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The Emotional Bank Account and the Four Horsemen of the Apocalypse in Romantic Relationships of People with Borderline Personality Disorder: A Dyadic Observational Study

J.E. Beeney¹, M.N. Hallquist³, L.N. Scott¹, W.R. Ringwald², S.D. Stepp¹, S.A. Lazarus⁴, A.A. Mattia², P.A. Pilkonis¹

¹Department of Psychiatry, University of Pittsburgh School of Medicine

²Department of Psychology, University of Pittsburgh

³Department of Psychology, Pennsylvania State University

⁴The Ohio State University Wexner Medical Center, Department of Psychiatry and Behavioral Health

Abstract

Few studies have examined behaviors in romantic relationships associated with borderline personality disorder (BPD). We assessed critical variables from marital research: the “emotional bank account” (positive-to-negative behaviors; Gottman, 1993) and the “four horsemen of the apocalypse” (criticism, defensiveness, contempt, and stonewalling; Gottman & Silver, 1999; Gottman & Krokoff, 1989). Couples ($N = 130$, or 260 participants) engaged in a conflict task and reported relationship satisfaction at intake and 12-months. Clinician-rated BPD and avoidant PD (APD) criteria were examined. People with more BPD symptoms and their partners were less satisfied, which worsened by follow-up. Conflict behaviors partially explained these associations. Partners of people with more BPD symptoms had a worse emotional bank account, which then predicted (a) poorer satisfaction for both members and (b) worsening partner satisfaction. People with more BPD symptoms criticized more; their partners defended and stonewalled more. APD predicted worsening satisfaction. BPD appears to link specifically with relationship dysfunction, partly through associations with partner behavior.

Keywords

personality disorder; romantic relationships; dyadic data analysis; interpersonal relationships; interpersonal theory

Clinical, theoretical, and research accounts suggest romantic relationships are a fraught social context for people with borderline personality disorder (BPD; Agrawal, Gunderson,

Correspondence concerning this article should be addressed to Joseph E. Beeney, Western Psychiatric Institute and Clinic, 3811 O'Hara Street, Pittsburgh, PA 15213. beeneyje@upmc.edu.

Authorship

J.E.B developed the study concept with input from P.A.P and P.A.P., S.D.S., and M.N.H., who also contributed to the study design. J.E.B., S.D.S., W.R.R., S.A.L., L.N.S., A.A.M., and P.A.P. contributed to the drafting and revision of the manuscript. J.E.B., S.D.S., M.N.H., and L.N.S. contributed to data analysis and interpretation. All authors approved the final version of the paper for submission.

Holmes, & Lyons-Ruth, 2004; Gunderson, 2007; Roepke, Vater, Preißler, Heekeren, & Dziobek, 2012). Many aspects of BPD reflect painful sensitivity to events in close relationships and problems managing the balance between interdependence and autonomy necessary for adaptive romantic relationships. People with BPD fear abandonment, become distressed and angry in response to real or perceived rejection (Berenson, Downey, Rafaeli, Coifman, & Paquin, 2011), and are mistrustful of others (Fertuck, Grinband, & Stanley, 2013; Miano, Fertuck, Roepke, & Dziobek, 2016). Furthermore, they often struggle to find a comfortable interpersonal distance, oscillating between strong bids for closeness and angry withdrawal when such bids are seen as thwarted (Melges & Swartz, 1989). Upon this backdrop, research suggests people with BPD also struggle to understand the emotions and mental states of others (Preißler, Dziobek, Ritter, Heekeren, & Roepke, 2010; Roepke et al., 2012) and express emotions that are difficult for others to read (Staebler et al., 2011). All these problems are likely to affect functioning across social domains, and romantic relationships in particular (Gottman & Krokoff, 1989; Richards, Butler, & Gross, 2003; Simpson, Collins, Tran, & Haydon, 2007).

Emotionally supportive relationships can positively affect the course of BPD (Kuhlken, Robertson, Benson, & Nelson-Gray, 2014; Links & Heslegrave, 2000). For example, improvement in romantic relationships can generalize to gains in other social domains (Zanarini, 2013). Thus, understanding the specific interpersonal behaviors that are disturbed in BPD can lead to more targeted treatment interventions centered on romantic relationships. The purpose of the present project was to examine whether maladaptive behaviors observed when couples interact may be relevant to specific romantic relationship dysfunctions among people with BPD.

More broadly, our study sought to integrate relationship science with clinical research on BPD. A rich history of observational coding of romantic couples during conflict has generated insight into the behaviors that predict relationship satisfaction (Gottman, Coan, Carrere, & Swanson, 1998; Gottman, 1993; Gottman & Krokoff, 1989). In particular, Gottman and colleagues have found that the ratio of positive-to-negative affect in interactions (Gottman, 1993) and the absence of certain “toxic” behaviors predict whether married couples will stay married (Gottman, 1994a, 1994b; Gottman, Coan, Carrere, & Swanson, 1998). Gottman has called a positive balance of interpersonal behavior the “emotional bank account.” He describes this pattern as a tendency for a partner to respond positively to the other’s bids for emotional connection, which results in the maintenance of an alliance serving mutually defined goals (Gottman & Silver, 1999).

On the other hand, the “four horsemen of the apocalypse” — criticism, defensiveness, contempt, and stonewalling — are the behaviors that are the most destructive to relationships, especially as indicated by subsequent divorce (Gottman & Silver, 1999). The four horsemen appear to cover varieties of attack (criticism and contempt) and defense (defensiveness and stonewalling). Criticism is an attack on a partner’s character and is differentiated from mere complaints about behavior. Defensiveness takes the form of claiming oneself blameless and a victim of the other’s attack, and it often involves deflecting blame back onto one’s partner. Contempt is behavior that is disrespectful, including sarcastic mocking, name-calling, and eye-rolling. Stonewalling is withdrawal from the interaction, an

emotional avoidance strategy. It is expressed by non-responsiveness to one's partner, avoiding eye contact, acting busy, or engaging in other distracting behaviors.

Previous research provides some indications of how BPD symptoms may be associated with a worse emotional bank account and the presence of the four-horsemen behaviors in romantic interactions. Within healthy relationships, romantic partners notice when they have a negative impact on each other and respond with attempts at repair (Gottman, 1999). Research on social exchanges among those with BPD suggests people with the disorder are less sensitive to social cues indicating rupture of cooperation, and thus, fail to repair such ruptures (King-Casas et al., 2008a). This research suggests that people with BPD affect others negatively without awareness, making regulation of an emotional bank account with a romantic partner a difficult endeavor. In addition, BPD is likely associated with the presence of more four-horsemen behaviors. A recent meta-analysis found that people with BPD show elevations on intrusive, vindictive, and domineering interpersonal styles (Wilson, Stroud, & Durbin, 2017). When perceiving rejection, or refusal of partners to meet their needs, people with BPD often become hostile (Lazarus et al., 2018; Scott et al., 2017). In terms of the four horsemen, this tendency is likely to be associated with greater criticism. Relationship partners who feel attacked are often defensive, and over time, may use stonewalling as an avoidance tactic.

Only a handful of studies have examined BPD and behaviors observed in interaction with romantic partners. Lavner and colleagues (2015) recruited a community sample of heterosexual newlyweds, evaluated BPD symptoms in each partner by self-report, and examined trajectories of marital satisfaction and marital problems over four years. BPD predicted concurrent relationship satisfaction, but not the slope of satisfaction over four years. In addition, couples engaged in a problem solving and social support task. BPD symptoms were associated with poorer social skills in these tasks. Miano and colleagues (Miano, Dziobek, & Roepke, 2017) asked participants to engage in personally-threatening and relationship-threatening conversations. Afterwards, participants rated their own and their partner's affective valence. Women with BPD were more accurate than control participants when rating their partner's emotion during the relationship-threatening conversation, suggesting that "inaccuracy" in this context may be protective of the relationship. These investigators (Miano, Grosselli, Roepke, & Dziobek, 2017) also found that a heightened stress response among women with BPD was associated with more negative and less positive communication. In another study (de Montigny-Malenfant et al., 2013), heterosexual couples in which the woman had BPD were compared to healthy couples on level of dominance, withdrawal, and criticism/attack/conflict. The authors found that couples in which the woman was diagnosed with BPD had higher dominance and criticism/attack/conflict than healthy couples.

At the same time, it is important to acknowledge that other PD symptoms and forms of psychopathology are also associated with social difficulties. One study (Daley, Burge, & Hammen, 2000) found non-BPD PD severity was the best predictor of romantic dysfunction rather than BPD specifically. Thus, to determine specificity of BPD, it is important for researchers to control for other types of PD symptoms. We considered using non-BPD PD severity as a predictor alongside BPD in the current models but found this index to be highly

associated with BPD ($r = .69$). In the past, researchers have compared BPD with antisocial PD or avoidant PD to examine social aspects of disorders (e.g., Beeney et al., 2015; Hill et al., 2008; Koenigsberg et al., 2014). BPD is a complicated disorder, marked by both interpersonal approach/attack and avoidance. Thus, both these PD symptom domains could provide relevant contrasts in predicting interpersonal problems.

For the current study, we chose to evaluate BPD alongside Avoidant PD (APD) for a number of reasons. Seeking to keep models tractable and interpretable, we included only one PD symptom dimension beyond BPD. Conceptually, APD shares a number of symptoms and interpersonal features with BPD, including rejection sensitivity (Fossati et al., 2003); elevations on problems with vindictive, cold, socially avoidant, and exploitable interpersonal styles (Wilson et al., 2017); and romantic relationship difficulties (Skodol et al., 2002). In addition, we expected partners of people with elevated BPD symptoms to show signs of avoidance. Including APD allows us to determine whether this is due to people with BPD partnering with people with high APD or whether this avoidant behavior is distinct from APD. In addition, past research has shown higher correlations between BPD and antisocial PD than BPD and APD (e.g., Beeney et al., 2015). Because convergence problems and suppression effects are common in complicated models with highly correlated predictors, we chose the pair with the lower correlation ($r = .47$ versus $.30$ in this sample). Thus, we chose APD for both conceptual and empirical reasons.

The current study improves on the designs of prior studies in the following ways: a) use of interview measures of psychopathology for both members of dyads, b) adoption of a coding system (Specific Affect Coding System; SPAFF) that has been extensively used within the marital literature, c) use of dyadic data analyses to examine both actor and partner associations between BPD symptoms and interaction behaviors, d) examination of effects specific to BPD after controlling for APD and depression, as well as age and gender, and e) investigation of associations between behaviors in the interaction task with ratings of concurrent relationship satisfaction and change in relationship satisfaction (i.e., assessment of external correlates of behaviors exhibited in the lab).

Hypotheses.

Overall, we assumed that BPD would be associated with both actor and partner behavior in a conflict task and that such behavior would be associated with decreased relationship satisfaction. Because of specific problems with maintaining collaboration and repairing broken collaboration (King-Casas et al., 2008b), we predicted that BPD would be associated with a more negative emotional bank account for both self and partner. In addition, we expected people with BPD would be more critical during conflict, whereas partners of those with more BPD symptoms would engage in more defensive behaviors (defensiveness, stonewalling). This prediction of hostile attack met with hostile defense is consistent with previous models of interpersonal behavior (e.g., Benjamin, 1974). We did not expect BPD, however, to be associated with contempt. Criticism (and anger generally) have prominent elements of “approach,” even if they do not often achieve their intended goal. Contempt, however, is a strategy that increases interpersonal distance by claiming moral superiority over one’s partner (Gottman & Silver, 1999). Creating interpersonal distance is inconsistent

with the desire for connection associated with BPD (Berenson et al., 2011). We further hypothesized that the emotional bank account and four-horsemen behaviors would serve as links in indirect associations between BPD and relationship satisfaction.

Methods

Participants

Recruitment.—Participants and their romantic partners were recruited via fliers posted in psychiatric treatment clinics. We used the McLean Screening Instrument for BPD (Zanarini & Vujanovic, 2003) and the personality disorder scales from the Inventory of Interpersonal Problems (Pilkonis, Kim, Proietti, & Barkham, 1996) to screen participants initially via telephone. Participants were stratified into one of three groups: a) those who met criteria for BPD, b) those who met criteria for any other PD, c) or those with a mental disorder other than a PD. We required that the identified participant currently participate in mental health treatment. Once admitted into the study, participants confirmed their current romantic relationship status. We required participants to be in a romantic relationship for at least one month, with contact at least four times per week (including at least two face-to-face contacts per week). Participants were excluded if they met criteria for a lifetime diagnosis of bipolar disorder or psychosis or suffered from major medical illnesses that influence the central nervous system.

Sample characteristics.—A total of 618 individuals were screened. Of those, 311 were screened out because they did not meet study criteria ($n = 188$; e.g., no romantic partner, not in treatment, not in age range), or were uninterested after the study was described ($n = 123$). Of the 307 remaining participants, 260 completed intake. All other participants either failed to complete intake ($n = 19$) or were found to meet exclusion criteria during intake. Thus, the final sample consisted of 130 couples and 260 participants. Relationship length for these couples averaged 54.5 months ($SD = 51.2$ months). Data from both members of each dyad were available for all participants for clinician-rated and self-report measures. Data were missing for nine couples for the conflict discussion task due to problems with video recording. Demographic characteristics of participants are summarized in Table 1.

Procedure

The University of Pittsburgh Institutional Review Board approved all study procedures, and participants provided informed, voluntary, written consent before enrollment. Participants attended baseline laboratory sessions to complete psychiatric interviews, self-report questionnaires, and a conflict discussion task. A 12-month follow-up visit was attended to complete self-report questionnaires.

Measures

Consensus PD diagnosis and severity.—Psychiatric diagnoses at baseline were determined by clinical evaluators using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID; First, Spitzer, & Williams, 1997) and the Structured Interview for DSM-IV Personality (SIDP-IV; Pfohl, Blum, & Zimmerman, 1997). Interviewers were trained clinicians with a master's or doctoral degree. Ratings for each participant were evaluated

within a diagnostic case conference meeting with at least three judges. For all analyses, BPD was treated dimensionally and operationalized as the sum of continuous ratings (0 = *not present*, 1 = *subthreshold*, 2 = *present*, 3 = *strongly present*) for the nine BPD criteria from the SIDP. Avoidant PD (APD) severity scores were calculated the same way using APD criteria. In addition, seven clinical evaluators independently scored the SCID-I and SIDP-IV interview from videotape for five participants to establish interrater agreement. Level of agreement among raters was high for BPD (ICC = .98) and APD severity scores (ICC = .92).

Conflict discussion.—Before discussing a relationship conflict for 10 minutes, participants were asked to complete a form indicating their major areas of disagreement, along with the degree of conflict associated with each. Clinical interviewers then used this information to identify topics for which both dyad members perceived a high degree of conflict. Interviewers then asked each member of the dyad to share their opinions on the areas of disagreement without interruption, including their desired resolution. Couples were then directed to begin the 10-minute discussion. Finances, childcare, sex, and household chores were commonly discussed. Each discussion was videotaped.

Observational coding.—The behavior of each dyad member was coded during the conflict task using the Specific Affect Coding System (SPAFF; Gottman & Krokoff, 1989), a microanalytic approach to coding interpersonal emotion and behavior. Coders were unaware of all clinical and demographic information concerning participants. Each second of the interaction was classified using 20 mutually exclusive codes: neutral, anger, contempt, disgust, belligerence, domineering, criticism, anger, tension, defensive, whining, sadness, stonewalling, interest, validation, affection, humor, surprise, joy, and physical affection. A random subset of interactions was chosen for assessing interrater reliability (20% of tapes). SPAFF data are sequential, making a free-marginal kappa preferable to ICC to allow for slight differences in timing of codes between raters. The free-marginal kappa for the 26 double-coded tapes was .74, reflecting high reliability. Positive-to-negative ratio was calculated by dividing the number of seconds coded as positive by the number of seconds coded negative (Gottman, 1993). When a participant had no seconds for either the numerator or denominator, a one was imputed to allow calculation. Whereas Gottman summed all positive codes for both members of the dyad, we calculated the positive-to-negative affect ratio for each member, allowing us to utilize dyadic analyses. Each of the four horsemen behaviors were the sum of seconds coded for each behavior individually.

Relationship satisfaction.—Relationship satisfaction was assessed for each member of the dyad using the Dyadic Adjustment Scale (DAS; Spanier, 1976) at baseline and at 12-month follow-up. The DAS has 32 self-report items, is among the most widely used measures of relationship satisfaction, and has consistently demonstrated good reliability (Graham, Liu & Jeziorski, 2006).

Depression.—Depression symptoms were assessed by the primary clinical evaluator at baseline using the Hamilton Depression Rating Scale (HAM-D; Hamilton, 1960). The HAM-D is a widely used 17-item interview measuring depressed mood, somatic symptoms,

and cognitive symptoms of depression. A dimensional score representing the sum of all items was used in the current study.

Data Analysis

APIM and Distinguishability of Dyads.—We used actor-partner interdependence models (APIM; Kenny, Kashy, & Cook, 2006) within a Bayesian structural equation modeling (SEM) framework and with partially distinguishable dyads for the major analyses. Mplus 8.1 was used for analyses (Muthén & Muthén, 2013). A Bayesian framework was used because we calculated indirect effects in all models, and product terms of indirect effects are typically not normally distributed (MacKinnon, 2008). A Bayesian approach does not assume normality of model parameters. Diffuse priors were used because the means and variances of the outcome variables have not been established with a sample with high PD severity. Model convergence must be verified within a Bayes context by examining potential scale reduction (PSR). Good convergence is indicated by models that quickly near a PSR of 1 and do not deviate over subsequent iterations. Model fit in a Bayesian framework uses posterior predictive checking (Gelman et al., 2004), a means of assessing the predictive accuracy of the model (i.e., the discrepancy between the data generated by the model and the actual data). Posterior predictive checking provides a confidence interval indicating the difference between observed and replicated chi-square values. A 95% confidence interval that includes zero is indicative of little difference between the specified model and the data. Similarly, a small posterior predictive p-value indicates a mismatch between data and model.

Partially distinguishable dyads are used when there is no categorical variable that distinguishes two members of the couple, but there are still differences in means and variances. Conceptually, we could not distinguish members on gender (though we controlled for gender in all analyses) because 22 of our couples were same-sex. We could also not distinguish members based on PD versus no-PD or patient versus non-patient status. In many instances, both members of the dyad were diagnosed with a PD or were in treatment. Analyses with partially distinguishable dyads do require a minimal group identifier, for which we used an indicator of who was the originally identified patient, i.e., the person initially screened into the study and selected for recruitment stratification goals. We did not expect there to be differences in effects based on this classification. At the same time, we expected there would be differences in means and variances between these two “groups,” with the initial patient group displaying greater severity and variability on most measures. By treating dyads as partially distinguishable, means and variances for each variable for actors and partners were freely estimated, though corresponding actor and partner associations were constrained to equality.

For prospective models, we utilized a two-part semi-continuous model to examine simultaneously the continuous outcome of relationship satisfaction and the categorical outcome of relationship status (i.e., still together versus broken up). Two-part models assess relationships between predictors and a binary outcome (still together, in this case) and simultaneously estimate relationships with continuous outcomes for participants for whom the binary variable is “positive.” This approach is necessary in the current study because relationship satisfaction is an irrelevant variable for couples who have broken up. Only

utilizing couples who did not breakup would have resulted in a significant proportion of missing data, limiting a correct characterization of the full data. Among outcome variables, 238 of the 260 participants (92%) completed the 12-month DAS or reported relationship status. DAS data at 12 months was not completed and relationship status was unclear for 3 couples. An additional 16 individuals did not complete the DAS at 12-months, whereas their partner did complete the measure.

In all analyses, we controlled for age, gender, and actor and partner depression symptoms (HAM-D). Relationship length was considered as an additional covariate but was redundant with age and its removal from all models improved model fit.

Results

Associations among PD symptoms, depression, and concurrent and prospective relationship satisfaction are presented in Table 2.

Associations between observational codes

The ‘four horsemen’ consist of four observational codes included in the ‘emotional bank account’. Previous studies have not reported associations between these variables. To examine the degree of overlap and distinction between Gottman’s constructs, we examined bivariate correlations between the four horsemen codes and the positive-to-negative affect ratio. Three of the four horsemen had small correlations with the positive-to-negative affect ratio ($r < .17$), whereas defensiveness had a moderate association ($r = -.30$). Similarly, associations amongst the four horsemen were generally modest. All associations were small ($r < .23$), other than the relationship between criticism and contempt ($r = .42$).

The emotional bank account, BPD, and relationship satisfaction: concurrent model

We hypothesized that the relationship between BPD and relationship satisfaction would be explained by an association with a smaller positive-to-negative affect ratio on the SPAFF. The results partially supported this hypothesis (see Figure 1) – BPD was not associated with actor (self) positive-to-negative ratio but was associated with partner’s more negative ratio. Indirect effects within an APIM framework are named actor-actor, actor-partner, partner-actor, and partner-partner, in which the first designation refers to the relationship between the independent variable (IV) and mediator, and the second refers to the relationship between the mediator and dependent variable (DV). Hence a partner-actor effect is a relationship between one person’s IV and DV, indirectly linked by their partner’s mediating variable. Both a partner-actor effect (BPD $\rightarrow$ partner positive-to-negative ratio $\rightarrow$ actor DAS; est. = -0.004 , s.e. = 0.002 , 95% CI = -0.008 and -0.001), and partner-partner effect (BPD $\rightarrow$ partner positive-to-negative ratio $\rightarrow$ partner DAS; est. = -0.002 , s.e. = 0.001 , 95% CI = -0.006 and $.00$) were significant. People with high BPD symptoms had partners who exhibited a more negative positive-to-negative ratio, which was associated with lower relationship satisfaction for both dyad members. In addition to these effects, BPD was directly associated with both actor and partner relationship satisfaction. Depression, age and gender were not significantly associated with relationships satisfaction ($p > .05$). The model converged according to the posterior scale reduction factor (PSR) diagnostic (Gelman &

Rubin, 1992), and examination of convergence, posterior density, and autocorrelation plots. The posterior predictive p-value was 0.50, indicating excellent fit.

The emotional bank account, BPD, and relationship satisfaction: longitudinal model

We examined a similar model to predict DAS scores at 12 months, controlling for baseline DAS scores using a Bayesian two-part model with breakup as the categorical part and DAS scores as the continuous part (see Figure 2). Both high BPD and high APD were associated with a worsening of relationship satisfaction over the year for persons with elevated PD symptoms. An indirect effect starting with BPD was also present: a significant partner-actor effect ($B = -.03$, $s.e. = .02$, $95\% \text{ CI} = -.07 \text{ and } -.005$). The indirect effect indicates high BPD symptoms were associated with more negative partner emotional bank account, which is associated with a worsening of relationship satisfaction for that same partner. Depression, age and gender were not significantly associated with relationships satisfaction ($p > .05$). No variables significantly predicted breakup, though depression scores were marginally associated ($p < .1$). The model converged according to the PSR diagnostic (Gelman & Rubin, 1992), and examination of convergence, posterior density, and autocorrelation plots. The posterior predictive p-value was 0.81, indicating good fit.

The four horsemen, BPD, and relationship satisfaction: concurrent model

We hypothesized that (a) people with high BPD symptoms would be more critical during the conflict discussion, (b) their partners would engage in more defensive behaviors, and (c) the presence of the four-horsemen behaviors would predict poorer relationship satisfaction. As expected, BPD severity was specifically associated with more actor criticism in the conflict task (see Figure 3). In addition, higher BPD severity was associated with more partner defensiveness and stonewalling. The partner-actor indirect effect (BPD → Partner Defensiveness → Partner DAS) was significant, ($est. = -.04$, $s.e. = .02$, $95\% \text{ CI} = -.10 \text{ to } -.002$). High BPD was associated with greater partner defensiveness, which was associated with the partner's lower relationship satisfaction. None of the four horseman behaviors, however, predicted change in DAS scores over 12 months ($ps > .1$). We predicted that BPD would not be associated with contempt. We found that BPD was not significantly associated with contempt for actor or partner ($ps > .1$). We also did not find any associations between APD and the horsemen ($ps > .1$). Age ($est. = -.01$, $s.e. = .003$) was significantly associated with relationship satisfaction, but gender and depression were not. The model converged according to the PSR diagnostic, and examination of convergence, posterior density, and autocorrelation plots. The posterior predictive p-value was 0.12, indicating acceptable fit.

Discussion

Though mental disorders are often conceptualized as intrapsychic problems, there is increasing acknowledgement of the interpersonal contexts in which psychopathology develops and is maintained. In this study, we found people with greater BPD severity were more critical and reported lower relationship satisfaction, which worsened over 12 months. BPD was also associated with partner behavior (i.e., lower positive-to-negative ratio and more defensive behavior) and lower partner-reported relationship satisfaction, highlighting social influences between romantic partners. Also, differences in the emotional behavior of

partners were not only associated with their own relationship satisfaction, but also with the satisfaction of the participant with elevated BPD severity, resulting in the significant indirect effects in our models. Although BPD is commonly associated with romantic relationship difficulties, the current results provide more detail about the specific two-person dynamic processes that influence this outcome. In addition, the current results document that the romantic relationship dysfunction associated with BPD is reflective of relationship dynamics commonly observed in couples and operationalized by Gottman et al. as the “emotional bank account” and the “four horsemen.”

Gottman (1993) suggested that healthy relationships are characterized by a ratio of positive-to-negative behaviors of 5:1 during conflict interactions. In his “balance theory” of marital dissolution, Gottman hypothesized both members must monitor and regulate the balance of positive and negative affectivity. We hypothesized that BPD would be associated with problems maintaining that balance – people with BPD and their partners would engage in a mix of positive and negative behaviors that were, on balance, more negative. Interestingly, BPD severity was not associated with positive-to-negative ratio among the actors in our dyads. This is surprising, given BPD is commonly associated with negative affect (e.g., Conklin, Bradley, & Westen, 2006). At the same time, BPD is defined by polarity of emotional and interpersonal experience (Coifman, Berenson, Rafaeli, & Downey, 2012), meaning people with BPD may swing from positive to negative emotion more readily.

As predicted, partners of people with higher BPD exhibited a lower positive-to-negative balance, which was associated with less relationship satisfaction. Consistent with previous research, this more negative emotional bank account was associated concurrently with poorer relationship satisfaction for both members of the couple and predicted worsening of relationship satisfaction in the partner. These findings suggest that day-to-day emotional behaviors, exemplified in a laboratory conflict task, accumulate to predict relationship outcomes, consistent with Gottman’s theory (Gottman, 1993). Previous studies have examined associations between BPD and emotional behavior in couple interactions, but have either examined men and women in separate analyses (Miano, Grosselli, et al., 2017) or examined behavior on the couple level (de Montigny-Malenfant et al., 2013). Neither approach allows for assessment of associations between members of the dyad. The current results suggest romantic relationship dysfunction among people with BPD is the result of dynamic processes within couples. Future research will need to determine if a worse emotional bank account among partners of people with elevated BPD is a result of poor monitoring of relationship processes and absence of repair attempts.

Building on previous research, we also evaluated whether BPD was associated with one or more of the “four horsemen” negative behaviors: namely criticism, contempt, defensiveness, and stonewalling. We found that BPD symptoms were associated specifically with increased critical behaviors in the affected person, as well as increased partner defensiveness and stonewalling. However, among the four-horsemen behaviors, defensiveness was the only unique predictor of concurrent relationship satisfaction, and none of the four-horsemen behaviors predicted worsening of relationship satisfaction over the year. The association between BPD symptoms and critical behaviors aligns with the broader literature on elevated attachment anxiety and rejection sensitivity among people with BPD (e.g., Berenson et al.,

2011). Criticism is distinct from evaluative feedback because criticism is defined as an ad hominem attack on the other person, rather than complaints about a specific behavior. People with elevated rejection sensitivity are hypervigilant for rejection cues and often react with anger and hostility to signals of rejection (Downey & Feldman, 1996). Some research suggests the link between rejection sensitivity and hostility may be emotional reactions to hurt feelings, despair, and hopelessness (Ben-David, 1993), which may also characterize the associations between rejection, hostility, critical behavior, and intrusiveness in those with BPD (Berenson et al., 2011; Wilson et al., 2017). Such associations may motivate people with BPD to criticize their partners more, paradoxically increasing the possibility of their partners withdrawing (Downey, Freitas, Michaelis, & Khouri, 1998).

Whereas people with elevated BPD criticized their partners more, their partners exhibited more defensiveness and stonewalling. This pattern of one person attacking and the other defending is consistent with interpersonal theories of complementarity. The structural analysis of social behavior (SASB; Benjamin, 1974) defines interpersonal complementarity as reciprocity on dominance behaviors (control-emancipation) and correspondence on affiliative behaviors (warmth-hostility). Defensiveness is a hostile behavior with the intent of “freeing” the self from the other, and is a typical complement to criticism, a hostile-controlling behavior. This finding is consistent with a previous study that found couples in which one person was diagnosed with BPD engaged in more attack/criticism/conflict (de Montigny-Malenfant et al., 2013). However, analyses in that study focused on a sum of couple behaviors and an aggregated construct. The current study extends these findings by showing effects of BPD on self and partner behavior and providing evidence of interpersonal complementarity among people with elevated BPD.

Though studies of BPD and interpersonal functioning often focus on a single person, a recurrent, if implicit theme in the clinical literature is how people with BPD negatively affect others. Treatment providers frequently report difficulty in caring for patients with BPD, with less empathy and more negative attitudes towards patients with BPD (Aviram, Brodsky & Stanley, 2006; Black et al., 2011). Researchers also found that spouses and romantic partners of individuals with BPD experience significantly more burden and grief compared with partners of individuals with other severe psychiatric conditions (Bailey & Grenyer, 2013; Bailey & Grenyer, 2014). Interaction patterns develop in transactions in which the emotional sensitivity and reactivity of the individual with BPD lead to maladaptive responses in the romantic partner (Fruzzetti & Payne, 2015). Romantic partners may then adopt a habitual strategy of emotional avoidance and defensiveness that only decreases relationship satisfaction for both members of the dyad.

It is important to note that either or both of two factors could account for the partner effects found in the present study: 1) partner selection or 2) social influences (the influence of one person's behavior on another). Researchers have suggested people with BPD make poor decisions regarding romantic partners, and some studies have found elevated psychopathology among partners of people with BPD (Bouchard & Sabourin, 2009; Lavner, Lamkin, & Miller, 2015). Partners of people with BPD may have their own difficulties with emotion regulation, decreasing their ability to cope in difficult conflict interactions. We found some evidence for matching in terms of BPD symptoms with a moderate correlation

between partners ($r = .32$), similar to that found by Lavner and colleagues (2015). Aspects particular to dyadic modeling using APIM make the partner selection interpretation less likely, however. We simultaneously estimated the relationship between a person's PD symptoms and their own behavior and their PD symptoms and their partner's behavior. This suggests the relationship between one person's PD symptoms and their partner's behavior is an effect over-and-above the relationship between their own PD symptoms and behavior. In addition, APIM accounts for the tendency of couples to be more similar on variables (e.g., BPD scores for each person) than random partners. This means similarity on BPD is also accounted for in our models, again arguing in favor of an influence interpretation over partner selection. At the same time, we cannot rule out the possibility that people with BPD partner with others who have unmeasured traits associated with greater conflict and negative emotionality.

We found BPD was directly associated with lower relationship satisfaction concurrently for both partners and, through direct and indirect paths, predicted worsening of relationship satisfaction for each member of the dyad. However, we did not find any significant predictors of break up over 12 months. Previous studies have found BPD is associated with relationship satisfaction concurrently but have failed to find a direct association between BPD severity and worsening of relationship variables. For instance, Lavner and colleagues (Lavner et al., 2015) found BPD symptoms predicted lower levels of marital satisfaction and higher levels of marital problems but did not predict a decline in these variables over four years. One possibility for these discrepant findings is the focus of previous studies on married or newlywed couples. The effects of BPD on relationships may be already established by the time people marry, reaching a stable, lower bound. Another possibility is that relationship satisfaction may covary with other factors across the year, including improvement or worsening of BPD symptoms themselves. Future research could shed light on more complex, reciprocal associations between BPD and relationship variables. Concerning breakups, our follow-up of 12 months may have not been long enough to detect effects, though Lavner and colleagues (2015) also did not find an association between BPD and divorce over 10 years.

Participants with elevated APD severity evidenced worsening of relationship satisfaction over 12 months. However, APD was not specifically associated with the "emotional bank account" or "four horsemen" behaviors. In addition, APD was not associated with any partner behaviors or satisfaction. These results provide an interesting contrast to the effects of BPD. In addition to demonstrating the specificity of associations between BPD, behavior, and relationship outcome, the results suggest APD severity may have a less prominent effect on relationship disturbance, particularly for the partner in the relationship. This finding is generally consistent with research regarding romantic relationships and avoidant PD and the tendency of people with elevated APD severity to be more submissive (Wilson et al., 2017).

Strengths and limitations

This study had a number of strengths. First, we utilized multiple methods – interview, observer ratings, and self-report – to ensure associations between measures were not unduly influenced by shared-method variance. Second, blindness was well maintained: diagnostic

interviewers were unaware of details regarding each participant's partner, and raters of the conflict discussion were unaware of any details regarding the couple. Third, our recruitment approach allowed for examination of the unique associations between BPD, conflict behaviors, and relationship satisfaction (i.e., we were able to control for APD severity and depression symptoms). Finally, we utilized dyadic data analyses that allowed us to examine effects between partners. This approach revealed associations between PD symptoms, behavior, and relationship satisfaction that had not previously been reported. At the same time, there are limitations to the study. All models tested only associations between variables and do not allow for causal inferences. Also, participants were at different stages of their relationships, with different relationship status (e.g., married versus not married). More research is needed to examine BPD-related relationship dynamics at various stages of relationships. In addition, the 'four horsemen' observational codes were included in the positive-to-negative affect ratio, though none of the four horsemen were more than moderately associated with the ratio. We decided to include all negative codes in the positive-to-negative affect ratio to be consistent with previous research. Finally, in making hypotheses and discussing results, we used BPD-specific difficulties (e.g., decreased awareness of effect on others) to explain behaviors that may be commonly observed amongst couples. However, we did not directly test these BPD-specific problems. More research is needed to understand what specific difficulties explain our behavioral findings.

Conclusion

BPD has long been associated with romantic relationship dysfunction, and yet few studies have examined the character of couple interactions that lead to disturbed relationships. This study suggests BPD is associated relationship dynamics that are commonly observed among couples with relationship difficulties. Further, interpersonal transactions characterized by the classic interpersonal dynamic of 'I attack' and 'you defend' appear to characterize the relationships of people with more BPD symptoms. Interrupting these dynamic processes may be a useful target for couple therapies in which at least one person has elevated BPD symptoms.

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a. Emotional bank account

b. Four horsemen of the apocalypse

Figure 1. Links between BPD and conflict interaction behavior predicting concurrent romantic relationship functioning.

Note. For clarity, only significant direct effects between independent and dependent variables are shown, though all were estimated. Unstandardized estimates are presented (standardized estimates are unreliable when treating dyads as partially distinguishable). BPD = borderline personality disorder symptom score totals from the SIDP; APD = avoidant personality disorder symptom score totals from the SIDP; DAS Satisfaction = Dyadic Adjustment Scale Satisfaction scores.

Categorical outcome.

Continuous outcomes.

Figure 2. Two-part model: BPD and positive-negative ratio in conflict interaction predicting change in romantic relationship satisfaction and breakup 1 year later.

Note. Bayes two-part semi-continuous model. The continuous and categorical parts were estimated simultaneously. For clarity, only significant paths are bolded, although all actor and partner paths between variables were estimated. Unstandardized estimates are presented (standardized estimates are unreliable when treating dyads as partially distinguishable). BPD = borderline personality disorder symptom score totals from the SIDP; APD = avoidant personality disorder symptom score totals from the SIDP; DAS Satisfaction = Dyadic Adjustment Scale Satisfaction scores. Positive:Negative = behavioral codes indicated times spent positive divided by time spent negative.

Table 1.

Demographic Characteristics and Psychopathology

Age (years)	Patient	Partner
M (SD)	29.2 (6.1)	30.2 (7.9)
Gender N		
Female	99 (76.2%)	45 (34.6%)
Male	31 (23.9%)	85 (65.4%)
Education N		
Graduate training	30 (23.1%)	35 (27.0%)
College graduate	29 (22.3%)	27 (20.8%)
Some college	56 (43.1%)	47 (36.2%)
High school graduate	15 (11.5%)	21 (16.2%)
Household Income		
\$24,999 or less	58 (44.6%)	56 (43.1%)
\$25,000 - \$49,999	33 (25.4%)	31 (23.9%)
\$50,000 - \$99,999	32 (24.6%)	30 (23.1%)
\$100,000 or more	7 (5.4%)	13 (10.0%)
Employment N		
Full Time	39 (30.0%)	60 (46.2%)
Part Time	37 (28.5%)	35 (26.9%)
Unemployed	54 (41.5%)	35 (26.9%)
Race N		
White	95 (73.1%)	101 (77.7%)
Black or African American	18 (13.8%)	19 (14.6%)
Mixed race	11 (8.5%)	7 (5.4%)
Asian	5 (3.9%)	3 (2.3%)
Native American	1 (0.8%)	0 (0.0%)
Sexual Identity N	(n = 1 unreported)	(n = 2 unreported)
Heterosexual or straight	96 (75.0%)	107 (82.9%)
Bisexual	19 (14.8%)	9 (7.0%)
Gay or Lesbian	13 (10.1%)	13 (10.2%)
Psychopathology	M (SD)	M (SD)
Hamilton Depression	13.83 (8.25)	7.16 (5.75)
Hamilton Anxiety	15.91 (9.69)	8.26 (6.24)
PD symptom scores		
Borderline PD	4.65 (4.21)	2.00 (2.60)
Antisocial PD	2.27 (3.51)	1.74 (2.95)
Narcissistic PD	1.76 (2.43)	1.47 (2.33)
Histrionic PD	1.77 (2.19)	0.76 (1.45)
Avoidant PD	2.78 (3.14)	1.60 (2.63)
Obsessive-Comp PD	3.24 (2.41)	2.12 (2.21)

Dependent PD	1.88 (2.53)	0.81 (1.37)
Paranoid PD	1.34 (2.04)	0.87 (1.59)
Schizoid	0.98 (1.62)	0.77 (1.55)
Schizotypal	0.78 (1.39)	0.56 (1.23)

Note. Hamilton Depression = Hamilton Rating Scale for Depression; Hamilton Anxiety = Hamilton Rating Scale for Anxiety; GAF = Global Assessment of Functioning. PD symptom scores represent the dimensional score from the SIDP (sum of all items for each disorder).

Table 2.

Associations among key variables.

Variable	1	2	3	4	5	6	7	8	9
1. BPD person 1									
2. BPD person 2	.32**								
3. APD person 1	.37**	.02							
4. APD person 2	-.13	.09	-.04						
5. Ham-D person 1	.53**	.06	.37**	-.07					
6. Ham-D person 2	.15	.34**	.18*	.15	.19*				
7. DAS Satisfaction person 1, Baseline	-.42**	-.40**	-.22*	.05	-.19*	-.22*			
8. DAS Satisfaction person 2, Baseline	-.34**	-.17	-.21*	.05	-.23**	-.34**	.51**		
9. DAS Satisfaction, person 1, 12-month	-.26*	-.12	-.23*	-.09	-.09	-.09	.44**	.22*	
10. DAS Satisfaction, person 2, 12-month	-.27*	-.27*	-.04	-.09	-.08	-.01	.40**	.22	.57**

Note. Person 1 refers to the originally identified participant and person 2 refers to their romantic partner. BPD = borderline personality disorder. APD = avoidant personality disorder. HAM-D = Hamilton Depression Inventory. DAS = Dyadic Adjustment Scale.

* indicates $p < .05$.

** indicates $p < .01$.