233	1	.267

Assessment Period	**-10.368**	**2.593**	**15.992**	**1**	**<.001**
Between-Person Skills Use	-0.070	0.255	.075	1	.785
Within-Person Skills Use	-0.039	0.228	.029	1	.866
Between-Person Skills Use × Assessment Period	**0.213**	**0.032**	**44.099**	**1**	**<.001**
Within-Person Skills Use × Assessment Period	**-0.160**	**0.057**	**7.946**	**1**	**.005**
Informant-Report					
(Intercept)	**29.422**	**1.654**	**316.588**	**1**	**<.001**
Study Day	0.006	0.021	0.085	1	.771
Assessment Period	**-0.991**	**0.384**	**6.673**	**1**	**.010**
Between-Person Skills Use	**-0.062**	**0.027**	**5.406**	**1**	**.020**
Within-Person Skills Use	**0.077**	**0.030**	**6.589**	**1**	**.010**
Between-Person Skills Use × Assessment Period	0.006	0.006	0.977	1	.323
Within-Person Skills Use × Assessment Period	-0.017	0.013	1.832	1	.176

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 16

Table 16

Generalized Estimating Equation Analyses Examining the Impact of Romantic Partners' General Skills Use on Emotion Dysregulation

	B	*SE*	χ^2	*df*	*p*
Self-Report					
(Intercept)	**114.100**	**12.866**	**78.647**	**1**	**<.001**
Study Day	-0.010	0.218	0.002	1	.962
Assessment Period	**-8.066**	**3.547**	**5.172**	**1**	**.023**
Between-Person Skills Use	-0.231	0.372	0.386	1	.535
Within-Person Skills Use	0.200	0.366	0.299	1	.585
Between-Person Skills Use × Assessment Period	0.049	0.070	0.483	1	.487
Within-Person Skills Use × Assessment Period	-0.063	0.063	1.016	1	.314
Informant-Report					
(Intercept)	**31.126**	**1.648**	**356.941**	**1**	**<.001**
Study Day	-0.040	0.025	2.593	1	.107
Assessment Period	**-1.297**	**0.426**	**9.266**	**1**	**.002**
Between-Person Skills Use	-0.017	0.043	0.169	1	.681
Within-Person Skills Use	0.041	0.034	1.445	1	.229
Between-Person Skills Use × Assessment Period	-0.002	0.009	0.036	1	.849
Within-Person Skills Use × Assessment Period	**-0.016**	**0.007**	**5.149**	**1**	**.023**

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 17

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills Use on Self-Reported Relationship Satisfaction

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	**117.183**	**6.476**	**327.452**	**1**	**<.001**
Study Day	0.523	0.309	2.858	1	.091
Assessment Period	-3.407	3.443	0.979	1	.322
Between-Person Skills Use	-0.076	0.092	0.675	1	.411
Within-Person Skills Use	-0.188	0.185	1.032	1	.310
Between-Person Skills Use × Assessment Period	0.018	0.052	0.120	1	.729
Within-Person Skills Use × Assessment Period	0.164	0.128	1.633	1	.201
Romantic Partners					
(Intercept)	**106.083**	**7.311**	**210.517**	**1**	**<.001**
Study Day	**0.292**	**0.105**	**7.817**	**1**	**.005**
Assessment Period	0.932	0.100	0.869	1	.351
Between-Person Skills Use	-0.074	0.138	0.292	1	.589
Within-Person Skills Use	-0.024	0.148	0.026	1	.872

Between-Person Skills Use × Assessment Period	**-0.033**	**0.017**	**3.970**	**1**	**.046**
Within-Person Skills Use × Assessment Period	0.083	0.050	2.818	1	.093

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 18

Generalized Estimating Equation Analyses Examining the Impact of Romantic Partners' General Skills Use on Self-Reported Relationship Satisfaction

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	**116.523**	**6.997**	**277.364**	**1**	**<.001**
Study Day	0.152	0.153	0.993	1	.319
Assessment Period	-1.189	3.168	0.141	1	.707
Between-Person Skills Use	-0.016	0.166	0.010	1	.922
Within-Person Skills Use	-0.173	0.106	2.655	1	.103
Between-Person Skills Use × Assessment Period	0.030	0.063	0.235	1	.628
Within-Person Skills Use × Assessment Period	0.071	0.056	1.627	1	.202
Romantic Partners					
(Intercept)	**106.010**	**9.785**	**117.386**	**1**	**<.001**

Study Day	-0.014	0.322	0.002	1	.965
Assessment Period	1.788	1.853	0.931	1	.335
Between-Person Skills Use	0.191	0.230	0.691	1	.406
Within-Person Skills Use	-0.248	0.161	2.363	1	.124
Between-Person Skills Use × Assessment Period	**-0.083**	**0.038**	**4.656**	**1**	**.031**
Within-Person Skills Use × Assessment Period	0.114	0.104	1.202	1	.273

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 19

Generalized Estimating Equation Analyses Examining the Impact of People with BPD's General Skills Use on Self-Reported Relationship Conflict

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	**24.197**	**2.259**	**114.765**	**1**	**<.001**
Study Day	-0.068	0.088	0.590	1	.442
Assessment Period	-1.011	0.938	1.162	1	.281
Between-Person Skills Use	-0.010	0.038	0.067	1	.795
Within-Person Skills Use	0.043	0.057	0.571	1	.450
Between-Person Skills Use × Assessment Period	-0.001	0.014	0.004	1	.951

Within-Person Skills Use × Assessment Period	-0.028	0.037	0.585	1	.444
Romantic Partners					
(Intercept)	**22.436**	**1.643**	**186.385**	**1**	**<.001**
Study Day	**-0.093**	**0.043**	**4.753**	**1**	**.029**
Assessment Period	-0.543	0.569	0.910	1	.340
Between-Person Skills Use	-0.020	0.033	0.348	1	.555
Within-Person Skills Use	0.090	0.048	3.495	1	.062
Between-Person Skills Use × Assessment Period	-0.001	0.009	0.005	1	.943
Within-Person Skills Use × Assessment Period	-0.034	0.020	3.031	1	.082

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Table 20

Generalized Estimating Equation Analyses Examining the Impact of Romantic Partners' General Skills Use on Relationship Conflict

	B	*SE*	χ^2	*df*	*p*
People with BPD					
(Intercept)	**24.249**	**2.262**	**114.900**	**1**	**<.001**
Study Day	0.032	0.036	0.800	1	.372
Assessment Period	-1.507	0.811	3.450	1	.063

Between-Person Skills Use	-0.035	0.046	0.564	1	.453
Within-Person Skills Use	0.058	0.038	2.318	1	.128
Between-Person Skills Use × Assessment Period	-0.006	0.013	0.213	1	.644
Within-Person Skills Use × Assessment Period	-0.004	0.012	0.118	1	.731
Romantic Partners					
(Intercept)	**22.361**	**1.488**	**225.731**	**1**	**<.001**
Study Day	-0.031	0.032	0.920	1	.338
Assessment Period	-0.758	0.563	1.813	1	.178
Between-Person Skills Use	-0.006	0.029	0.047	1	.828
Within-Person Skills Use	0.026	0.021	1.590	1	.207
Between-Person Skills Use × Assessment Period	-0.005	0.008	0.379	1	.538
Within-Person Skills Use × Assessment Period	-0.004	0.011	0.110	1	.740

Note. BPD = borderline personality disorder. *B* = unstandardized beta coefficient. *SE* = standard error. χ^2 = chi-square. *df* = degrees of freedom. *p* = probability level. Significant main effects and interactions are bolded.

Appendix

Sage Skills

Table 1
Sage Session Content and Practice Assignments

Session by phase	Central content	Practice assignment
Phase 1: Orientation and Safety		
1. Orientation	– -Psychoeducation on BPD, emotion dysregulation, relationships – Intervention rationale and goals	– Write letter to partner about impact of BPD, things they appreciate in their partner, and hopes for intervention
2. Personal Safety	– Review letters, discuss implications for formulation – Develop dyadic safety plan	– Daily trust discussions – Review safety plan and implement as needed
3. Personal and Relationship Safety	– Distraction-based skills for reducing intense emotions – Skills for de-escalating conflict	– Daily trust discussions – Monitor for signs of high-intensity emotions – Distraction-based skills – Time-out skills
Phase 2: Communication and Emotions		
4. Communication Skills	– Paraphrasing and channel checking – Psychoeducation about emotional avoidance "cycles"	– Daily trust discussions – Paraphrasing and channel checking – Catching and disrupting emotional avoidance
5. Identifying and Feeling Emotions	– Psychoeducation about emotions and avoidance – Skills for approaching emotions	– Daily trust discussions – Tracking and identifying emotions – Approaching emotions – Catching and disrupting emotional avoidance
6. Expressing Emotions and Reducing Invalidation	– Skills for sharing emotions – Skills to validate emotions and reduce invalidation	– Daily trust discussions – Sharing and validating emotions – Catching and disrupting emotional avoidance
7. Acting on Emotions	– Distinguishing between experiencing and acting on emotions – Introduce I-FEEL skill to dyadically determine if, when, and how to act on emotions	– Daily trust discussions – I-FEEL skill – Catching and disrupting emotional avoidance
8. Impact of Beliefs on Emotions	– Psychoeducation on impact of beliefs – Practice sharing beliefs and paraphrasing – Introduce theme of beliefs about emotions	– Sharing and paraphrasing thoughts with paraphrasing and validation as appropriate – Reading and discussion on beliefs about emotions
Phase 3: Beliefs and Planning for the Future		
9. Beliefs About Emotions	– Introduce UNSTUCK skill and practice – Introduce theme of beliefs about self	– UNSTUCK on beliefs about emotions – Reading and discussion on beliefs about self
10. Beliefs About Self	– UNSTUCK on beliefs about self – Introduce theme of beliefs about others	– UNSTUCK on beliefs about self – Reading and discussion on beliefs about others
11. Beliefs About Others	– UNSTUCK on beliefs about others	– UNSTUCK on beliefs about others – Write a letter to partner about progress and hopes for future
12. Planning for the Future	– Reflect on progress and areas for continued growth – Develop maintenance plan	– Review skills as needed – Refer to plan for maintaining progress, continued growth

Note. BPD = borderline personality disorder.

Note. From "Protocol Development of Sage: A Novel Conjoint Intervention for Suicidal and Self-Injuring People With Borderline Personality Disorder and Their Significant Others," by S.