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TESTING THE LINK BETWEEN MOTHERS' GENERAL REFLECTIVE FUNCTION CAPACITY AND ADOLESCENT BORDERLINE PERSONALITY FEATURES: PERCEIVED PARENTING BEHAVIORS AS A POTENTIAL MECHANISM

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Abstract

Impairments in mothers' reflective function (RF), the ability to imagine the mental states of the self and others, underlies maladaptive parenting strategies, which have been associated with borderline personality disorder (BPD). The current study evaluated the association between mother's RF and adolescents' BPD and the mediating role of a range of parenting behaviors. Five hundred and thirty-one inpatient adolescents and their mothers participated in the current study. A multimethod assessment of BPD was used alongside mothers' self-reported quality of RF. Children completed three questionnaires about maternal parenting behaviors. There was no direct relation between mother's RF capacity and adolescents' BPD. However, mothers' adaptive certainty about mental states related to less severe BPD in adolescents, specifically through decreases in inconsistent punishment. Mothers' RF capacity predicted various parenting behaviors, which was associated with adolescents' BPD severity. Implications of findings for early intervention and prevention are discussed.

Keywords

borderline personality disorder; parenting; reflective function; adolescence; mentalizing

Developmental models for borderline personality disorder (BPD) agree that maladaptive environmental factors interact with a biological predisposition to increase risk for BPD (e.g., Linehan, 1993). More specifically, problematic parent–child dynamics have emerged as a robust predictor of BPD in several reviews (e.g., Boucher et al., 2017). Fonagy and Luyten (2009) have identified reflective function (RF; also referred to as mentalizing) as an important social-cognitive process that may underlie problematic parent–child relationships. The purpose of this study was to evaluate the association between mothers' RF capacity and adolescent offspring's BPD features and to examine a range of parenting behaviors as potential mechanisms.

Efforts to characterize maladaptive qualities of the parent–child relationship in the context of BPD have utilized constructs as varied as disciplinary strategies, invalidation, and boundaries. Fonagy and Luyten (2009) suggested that a parent's capacity for RF may underlie these early maladaptive transactions between parents and children that put children at risk for BPD. This perspective is advantageous because it focuses research on a potential underlying driver of maladaptive parent–child interactions that can become the focus of treatment if empirically validated. RF is defined as the metacognitive ability to imagine the mental states of self and of others; it is a key component to successful parenting (Camoirano, 2017) and is associated with a range of offspring outcomes. Most research on RF and parenting behaviors has been conducted with parents of infants and young children and suggests that parents' RF in relation to their child, specifically, is associated with offspring attachment security (Ensink et al., 2019), social cognition (Borelli, Hong, Rasmussen, & Smiley, 2017), and emotion regulation (Heron-Delaney et al., 2016), and protects against the development of psychopathology (Ensink, Bégin, Normandin, & Fonagy, 2016).

More recently, this has been extended to studies with adolescent children. This nascent literature suggests that parents' RF of their children, specifically, maintains significance in adolescence. For example, Benbassat and colleagues (Benbasset & Priel, 2012; Benbasset & Shulman, 2016) studied a sample of nonclinical Israeli adolescents and found that parental RF was associated with adolescents' increased socioemotional competence and friendship quality as well as greater complexity of self-description and romantic competence in young adulthood. However, it was also associated with negative outcomes of internalizing problems and negative self-perception during these developmental phases. In the only study to consider BPD, Quek and colleagues (2018) used a task-based measure to assess RF capacity of parents in a small mixed community/clinical sample in relation to adolescents' BPD features. In this study, it was found that parents' RF capacity did not relate directly to adolescents' BPD features. However, parents' extreme tendency to hypomentalize (no use of mental states to understand behavior) indirectly related to adolescents' BPD via adolescents' own RF capacity. Results across these studies suggest that parents' RF capacity is associated with adolescents' socioemotional competence. Relevant for the current study, Quek and colleagues interpreted their findings as suggesting that parents'

reduced capacity for RF may predict maladaptive parenting behaviors, which subsequently interferes with healthy social-cognitive development of offspring, putting them at risk for borderline pathology. However, more research is needed to understand the relevance of parent's RF for BPD in their adolescent offspring and if it does indeed relate to parenting behaviors. This is especially crucial because BPD onsets and reaches peak levels of severity during adolescence (Bornovalova, Hicks, Iacono, & McGue, 2009). In addition, parent-child relationships face unique demands and challenges during adolescence (Laursen & Collins, 2009). While autonomy and independence seeking are normative for adolescents, they present a strain on the parent-child relationship, which may be compounded by RF impairments in parents.

Given that parents' RF seems to remain an important factor throughout children's development, a mechanistic question emerges as to how the quality of parents' RF capacity influences outcomes. Based on infant and toddler research, it appears that parents' RF influences children via facilitating appropriate and sensitive parenting behaviors, over and above parents' level of education or psychopathology (Rosenblum, McDonough, Sameroff, & Muzik, 2008). For example, mothers' RF was related to the ability to tolerate infants' distress and more effective soothing (Rutherford, Goldberg, Luyten, Bridgett, & Mayes, 2013). Parents' RF capacity has been related to sensitivity (Suchman, DeCoste, Leigh, & Borelli, 2010), less disruptive mother-infant interactions and better parental communication (Sadler et al., 2013), increased mind-minded comments to children (Rosenblum et al., 2008), less maternal negativity (Stacks et al., 2014), and higher involvement (Rostad & Whitaker, 2016). Although no analog studies have yet to be conducted among adolescents, we would expect similar associations to be found during this sensitive period. We expect that parents with high RF capacity are more adept in interacting with adolescent children such that they rely less on maladaptive and harmful parenting behaviors.

In addressing this question, we considered parenting behaviors that have been shown to be specifically relevant to BPD, as derived from three broad domains of research and theory. First, in the biopsychosocial theory introduced by Marsha Linehan (1993), parental invalidation is a core aspect of environmental risk for BPD. Invalidation is described as delegitimizing someone's internal experience by communicating that his or her mental states are either unacceptable or wrong. Another body of literature has focused on boundaries between parents and children (Macfie, Brumariu, & Lyons-Ruth, 2015), suggesting that when there is a deviation from the hierarchical relationship division between parent and child (e.g., treating children like peers), typical socioemotional and identity development is disrupted. Finally, a range of literature has examined more traditional parenting behaviors of discipline and limit setting (e.g., harshness, inconsistency, or monitoring), involvement, warmth (e.g., Stepp et al., 2014), and inconsistent parenting (Boucher et al., 2017). Despite the expansive examination of parenting behaviors in relation to BPD, studies do not typically evaluate multiple forms of parenting behaviors simultaneously to account for intercorrelations between different parenting behaviors. In fact, in a recent review of empirical tests of the environment aspect of Linehan's biosocial model, conceptual overlap was found between invalidation and aspects of parenting such as harshness, appropriate boundaries, involvement, and withdrawal of warmth (Musser, Zalewski, Stepp, & Lewis, 2018). In sum, despite the theoretical and likely empirical overlap between each of these

three domains of parenting behaviors, studies examining each of these domains in relation to BPD have largely evolved independently of each other. The field would greatly benefit from clarity regarding the overlap between these parenting constructs and, further, how each may relate uniquely to offspring's borderline pathology.

To this end, the current study evaluated the association between mother's general RF capacity and BPD features among adolescent inpatients and examined the mediating role of a range of parenting behaviors as reported by adolescents. We used a model of RF introduced by Fonagy and colleagues (2016) in which adaptive RF is characterized by both certainty and low levels of uncertainty. Certainty reflects the perceived ability to accurately infer about another's mental states; thus, it is adaptive to have some levels of certainty about one's mental state inferences in order to make sense of people's behavior. Uncertainty about mental states reflects a complete lack of knowledge of mental states and at high levels resembles hypomentalizing. Fonagy and colleagues developed a questionnaire measure of RF following this framework, which was used in the present study to measure RF capacity in mothers. We specifically recruited adolescents from an inpatient facility in order to detect sufficient variability in BPD features and maladaptive parenting experiences. To examine the mechanistic role of parenting behaviors, we used multiple mediation to examine the combined and unique indirect effects of each parenting behavior (which fell under the domains of invalidation, boundaries, and behaviors), while also accounting for their intercorrelations. Finally, to determine the unique effects of these parent variables on adolescent BPD features, we controlled for overall level of psychiatric severity, because previous research has demonstrated that the effects of maladaptive parent-child relationships are not necessarily unique to BPD (Boucher et al., 2017) and that adolescents with borderline pathology display greater comorbidity with a range of psychiatric problems (Ha, Balderas, Zanarini, Oldham, & Sharp, 2014). Given that we used a sample of inpatient adolescents, we expected that, overall, subjects had experienced high levels of negative parenting and low levels of positive parenting. We also examined whether models differed between mother-son and mother-daughter dyads. While child gender has been shown to be related to maternal parenting behaviors in general (Cui et al., 2018), studies on parenting practices predicting BPD tend to be composed of majority female samples (Musser et al., 2018). Thus, there is a gap in knowledge regarding how parenting practices may differentially relate to BPD based on gender. The limited studies on parenting and BPD that have differentiated between child gender suggest that early caregiving experiences, both positive and negative, have a stronger influence on BPD in females, relative to males (Vanwoerden, Hofmans, & De Clercq, 2020).

We hypothesized that mothers' RF capacity would not have a direct effect on BPD (similar to findings of Quek et al., 2018), but would indirectly relate to adolescents' BPD via parenting behaviors. Because previous studies examining parental RF and child BPD did not examine the specific behaviors of parent that may mediate this link, we had no empirical evidence to base hypotheses on. However, on the basis of theoretical descriptions, we expected this association to be mediated by harshness, warmth, involvement, and psychological control (withdrawal of warmth to control adolescent behavior). We expected that inconsistent parenting and invalidation would emerge as unique predictors of BPD given their prominence in empirical and theoretical literature, respectively. However, because no

previous studies have examined parenting behaviors simultaneously in relation to BPD, empirical overlap between some of these measures was expected, such that once shared variance is accounted for, the effects of certain parenting behaviors may no longer be predictive of BPD. Lastly, we expected that negative parenting behaviors would predict BPD to a stronger degree among females.

METHOD

PARTICIPANTS AND PROCEDURES

The sample was recruited from an inpatient psychiatric unit for adolescents with severe psychiatric disorders. Inclusion criterion was proficiency in English to complete study measures and exclusion criteria were a diagnosis of an autism or psychotic spectrum disorder or IQ below 70. In addition, only participants whose mothers completed study assessments were included because there were not enough participants who completed the study with their fathers to justify our models. Of 801 consecutive admissions who were approached for consent, 72 declined participation or were discharged immediately and 77 were excluded based on the above-noted criteria; 121 had parent reports completed by fathers. Therefore, the final sample consisted of 531 adolescents and their mothers. Adolescents ranged in age from 12 to 17 years old ($M = 15.27$, $SD = 1.47$; 64.4% female), with the following racial/ethnic breakdown: 78.0% White/Not Hispanic ($n = 414$), 5.8% White/Hispanic ($n = 31$), 1.7% Black or African American ($n = 9$), 2.4% Asian ($n = 13$), 4.5% multiracial or other ($n = 24$), and 13.2% unspecified ($n = 70$). Based on the DSM-IV, 32.4% met criteria for BPD, 53.5% for an anxiety disorder, 51.4% for a depressive disorder, 6.8% for a bipolar disorder, 7.7% for an eating disorder, and 38.4% for an externalizing disorder. On average, adolescents in the sample were admitted for 35.16 days ($SD = 13.45$).

Upon adolescents' admission to the unit, parents were invited to participate in the study. If parents consented, adolescents were asked for assent. Assessments were completed independently in the first 2 weeks of admission and were administered by doctoral-level clinical psychology students and/or trained clinical research coordinators. The study was approved by the human subjects review committees at the appropriate institutions.

MEASURES

BPD Features.—A multimethod (self-, mother-, interviewer-rated) latent factor of BPD features was created using total scores from four measures described below (BPFS-C-C; BPFS-C-P; PAI-BOR; CI-BPD). This latent factor was identified by fixing the first factor loading to 1. A measurement model of this latent factor was examined within the full sample and was found to fit the data well, $\chi^2(2) = 4.85$, $p = .089$; RMSEA = .052, CFI = .995, SRMR = .019. Standardized factor loadings ranged from .30 (BPFS-C-P) to .93 (PAI-BOR).

The Borderline Personality Disorder Features Scale for Children (BPFS-C; Crick, Murray-Close, & Woods, 2005) is a questionnaire of BPD features developed for use with youth. The BPFS has two versions, a child self-report version (-C) and a parent-report version (-P), which were both included. The BPFS includes 24 items rated on a 5-point Likert scale from 1 (*not true at all*) to 5 (*always true*), which are summed for a total score. Research has

supported the criterion and concurrent validity of both parent and child reports of the BPFs (Chang, Sharp, & Ha, 2011; Sharp, Mosko, Chang, & Ha, 2011). Cronbach's alphas were .89 (BPFs-C-C) and .90 (BPFs-C-P).

The Borderline Scale of the Personality Assessment Inventory for Adolescents (PAI-BOR; Morey, 2007) is calculated from 20 items of the 264-item self-report measure of personality functioning for adolescents, the PAI-A. Items are rated on a 4-point Likert scale ranging from 1 (*false*) to 4 (*very true*). Adequate psychometric properties for the PAI-A (Morey, 2007) have been demonstrated. Cronbach's alpha in the current sample was .90.

The Childhood Interview for DSM-IV Borderline Personality Disorder (CI-BPD; Zanarini, 2003) is a semistructured interview developed for youth that assesses the nine criteria of BPD in the DSM. Each criterion includes a list of prompts to fully evaluate the symptom. Interviewers rate a score of 0 (*absent*), 1 (*probably present*), or 2 (*definitely present*) for each criterion. A total score of the CI-BPD (ranging from 0 to 18) was calculated for the current study by summing each of the criteria ratings. Strong support for the psychometric properties of this measure has been demonstrated (Sharp, Ha, Michonski, Venta, & Carbone, 2012).

Parenting.—The Alabama Parenting Questionnaire (APQ; Frick, 1991) is a 42-item questionnaire completed by adolescents to assess parenting behaviors. Items are scored using a Likert scale ranging from 1 (*never*) to 5 (*always*). The measure includes five scales: Maternal Involvement (10 items), Positive Parenting (6 items), Poor Monitoring (10 items), Inconsistent Discipline (6 items), and Corporal Punishment (3 items). Adequate internal consistency and validity of the measure has been demonstrated with adolescents (Shelton, Frick, & Wootton, 1996; Zlomke, Bauman, & Lamport, 2015). In the present sample, Cronbach's alpha ranged from $\alpha = .62$ to .87 for the five scales.

The Inadequate Boundaries Questionnaire (IBQ; Mayseless & Scharf, 2000) is a 35-item adolescent-report measure of mother's behavior indicating boundary violations. Items are rated on a Likert-type scale ranging from 1 (*Never or almost never*) to 5 (*Always or almost always*). The measure consists of five sum scores, including Guilt Induction (8 items), Lack of Boundaries (6 items), Parentification (8 items), Triangulation (5 items), and Psychological Control (8 items) (Mayseless & Scharf, 2000). Because of the high overlap in the Guilt Induction and Psychological Control scales ($r = .84$), we averaged these two subscales for a single Psychological Control and Guilt Induction scale. Internal consistency for the current sample was adequate (ranging from .62 to .92).

The Socialization of Emotion Scale (SES; Krause, Mendelson, & Lynch, 2003) is a 33-item adolescent-reported scale of mother's invalidation and validation of child emotions. The SES was modified from a parent-report measure, the Coping with Children's Negative Emotions Scale (CCNES; Fabes, Eisenberg, & Bernzweig, 1990). In the SES, six examples of situations are presented, each involving a negative emotion. Respondents rated the likelihood, from 1 (*very unlikely*) to 7 (*very likely*), that their mother would react in different ways, ranging from problem-focused, emotion-focused, expressive encouragement, distress, punishment, to minimization strategies. The measure yields the scales of Validation

of Emotions (18 items) and Invalidation of Emotions (15 items, including distress, punitive, and minimization reactions). Cronbach's alpha was .95 for validation scores and .91 for invalidation scores.

Mothers' General Reflective Functioning.—The Reflective Function Questionnaire (RFQ; Fonagy et al., 2016) is an 8-item self-report questionnaire that was completed by mothers about their own RF capacities. Respondents answered items on a 6-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Fonagy and colleagues' (2016) validation work on the RFQ supported two subscales, both of which were used in this study: Certainty about Mental States and Uncertainty about Mental States. We followed the recoding, scoring, and interpretation used by Fonagy et al. (2016) in the RFQ validation paper. Specifically, for the Certainty scale, items (e.g. "People's thoughts are always a mystery to me") were recoded from 1, 2, 3, 4, 5, 6 to 2, 1, 0, 0, 0, 0 and then averaged for an overall Certainty score. This recoding changes item scores so that disagreement leads to higher scores after recoding. In terms of interpretation, higher scores on this scale are reflective of adaptive certainty about mental states whereas lower scores reflect difficulty in inferring mental states (Fonagy et al., 2016; P. Fonagy, personal communication, February 4, 2019). For the Uncertainty scale, items (e.g., "Sometimes I do things without really knowing why") were recoded from 1, 2, 3, 4, 5, 6 to 0, 0, 0, 0, 1, 2, and averaged for an overall Uncertainty score. Thus, higher agreement on items leads to higher scores on the Uncertainty scores. Higher scores on this scale may reflect hypomentalizing, or a lack of understanding of mental states, whereas lower scores reflect adaptive mentalizing, including recognition that mental states are opaque (Fonagy et al., 2016).

Factor structure, internal consistency and test–retest reliability, and validity of the RFQ measure using these two scales were demonstrated among both community and clinical adults (Fonagy et al., 2016). For example, Certainty scores were positively related to mindfulness and perspective-taking, infant attachment security, and anger control, and negatively related to borderline features, identity diffusion, and trait anger. In contrast, Uncertainty scores were positively related to self-harm, borderline features, eating disorder symptoms, depression, interpersonal problems, and symptomatic distress, and negatively related to mindfulness and perspective-taking. In the current sample, Cronbach's alpha was .81 for the Certainty subscale and .75 for the Uncertainty subscale.

General Psychiatric Severity.—The Youth Self-Report (YSR; Achenbach, 1991) is a gold standard, well-validated self-report questionnaire for a broad range of psychopathology (Achenbach, 2018). The scale consists of 112 items, each scored on a 3-point Likert scale ranging from 0 (*not true*) to 2 (*very or often true*). For the purpose of the current study, we utilized the Total Problems Scale as an index of general psychiatric severity.

DATA ANALYTIC STRATEGY

All descriptive analyses were conducted using SPSS 25 (IBM Corp., 2016), and path analyses were conducted using Mplus 8.1 (Muthén & Muthén, 1998–2017). Multiple mediation within a structural equation model (SEM) was chosen because SEM removes the effect of measurement error and is more parsimonious than single mediation. Furthermore,

to limit measurement bias, we used a latent variable of borderline features that included multiple methods. Also, because RF capacity of mothers was measured with self-report, we used adolescent reports of parent behaviors to reduce shared method variance. All scales approximated a normal distribution (skew and kurtosis $< |1.5|$) with the exception of the Corporal Punishment scale and the Uncertainty scale. Therefore, maximum likelihood with robust standard errors was used to estimate missing data, which is robust to nonnormality. Correlation analyses among all observed variables were run to examine associations between constructs of interest.

Next, two separate mediation models were tested for the two domains of RF: Certainty and Uncertainty (hypomentalizing) about mental states (see Figure 1). For these models, the respective RF variable was included as the independent variable; mediators included relevant scales of parenting, which were all allowed to correlate with one another; and the dependent variable was a latent variable of BPD, which consisted of the four measures detailed above. Each of the indirect effects of mothers' RF on BPD was evaluated by examining 95% confidence intervals, with significant effects identified as intervals that did not include zero. Age and YSR Total Problems were included as covariates in both models. Model fit was evaluated based on values of the root mean square error of approximation (RMSEA; with values of less than .08 indicating reasonable fit and values above .10 suggesting poor fit; Browne & Cudeck, 1993), comparative fit index (CFI; with values between 0.95 and 1.00 indicating excellent fit and values between .90 and .95 indicating acceptable fit), and the standardized root mean square residual (SRMR; with values less than .08 indicating good fit, but with a large sample size and number of parameters, values less than .10 were considered acceptable; Kline, 2011). To evaluate gender differences for these models, a multigroup analysis was conducted in which two models were evaluated: one in which all parameters were constrained across offspring gender, and another in which all parameters were freed to vary across gender. These models were compared using a Satorra-Bentler chi-square difference test.

RESULTS

Results of correlation analyses are displayed in Table 1. Gender (coded 0 for females, 1 for males) was negatively correlated with age and positively correlated with all indices of BPD: Girls were younger and displayed higher levels of symptoms, in line with previous research findings within clinical samples (Sharp et al., 2014). In regard to parenting behaviors, Monitoring was higher among boys and Validation was higher among girls. Adolescent gender was not related to mothers' RF capacity. Age was related to several of the parenting variables; older adolescents perceived more Monitoring, less Corporal Punishment, and more Triangulation. There was a small but statistically significant correlation between age and mothers' RF scores on the Uncertainty scale, suggesting that mothers with older adolescents engaged in less hypomentalizing. Indices of BPD were largely unrelated to mothers' RF, with the exception of a small but statistically significant negative correlation between mothers' reports on the BPFs and Certainty: Mothers of adolescents with higher levels of BPD features tended to report problems with certainty about mental states. There were correlations between BPD features and a range of parenting variables. Most notably, both self-reports and structured interview measures of BPD correlated positively

with Psychological Control/Guilt Induction, Invalidation, Monitoring, and Inconsistent Punishment; however, these correlations were mostly small in magnitude (ranging from $r = .16$ to $.40$). There were small but statistically significant negative correlations between the BPFSC-C-P and CI-BPD and Positive Parenting and Involvement. Overall, correlational analyses suggest that BPD was related consistently, but to a small degree, with various indices of negative parenting behaviors. Finally, we examined correlations between mothers' RF capacity and parenting behaviors. All of these correlations were small in magnitude and only a few were statistically significant, which is inconsistent with previous research conducted among children and infants and with our hypotheses that mothers' capacity for RF would be related to their parenting behaviors, as perceived by adolescents.

Following these correlational analyses, we tested our hypothesized mediational model. We did not include the scales of Validation, Parentification, Triangulation, and Corporal Punishment in the models given that correlations between these scores and all indices of BPD were trivial in magnitude and did not reach statistical significance. In addition, based on bivariate results, age was entered as a covariate along with psychiatric severity.

The first model evaluated the associations displayed in Figure 1 with mothers' certainty about mental states as the independent variable. First, we tested a model in which parameters were allowed to differ between boys and girls. This model had adequate fit, $\chi^2(67) = 99.65$, $p = .006$; RMSEA = .043, CFI = .983, SRMR = .044. When this model was tested with parameters constrained to be equal across gender, model fit was worsened, $\chi^2(125) = 174.26$, $p = .002$; RMSEA = .039, CFI = .974, SRMR = .089, although not significantly so, $\chi^2(58) = 74.25$, $p = .074$. Therefore, we concluded that the model did not significantly differ based on adolescent gender, and results were reported from the constrained model (Table 2). When intercorrelations between parenting behaviors and the effects of covariates were accounted for, mothers' adaptive certainty about mental states predicted decreases in Inconsistent Punishment to a small but significant degree. Inconsistent Punishment and Psychological Control/Guilt Induction had small and moderate positive effects on BPD features, respectively. An indirect effect from mothers' certainty to adolescent BPD via decreases in Inconsistent Punishment was statistically significant. Therefore, while both Psychological Control/Guilt Induction and Inconsistent Punishment were uniquely relevant for BPD, mothers' certainty about mental states was related to less severe BPD in adolescents, specifically through decreases in Inconsistent Punishment.

The next model was identically constructed; however, mothers' hypomentalizing scores (Uncertainty) were the independent variable. Model fit for the unconstrained model across genders was adequate, $\chi^2(67) = 95.98$, $p = .012$; RMSEA = .040, CFI = .985, SRMR = .043; however, the constrained model did not fit significantly worse [constrained model fit: $\chi^2(125) = 161.103$, $p = .016$; RMSEA = .033, CFI = .981, SRMR = .086; chi-square difference test: $\chi^2(58) = 64.85$, $p = .250$]. Therefore, we retained the constrained model for parsimony. Hypomentalizing scores had a negative relation with Involvement, although to a small degree. As found previously, Inconsistent Punishment and Psychological Control with Guilt Induction had small to moderate positive effects on BPD. No indirect or direct effects between mothers' scores of hypomentalizing and adolescents' BPD emerged from this model.

DISCUSSION

The current study was the second to date to examine the effects of maternal RF capacity on adolescent BPD. Furthermore, it was the first study to examine these effects via a range of parenting behaviors. In doing so, we were able to evaluate the unique forms of parenting that may be relevant for adolescents with significant BPD features, over and above those that would be found in a sample of inpatient adolescents with high levels of severity. Similar to what was found in one previous study (Quek et al., 2018), there were no direct relations between maternal RF capacity and adolescent BPD; however, mothers' RF (representing adaptive certainty about mental states) was inversely associated with adolescent BPD via lower levels of inconsistent discipline. Other notable findings included that when accounting for interrelations between parenting behaviors and general psychiatric severity and age, only inconsistent punishment and psychological control with guilt induction were related to BPD.

First, given theoretical suggestions of the underlying effect of maternal RF capacity for BPD, it was notable that there were no direct effects between these variables. However, this is consistent with the single previous study examining these associations (Quek et al., 2018). That being said, a range of studies conducted among younger children suggest that parents' RF capacity is related to children's internalizing and externalizing pathology (Camoirano, 2017). This null finding may be because we assessed mothers' general capacity for RF (i.e., to what extent mothers considered the role of mental states in driving behavior). While a parent's general RF capacity would naturally impact the ability to understand and empathize with their teen, research has suggested that RF may be context- and relationship-specific (e.g., with a parent versus a stranger; Vanwoerden, Greiner, Ensink, & Sharp, 2019) or dependent on attachment quality (De Rosnay & Harris, 2002) and situation-specific characteristics (e.g., arousal level, affect; Borelli, Burkhart, Rasmussen, Brody, & Sbarra, 2017). Therefore, a stronger effect between mothers' RF capacity may be found if mothers are asked to engage in RF specifically about their child (Slade, 2005), rather than answering questions about general RF capacity. In one study, correlations between parental RF and parenting behaviors were stronger when RF was assessed using a specific parenting interview rather than an interview probing early experiences (Crumbley, 2009). In fact, given that BPD is associated with tumultuous relationships (Stepp, Hallquist, Morse, & Pilkonis, 2011), it is very likely that adolescents with BPD have more frequent negative interactions with their mothers. RF is inhibited when affect is intense and negative (Borelli, Hong, et al., 2017). Therefore, even mothers with greater capacity for RF may have difficulty mentalizing their children during conflict, which may be further exacerbated during adolescence when conflict reaches peak levels (Moed et al., 2015).

In terms of the effects between mothers' RF capacity and child-perceived parenting behaviors, differential relations emerged between the scales of Certainty and Uncertainty. Specifically, adaptive certainty about mental states was related to lower levels of inconsistent discipline, and mothers' hypomentalizing (measured with the Uncertainty scale) was inversely related to involvement. The direction of these associations is intuitive given that higher certainty scores on the RFQ are reflective of more adaptive mentalizing and have been shown to be higher in healthy versus clinical populations of adults (Fonagy et al., 2016). Therefore, mothers with higher scores on this scale would be expected to have greater

RF ability, allowing them to be more reflective and understanding of behavior in terms of underlying mental states (Camoirano, 2017). It is likely that mothers who can be more reflective in linking their own and others' (including their adolescent's) behavior to internal states are also more consistent in how they respond to their child's problem behavior. In fact, while there were no direct associations between mothers' capacity for RF and adolescents' BPD features, there was an indirect association via inconsistent discipline (originating from mothers' certainty about mental states). Therefore, mothers who showed less certainty in inferring mental states of others were perceived to be more inconsistent in their punishment, which was subsequently related to increased borderline pathology in adolescent offspring. On the other hand, higher levels of uncertainty on the RFQ reflect a greater tendency to hypomentalize, which occurs when mental states are less attuned to and less often used to explain one's own and others' behavior (Fonagy et al., 2016). A mother who tends to hypomentalize may lack knowledge of how her own internal states affect her behavior. Therefore, she may act less positively toward or be less involved with her adolescent. She may also lack understanding of how she affects her adolescent and thus not change her behavior.

A notable contribution of the current study is the evaluation of unique relations between parenting and BPD. Despite extensive research on parenting behaviors related to BPD, no previous study has examined this range of different forms of parenting behaviors simultaneously. The types of parenting behaviors examined in the current study originate from different theoretical orientations and literature bases. While not often studied together, there are considerable overlaps. For example, invalidation is defined as delegitimizing one's inner experiences (emotions, thoughts). This can be expressed in a variety of ways, from subtle (e.g., minimizing a negative experience by telling a child to laugh it off) to more overt (e.g., mocking a child for a negative emotional reaction). This example of a more overt *invalidating* response may also be characterized as hostility, and thus be tapped into by other assessments of parenting. Results from this study provide empirical evidence that theoretical orientations emphasizing different aspects of the parent-child relationship are not incompatible with each other; rather, differentiation of key constructs may lie in how parenting behaviors are defined and measured. In addition, it is likely that parents who display one form of negative parenting also display other forms of negative parenting. By conducting a multiple mediation, we were able to control for patterns of covariance. In doing so, we found that there were unique relations between inconsistent discipline and BPD, which is consistent with the recent review by Boucher and colleagues (2017). In addition, psychological control with guilt induction was also uniquely related to BPD. We unexpectedly found no significant associations between BPD and invalidation, even though it is a central component of one of the key developmental theories of BPD (Linehan, 1993). It may be the case that the measure of invalidation is not age-appropriate (responses to emotional display), and perceived invalidation during adolescence may instead relate to how parents respond to adolescents' bids for independence and autonomy, or more age-specific behaviors. However, it may also be the fact that other aspects of parenting, such as psychological control with guilt induction, are a more prominent and severe form of invalidation found in clinical samples of the severity observed in the current sample. Given that our study was conducted with a severe inpatient sample of adolescents, it is likely that

negative parenting experiences across the sample are much more severe than what would be observed in community samples, making it difficult to identify effects of more subtle forms of invalidation measured in the current study.

Neither of the positive aspects of parenting (involvement, positive parenting) were found to relate to BPD, either at the bivariate level or in the mediation model. This result may seem surprising given previous research that has found significant associations between similar constructs, such as low warmth, rejection, and low satisfaction with the child, and BPD (see Stepp, Lazarus, & Byrd, 2016, for a review). Previous literature has suggested that parents' fluctuation between over- and underinvolvement may contribute to the development of BPD (Boucher et al., 2017). Therefore, it is possible that maternal involvement alone is not related to adolescent BPD. It is also the case that the effects of some forms of parenting are contingent on the presence of other types of parenting (Caron, Weiss, Harris, & Catron, 2006). For example, one study found that maternal problem solving was problematic for adolescent BPD, but only in the absence of support and validation (Dixon-Gordon, Whalen, Scott, Cummins, & Stepp, 2016). Thus, it may be more appropriate to examine profiles of parenting experienced by adolescents. Therefore, while our approach was advantageous in controlling for patterns of covariance between types of parenting behaviors, this research may be complemented by future research using modeling such as latent profile analysis to capture patterns of parenting and their effect on adolescent BPD. Another potential explanation for our negative finding with regard to positive parenting is that the positive parenting scale of the APQ includes items such as "Your parents praise you for behaving well," which largely tap into *behavioral* positive parenting strategies such as praise and positive reinforcement. However, in their review, Stepp and colleagues (2016) emphasize warmth and satisfaction as *affective* domains of parenting.

Finally, our study examined whether there were gender differences in the associations between mothers' RF, parenting behaviors, and adolescent BPD. Contrary to our hypotheses, we found that models fit similarly across genders, suggesting that effects were not different between adolescent boys and girls. Research on the etiology of BPD has largely been dominated by a focus on females (e.g., Musser et al., 2018), or research that simply covaries for gender, without testing whether risk factors and trajectories differ between males and females. One insightful study by Cicchetti, Rogosch, Hecht, Crick, and Hetzel (2014) revealed how preschool parenting predicted adolescent BPD differently based on gender. Using a genetically informed design, it was concluded that among females, risk for BPD was characterized by a diathesis-stress model, whereas among males, a differential-susceptibility model was more appropriate. It is notable that the cross-sectional design of the current study precludes the examination of these complex etiological differences.

This study's findings should be considered alongside its limitations. First, as mentioned, the study design precludes any directional or causal inferences about relations between maternal RF, parenting behaviors, and adolescent BPD. While the framework of our study was positioned to address the role of maternal RF and parenting behaviors in BPD, it fails to acknowledge the reciprocal nature of parenting and adolescent pathology. For example, a recent study found that during adolescence, girls' BPD predicted increases in mothers' BPD (Kaufman, Victor, Hipwell, & Stepp, 2020), demonstrating the evocative

effect that adolescent BPD may have on parents. Second, there were also limitations of this study's sample of inpatient adolescents with a high level of psychiatric severity. Therefore, results may not generalize to community or outpatient adolescents. Furthermore, while the inpatient sample was unusually large, it was made up of a majority of White adolescents, which limits generalizability of findings for adolescents of other ethno-racial backgrounds. Given the important influence of culture on parenting practices, future studies on this topic should recruit families from a broader range of cultural, ethnic, and racial backgrounds. Third, while the Uncertainty scale of the RFQ has been described to be a proxy for hypomentalizing, the RFQ did not assess hypermentalizing. Future research should be conducted with more comprehensive measurement of parental RF. A final limitation concerns the lack of focus on fathers, which should be addressed in future research.

The current study has important implications. It is one of few to expand the examination of the role of parents' RF for child outcomes upward into adolescence, and one of the first to examine unique effects of specific parenting constructs for adolescent BPD while accounting for several parenting constructs simultaneously, as well as adolescents' general psychiatric severity. Although cross-sectional, the findings tentatively suggest that targeting parents' RF capacity may have positive effects for adolescent BPD. Targeting parents' RF ability may be addressed in Mentalization Based Treatment for Adolescents (MBT-A; Rossouw & Fonagy, 2012), which has been shown to be effective in reducing BPD symptoms in adolescents and includes parents in treatment (Bo et al., 2017). A range of other mentalization-based parenting interventions (e.g., Slade et al., 2020) can be used preventatively if done with mothers at risk.

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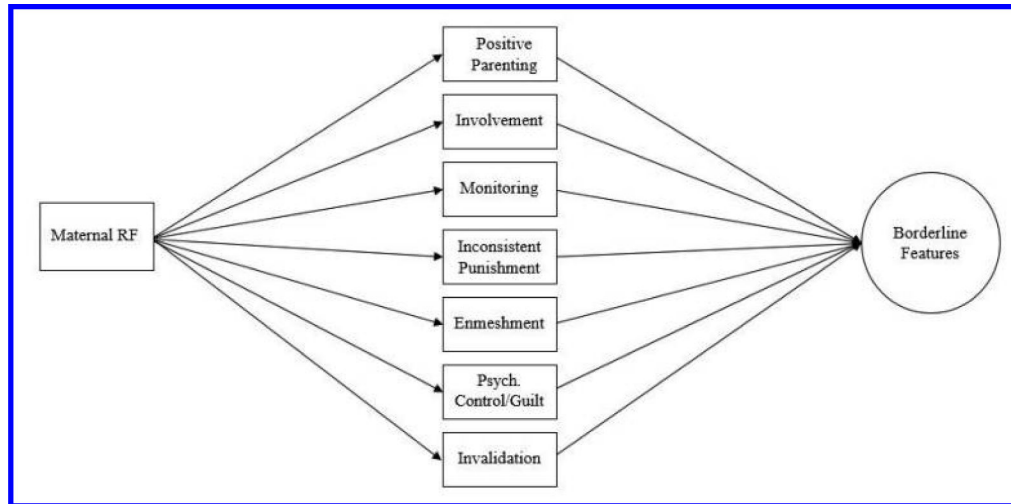


FIGURE 1. Conceptual mediation model for the relation between mothers’ capacity for RF on borderline pathology via parenting behaviors.

TABLE 1.

Descriptive and Correlational Statistics for Main Study Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
1. Gender																				
2. Child Age	.13**																			
3. BPFS-C— youth report	-.19**	-.06																		
4. BPFS-C— parent report	-.14**	-.10*	.26**																	
5. CI-BPD	-.27**	-.02	.60**	.28**																
6. PAI-BOR	-.24**	-.06	.81**	.27**	.65**															
7. RFQ Certainty	.01	.03	-.07	-.12**	-.04	-.02														
8. RFQ Uncertainty	-.01	-.14**	-.03	.04	-.03	-.02	-.27**													
Parenting behaviors																				
9. Positive Parenting	-.06	-.04	-.06	-.11*	-.04	-.06	.06	-.08												
10. Involvement	-.07	-.10*	-.09	-.13*	-.14**	-.09	.08	-.12*	.69**											
11. Monitoring	.14**	.29**	.16**	.07	.17**	.13*	-.07	.07	-.25**	-.36**										
12. Inconsistent Punishment	.05	.03	.30**	.02	.17**	.27**	-.11*	-.02	-.07	-.10*	.49**									
13. Corporal Punishment	.04	-.21**	.08	.06	-.04	-.02	-.06	.11*	-.17**	-.07	.00	-.03								
Boundaries																				
14. Enmeshment	-.09	.08	.17*	.02	.14	.15	-.03	-.07	.23*	.16	.14	.26**	.04							
15. Parentification	-.05	.16	.09	.02	.14	.06	.03	-.12	.28**	.33**	.08	.14	.05	.57**						
16. Triangulation	.05	.17*	.04	-.08	.09	.03	-.10	-.16	.19	.24*	.13	.35**	.07	.46**	.65**					
17. Psychological Control/Guilt	-.04	.14	.40**	.08	.26**	.40**	-.15	-.04	-.28**	-.26**	.43**	.40**	.31**	.42**	.08	.29**				

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Validation/ Invalidation																			
18. Validation	-.16*	-.05	-.02	-.07	-.10	-.05	.11	-.12	.47**	.56**	-.25**	-.15	-.15	.22*	.26**	.06	-.23**		
19. Invalidation	-.05	.03	.26**	.06	.16*	.24**	-.11	.01	-.30**	-.30**	.26**	.16	.09	.17*	.12	.21*	.54**	-.36**	
Mean	—	15.27	70.13	71.63	8.39	32.45	7.48	3.55	19.46	3.22	2.42	2.59	1.36	2.58	2.55	2.02	2.88	85.89	33.49
SD	—	1.47	15.55**	14.60	4.97	12.04	4.98	3.49	5.23	.73	.68	.73	.62	.76	.85	.88	.88	26.16	15.90
Skew	—	-.50	-.09	-.11	.10	-.10	.77	1.82	-.34	-.13	.11	.18	2.34	.14	.62	.97	-.09	-.45	1.11
Kurtosis	—	-.73	-.28	-.29	-1.09	-.57	.83	4.84	-.44	.004	-.32	-.19	6.59	-.34	.45	.45	-.94	-.48	1.50

Note. Gender is coded 0 for females, 1 for males. BPFS = Borderline Personality Disorder Features Scale; CJ-BPD = Childhood Interview for DSM-IV Borderline Personality Disorder; PAI-BOR = Borderline Scale of the Personality Assessment Inventory for Adolescents; RFQ = Reflective Function Questionnaire.

* $p < .05$.

**

*** $p < .01$.

TABLE 2. Results of Mediation Models Examining the Effect of Mothers' RF on Borderline Features via Parenting Behaviors

	IV: RF – Certainty				IV: RF – Uncertainty			
	<i>B(SE)</i>	95% CI	<i>β-females</i>	<i>β-males</i>	<i>B(SE)</i>	95% CI	<i>β-females</i>	<i>β-males</i>
A paths (RF →)								
Positive involvement	0.07 (0.06)	[-.04, .18]	.07	.07	-0.15 (0.08)*	[-.31, .02]	-.10	-.09
Monitoring	0.01 (0.01)	[-.004, .03]	.08	.09	-0.03 (0.01)*	[-.05, -.01]	-.14	-.14
inconsistent Punishment	-0.01 (0.01)	[-.02, .005]	-.07	-.07	0.01 (0.01)	[-.01, .04]	.07	.06
Enmeshment	-0.02 (0.01)*	[-.03, -.004]	-.11	-.14	-0.00 (0.01)	[-.02, .02]	-.02	-.02
Psychological Control/Guilt	0.00 (0.01)	[-.03, .03]	-.00	-.00	-0.01 (0.02)	[-.04, .03]	-.03	-.03
Invalidation	-0.03 (0.01)	[-.05, .002]	-.14	-.15	-0.01 (0.02)	[-.04, .03]	-.03	-.03
Invalidation	-0.32 (0.24)	[-.80, .15]	-.09	-.12	-0.04 (0.35)	[-.72, .64]	-.01	-.01
B paths (-BPD)								
Positive involvement	0.24 (0.22)	[-.20, .68]	.09	.10	0.21 (0.22)	[-.23, .65]	.08	.08
Monitoring	-1.50 (1.45)	[-4.35, 1.34]	-.09	-.08	-1.79 (1.45)	[-4.63, 1.05]	-.10	-.09
inconsistent Punishment	-0.66 (1.34)	[-3.29, 1.97]	-.03	-.03	-0.40 (1.34)	[-3.02, 2.22]	-.02	-.02
Enmeshment	4.12 (1.10)**	[1.98, 6.27]	.24	.20	3.89 (1.13)*	[1.68, 6.10]	.22	.19
Psychological Control/Guilt	-0.75 (2.12)	[-4.91, 3.41]	-.05	-.04	-0.18 (2.14)	[-4.37, 4.01]	-.01	-.01
Invalidation	5.51 (2.16)*	[1.27, 9.75]	.37	.36	5.05 (2.26)*	[.62, 9.49]	.34	.33
Invalidation	-0.02 (0.09)	[-.20, .16]	-.02	-.02	-0.02 (0.09)	[-.21, .16]	-.03	-.02
C path (RFQ→BPD)								
Total	-0.13 (0.13)	[-.38, .12]	-.05	-.05	-0.18 (0.20)	[-.57, .21]	-.05	-.05
Total Indirect	-0.20 (0.09)*	[-.37, -.03]	-.07	-.08	-0.04 (0.11)	[-.25, .18]	-.01	-.01
Direct	0.07 (0.14)	[-.20, .34]	.03	.03	-0.15 (0.18)	[-.50, .21]	-.04	-.04
C path indirect via:								
Positive involvement	0.02 (0.02)	[-.02, .06]	.01	.01	-0.03 (0.04)	[-.10, .04]	-.01	-.01
Monitoring	-0.02 (0.02)	[-.06, .02]	-.01	-.01	0.05 (0.05)	[-.05, .15]	.01	.01
inconsistent Punishment	0.01 (0.01)	[-.02, .03]	.00	.00	-0.01 (0.02)	[-.04, .03]	-.00	-.00
Enmeshment	-0.07 (0.04)*	[-.14, -.004]	-.03	-.03	-0.02 (0.04)	[-.09, .06]	-.00	-.00
Enmeshment	0.00 (0.01)	[-.02, .02]	.00	.00	0.00 (0.01)	[-.03, .03]	.00	.00

	IV: RF – Certainty				IV: RF – Uncertainty			
	<i>B</i> (<i>SE</i>)	95% CI	<i>β</i> - <i>females</i>	<i>β</i> - <i>males</i>	<i>B</i> (<i>SE</i>)	95% CI	<i>β</i> - <i>females</i>	<i>β</i> - <i>males</i>
Psychological Control/Guilt	-0.14 (0.09)	[-.32, .04]	-.05	-.05	-0.04 (0.09)	[-.21, .13]	-.01	-.01
Invalidation	0.01 (0.03)	[-.05, .06]	.00	.00	0.00 (0.01)	[-.02, .02]	.00	.00

Note. RF = reflective functioning; RFQ = Reflective Function Questionnaire.

* $p < .05$.

** $p < .01$.