

RESEARCH ARTICLE

Patterns of emotional availability between mothers and young children: Associations with risk factors for borderline personality disorder

Rebecca D. Trupe | Jenny Macfie  | Rebecca M. Skadberg | Gretchen Kurdziel

Department of Psychology, University of Tennessee, Knoxville, TN, USA

Correspondence

Jenny Macfie, Department of Psychology, University of Tennessee, 301E Austin Peay Knoxville, TN 37996-0900, USA
Email: macfie@utk.edu

Funding information

National Institute of Mental Health, Grant/Award Number: MH077841

Abstract

Emotional availability (EA) characterizes a warm, close relationship between caregiver and child. We compared patterns (clusters) of EA on risk factors, including those for borderline personality disorder (BPD). We sampled 70 children aged 4 to 7 years from low socio-economic backgrounds: 51% of whose mothers had BPD. We coded filmed interactions for EA: mothers' sensitivity, structuring, non-intrusiveness, non-hostility, and children's responsiveness to, and involvement of, mothers. We additionally coded children's *over-responsiveness* and *over-involvement*. Using person-centred analyses, we identified four clusters: *high functioning*, *low functioning*, *asynchronous* (mothers above average on two of four dimensions and children below), and *below average*. Mothers in the low-functioning cluster had lower income, less social support, more of the borderline feature of negative relationships, and more depression than did mothers in the high-functioning cluster. The children in the low-functioning group had more risk factors for BPD (physical abuse, neglect, and separation from, or loss of caregivers, and negative narrative representations of the mother-child relationship in their stories) than did children in the high-functioning group. The asynchronous group included older girls who were *over-responsive* and *over-involving* with their mothers in an apparent role reversal. Interventions targeting emotional availability may provide a buffer for children facing cumulative risks and help prevent psychopathology.

Highlights:

- This paper investigated how mother-child emotional availability (warmth and closeness) relates to risk factors for borderline personality disorder, including mother-child role reversal.

A grant from the National Institute of Mental Health (MH077841) to the second author funded this research. We would also like to thank the mothers and children who participated to make this study possible.

- In filmed mother-child interactions, low emotional availability was associated with risk for borderline personality disorder and role reversal was more likely for older girls.
- Findings support the cumulative risk hypothesis and may inform interventions to improve mother-child emotional availability to prevent the development of psychopathology.

KEYWORDS

borderline personality disorder, children, emotional availability, mothers, risk, role reversal

1 | INTRODUCTION

To an infant or young child, the relationship with parents (or other primary caregivers) is of supreme importance for physical survival and emotional and social development. The parent-child relationship has crucial implications for how well the child develops the ability to harness emotions productively in the home, school, and playground (Cox & Harter, 2003; Patterson & Fisher, 2002). Moreover, from ecological (Bronfenbrenner & Ceci, 1994) and developmental psychopathology (Cicchetti, 1984, 1993, 2006; Sroufe, 2002; Sroufe & Rutter, 1984) perspectives, the parent-child relationship can serve as a protective or vulnerability factor for a child's development in the presence of contextual risk. One aspect of the relationship is emotional communication, which develops long before a child can talk (Field, 1994; Hofer, 1994). The exchange that regulates emotional communication between child and parent is termed "emotional availability" (Easterbrooks, Chaudhuri, & Gestsdottir, 2005; Emde, 1980; Mahler, Pine, & Bergman, 1975) and refers to the ability of parent and child to enjoy a warm, close, emotional connection across both positive and negative emotions (Biringen & Robinson, 1991; Emde & Easterbrooks, 1985). Furthermore, there is evidence that parent-child emotional availability contributes to the child's development of a secure attachment, a sense of self, emotion regulation, and healthy peer relationships (Biringen, Derscheid, Vliegen, Closson, & Easterbrooks, 2014). In this study, we sought to understand the relationship between emotional availability and risk factors for psychopathology, including borderline personality disorder (BPD), in a high-risk sample of mothers and their young children.

1.1 | Risk factors for BPD

BPD is a severe and chronic disorder, which is first diagnosed in adolescence or early adulthood (American Psychiatric Association, 2013). Individuals with BPD may experience tumultuous emotions, volatile relationships, and fear of abandonment; they may be confused about their sense of self and engage in self-harming behaviour involving drugs, alcohol, suicidal behaviour, and self-mutilation; they may also be prone to inappropriate angry outbursts. According to the biosocial theory, the aetiology of BPD lies in the interaction of child temperament and an invalidating parenting environment, which is defined as intolerance towards the child's expression of emotional experiences (Crowell, Beauchaine, & Linehan, 2009; Linehan, 1993). Thus, a lack emotional availability in the parent-child relationship may reflect an invalidating environment and partially link known risk factors to the development of BPD. Identified risk factors for BPD include child maltreatment and separation from, or loss of, caregivers (Zanarini, 2000). These negative experiences in early childhood may be carried forward as mental representations, which are thought to reflect the process by which parenting informs children's future relationships and the development of psychopathology (Bowlby, 1969; Carlson, Sroufe, & Egeland, 2004). One window on young children's mental representations lies in their narrative representations of the mother-child relationship (Macfie & Swan, 2009), which may make the development of BPD more likely in adolescence or early adulthood (Macfie, 2009).

1.2 | Patterns of emotional availability

Emotional availability is coded from filmed parent–child interactions for the parent's behaviour (sensitivity, structuring, non-intrusiveness, and non-hostility) and the child's behaviour (responsiveness to, and involvement of, the parent; Biringen, 2008; Biringen, Robinson, & Emde, 1998). *Too much* child responsiveness or involvement of the parent is termed *over-responsive* or *over-involving*, as the child tries to please the parent and appears to sacrifice autonomy in the process. Over-responsiveness and over-involvement represent a parent–child role reversal in which the child gives up some of what he or she needs in order to maintain the relationship on the parent's terms, which is often associated with maladaptive outcomes for the child (Macfie, Brumariu, & Lyons-Ruth, 2015). Moreover, childhood role reversal is also associated with the development of BPD in retrospective (Zanarini, 2000) and prospective (Carlson, Egeland, & Sroufe, 2009) studies.

If researchers examine each of the parent and child emotional availability behaviours separately, however, they may not gain an accurate reflection of the relationship as a whole. Do optimal parent behaviours always align with optimal child behaviours and suboptimal parent behaviours with suboptimal child behaviours? These are important questions because of the parent–child relationship's role as a protective or vulnerability factor in conditions of risk. Moreover, because emotional availability behaviours are highly correlated, it may be better to examine *patterns* of emotional availability than individual components (Oppenheim, 2012). Patterns reflect clusters of parent–child pairs that share a similar constellation of characteristics and are identified using person-centred analyses (von Eye & Bergman, 2003). It is then possible to examine how different clusters of parent and child emotional availability differ on known risk factors.

Ann Easterbrooks and colleagues utilized this person-centred approach with emotional availability in an at-risk sample of 80 mothers less than 21 years of age and their infants, average age 10 months (Easterbrooks et al., 2005). They found four clusters: three synchronous where mothers' and children's behaviour matched (high, low, and average functioning), and one asynchronous where mothers' and children's behaviour differed (average-functioning mothers and low-functioning children). They then compared the clusters on risk factors (including maternal depressive symptoms, social support, partner status, and education). In the synchronous groups, the relationship with risk was clear: High emotional availability was associated with low risk, and low emotional availability was associated with high risk. However, in the asynchronous group, although the mothers appeared average, their infants demonstrated poor responsiveness to, and involvement of, their mothers (Easterbrooks et al., 2005).

Interestingly, only the asynchronous group included mothers who were not the infant's primary caregiver (Easterbrooks et al., 2005). These mother–infant pairs may not have been as comfortable with one other, so these infants may grow into young children who try especially hard to engage their mothers and display both over-responsiveness and over-involvement in a mother–child role reversal. Indeed, in a more recent study (Mingo & Easterbrooks, 2015) with a much larger sample ($N = 226$) in which only maternal sensitivity, non-hostility, and child responsiveness were assessed, the asynchronous cluster was associated with high infant responsiveness together with low maternal sensitivity and high hostility. Importantly, mothers in this cluster scored significantly higher on a self-report questionnaire on parent–child role reversal than did the high-functioning cluster. Even in infancy, older infants were trying overly hard to engage their inconsistently available mothers in a role reversal (Mingo & Easterbrooks, 2015). In this study with young children, we included assessment of over-responsiveness and over-involvement to explore correlates of a mother–child role reversal. Given the risk status of both the Easterbrooks et al. (2005) and the current samples, we expected to find four similar clusters, and to find that over-responsiveness and over-involvement (not assessed by Easterbrooks et al., 2005, or Mingo & Easterbrooks, 2015) would characterize the asynchronous cluster in early childhood.

1.3 | The current study

A previous study using the current sample (Trupe, 2010) assessed the relationship between emotional availability and a diagnosis of maternal BPD. There was no overall significant effect for BPD on emotional availability, although

mothers with BPD were more hostile than were normative comparisons. However, the study did not assess child over-responsiveness and over-involvement or patterns of emotional availability in the sample as a whole. Patterns may reveal interesting relationships between emotional availability and risk. We therefore included both a maternal BPD diagnosis and maternal self-reported borderline features as risk factors.

The goal of this study was to extend the Easterbrooks et al. (2005) and Mingo and Easterbrooks (2015) studies with infants to children aged 4 to 7 years. We first aimed to replicate the Easterbrooks et al. (2005) four clusters of parent-child emotional availability. We then examined how clusters differed on risk factors. To extend existing research, this study included additional risk factors: child over-involvement and over-responsiveness, maternal BPD and maternal self-reported borderline features (Morey, 1991), child maltreatment, child separation from, or loss of, caregivers, child representations of the mother-child relationship, and child sex.

We hypothesized that (a) we would replicate three synchronous clusters of emotional availability (high, low, and average functioning) and one asynchronous cluster (average/above average mother functioning and low child functioning) that were found in an at-risk sample of mothers and infants (Easterbrooks et al., 2005). We also hypothesized that (b) the asynchronous cluster would be associated with child over-involvement and over-responsiveness in older children (role reversal). We further hypothesized that (c) the high- and low-functioning clusters would differ such that the low-functioning cluster would have more risks with respect to demographic (maternal partner status, maternal social support, and family income), and maternal (BPD, borderline features, and lifetime major depressive disorder), and child (the experience of maltreatment, separation from or loss of caregivers, and negative narrative representations of the mother-child relationship) factors. We made no a priori hypotheses about child sex but included it because it is central to child development.

2 | METHOD

2.1 | Participants

The low socio-economic sample consisted of $N = 70$ children and their mothers. The children's average age was 5 years 4 months ($SD = 11$ months; range 4 to 7 years), with 50% girls, 11% minority race, and 11% Hispanic ethnicity (across race). The sample was recruited from both rural and urban areas in a five-county region of the Southeastern United States. Fifty-one percent of mothers had BPD, and 49% of mothers had no disorder. Of mothers with BPD, 61% also had lifetime major depressive disorder. See Table 1 for sample details. We recruited mothers with BPD from two sources: mental health treatment facilities and directly from the community. A clinical psychologist presented information on treatment for BPD at mental health treatment facilities and then distributed brochures to the attending healthcare professionals. One brochure described symptoms of BPD to assist the healthcare professionals in identifying patients who might be appropriate for the study. The other brochure described the study (in terms of stress and child development) that the professionals handed to female patients whom they thought met criteria for BPD and who had a child between ages 4–7 years. Exclusionary criteria included inability to give informed consent or the presence of psychosis. Research assistants recruited comparison mothers with brochures distributed at local Boys and Girls Clubs and preschools. We also recruited mothers with BPD and comparison mothers directly from the community by posting flyers, for example, in laundromats and community centres. Flyers to attract women with BPD mentioned symptoms of BPD; flyers to attract normative comparisons did not. We provided compensation to all participants: gift cards for mothers and small toys for children.

2.2 | Procedures

2.2.1 | Home visit

After an initial phone call, two research assistants met with the mother, either at her home or at an alternative location that she suggested such as a park or other public place. We obtained informed consent, a preliminary maternal self-report screen for BPD symptoms, and demographic information. Institutional Review Boards at the university,

TABLE 1 Demographic characteristics of the sample

Variable	N = 70 M (SD)
Age (years)	
Mother	32.41 (5.04)
Child	5.37 (0.90)
Family yearly income (\$)	31,841 (27, 854)
Living in home	
Adults	1.83 (0.78)
Children	2.47 (1.16)
	%
Mother	
High school diploma (or GED)	89
Partnered	57
Child	
Sex (girls)	50
Minority race	11
Hispanic ethnicity (across race)	11

the Department of Children's Services, and at each institution from which we recruited participants approved all aspects of the study. The Department of Children's Services mandated a separate paragraph and signature on the consent form to grant permission to contact them for maltreatment data, which all participants signed.

2.2.2 | Laboratory visit

Mother–child dyads were invited to participate in a laboratory visit at a university where we assessed maternal psychopathology with a clinical interview and filmed mother–child interactions where the mother read a story to her child. We also interviewed mothers about their children's experience of maltreatment and separation from or loss of caregivers and requested permission to contact the Department of Children's Services for additional information. Children completed a set of 10 stories begun for them by a research assistant using household props and family figures to set the scene.

2.3 | Measures

2.3.1 | Emotional availability

We observed mothers interacting with their children during a 10-minute storytelling task filmed through a one-way mirror. A research assistant gave mothers a textless storybook and asked, "Please read this book to your child. It does not have any words, so read the story in a way that makes sense to you." We coded the filmed mother–child interactions with the *Emotional Availability Scales*, third edition for middle childhood (Biringen et al., 1998). These consist of six globally rated dimensions, each concerned with emotional communication and interaction in the parent–child dyad. There is support for both short- and long-term reliability and continuity across contexts (Bornstein, Gini, Putnick, et al., 2006; Bornstein, Gini, Suwalsky, Putnick, & Haynes, 2006). Because scales differed in their ranges, we standardized each prior to conducting person-centred analyses.

2.3.2 | Maternal scales

Maternal sensitivity refers to awareness of, and appropriate responsiveness to, the child's communications. Scores range from 1 (*highly insensitive*) to 9 (*highly sensitive*) with scores below 4 considered suboptimal. *Maternal structuring* denotes

the ability to facilitate the child's play, exploration, or task completion. Scores range from 1 (*non-optimal*) to 5 (*optimal*) with scores below 3 considered suboptimal. *Maternal non-intrusiveness* measures the ability to be responsive and available to the child, without interrupting the child by being interfering, overprotective, or overstimulating. Scores range from 1 (*intrusive*) to 5 (*non-intrusive*), with below 3 being suboptimal. The "non" was added to this scale and to the next (*non-hostility*) so that they run in the same direction, from non-optimal to optimal, as do the other emotional availability scales. *Maternal non-hostility* measures the ability to be patient, pleasant, and kind, rather than rejecting, abrasive, and antagonistic. Scores range from 1 (*markedly hostile*) to 5 (*non-hostile*), and scores below 3 represent suboptimal levels.

2.3.3 | Child scales

Child responsiveness refers to the child's age- and context-appropriate ability and interest in responding to the mother's bids for interaction, as well as to the child's enjoyment. Scores range from 1 (*non-optimal*) to 7 (*optimal*), with those below 4 being suboptimal. Suboptimal scores reflect either too little or too much responsiveness. Either the child demonstrates a lack of interest in, or opposition to, responding to bids from mother, or he or she responds at every instance and thus gives up autonomy to please the mother instead. The latter is termed *over-responsiveness*. The authors of the third edition of the coding system (Biringen et al., 1998) recommend noting the presence of over-responsive qualities and analysing them separately. We classified children (yes/no) for being over-responsive with the mother, displaying diminished autonomy in the process. *Child involvement* assesses the child's ability and willingness to engage the mother in interaction; scores range from 1 (*suboptimal*) to 7 (*optimal*), with scores below 4 representing suboptimal interactions. Parallel with child responsiveness, suboptimal scores on child involvement describe a child ignoring the mother or alternatively, of trying too hard to engage her. The latter is termed *over-involvement*, and as recommended (Biringen et al., 1998), we noted its presence separately with a categorical variable (yes/no).

2.3.4 | Coding

Two coders trained to reliability with the first author of the coding system (Zeynep Biringen). They then established inter-rater reliability using intraclass correlations on 20% of the current sample: sensitivity, $r_i = .78$; structuring, $r_i = .60$; non-intrusiveness, $r_i = .76$; non-hostility, $r_i = .86$; responsiveness, $r_i = .79$; and involvement, $r_i = .80$. Conferencing resolved differences between coders.

2.3.5 | Demographic risk

We collected demographic information with a maternal interview (Mt. Hope Family Center, 1995). See Table 1. Demographic variables used to assess differences in risk between clusters in emotional availability included child age, family income, child sex, and whether or not mother has a partner.

2.4 | Maternal risk

2.4.1 | Psychosocial risk

BPD

We assessed BPD with a preliminary self-report screen (First, Gibbon, Spitzer, Williams, & Benjamin, 1997), followed by the accompanying Structured Clinical Interview for DSM-IV-TR Axis II Disorders, SCID-II (First et al., 1997), which has good inter-rater reliability (Lobbstaël, Leurgans, & Arntz, 2011; Maffei et al., 1997). Fifty-one percent of the sample had BPD.

Borderline features

Maternal borderline features were assessed with the Personality Assessment Inventory (PAI; Morey, 1991). We assessed internal consistency with Cronbach's alpha (α). There are four subscales with six items each: *affective instability* (intense and unmodulated emotional experiences) $\alpha = .90$, *identity disturbance* (confusion about identity and lack of an integrated sense of self), $\alpha = .81$, *negative relationships* (acute dependence, fear of abandonment, and mistrust),

$\alpha = .81$, and *self-harm/impulsivity* (tendencies to hurt the self if distressed), $\alpha = .58$. The PAI measure of borderline features has shown good test-retest reliability (Slavin-Mulford et al., 2012). A DSM-IV diagnosis of BPD and borderline features are significantly related (Stein, Pinsker-Aspen, & Hilsenroth, 2007).

Lifetime major depressive disorder

Lifetime major depressive disorder was assessed on the basis of one or more episodes of major depressive disorder across the lifetime. We assessed maternal lifetime major depressive disorder with a preliminary self-report screen followed by the accompanying structured clinical interview for DSM-IV Axis I Disorders, SCID-I (First, Gibbon, Spitzer, & Williams, 1996). A diagnosis of lifetime major depression has good inter-rater reliability (Zanarini, 2000).

2.4.2 | Contextual risk

Social support

We assessed maternal social support using the nonsupport scale of the PAI (Morey, 1991), which has eight items. The scale assesses an individual's perceptions of the degree and availability of social support. Higher scores reflect lower levels of social support. Scores correlate highly with other measures of perceived social support such as the Perceived Social Support Scale (Procidano & Heller, 1983). Internal consistency for social support was $\alpha = .84$.

2.5 | Child risk

2.5.1 | Psychosocial

Narrative representations of mother-child relationship expectations

Each child completed 10-story stems (Bretherton, Oppenheim, Buchsbaum, Emde, & the MacArthur Narrative Group, 1990). A female research assistant sat with the child at a small table and told the beginning of each story, about conflictual or other emotionally charged themes in family life. She matched the ethnic background and gender of the child with those of family figurines. She presented the stories in a dramatic fashion with family figurines (Mom, Dad, two children, and Grandma) and props (e.g., kitchen table, stove, and car). She then asked the child to complete the stories ("Show me and tell me what happens now"), which she administered in the same order for each child in a session lasting approximately 30 minutes. Because this is consistent with developmentally appropriate play, children enjoy completing them. A research assistant filmed the session through a one-way mirror. Story stems included a child spilling juice at a family dinner, Mom and Dad arguing about who lost Mom's car keys, and Mom and Dad leaving the children with Grandma for the weekend.

The narratives created by the child by completing the story stems are coded from videotapes for variables of interest. We used the Narrative Coding Manual (Bickham & Fiese, 1999) to code *mother-child relationship expectations* directly from videotapes on a 5-point scale. A score of "1" reflects the parent-child relationship portrayed as dissatisfying, dangerous, and/or unpredictable, with serious and/or willful harm portrayed. A score of "5" reflects the parent-child relationship portrayed as safe, reliable, rewarding, and fulfilling, and the relationship provides opportunities for success and satisfaction. Coders scored mother-child relationship expectations once across all 10 narratives. Inter-rater reliability, calculated on 20% of the sample, was $r_t = .74$.

Child maltreatment and separation from, or loss of, a caregiver

We assessed child abuse and neglect with the Maltreatment Classification System (Manly, Cicchetti, & Barnett, 1994) from two sources: Department of Children's Services records and a semistructured interview with the mother, the Maternal Child Maltreatment Interview (Cicchetti, Toth, & Manly, 2002). The Maltreatment Classification System provides criteria for each subtype and is designed to assess maltreatment across multiple sources (Manly et al., 1994). We assessed each subtype of maltreatment (sexual abuse, physical abuse, neglect, and emotional abuse) and

separation from, or loss of, a caregiver categorically (present or absent) across the developmental periods of infancy to early childhood. Inter-rater reliability was assessed on 20% of the sample with Cohen's kappa (κ): for sexual abuse, $\kappa = .83$; for physical abuse, $\kappa = .78$; for neglect, $\kappa = .75$; and for separation/loss, $\kappa = .92$.

3 | RESULTS

3.1 | Preliminary analyses

Six children (8.6%) were classified as over-responsive, and six children (8.6%) were classified as over-involving. There was a 57% overlap between children who demonstrated over-responsiveness and over-involvement. Moreover, 31% of mothers had lifetime major depressive disorder; all of whom also had BPD. Thus, 61% of mothers with BPD also had lifetime major depressive disorder. Furthermore, a BPD diagnosis (yes/no) was significantly correlated with the borderline features of affective instability, $r = .82$, $p < .001$; identity disturbance, $r = .78$, $p < .001$; negative relationships, $r = .73$, $p < .001$; and self-harm, $r = .67$, $p < .001$. A cut-off of ≥ 38 has been established for clinical range of the sum of these four subscales, which is termed total borderline features (Trull, 1995). In the current sample, total borderline features were in the clinical range for the BPD group: for the BPD group, $M = 44.38$ ($SD = 13.07$); for normative comparisons, $M = 12.26$ ($SD = 8.09$); and for the sample as a whole, $M = 28.78$ ($SD = 19.48$). Finally, a majority of children had experienced maltreatment ($n = 53$, 75%), and mothers were perpetrators of at least one subtype for 47% of these children ($n = 25$).

In comparing emotional availability scores in the current, partially clinical, sample ($N = 70$) with that of Easterbrooks et al.'s, 2005 sample ($N = 80$) of adolescent mothers, we observed that the current sample had similar but mostly lower average scores. See Table 2 for emotional availability descriptives in the current sample, including

TABLE 2 Maternal and child emotional availability means by cluster and comparisons with the Easterbrooks et al. (2005) adolescent sample

Emotional availability variables	Cut-off score	Cluster 1:		Cluster 2:	Cluster 3:	Cluster 4:	
		Sample	ANOVA	High functioning	Low functioning	Asynchronous	Low average
		$N = 70$ [$N = 80$]	$F(3, 66)$	$n = 30$ (43%) [25%]	$n = 6$ (9%) [18%]	$n = 17$ (24%) [18%]	$n = 17$ (24%) [39%]
		M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	
Mother							
Sensitivity	4	5.23 (2.09) [5.60]	72.67**	7.20 ^{2, 3, 4} (1.03)	2.08 ^{1, 3, 4} (0.74)	3.50 ^{1, 2, 4} (1.35)	4.71 ^{1, 2, 3} (0.69)
Structuring	3	3.11 (1.13) [3.50]	39.29**	4.07 ^{2, 3, 4} (0.69)	1.75 ^{1, 4} (0.61)	2.09 ^{1, 4} (0.69)	2.94 ^{1, 2, 3} (0.73)
Non-intrusiveness	3	4.04 (1.03) [3.70]	46.85**	4.58 ^{2, 4} (0.53)	2.33 ^{1, 3} (1.13)	4.68 ^{2, 4} (0.39)	3.06 ^{1, 3} (0.64)
Non-hostility	3	4.08 (1.07) [4.40]	36.00**	4.80 ^{2, 3, 4} (0.43)	2.00 ^{1, 3, 4} (0.84)	4.18 ^{1, 2, 4} (0.81)	3.44 ^{1, 2, 3} (0.81)
Child							
Responsiveness	4	4.50 (1.74) [5.10]	70.63**	6.12 ^{2, 3, 4} (0.76)	1.92 ^{1, 3, 4} (0.86)	3.03 ^{1, 2, 4} (0.93)	4.03 ^{1, 2, 3} (0.98)
Involvement	4	4.51 (1.71) [4.40]	84.85**	6.13 ^{2, 3, 4} (0.74)	2.00 ^{1, 4} (0.84)	2.97 ^{1, 4} (0.89)	4.06 ^{1, 2, 3} (0.77)

Note. [] Values between square brackets are those from the Easterbrooks et al. (2005) sample. Scores at cut-off and below, indicate suboptimal emotional availability. Numerical superscripts indicate clusters that are statistically different from one another, $p < .05$. ANOVA, analysis of variance.

** $p < .01$.

comparisons with means and cluster sizes for the earlier sample. The cut-off scores, which denote suboptimal emotional availability, are those used by Biringer et al., 1998, and Easterbrooks et al. (2005).

3.2 | Analytic plan

We conducted person-centred analyses to identify groups (clusters) distinguished by a particular constellation of mother and child emotional availability variables. Cluster analysis is ideal for studies in which two samples are combined (von Eye & Bergman, 2003). In this study, we combined samples of mothers with BPD and mothers with no disorder. We then examined differences between the clusters on child over-responsiveness and over-involvement, and on demographic, maternal and child risk. Similar to Easterbrooks et al. (2005), we conducted chi-squared tests for categorical variables and analyses of variance for continuous variables.

3.3 | Hypothesis testing

3.3.1 | Identifying patterns of emotional availability

To test Hypothesis 1, that there would be confirmation of three synchronous and one asynchronous clusters of emotional availability, we included four maternal variables (sensitivity, structuring, non-intrusiveness, and non-hostility), and two child variables (responsiveness and involvement) in person-centred analyses. All variables had been standardized so that different ranges in the scales would not impact distance measures (Aldenderfer & Blashfield, 1984). We conducted a *k*-means cluster analysis, which assigns cases to prespecified numbers of clusters (*k*) on the basis of the Euclidean distance from the group centres (Aldenderfer & Blashfield, 1984; Hill & Lewicki, 2007). The goal of the *k*-means method is to produce exactly *k* different clusters of greatest possible distinction, with minimum variability within, and maximum variability between, clusters (Hill & Lewicki, 2007).

As hypothesized, there were four clusters: three synchronous and one asynchronous. Cluster 1, *n* = 30, labelled “*high functioning*” was characterized by optimal emotional availability. Cluster 2, *n* = 6, labelled “*low functioning*” was characterized by suboptimal emotional availability. Cluster 3, *n* = 17, labelled “*asynchronous*” was characterized by mothers being above average on non-intrusiveness and non-hostility (but below average on sensitivity and structuring), and children below average in their emotional availability. The asynchronous group thus differed from that found by Easterbrooks et al. (2005) with infants such that mothers were not above average on all maternal variables. Cluster 4, *n* = 17, labelled “*low average*” lay in between the high and low-functioning clusters. The Easterbrooks et al. (2005) group was average rather than low average on overall emotional availability. The proportion of dyads in each cluster also varied between the Easterbrooks et al. (2005) sample (*N* = 80) and the current one (*N* = 70): In the Easterbrooks et al. (2005) sample, there was a lower percentage in the high-functioning cluster, higher in the average/low-average cluster, higher in the low-functioning cluster, and lower in the asynchronous cluster. See Table 2 for means of emotional availability by cluster and comparisons with Easterbrooks et al. (2005). See Figure 1 for a graphic representation of current clusters.

3.3.2 | Patterns of emotional availability and child over-responsiveness and over-involvement

To test Hypothesis 2, we conducted a chi-squared analysis and found that the asynchronous cluster was significantly associated with child over-responsiveness, $\chi^2(3, N = 70) = 12.95, p < .01$, and child over-involvement $\chi^2(3, N = 70) = 20.46, p < .001$, as hypothesized. All but one child who displayed over-responsiveness, *n* = 5, and all children who displayed over-involvement, *n* = 6, were in the asynchronous cluster. Fisher's exact tests found significantly more child over-responsiveness in the asynchronous cluster than in the high-functioning cluster and significantly more over-involvement in the asynchronous cluster than in both the high- and low-average functioning clusters, *p* < .05.

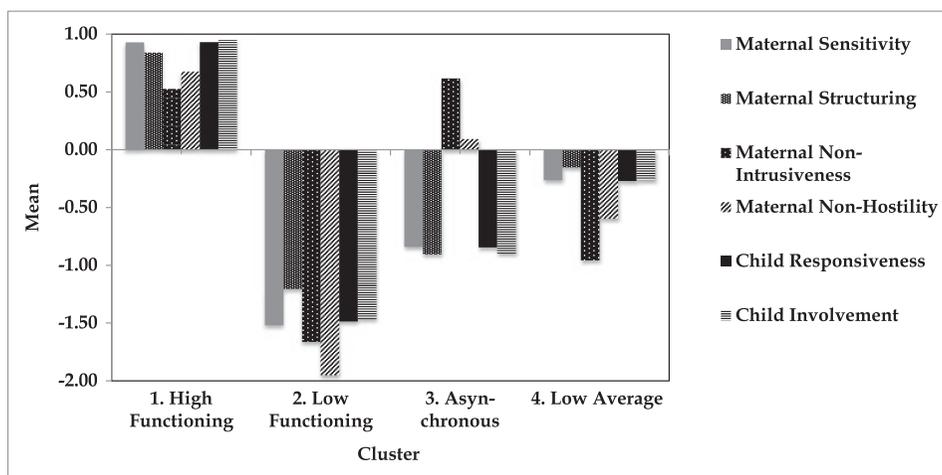


FIGURE 1 Emotional availability scores by cluster show markedly different patterns, with the high-functioning cluster showing strong positive deviations from the mean, the low-functioning cluster showing strong negative deviations from the mean, and the asynchronous cluster showing mothers looking more positive than do their children

3.3.3 | Patterns of emotional availability, risk factors, and child sex

We then tested Hypothesis 3 for differences among the four clusters (independent variables) on demographic, maternal, and child risk factors (dependent variables). We conducted analyses of variance and Tukey's post hoc comparisons for continuous variables, and chi-squared analyses and Fisher's exact tests for categorical variables. See Table 3 for tests of significance for differences on all risk factors. As hypothesized, mothers in the high-functioning cluster reported higher family income, more social support, less of the borderline feature of negative relationships (but not less affective instability and identity disturbance or self-harm) than did the low-functioning cluster. Furthermore, mothers in the high-functioning cluster were more likely to have a partner than were those in the low-functioning cluster. They were also less likely to have lifetime major depressive disorder than were those in the low-functioning and low average clusters. However, there were no significant differences on a categorical diagnosis of BPD, contrary to prediction.

Also as hypothesized, fewer children in the high-functioning cluster experienced maltreatment than in the low average cluster (even though 63% of children in the high-functioning cluster had experienced maltreatment). Fewer children in the high-functioning cluster had experienced physical abuse, separation from, or loss of, caregivers compared with children in the low-functioning cluster, and fewer had experienced neglect than in the low-functioning and low average clusters. Children in the high-functioning group told stories with higher mother-child relationship expectations than did children in the low-functioning cluster. Unexpectedly, the asynchronous cluster also demonstrated high mother-child relationship expectations in the children's stories similar to the high-functioning cluster. The asynchronous cluster consisted of older children, as hypothesized.

We explored demographic factors of child sex with no specific hypotheses and found that the asynchronous cluster consisted of more girls compared with the high-functioning cluster. We also explored the low-average cluster with no specific hypotheses. The low-average cluster consisted of younger children and lower mother-child relationship expectations in their stories, than in the asynchronous group. Indeed, these children had experienced more maltreatment, specifically neglect and emotional abuse, than had children in the high-functioning group. Their mothers had more lifetime major depression, but there were no significant differences on family income, having a partner, or borderline features, compared with the high-functioning group. See Table 3 for tests of cluster differences.

TABLE 3 Continuous and categorical demographic, maternal, and child variables by cluster

Variables	Test	Overall sample (N = 70)	Cluster 1: high functioning (n = 30)	Cluster 2: low functioning (n = 6)	Cluster 3: asynchronous (n = 17)	Cluster 4: low average (n = 17)
Continuous						
	F(3, 36)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)
Demographic						
Child age	3.09*	5.37 (0.90)	5.44 (0.91)	5.01 (0.81)	5.78 ⁴ (0.76)	4.95 ³ (0.87)
Income (\$)	2.72***	31, 841 (27,854)	41, 080 ² (34,716)	10,722 ¹ (5,654)	27,484 (22,552)	27,347 (16,552)
Maternal						
Affective instability	0.91	8.16 (6.16)	6.87 (6.17)	10.00 (7.51)	8.41 (5.34)	9.53 (6.48)
Identity problems	1.21	7.33 (5.41)	6.49 (5.95)	10.67 (5.43)	6.76 (3.70)	8.18 (5.74)
Negative relationships	3.03*	9.40 (5.59)	7.90 ² (5.91)	15.00 ¹ (3.03)	9.94 (4.88)	9.53 (5.32)
Self-harm/impulsivity	1.08	3.90 (4.34)	3.67 (5.15)	6.00 (4.73)	2.76 (2.46)	4.71 (4.04)
Nonsupport	2.81*	6.73 (6.15)	5.33 ² (6.34)	13.00 ¹ (7.90)	6.88 (4.65)	6.73 (6.15)
Child						
Mother-child relationship expectations	4.95**	2.90 (1.46)	3.17 ² (1.26)	1.50 ^{1,3} (0.84)	3.53 ⁴ (1.46)	2.29 ³ (1.49)
Categorical						
	χ^2	N	n	n	n	n
Demographic						
Child gender (girls)	6.90***	35 (50%)	12 ³ (40%)	3 (50%)	13 ¹ (73%)	7 (41%)
Mother partnered	8.89*	40 (57%)	18 ² (60%)	0 ^{1,3,4} (0%)	11 ² (65%)	11 ² (n = 65%)
Maternal						
Borderline personality disorder	1.73	36 (51%)	13 (43%)	4 (67%)	9 (53%)	10 (59%)
Lifetime major depression	8.45*	22 (31%)	5 ^{2,4} (17%)	4 ¹ (67%)	5 (29%)	8 ¹ (47%)
Child						
Overall maltreatment	7.80*	53 (76%)	19 ⁴ (63%)	6 (100%)	12 (71%)	16 ¹ (94%)
Physical abuse	6.31***	11 (16%)	3 ² (10%)	3 ¹ (50%)	3 (18%)	2 (12%)
Sexual abuse	0.68	7 (10%)	3 (10%)	1 (17%)	2 (12%)	1 (6%)
Neglect	9.01*	30 (43%)	8 ^{2,4} (27%)	5 ¹ (83%)	7 (41%)	10 ¹ (59%)
Emotional abuse	8.58*	43 (61%)	13 ⁴ (43%)	5 (83%)	11 (65%)	14 ¹ (82%)
Separation/loss	7.04***	26 (37%)	8 ² (27%)	5 ¹ (83%)	6 (35%)	7 (41%)

(Continues)

TABLE 3 (Continued)

Variables	Test	Overall sample (N = 70)	Cluster 1: high functioning (n = 30)	Cluster 2: low functioning (n = 6)	Cluster 3: asynchronous (n = 17)	Cluster 4: low average (n = 17)
Continuous						
	<i>F</i> (3, 36)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
Emotional availability						
Child over- responsiveness	12.95**	6 (9%)	0 ³ (0%)	0 (0%)	5 ¹ (29%)	1 (6%)
Child over- involvement	20.46**	6 (9%)	0 ³ (0%)	0 (0%)	6 ^{1,4} (35%)	0 ³ (0%)

Note. Numerical superscripts indicate clusters that are statistically different from one another, ($p < .05$).

* $p < .05$.

** $p < .01$.

*** $p < .10$.

4 | DISCUSSION

We examined differential patterns of emotional availability in a high-risk sample in which 51% of mothers had BPD. We observed mothers with their young children aged 4 to 7 years and reliably coded emotional availability from filmed mother–child interactions. Using a multimodal design, we derived four patterns (clusters) of six dimensions of mother–child emotional availability and examined their relationship to risk factors within an ecological framework (Bronfenbrenner & Ceci, 1994). In this way, we extended the Easterbrooks et al. (2005) work with adolescent mothers of infants to a partially clinical sample of adult mothers of young children.

We confirmed Easterbrooks et al. (2005)'s four clusters of emotional availability (three synchronous and one asynchronous) found in a high-risk sample of adolescent mothers and infants. However, the average cluster found by Easterbrooks et al. (2005) was low average in the current sample. Moreover, the nature of the asynchronous cluster differed from that found with infants by Easterbrooks et al. (2005), such that although young children were below average and mothers above average on non-intrusiveness and non-hostility, mothers were below average on sensitivity and structuring, suggesting a passive stance for the mothers. In the high-functioning cluster, both mothers and children showed optimal emotional availability behaviours. Mothers were highly sensitive and successfully structured interactions with their children, and in turn, their children were responsive to, and involving of, their mothers. In contrast, in the low-functioning cluster, mothers demonstrated the lowest emotional availability and were intrusive and hostile during interactions with their children. Mothers displayed very few instances of sensitive behaviours and struggled to engage their children. Their children demonstrated the lowest responsiveness and involvement, indicating a significant lack of interest and pleasure in relating to their mothers. The proportion of dyads in each cluster varied between the Easterbrooks et al. (2005) sample ($N = 80$) and the current one ($N = 70$): In the Easterbrooks et al. (2005) sample, there were lower percentages in the high-functioning cluster, more in the average/low average, more in the low-functioning cluster, and fewer in the asynchronous cluster. This may reflect a more uniform risk across the adolescent sample, and the inclusion of more severe risk factors in the current sample of older mothers, 51% of whom had BPD.

We compared the high-functioning cluster ($n = 30$) to that of the low-functioning cluster ($n = 6$). The low-functioning cluster, analogous to findings in Easterbrooks et al. (2005) was characterized by lower family income, mothers who were less likely to have a partner, mothers who were more likely to have a diagnosis of lifetime depressive disorder, and mothers who reported less social support. Moreover, the low-functioning cluster also scored higher than the high-functioning cluster on variables associated with the aetiology of BPD. Children in the low-functioning cluster

told stories where mother–child relationship expectations were significantly more dangerous and more frightening, which is thought to be a precursor to BPD (Macfie & Swan, 2009). Furthermore, all six dyads classified as low functioning had experienced maltreatment, with significantly more physical abuse, neglect, and separation from, or loss of, a caregiver than had children in the high-functioning cluster. The experience of maltreatment, and separation from, or loss of, caregivers both predict BPD in longitudinal studies (Carlson et al., 2009; Crawford, Cohen, Chen, Anglin, & Ehrensaft, 2009). However, maternal BPD did not align perfectly with this cluster. Mothers in the low-functioning cluster reported more of the borderline feature or negative relationships than did mothers in the high-functioning cluster, but there were no significant differences on affective instability, identity disturbance, or self-harm. Maternal negative relationships may be more immediately salient for emotional availability in mother–child interactions than the other features. Negative adult relationships may replicate in relationships with offspring, including the perpetration of maltreatment, which was the case for almost half of the current sample. Moreover, although four mothers (67%) in the low-functioning cluster had a diagnosis of BPD, which was the highest percentage among the clusters, this was not significantly different from that of the high-functioning cluster, perhaps because of a lack of power due to the size of the low-functioning cluster ($n = 6$).

This combination of risk factors found in the low-functioning cluster may however make the development of BPD for these children more likely in early adulthood (Macfie, 2009), especially if combined with an emotionally reactive temperament (Crowell et al., 2009; Linehan, 1993). However, despite the severe maternal psychopathology that characterized approximately half of the sample, the group of children with suboptimal emotional availability and facing the highest risk was small, reflecting resilience in most dyads that were able to maintain at least low-average emotional availability despite challenges.

Mothers in the asynchronous cluster in the current sample demonstrated low sensitivity and structuring, together with above average non-intrusiveness and non-hostility (passivity). Their children displayed suboptimal levels of responsiveness and involvement, and, as hypothesized, this was due to *over-* rather than *under-*responsiveness and involvement. These children were significantly more likely than were children in the high-functioning cluster to work overly hard to try to engage their mothers. The difference between the asynchronous groups in Easterbrooks et al. (2005) and this study may reflect the difference in the ages of the children. In infancy, Easterbrooks et al. (2005) suggested that the asynchrony reflected a lack of “goodness of fit” in the dyads. However, by the preschool period, the mother–child relationship becomes more of a goal-corrected partnership, which puts extra demands on mothers to respond (Main, Kaplan, & Cassidy, 1985). Indeed, this cluster consisted of the oldest children, (significantly older than children in the low-average group), and the most girls, and their stories revealed mother–child relationship expectations as safe, and as rewarding, as those in the high-functioning cluster.

Girls are theorized to be more prone to prosocial behaviour than are boys as they get older because they learn to value continued relatedness with their mothers, whereas boys are more likely to learn to value independence (Chodorow, 1978). These girls may have been old enough consciously to relinquish some autonomy to gain an increased feeling of emotional security in the relationship with their mothers (Davies & Cummings, 1994). To do this, they may have tried to engage with their mother in a role reversal with the child, taking on a role more appropriate to the parent than to a young child (Macfie et al., 2015). Indeed, these children's representations of the mother–child relationship expectations may also have reflected attempts to please, because they were unexpectedly positive and idealized, given the mothers' passive stance. However, we should interpret these findings cautiously because there were no a priori hypotheses for child sex.

Mothers and children in the low-average cluster fell between the other clusters. Interestingly, although these mothers were more likely to experience lifetime major depression, they did relatively well with respect to family income, having a partner, and having low-borderline features. Their children had experienced more maltreatment, specifically emotional abuse, than had children in the high-functioning cluster. These children's representations of the mother–child relationship were more positive than were those in the low-functioning cluster, but more negative than those in the asynchronous cluster. In a hierarchy of subtypes of abuse, emotional abuse is considered less severe than sexual abuse, physical abuse, and neglect (Manly et al., 1994). However, retrospectively self-reported childhood

emotional abuse (not sexual abuse, physical abuse, or physical or emotional neglect) was uniquely associated with a dampened cortisol response (Carpenter et al., 2009), which may have pre-disposed these children to psychopathology in adulthood. These conclusions are tentative, however, because of the post hoc nature of the findings.

Limitations of this study include a small low socio-economic sample with little ethnic diversity. In addition, we did not assess birth order of the children, which may have made a difference with mothers' experience and thus emotional availability. Furthermore, although more risk factors were examined with this sample of young children than in the previous study with infants (Easterbrooks et al., 2005), other risk factors such as child temperament should ideally be included in future research (Chess & Thomas, 1999). Additionally, although we assessed BPD both as a categorical diagnosis and along a continuum of self-reported borderline features, we did not do the same for depression. This may have limited our understanding of the relationship between depression and clusters of emotional availability. Moreover, we used the third edition of the Emotional Availability Scales (Biringen et al., 1998). In the fourth edition (Biringen, 2008), two additions would be useful in future studies: clinical rating scales and separate subscales for child over-responsiveness and over-involvement. Finally, a major limitation is the cross-sectional design. Without longitudinal data, we are limited to description of the relationship between emotional availability and risk factors rather than being able to examine how they influence each other over time and result in resilient versus maladaptive outcomes for children (Sameroff, 2000).

There are important implications for preventive interventions, for both mothers and children in the low-functioning cluster. The relative lack of emotional availability could reflect the mother's inability to read a child's emotional signals and make sense of her own or the child's behaviour in terms of mental states such as thoughts, beliefs, and feelings, termed mentalization (Fonagy, Target, Steele, & Steele, 1998). Mentalization-based therapy is an evidence-based treatment that reduces symptoms of BPD by improving mentalization, gains which continue after treatment has ended (Bateman & Fonagy, 2001, 2008). Moreover, Child-Parent Psychotherapy, where both child and parent meet together with a therapist, also focuses on improving mentalization (Lieberman, 1992; Lieberman, Silverman, & Pawl, 2000). Indeed, Child-Parent Psychotherapy successfully improved maltreated preschoolers' representations of the parent-child relationship portrayed in their stories (Toth, Maughan, Manly, Spagnola, & Cicchetti, 2002). Similarly, parent-child interactive therapy improved emotional availability in normative and clinical populations (Suchman & Luthar, 2001). Furthermore, an Early Head Start intervention resulted in gains in emotional availability, particularly for those with multiple risks (Robinson & Emde, 2004). In order to clarify who is in need of an intervention, it would be helpful to develop a screen for emotional availability. Improved emotional availability would help provide a buffer for children growing up in high-risk situations and lower their own chances of maladaptation and the development of psychopathology, including BPD.

Children in the low-functioning cluster faced many risk factors, and the opposite of each one served as protective factors for the high-functioning cluster. The cumulative risk hypothesis (Deater-Deckard, Dodge, Bates, & Pettit, 1998; Rutter, 1979) may be relevant to current findings. It is theorized that the accumulation of risk factors, more than any particular one, makes the development of disorder more likely (Hoffman, Crnic, & Baker, 2006; Sameroff, 2000). Bornstein, Suwalsky, & Breakstone (2012) wrote eloquently about emotional availability's generating energy for both parent and child development such that, "... mother and infant take each other's measure and jointly shape the dyadic path they travel together" (p. 120). Minimal levels of emotional availability found in the low-functioning cluster may not allow the growing child to thrive and reach his or her potential. Future research might examine the constellation of factors surrounding these children in terms of low emotional availability, demographic, maternal, and child risk, which may potentiate a pathway to psychopathology, including the development of BPD.

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How to cite this article: Trupe RD, Macfie J, Skadberg RM, Kurdziel G. Patterns of emotional availability between mothers and young children: Associations with risk factors for borderline personality disorder. *Inf Child Dev*. 2017:e2046. <https://doi.org/10.1002/icd.2046>