

MULTIMODAL ASSESSMENT OF THE MOTHER–CHILD RELATIONSHIP IN A SUBSTANCE-EXPOSED SAMPLE: DIVERGENT ASSOCIATIONS WITH THE EMOTIONAL AVAILABILITY SCALES

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ABSTRACT: The aim of this study was to compare ratings of mother–child relationship quality from diverse assessment perspectives. The quality of the mother–child relationship was rated in a sample of 34 mothers with substance-use difficulties and their children using the Emotional Availability Scales (EAS; Z. Biringen, 2008), based on videotaped observation of a 20-min, free-play session. These ratings were compared to clinician ratings on the Parent–Infant Ratings Global Assessment Scale (PIR-GAS; ZERO TO THREE, 2005) and maternal ratings on the Parenting Stress Index–Short Form (PSI-SF; R.R. Abidin, 1995). Ratings on the Emotional Attachment and Emotional Availability (EA2) Clinical Screener (EA2 Clinical Screener) and adult dimensions of the EAS (particularly maternal sensitivity), but not child dimensions, were associated with clinician ratings on the PIR-GAS. In contrast, child dimensions of the EAS, but not adult dimensions, were associated with maternal ratings on the Child scales of the PSI-SF (particularly parent–child difficult interactions). While clinician ratings seem to be more sensitive to maternal contributions to the relationship, maternal ratings seem to emphasize child behaviors. Results highlight the importance of multimethod assessment in fully capturing the transactional nature of the mother–child relationship in high-risk samples. The validity of the EA2 Clinical Screener as an index of the quality of mother–child relationship in a high-risk, substance-exposed sample is also supported.

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The quality of an infant's relationship with his or her primary caregiver sets a critical context for healthy development (e.g., Bornstein, 2002; Bornstein, Hendricks, Haynes, & Painter, 2007; Skovgaard et al., 2007). Unfortunately for mothers struggling with substance abuse and their children with prenatal substance exposure, this context is generally compromised. Observations of these mother–child dyads reveal a difficult interactional pattern in which

the mother lacks sensitivity and has a difficult time adjusting her own behaviors and emotional needs to support the needs of her child, while the child struggles with limited regulatory capacities and requires extra support (Pajulo et al., 2011). These relational difficulties are exacerbated by the myriad of risk factors associated with a substance-using lifestyle including, but not limited to, poverty, single-parenthood, maternal history of neglect and abuse, and maternal mental health difficulties (e.g., Motz et al., 2012; Nair, Schuler, Black, Kettinger, & Harrington, 2003). The cumulative effect of these stressors places the dyad at increased risk for maladaptive interaction patterns, and the child at risk for neglect and abuse (e.g., Coyl, Roggman, & Newland, 2002; Pajulo et al., 2011; Suchman, Mayes, Conti, Slade, & Rounsaville, 2004). Children exposed to maternal substance abuse and associated risk factors frequently end up in kinship placements or permanent foster care (Mayes & Bornstein, 1996). With the recent rise in dyadic treatment approaches to maternal substance abuse (Goldman Fraser, Harris-Britt, Thakkallipalli, Kurtz-Costes, & Martin, 2010; Pajulo et al., 2011; Suchman et al., 2010; Suchman, DeCoste, McMahon, Rounsaville, & Mayes, 2011), however, more of these children are being seen in clinical contexts while still in the care of their biological mothers. As such, it has become imperative, from a program-evaluation and child-safety perspective, to be able to adequately assess the quality of these relationships.

Data are not unequivocal regarding the quality of these relationships, which are influenced by a number of factors including: the presence or absence of maternal social supports, the occurrence of stressful life events, and the child's temperamental reactivity (e.g., Bornstein et al., 2007; Eiden, Schuetze, & Coles, 2011; Goldman Fraser et al., 2010). Another important consideration is the methodological approach taken to assess these relationships. Variations in the length, context, and mode (e.g., self-report, clinical assessment, observation) of assessment (Biringen et al., 2005) can significantly alter how these relationships are viewed. The ways in which data from distinct assessment methods (e.g., self-report, clinical assessment, observation) converge and diverge, and whether discrepancies between measures yield meaningful information, has not yet been systematically examined, however.

MULTIMETHOD ASSESSMENT OF MOTHER–CHILD RELATIONSHIP QUALITY

All methodological approaches to measuring psychological constructs have inherent strengths as well as weaknesses that render the use of individual measures alone problematic. Any single measure on its own can provide only a partial picture of the behavior of interest, at best, that is inherently biased by the rater's perspective (Meyer et al., 2001). In a broad survey of the research literature, Meyer et al., (2001) found a high degree of independence between distinct assessment methodologies designed to measure the same construct, with associations across informants (e.g., self, clinician, parent, peer, child) and modes of assessment (e.g., observed behaviors, task performance, self-reports) in the low to moder-

ate range. Method disparities were evident in clinical practice as well, with only moderate correspondence between patients, clinicians, and observers in terms of the patient's current functioning, progress, and diagnosis. Based on principles for optimal nomothetic research, Meyer et al. recommended the use of a multimethod approach in clinical research and practice to enhance methodological validity and to prevent "monomethod bias." Moreover, they suggested that variability stemming from the juxtaposition of multiple assessment methods provides a unique source of information that can reveal greater complexity in the construct of interest than can one method alone. Indeed, patterns of both divergence and convergence between methods have been found to reflect clinically meaningful sources of information regarding clinical diagnosis and treatment (e.g., Hourigan, Goodman, & Southam-Gerow, 2011; Prinstein, Nock, Spirito, & Grapentine, 2001; Sims & Lonigan, 2012, 2013; Vliegen, Luyten, & Biringen, 2009). For example, Vliegen et al. (2009) found convergence between reports by clinically depressed mothers of their own hostility, but not their own intrusiveness, and observation-based ratings. This methodological variance revealed a critical level of self-awareness on the part of these mothers, at least regarding certain behaviors, providing a critical starting point for intervention.

The nature of the mother–child relationship in polysubstance-exposed dyads has only recently begun to be elucidated, and it may be particularly informative to assess the dyadic quality of these relationships from multiple perspectives, instead of relying on single, self-report measures. We sought to extend the small body of extant research on the quality of the relationship between children with polysubstance exposure and their mothers with substance-abuse issues using a multimethod framework. To this end, we compared relatively objective, observation-based ratings on the Emotional Availability Scales, fourth edition (EAS; Biringen, 2008) with maternal self-report on the Parenting Stress Index-Short Form (PSI-SF; Abidin, 1995) and clinician ratings on the Parent–Infant Ratings Global Assessment Scale (PIR-GAS; ZERO TO THREE, 2005).

EAS: OBSERVATION-BASED RATINGS

According to the transactional model of development, the quality of the mother–child relationship is a product of both the mother and the child mutually influencing each other (Sameroff, 2009; see, e.g., Molitor & Mayes, 2010; Paley, O'Connor, Kogan, & Findlay, 2005). Despite an emphasis in the attachment literature on the importance of maternal sensitivity in forming secure attachment relationships, Biringen (2008) took a transactional approach in developing the EAS, fourth edition, recognizing that maternal sensitivity does not just depend on what the mother contributes to the relationship but also on what the child contributes. As a result, EAS ratings are dyadic in nature, recognizing these bidirectional influences. Emphasis is on the emotional attunement between mother and child during social interactions while also taking the context into account (e.g., Beeghly, 2012; Biringen, 2000). In addition, the EAS provides a multidimensional assessment of the

relationship, recognizing the broad range of maternal behaviors (sensitivity, structuring, nonhostility, and nonintrusiveness) and child behaviors (involvement and responsiveness) that contribute to the relationship.

Although the EAS is increasingly utilized in both research and clinical contexts as a standardized tool for assessing the quality of the mother–child relationship (Vliegen, 2006), it has rarely been used with polysubstance-exposed dyads, particularly in a North American context. Existing studies show that dyads including children with substance exposure demonstrate poorer EA than do dyads with nonexposed children (Salo et al., 2009; Salo et al., 2010); that negative and idealized parenting expectations predict poor EA in these mothers (Flykt et al., 2012); that maternal hostility predicts poor attachment outcomes (disorganized) in these children (e.g., Swanson, Beckwith, & Howard, 2000), and that the behaviors of both members of these dyads are less optimal (i.e., the mothers are less sensitive and more hostile, and the children are less responsive) than are the behaviors of dyads who are not at risk due to maternal substance abuse (Goldman Fraser et al., 2010). Taken together, these studies support the transactional nature of the relational challenges faced by these high-risk dyads, emphasizing the importance of assessing contributions of both members of the dyad.

PSI: MATERNAL SELF-REPORT

While observation-based ratings are useful in providing a fairly objective, standardized assessment of the mother–child relationship, these ratings are limited in focus to directly observable behavior. Despite the many limitations of self-report, the most obvious being the lack of objectivity, self-report offers a means of assessing psychological influences (parenting beliefs, expectations, and motivations) on parenting behaviors, which are strongly associated with parent–child interactional patterns and child behavioral outcomes (e.g., Abidin, 1992; Bagner et al., 2009). The PSI (Abidin, 1990, 1995) was developed in recognition of this potential for self-report to add greater complexity to our understanding of the determinants of parenting behaviors.

Like the EAS, the PSI-SF is dyadic in nature in that it considers both parent and child contributions to stress due to parenting. The short-form of the PSI (PSI-SF; Abidin, 1995), used in this study, is comprised of two main subscales: a Parent Scale that focuses on the parent's own distress due to factors not directly related to the child (e.g., restriction in roles outside of parenting, impaired sense of parenting competence, conflict with coparent, lack of support and depression) and a Child scale that focuses on parenting stress experienced in direct relation to the child (e.g., child does not meet maternal expectations, unsatisfying mother–child interactions, challenging child characteristics) (Bigras, LaFreniere, & Dumas, 1996). Although a number of studies have linked the PSI with observed mother and child behaviors (e.g., Birgras et al., 1996; Teti, Nakagawa, Das, & Wirth, 1991), only a few have used the PSI-SF. In one study in which parenting behaviors were observed in an Early Head Start sample, Whiteside-Mansell et al. (2007) found that parental reports of stress on the Parent scale and on the

Parent–Child Dysfunctional Interaction dimension of the Child scale, were associated with observed parenting behaviors assessed in the home (e.g., punity, emotional responsiveness). McMahon and Meins (2012) used the EAS to rate observed parenting behaviors in a nonclinical sample and also found convergence between maternal ratings of stress on the PSI-SF Parent scale (The Child scale was not included.) and observed parenting behaviors such as sensitivity, hostility, and intrusiveness. In another study involving a nonclinical sample that included observations of both parent and child behaviors, Haskett, Ahern, Ward, and Allaire (2006) found that parental ratings of stress on both the Parent and Child scales of the PSI-SF were associated with observed child behaviors (positive child behaviors), but only ratings on the Child scale were associated with observed parenting behaviors (sensitivity). These findings point to a high degree of convergence between parental ratings of stress in relation to both self and child, and more objective ratings of observed parenting and child behaviors, albeit data are limited. To our knowledge, no study to date has examined the pattern of convergence and divergence between both Parent and Child scales on the PSI-SF and observed parent and child behaviors using the EAS, particularly in a high-risk, substance-exposed sample.

PIR-GAS: CLINICIAN RATINGS

Clinical assessment provides another distinct means of evaluating mother–child relationship quality that—like maternal self-report—is somewhat subjective in nature, yet offers several advantages. Whereas client self-report is heavily biased by expectations for what is normal based on past experiences, clinicians tend to have a more normative reference for making judgments. Clinical knowledge and experience afford clinicians the ability to make finer discriminations and they can base their judgements on direct observation of mother–child interactions rather than on personal experience alone (e.g., Westen & Weinberger, 2004). Moreover, unlike maternal self-report, clinician ratings are not limited by defensive and self-presentational biases. Although a clinician's theoretical framework can bias his or her judgments, potential sources of bias can be overcome using well-validated instruments (Westen & Weinberger, 2004).

One common measure of the mother–child relationship used in the clinical context is the PIR-GAS from the DC: 0–3R (ZERO TO THREE, 2005). Like the EAS and the PSI-SF, the PIR-GAS captures dyadic contributions to the relationship by considering the functioning of the mother and child independently. However, ratings are provided on only a single dimension that emphasizes the impact of relationship disturbances (taking the nature, extent, and length of the disturbance into account) on the adaptive functioning of the dyad. To our knowledge, only one study has previously compared clinician ratings on the PIR-GAS to ratings on the EAS. Motz et al. (2012) found a moderate association of the PIR-GAS with the Emotional Attachment and Emotional Availability (EA2) Clinical Screener (now referred to as the *EA2 Clinical Screener*) recently included in the fourth edition of the EAS (Biringen, 2008),

supporting the validity of the PIR-GAS in a substance-exposed sample.

PRESENT STUDY

Previous research has demonstrated that high-risk mothers in treatment for substance abuse score lower on overall EA than do demographically matched mothers without substance-abuse problems (Goldman Fraser et al., 2010). We sought to extend this knowledge by obtaining a more nuanced perspective of these relationships through multiple methods of assessment. Our main objective was to clarify important differences in how these relationships are understood depending on assessment approach and whether these differences are informative. Despite the wide use of the EAS, the PIR-GAS, and the PSI-SF in both clinical practice and research, this study is the first to compare ratings on all three measures in a substance-exposed sample.

Specific *a priori* predictions based on past research were that observed mother and child behaviors on the EAS would be negatively associated with maternal perceptions of stress on the Parent and Child scales of the PSI-SF (e.g., McMahon & Meins, 2012), such that higher stress would be associated with lower EA. However, we expected maternal ratings on the Child scale to be more strongly associated with both observed mother and child EA than maternal ratings on the Parent Scale (Bigras et al., 1996; Haskett et al., 2006). Given that clinical assessment is relatively more objective than is maternal self-report (Westen & Weinberger, 2004), we expected stronger associations between clinician ratings on the PIR-GAS and both observed maternal and child EA than between maternal self-report (PSI-SF) and the observation-based measures. Finally, we did not expect a high degree of correspondence between clinician ratings and maternal self-report (Westen & Weinberger, 2004).

A secondary goal of this study was to explore the utility of the EA2 Clinical Screener as a clinical and research tool for categorizing the dyadic nature of the mother–child relationship. Like the EAS, the EA2 Clinical Screener is designed to capture dyadic contributions of both mother and child to the relationship. Like the PIR-GAS, ratings on the EA2 Clinical Screener are categorical such that ratings are made on a scale of 1 to 100 (Emotionally Available: 81 – 100; Complicated: 61 – 70; Emotionally Unavailable: 41 – 60; and Problematic: 1 – 40) and are meant to represent a first impression of the global EA functioning of the dyad. However, the EA2 Clinical Screener is dimensional in nature to the extent that both parenting and child dimensions of emotional availability (EA) are taken into consideration for the ratings, and ratings are based on classic attachment categories. Despite the ease with which the EA2 Clinical Screener can be administered and its capacity to tap both maternal and child contributions to the relationship, the potential utility of the recent EA2 Clinical Screener as a clinical and research tool has not yet been fully investigated. Due to the lack of previous research with the EA2 Clinical Screener, we took an exploratory approach to analyzing associations between

the Screener, the PIR-GAS, and the PSI-SF, without formulating specific *a priori* predictions.

METHOD

Participants

The sample for this study was drawn from Breaking the Cycle (BTC), a Toronto-based children's mental health/early intervention program for substance-exposed infants and young children (0–6 years of age) and their mothers, that is focused on promoting healthy mother–child relationships (Motz, Leslie, Pepler, Moore, & Freeman, 2006). A subsample of 34 high-risk mother–child dyads were selected for the present study from the larger sample of women participating in intervention services at BTC. All women who met the following criteria were included in this study: (a) The mother, a BTC client, had consented to participating in research, (b) the mother and child had participated in a videotaped observation between September 2005 and July 2010 inclusive, and (c) the child was living with his or her biological mother at the time of the observation. Institutional Review Board approval was obtained for this particular study. Demographic data for the sample were obtained from information collected as part of the intake process at BTC, and were based on maternal self-report (discussed next).

Demographic Information

Mothers. At the time of intake, mothers in the current study ranged in age from 17 to 40 ($M = 28.8$, $SD = 5.4$) years, and the majority (71%) were of North American or European descent while a smaller percent (29%) indicated their ethnicity as African (15%), Aboriginal (6%), Caribbean (6%), and South American (3%). Fifty-three percent of mothers reported that they had completed high school. Just less than one third of mothers were uniparous while 67.6% were multiparous (2 children: 38.2%, 3 children: 11.8%, 4 children: 14.7%, 5 children: 2.9%). On average, mothers had given birth to 2.18 children ($SD = 1.14$). The majority of mothers were living with one of their children (70.6%); the rest were living with two children (29.4%). None of the mothers had custody of more than two of their children. Of the mothers for whom data were available, almost all (97%; $n = 33$) were unemployed at intake, and 72.7% ($n = 22$) had annual incomes below \$15,000. Almost all of the women (88.2%) reported experiencing sexual, physical, and/or emotional abuse at some point in their lives. While all women reported experiencing addiction to multiple substances since adolescence, the most commonly reported primary substances of addiction were crack (35%) and alcohol (21%). Other substances used included cocaine (15%), cannabinoids (9%), and other drugs, including oxycodone and other opiates, amphetamines/methamphetamines, and ecstasy (20%). At intake, just over half of the women (53%) reported that they had abstained from their primary substance of addiction in the past 3 months while 27% reported daily use, 18% less than daily, and 3% weekend use. One fourth of the women reported experiencing

symptoms of depression and anxiety in the clinical range on the Center for Epidemiologic Studies Depression Scale (Radloff, 1977) and on the Beck Anxiety Inventory (Beck & Steer, 1993).

Children. A total of 34 children (16 male, 18 female) were included in this study. At the time of observation, the children were between 12 and 40 ($M = 19.53$, $SD = 8.31$) months of age. According to maternal report, child welfare was or had been involved with 91.2% of the families at the time of intake. Thirteen children had experienced at least one separation from their mothers prior to intake, but all children were living with their mothers at the time of videotaped observation. According to maternal report, all children in the present study had been exposed to substances in utero. Percentages of children exposed to specific substances were: nicotine (82.4%), alcohol (58.8%), cannabis (51.5%), cocaine (32.4%), and crack (32.4%), as well as other substances such as heroin, amphetamines, prescribed opiates, and ecstasy (50%). The majority of children were exposed to substances throughout all three trimesters (76.5%). Most children (85.3%) had been prenatally exposed to multiple substances.

Measures and Procedure: Mother–Child Relationship Functioning

To assess the emotional quality of the mother–child relationship, information from clinical case notes, videotaped dyadic interactions, and maternal self-report were used in this study. Clinical case notes were extensive, semistructured notes of observations by Parent–Infant Program (PIP) therapists regarding mother–child interactions during home visits. Mother–child dyadic interactions were videotaped at BTC for a duration of 20 min, during which time dyads had access to a standard set of developmentally appropriate toys and mothers were asked to play with their children as they normally would. Dyads were asked to clean up the toys at the end of each observation session.

Infancy/Early Childhood Version of the EAS, fourth edition. In the fourth edition of the Infancy/Early Childhood version of the EAS (Biringen, 2008), global ratings of four parent dimensions (sensitivity, structuring, nonintrusiveness, and nonhostility) and two child dimensions (responsiveness to the parent and involvement in the interaction) are obtained on a scale from 1 (nonoptimal) to 7 (optimal). Higher scores on all global dimensions represent more positive behaviors. EA ratings have been linked to externalizing and internalizing behaviors as well as to social competence of children under the age of 6 years (Biringen et al., 2005; Carter, Garrity-Rokous, Chazan-Cohen, Little, & Briggs-Gowan, 2001). The EAS also has been found to have good reliability (Bornstein et al., 2006). In this study, EA ratings were based on videotaped free-play observation sessions conducted at BTC. Raters received 3 days of intensive training from the scale developer and subsequently attained reliability with the developer's lab. A graduate student blind to any clinical information rated all videotaped mother–child interactions. The fourth author, also a graduate student, double-coded 17 (50%) of the dyads. Interrater reliability was achieved (for the

global ratings of each domain: $ICC = .79-.95$; total ratings: $ICC = .81-.95$), and all final ratings were based on consensus agreement.

The scale for the EA2 Clinical Screener included in the fourth edition of the EAS (Biringen, 2008) ranges from 1 to 100. Ratings along this scale fall into one of four zones: “Problematic” (1–40), “Detachment” (41–60), “Complicated” (61–80), and “Dyadic Emotionally Availability” (81–100). The adult–child relationship is categorized in the Dyadic Emotionally Availability zone if both members of the dyad are, in general, emotionally available and responsive to one another. That is, the adult is observed to be sensitive to the needs of the child, appropriately structuring the interaction, and nonintrusive and nonhostile toward the child, while the child is observed to be socially/emotionally responsive and involving. In contrast, dyads in the lowest three zones are considered to be most at risk for poor EA. Dyads categorized in this range are observed as connected, but in a way that is not healthy. More specifically, the Complicated zone indicates a mismatch in EA, with one member available and the other less so; the Detachment zone indicates an emotional disconnection but basic needs are met; and the Problematic zone indicates an extreme lack of adult sensitivity and child responsiveness (Biringen, 2008). Within each zone, lower on the scale indicates more problems in the relationship. The scales are designed to take both adult and child EA into account. Although all parent and child dimensions are considered in the EA rating, adult sensitivity and child responsiveness are emphasized. Both the raters and the rating procedure for the EA2 Clinical Screener were the same as that for the global EAS scores. Intraclass correlation analysis ($ICC = .95$) indicated that interrater reliability for the EA2 Clinical Screener was achieved in this study.

PSI-SF. Maternal perceptions of the mother–child relationship were assessed using the PSI-SF (Abidin, 1995), a well-validated and widely used measure in both normative and high-risk samples (e.g., Kelley, 1992; Killeen & Brady, 2000). On average, mothers completed the PSI-SF within 6 ($SD = 1.5$) months of the videotaped free-play observation session. The PSI-SF includes 36 items from the original 120-item index. These items are rated on a Likert scale ranging from 0 (*strongly agree*) to 4 (*strongly disagree*) to yield scores on two subscales: a Parent scale including one dimension: Parental Distress (PD) and a Child scale including two dimensions: Parent–Child Dysfunctional Interaction (PCDI) and Difficult Child (DC). The PD subscale provides an index of the amount of stress a parent is experiencing with respect to the parenting role, the PCDI subscale provides an index of the parent's perception of parent–child interaction quality and satisfaction with these interactions, and the DC scale provides an index of the behavioral characteristics of the child (e.g., regulatory difficulties) that may lead the mother to perceive the child as difficult to manage. Higher scores on all scales of the PSI-SF indicate more maladaptive parenting perceptions. The clinical cutoff values for the PD, PCDI, and DC scale raw scores are 33, 26, 33, and 86, respectively (Abidin, 1990). For this study, Cronbach's α for the PD, PCDI,

and DC scales were .76, .87, and .83, respectively. The PSI-SF has been found to have good reliability and validity (Abidin, 1995).

PIR-GAS. The PIR-GAS from the Diagnostic Classification of Mental Health and Developmental Disorders of Infancy and Early Childhood-Revised (ZERO TO THREE, 2005) was used to assess the mother–child relationship in terms of the behavioral quality of the interaction, affective tone, and psychological involvement. There are 10 categories of parent–child relationship functioning, ranging from 1 (*well-adapted*) to 100 (*severely impaired*) (see Table 4). Ratings take into account the overall functioning of the dyad including the level of dyadic distress, the adaptive flexibility of both mother and child along with the level of conflict and resolution, and the effect of perturbations in the relationship on the child’s development. The scale demonstrates predictive validity to behavioral domains such as socioemotional functioning (e.g., Aoki, Zeanah, Heller, & Bakshi, 2002; Thomas & Guskin, 2001) as well as concurrent validity with the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [APA], 1987; 1994) (Thomas & Guskin, 2001). The PIR-GAS has been used in both observational and retrospective file-review studies (Boris, Zeanah, Larrieu, Scheeringa, & Heller, 1998; Motz et al., 2012; Öztop & Uslu, 2007). PIR-GAS ratings for this study were based on clinical case notes by therapists regarding the last few (3–5) home visit sessions that occurred closest to the time of each observation. This time frame was chosen to maintain temporal consistency across assessment methods. The third author, a psychologist clinically involved with the clients and familiar with the mother–child relationships, rated the relationship quality of all dyads in this sample using the PIR-GAS. In addition, the first author, a postdoctoral student who had clinical knowledge of the dyads, independently rated the relationship quality of 17 (50.0%) dyads. Both PIR-GAS coders were unfamiliar with the EAS used to rate the videotaped observations. Interrater reliability was achieved ($ICC = .94$), and all final category ratings were based on consensus agreement.

Data-Analysis Plan

A series of nonparametric Spearman correlations were carried out to examine concurrent associations between ratings of observed mother–child relationship quality on the EAS, maternal self-report on the PSI-SF, and clinician ratings on the PIR-GAS. Spearman correlation analyses were also used to explore EA2 Clinical Screener associations with the PSI-SF and the PIR-GAS. Because this was an exploratory study based on a small sample, results are provided both with Bonferroni correction for repeated testing, as well as without, to avoid reductions in statistical power (i.e., avoid increasing Type II error rate).

RESULTS

Mother–Child Relationship Functioning

Preliminary analyses. Using the Shapiro–Wilk test, the distributions of all variables of interest were tested for normality. Findings

TABLE 1. Emotional Availability Scales Results

	<i>M</i>	<i>Mdn</i>	Range	<i>SD</i>
Adult				
Sensitivity	3.82	4.00	2–5	.80
Structuring	3.88	4.00	2–5	.77
Nonintrusiveness	3.59	4.00	2–5	.93
Nonhostility	3.94	4.00	2–5	.95
Child				
Responsiveness	3.59	4.00	2–5	.86
Involvement	3.38	3.00	2–5	.74
EA2 Clinical Screener	55.38	59.00	15–75	15.67

Note. EA2 Clinical Screener = Emotional Attachment and Emotional Availability (EA2) Clinical Screener.

indicated that the majority of variables were significantly skewed, $p < .05$, and could not be normalized using transformations, although this was due to the spread of the data rather than to the presence of outliers. Therefore, nonparametric Spearman’s rank correlational analyses were used to examine associations between measures.

Observation-based ratings (EAS). In the present sample, ratings on the four parent EA dimensions (sensitivity, structuring, nonintrusiveness, and nonhostility) and the two child EA dimensions (responsiveness to the adult and involvement with the adult) ranged from 2 to 5 (see Table 1). Recall that the scale for global ratings on the EAS ranged from 1 to 7. The most frequently rated score on the maternal dimensions was 4, and the most frequently rated scores on the child dimensions were 3 and 4. Based on the EA2 Clinical Screener, over half of the mother–child dyads were rated as having relationships in the problematic to detached range, and none of the dyads were rated as demonstrating dyadic EA (see Table 2).

Maternal self-report (PSI-SF). Results of the maternal self-reports on the PSI-SF are presented in Table 3. The mean and median scores for the Parent Scale (PD) and Child Scale (PCDI and DC subscales) were all within the normal range. However, between 10 and 30% of mothers indicated experiencing clinical levels of distress on both the Parent Scale and the Child Scale, with the highest levels of clinical stress evident on the Parent Scale.

Clinician ratings (PIR-GAS). On average, clinician ratings of the mother–child dyads on the PIR-GAS were in the distressed range (51–60), indicating that one or both partners of the dyad were experiencing significant levels of distress in the context of their relationship. The majority of the dyads (76.0%) were rated as having *less than optimal* relationship quality (<80) ranging from *grossly impaired* to *perturbed* (Table 4). Although dyads were rated as *well adapted*, one third were rated as *adapted*, indicating that a subset of the dyads was functioning quite well, according to clinicians, with no significant problematic relationship features.

TABLE 2. EA2 Clinical Screener Results

	<i>n</i>	%	Cumulative %
Dyadic Emotional Availability			
91–100	–		
81–90	–		
Complicated Emotional Availability			
71–80	3	8.8	100.0
61–70	12	38.1	91.0
Detachment			
51–60	7	20.6	52.9
41–50	6	17.7	32.3
Problematic Zone			
31–40	1	2.9	14.6
21–30	2	5.9	11.7
11–20	2	5.8	5.8
0–10	–		
Total	34	100.0	

Note. EA2 Clinical Screener = Emotional Attachment and Emotional Availability (EA2) Clinical Screener.

TABLE 3. Parenting Stress Index-Short Form Results (*N* = 32)

	<i>M</i>	<i>Mdn</i>	Range	<i>SD</i>	% in Clinical Range
Parent Scale					
PD	29.5	28.5	19–41	6.11	29.2
Child Scale					
P-CDI	22.0	22.0	12–39	6.63	20.8
DC	26.3	26.0	14–41	6.96	13.0
Total Stress	76.7	75.0	44–112	17.9	25.0

Note. Two participants are missing data. PD = Parent Distress; P-CDI = Parent–Child Difficult Interaction; DC = Difficult Child. Clinical cutoff for: PD = 33, PCDI = 26, DC = 33, Total Stress = 86 (Scores above these are in clinical range.)

TABLE 4. Parent–Infant Ratings Global Assessment Scale (PIR-GAS) Results

	<i>n</i>	%	Cumulative %
Adapted			
91–100 Well Adapted	0	–	–
81–90 Adapted	11	32.4	100.0
Perturbed			
71–80 Perturbed	2	5.9	67.6
61–70 Significantly Perturbed	7	20.6	61.7
51–60 Distressed	7	20.6	41.1
41–50 Disturbed	4	11.8	20.5
Problematic Zone			
31–40 Disordered	1	2.9	8.7
21–30 Severely Disordered	1	2.9	5.8
11–20 Grossly Impaired	1	2.9	2.9
0–10 Maltreatment	0	–	–
Total	34	100.0	
	<i>M</i>	<i>Mdn</i>	Range
PIR-GAS Ratings	5.91	6.00	1–8
			<i>SD</i>
			1.90

TABLE 5. Associations Between Observation-Based Ratings on the Emotional Availability Scales Dimensions and Maternal Ratings on the Parenting Stress Index-Short Form Scales (*N* = 32)

	PD	PCDI	DC
Adult Dimensions			
Adult Sensitivity	–.04	–.18	–.12
Adult Structuring	–.10	–.13	–.21
Adult Nonintrusiveness	–.09	–.03	–.02
Adult Nonhostility	–.05	.02	.02
Child Dimensions			
Child Responsiveness	–.05	–.37*	–.22
Child Involvement	–.18	–.39*	–.33†

Note. PD = Parental Distress; PCDI = Parent–Child Difficult Interaction; DC = Difficult Child.

**p* < .05. †*p* < .10.

Associations Between Observed Behavior (EAS), Maternal Self-Report (PSI-SF), and Clinician Ratings (PIR-GAS)

Observed behavior (EAS) and maternal self-report (PSI-SF). Observed child behaviors (responsiveness and involvement) on the EAS were found to be significantly negatively associated with maternal perceptions of the child as difficult (DC subscale) on the PSI-SF. In contrast, observation-based ratings of maternal behaviors on the adult dimensions of EAS were not significantly associated with maternal self-report on either the Parent or the Child Scales of the PSI-SF (see Table 5). Ratings of observed dyadic EA on the EA2 Clinical Screener also were not associated with maternal self-report on either scale of the PSI-SF (Table 8).

Observed behavior (EAS) and clinician ratings (PIR-GAS). Significant positive associations were found between clinician ratings on the PIR-GAS and observation-based ratings of maternal sensitivity on the EAS, as well as dyadic EA on the Clinical Screener (Table 8). Marginal associations were also found between clinician ratings on the PIR-GAS and observed maternal structuring and nonhostility on the EAS, but not intrusiveness (Table 6).

Clinician ratings (PIR-GAS) and maternal self-report (PSI-SF). Clinician ratings on the PIR-GAS were not found to be significantly associated with maternal self-report on the Parent Scale of the PSI-SF. However, a marginal association was found between maternal self-report on the child scale (DC subscale) of the PSI-SF and clinician ratings on the PIR-GAS (Table 7).

DISCUSSION

The overall aim of this study was to gain a better understanding of the nature of the mother-child relationship in substance-impacted dyads. This study was based on a high-risk sample of mothers and their young children receiving mental health/early intervention services for maternal substance abuse. The majority of mothers in this

TABLE 6. Associations Between Observation-Based Ratings on the Emotional Availability Scales Dimensions and Clinician Ratings on the Parent–Infant Ratings Global Assessment Scale (PIR-GAS)

	PIR-GAS
Adult Dimensions	
Sensitivity	.43*
Structuring	.31†
Nonintrusiveness	.01
Nonhostility	.30†
Child Dimensions	
Responsiveness	.15
Involvement	.29

* $p < .05$. † $p < .10$.

TABLE 7. Associations Between Maternal Self-Report on the Parenting Stress Index-Short Form Scales and Clinician Ratings on the Parent–Infant Global Assessment Scale (PIR-GAS) ($N = 32$)

	PIR-GAS
Parent Scale	
PD	-.25
Child Scale	
PCDI	-.12
DC	-.31†

Note. PD = Parent Distress; P-CDI = Parent–Child Difficult Interaction; DC = Difficult Child.

TABLE 8. Associations Between Observed Ratings on the EA2 Clinical Screener and Clinician Ratings on the Parent–Infant Ratings Global Assessment Scale (PIR-GAS) and Maternal Ratings on the Parenting Stress Index-Short Form Scales ($N = 32$)

	EA2 Clinical Screener
PIR-GAS	.41***
PD	-.09
PCDI	-.28
DC	-.20

Note. PD = Parental Distress; PCDI = Parent–Child Difficult Interaction; DC = Difficult Child; EA2 Clinical Screener = Emotional Attachment and Emotional Availability (EA2) Clinical Screener.

*** $p < .05$ with Bonferroni correction. * $p < .05$.

sample are single parents, with a high-school level of education, unemployed, and living at or below the poverty line. Most have experienced high rates of abuse and violence in relationships and are addicted to multiple substances. The children all have prenatal substance exposure, most to multiple substances, and many are continuing to live in contexts of maternal substance abuse and other risk factors associated with a substance-using lifestyle. The

goal of this study was to describe these relationships from multiple perspectives.

A high degree of impairment was evident in these mother–child relationships. Although there was variability within the sample on both the EA2 Clinical Screener and the PIR-GAS, average ratings were quite low, falling within the detached range on the Clinical Screener and within the distressed range on the PIR-GAS. Average global EA ratings in this study were substantially lower than those reported in a previous study with middle-class families experiencing extremely high levels of stress (McMahon & Meins, 2012). In short, average ratings of both clinicians and trained observers fell just outside the Problematic zone characterized by disorganized attachment patterns and a lack of EA. A substantial body of literature has discussed the negative sequelae of such problematic and detached relationships on children’s developmental outcomes (for a review, see Benoit, 2004).

We sought to examine the nature of these relationships in greater detail using three distinct methods of assessment including: observation, clinical evaluation, and maternal self-report. Consistent with our predictions, maternal self-report of stress in relation to the child was associated with behaviors observed by trained raters. Specifically, we found that children of mothers who perceived them as demanding and difficult to interact with were correspondingly rated as less involving of their mothers by independent observers; however, maternal reports of stress on the Child Scale of the PSI-SF were not reflected in observed maternal behaviors.

In contrast to the clear association between maternal self-reports of stress in relation to the child and observed child behaviors, maternal reports of their own distress were not associated with either observed mother or child behaviors. These findings are consistent with previous research that has suggested a strong link between parental reports of stress on the Child Scale and observed behaviors of both mother and child, rather than parental reports of their own distress (Bigras et al., 1996; Haskett et al., 2006). Taken together, the findings of this study suggest that while high-risk mothers may be able to accurately report on their child’s contributions to difficulties in the relationship, they are limited in their capacity to report on their own behaviors. Mothers in this sample may have had difficulty identifying their own distress and/or the dysfunction in the relationship with their child for a number of reasons including: their desire to appear as if they are parenting competently, a distorted reference point for what level of distress/stress is “normal” as a result of past trauma, their hesitation in admitting ongoing feelings of parenting stress while engaged in an early intervention program that supports parenting, and their limited reflective capacity (Suchman, DeCoste, Leigh, & Borelli, 2010; Suchman et al., 2011).

Mothers with substance-use problems generally tend to demonstrate low reflective capacity—the capacity to consider the intentions and emotions underlying the behaviors of oneself and others (Fonagy, Steele, Moran, Steele, & Higgitt, 1991), which has been associated with disruptions in the mother–child relationship and low levels of maternal contingent behaviors (e.g., Pajulo et al., 2011; Suchman, DeCoste, Leigh, & Borelli, 2010). Low reflective

capacity may also interfere with a mother's capacity to report on her own and her child's emotions and behaviors. In a high-risk sample of mothers with depression, Vliegen et al. (2009) found that maternal ratings on a self-report version of the EAS were associated with EA ratings by trained observers only for certain dimensions (e.g., hostility but not intrusiveness). This discrepancy in what mothers were able to accurately report (in relation to observed ratings) was interpreted as partly stemming from a lack of introspection—the inability to be aware of their own intrusiveness. Similarly, in a previous study using the PSI-SF in a sample including high-risk mothers and fathers who had physically abused their children and high-risk, nonabusive comparison mothers, maternal ratings on the Child Scales (P-CDI, DC) were found to predict parenting behaviors and child outcomes over and above ratings on the Parent Scales (PD) (Haskett et al., 2006). This finding supports the idea that high-risk mothers may be more accurate in reporting objective information about their children than subjective information about themselves, which requires greater reflective capacity.

Clinician ratings tend to provide an advantage over maternal ratings as a result of the clinician's objectivity, knowledge, and experience with high-risk dyads, and lack of presentation bias (Westen & Weinberger, 2004). We expected that clinician ratings of the relationships on the PIR-GAS would be more closely associated with observed behaviors of both mother and child on the EAS than would maternal self-report. The association between clinician ratings and ratings by trained observers on almost all of the adult dimensions of the EAS provides support for this hypothesis. In particular, mothers who were rated by the clinician as having a perturbed relationship with their child were also rated as less sensitive by observers. However, the children of these mothers were not correspondingly rated as uninvolved and unresponsive by observers, seemingly inconsistent with a transactional model (discussed later).

As expected, clinician ratings of the relationships were not found to relate with maternal self-reports on either the Parent or the Child Scales of the PSI-SF, potentially due to the limited reflective capacity of the mothers previously discussed (e.g., Vliegen et al., 2009). More unexpected was that clinician ratings and maternal self-report exhibited divergent associations with observation-based ratings of the mother-child relationships. Relative to the ratings of mother and child behaviors by trained observers, clinician ratings seemed to more accurately reflect maternal contributions to the relationship than child contributions whereas mothers were better at reporting their child's behaviors and contributions to difficulties in the relationship than their own contributions. The lack of association between clinician ratings and maternal self-report is also consistent with the idea that clinician ratings on the PIR-GAS reflect a focus on maternal behaviors in contrast with maternal ratings on the PSI-SF, which reflect a focus on child behaviors.

Regarding clinician ratings reflecting maternal behaviors, this finding is difficult to explain in terms of the structure of the PIR-GAS, which is dyadic in nature and designed to capture the effect of perturbations in the relationship on both mother and child. It

also is difficult to interpret these findings in terms of a bias in the clinical context to focus on mothers, as intervention provided at BTC is dyadic in nature. It is possible, however, that these children were being overly responsive to compensate for their mother's lack of EA, as has been found with other high-risk samples (Timmer, Thompson, Culver, Urquiza, & Altenhofen, 2012). The findings may also reflect a bias in the clinical context toward maternal contributions to dyadic mother-child interactions when children are very young, as in this sample. Maternal behaviors may have been particularly salient in this sample of high-risk mothers who often demonstrate dysregulated emotions that tend to overshadow the needs and preferences of their children. As children age and act more independently of their mothers, it may be easier for clinicians to assess children's temperamental dispositions and personal reactions to situations that contribute to stress in the mother-child relationship, which might afford a more balanced perspective in rating the PIR-GAS. Given the restricted age range for the PIR-GAS (0–3 years), however, it may be necessary to rely on alternative indices in clinical settings to ascertain the young child's contributions to the relationship and to pick up on the transactional nature of the relationship. Our findings suggest that maternal ratings may be quite valuable in this respect.

As a secondary goal of this study, we explored associations of first-impression ratings of the dyads using the EA2 Clinical Screener with maternal self-reports of stress in the relationship on the PSI-SF. Although these were not significantly associated, ratings on the EA2 Clinical Screener were associated with clinician ratings of the relationships on the PIR-GAS. These findings support the validity of the EA2 Clinical Screener in a high-risk, substance-exposed sample. Given that clinician ratings on the PIR-GAS seemed to emphasize maternal contributions to the relationship, the association between the EA2 Clinical Screener and the PIR-GAS indicates that ratings on the Screener may reflect maternal interactional behaviors, and in particular, maternal sensitivity.

In summary, the findings of this study indicate that global measures of the mother-child relationship, like the EA2 Clinical Screener and the PIR-GAS, seem to better capture maternal contributions to the relationship than child contributions, yet both are designed to account for both the mother's and the child's influence on the relationship. In this high-risk sample of mothers with young children, it is not surprising that the mother's behaviors figure most prominently in clinician and observation-based ratings of the relationships. It is possible that in a less-high-risk samples, particularly with older children, an emphasis on child behaviors would be evident in ratings on these measures. In addition, it is possible that children in this sample were trying to compensate for their mother's lack of sensitivity and availability by being overly responsive to and involving of their mothers (e.g., Timmer et al., 2012). It is also possible that for these dyads with high rates of problematic relationship features (Mutz et al., 2012), quality time sitting down and playing together may not feel natural. Children may have had to adjust for their mother's sudden and unexpected availability as well.

In contrast to these global measures, questionnaire-based, maternal self-report measures of the mother–child relationship, such as the PSI-SF, seem to reflect child behaviors over maternal behaviors. Although clinician ratings alone may not suffice in fully capturing the transactional nature of the mother–child relationship in substance-exposed samples, it seems that maternal ratings may lend well to achieving a more balanced conceptualization of the dyad to support clinical formulation and intervention. Taken together, the findings of this study highlight the importance of a multimethod assessment approach to assessing mother–child relationship quality in substance-exposed samples (e.g., Sameroff, 2009), rather than relying more narrowly on particular tools such as observation or semistructured interviews, as has been suggested (Smith, 2011). The results also point to a need to target reflective functioning in clinical intervention to improve maternal self-awareness and understanding of how their behaviors and emotions both affect, and are affected by, their child.

Considerations and Limitations

Intervention for maternal substance abuse is becoming increasingly dyadic in nature, with the recognition that maternal treatment outcomes and healthy mother–child attachment are intimately linked (e.g., Goldman Fraser et al., 2010; Pajulo et al., 2012; Suchman, DeCoste, Castiglioni et al., 2010; Suchman et al., 2011). At BTC, the focus is on improving maternal sensitivity and teaching mothers to take their child's perspective, which may have led to improved maternal reflective capacity in this sample, despite sustained parenting stress. It is possible that such intervention effects may have obscured associations between maternal perceptions of stress and observed mother and child behaviors (e.g., Goldman Fraser et al., 2010). Given that observations were conducted early in the treatment process, however, this possibility seems unlikely. Future work should address treatment effects more directly by considering, for instance, whether the association between maternal reports of self-distress and observed dyadic behaviors increases as maternal reflective capacity improves.

A wide variety of methods are used to assess the quality of mother–child relationships in research and clinical practice (Smith, 2011). It is important to clarify which kinds of information each provides and misses. Although variability in assessment approach may have contributed to the lack of convergence between measures in this study, we expected a high-degree of independence between measures and were specifically interested in whether this variability could provide meaningful information (Meyer et al., 2001). It will be useful for future studies to also look at how ratings from different perspectives converge (e.g., self-ratings, clinician ratings), on each of these measures (e.g., Vliegen et al., 2009). In addition, as this study was based on a small, exploratory sample of high-risk dyads, conclusions based on these findings should be made with caution. Future work should attempt to replicate these results with larger samples, including nonclinical and high-risk comparisons.

Notwithstanding these limitations, this study is among the first in North America to examine the quality of the mother–child

relationship in a polysubstance-exposed sample using the EAS, and it represents the first attempt to understand these relationships from distinct assessment perspectives. Overall, the findings of this study highlight the importance of a multimethod approach to understanding and fully capturing the complex, transactional nature of the mother–child relationship in high-risk samples.

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