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Regular Article

Disrupted caregiving behavior as a mediator of the relation between disrupted prenatal maternal representations and toddler social–emotional functioning

Katherine L. Guyon-Harris[1], Sarah M. Ahlfs-Dunn[2], Sheri Madigan[3,4], Elisa Bronfman[5], Diane Benoit[6] and Alissa C. Huth-Bocks[7]

[1]Department of Pediatrics, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA; [2]Department of Psychology, Eastern Michigan University, Ypsilanti, MI, USA; [3]Department of Psychology, University of Calgary, Calgary, Alberta, Canada; [4]Alberta Children's Hospital Research Institute, Calgary, Alberta, Canada; [5]Boston Children's Hospital/Harvard Medical School, Boston, MA, USA; [6]Department of Psychiatry, University of Toronto, Toronto, Ontario, Canada and [7]Department of Pediatrics, Rainbow Babies & Children's Hospital, University Hospitals Cleveland Medical Center, Case Western Reserve University School of Medicine, Cleveland, OH, USA

Abstract

The development of maternal representations of the child during pregnancy guides a mother's thoughts, feelings, and behavior toward her child. The association between prenatal representations, particularly those that are disrupted, and toddler social-emotional functioning is not well understood. The present study examined associations between disrupted prenatal representations and toddler social-emotional functioning and to test disrupted maternal behavior as a mediator of this association. Data were drawn from 109 women from a larger prospective longitudinal study (N=120) of women and their young children. Prenatal disrupted maternal representations were assessed using the Working Model of the Child Interview disrupted coding scheme, while disrupted maternal behavior was coded 12-months postpartum from mother-infant interactions. Mother-reported toddler social-emotional functioning was assessed at ages 12 and 24 months. Disrupted prenatal representations significantly predicted poorer toddler social-emotional functioning at 24 months, controlling for functioning at 12 months. Further, disrupted maternal behavior mediated the relation between disrupted prenatal representations and toddler social-emotional problems. Screening for disrupted representations during pregnancy is needed to facilitate referrals to early intervention and decrease the likelihood of toddler social-emotional problems.

Keywords: disrupted, maternal behavior, prenatal representations, toddler social-emotional functioning, transmission

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The prenatal period is full of transformations that are crucial for the wellbeing of both mothers and their developing offspring. While both mother and baby undergo tremendous biological and physical changes, the mother may also undergo complex psychological reorganization. That is, the prenatal period is a time when women are faced with the important developmental challenge of transitioning from being a receiver of care to a provider of care (Solomon & George, 1996). While this process is welcomed and joyful for some mothers, it is marked by painful reminders of abuse, neglect, and other adverse childhood experiences for others. Although the impact of past harms on the psychological transition to motherhood may be largely unconscious, this transition has significant implications for caregiving behavior and child outcomes (Slade & Sadler, 2019).

Author for Correspondence: Katherine Guyon-Harris, PhD, University of Pittsburgh, Department Pediatrics, 3414 5th Ave., CHOB 3rd floor, Pittsburgh, PA 15213, USA; E-mail: guyonharriskl@upmc.edu

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During pregnancy, women begin to develop thoughts and feelings about who their baby will be, what they will be like as mothers, and the relationship they will have with their baby (Slade & Sadler, 2019). These collective thoughts and feelings are often referred to as "maternal representations of the child." Maternal representations of the child are grounded in the mother's early experiences of being parented by her caregivers (Bowlby, 1983; Main & Goldwyn, 1984). They function as an internalized template that guides a mother's interpretation of her child's behavior as well as her own thoughts, feelings, and behaviors as a parent (Bowlby, 1983; Bretherton & Munholland, 2008; George & Solomon, 2008). The content, organization, and consistency of a mother's representations are thought to influence her interpretations, expectations, and behavior in relation to, or interactions with, her infant.

Representations are typically assessed through caregiver interviews, one of which is the Working Model of the Child Interview (WMCI; Zeanah, Benoit, Barton, & Hirshberg, 1996; Zeanah, Benoit, Hirshberg, Barton, & Regan, 1994). Research on the WMCI has identified four types of representations of the child: balanced, disengaged, distorted, and disrupted (Benoit, Parker, & Zeanah, 1997a; Crawford & Benoit, 2009). Balanced representations

are characterized by, for example, coherency, flexibility, joy, and sensitivity. Disengaged representations are characterized by, for example, detachment, emotional withholding, indifference, lack of detail about the infant, and rigidity, whereas distorted representations are characterized by, for example, inconsistency, heightened affect, preoccupation with closeness, and confusion (Benoit, Zeanah, Parker, Nicholson, & Coolbear, 1997b).

Balanced representations tend to be associated with optimal child outcomes, such as secure mother–infant attachment (Benoit et al., 1997a; Huth-Bocks, Theran, Levendosky, & Bogat, 2011). Disengaged and distorted representations have been found to be associated with avoidant and ambivalent mother–infant attachment, respectively, and other poor social–emotional child outcomes, such as failure to thrive, negative affect, and poorer quality of play (Benoit et al., 1997b; Korja et al., 2010; Rosenblum, McDonough, Muzik, Miller, & Sameroff, 2002). Although balanced representations are considered more favorable than disengaged and distorted representations, all three are considered organized types of representations, meaning there is a specific and consistent set of "rules" that the mother uses to process information and guide behavior regarding protection and care for her child (Solomon & George, 1996).

In contrast to organized types of representations, disrupted representations are characterized by incoherence, contradictory styles of responding to infant needs, fearfulness, helplessness, prioritizing one's own needs over the needs of the child, and disorientation, among other things (Crawford & Benoit, 2009). Limited research has been conducted on disrupted representations of the child thus far; however, a notable finding has been an association with disorganized mother–infant attachment (Crawford & Benoit, 2009). Other important work has demonstrated associations between postnatal disrupted representations and mother–infant attachment insecurity and maternal interactive behavior, including insensitivity, withdrawal, and intrusiveness (Hall et al., 2015; Niccols, Smith, & Benoit, 2015). However, child-focused outcomes resulting from disrupted prenatal representations, such as toddler social–emotional problems, have yet to be examined.

Because other attachment-based representations, such as parental states of mind, have been linked with child social–emotional outcomes (e.g., Cowan, Cohn, Cowan, & Pearson, 1996; Greenberg, Speltz, & Deklyen, 1993; Madigan, Moran, Schuengel, Pederson, & Otten, 2007), it stands to reason that prenatal disrupted representations of the child may also be associated with child outcomes. Furthermore, the specific mechanisms through which disrupted representations of the child might be associated with toddler social–emotional problems have gone unexamined. One viable mechanism, consistent with a wealth of research examining mechanisms of transmission from parental states of mind with respect to attachment and child attachment (see Madigan et al., 2006a), may be the manifestation of observable forms of disrupted maternal caregiving behavior.

Disrupted maternal caregiving behavior refers to anomalous behaviors and communications during mother–child interactions, including maternal role reversal, disorientation, apprehension, and/or withdrawal from the child, as well as hostility. It has been purported that disrupted behavior may stem from unresolved experiences of trauma and/or traumatic grief and loss during childhood (Ballen, Bernier, Moss, Tarabulsy, & St-Laurent, 2010; Goldberg, Benoit, Blokland, & Madigan, 2003; Lyons-Ruth, Bureau, Holmes, Easterbrooks, & Brooks, 2013; Madigan, Moran, & Pederson, 2006c; Madigan et al., 2007). Disrupted caregiving behavior has been shown to be associated with disrupted representations in at least one study (Crawford & Benoit, 2009).

The construct of disrupted caregiving behavior is rooted in early theoretical work conducted by Solomon and George on disorganized/helpless caregiving (George & Solomon, 2008; Solomon & George, 1996), by Main and Hesse on frightened/frightening caregiving behavior (Hesse & Main, 2006; Main & Hesse, 1990), and by Lyons-Ruth and colleagues on disrupted/atypical caregiving behavior (Lyons-Ruth, Bronfman, & Parsons, 1999). Despite slightly differing labels and definitions, this class of caregiving behaviors is consistently associated with increased risk for poor social–emotional development across early childhood and adolescence, and even into adulthood (Lyons-Ruth et al., 2013; Madigan et al., 2007; Shi, Bureau, Easterbrooks, Zhao, & Lyons-Ruth, 2012). In infancy, disrupted maternal behavior is significantly associated with disorganized mother–infant attachment (Lyons-Ruth et al., 1999; Madigan et al., 2006b, 2007; Main & Hesse, 1990), a particularly concerning category of infant attachment that has been shown to be associated with a range of negative outcomes across development (Lyons-Ruth, Alpern, & Repacholi, 1993; O'connor, Bureau, Mccartney, & Lyons-Ruth, 2011; van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

In sum, disrupted prenatal representations of the child and disrupted caregiving behavior are each associated with increased social–emotional problems for children, although empirical work examining disrupted representations is quite sparse due to the recency of an established and valid coding system. Furthermore, disrupted representations and disrupted caregiving behavior as predictors of child social–emotional functioning have not been examined in the same study. Specifically, we are not aware of any research to date that examines disrupted caregiving behavior as a mediator of the association between disrupted thoughts and feelings about a child in utero and poor social–emotional outcomes in toddlerhood. Identifying links between disrupted parental representations during pregnancy and later child social–emotional difficulties, as well as factors mediating these links, is important as it creates an opportunity for researchers and clinicians to develop interventions that could target specific disrupted caregiver representations (before the child is born) and/or specific postnatal disrupted caregiver behavior (after the child is born) to use with those considered to be most at risk for problematic caregiving. The ultimate goal of such interventions before and soon after a child is born is to prevent later social–emotional problems and/or improving children's developmental trajectories.

In the study reported here, we hypothesized that disrupted prenatal representations would predict poorer toddler social–emotional functioning. Next, we explored disrupted maternal behavior as a mediator of the relation between disrupted prenatal representations and social–emotional functioning in toddlerhood. It was hypothesized that disrupted maternal behavior would mediate the relation between disrupted prenatal representations of the child and toddler social–emotional functioning.

Study Method

Participants

Data were drawn from a sample of 120 women participating in a prospective longitudinal study. Participants were recruited via the

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Table 1. Demographic information of participant mothers

	m	*SD*		*n*	%
Age (years)	26.21	5.70	Race		
Monthly income ($)	2143.14	2109.69	African American	56	47
			White	43	36
			Biracial	15	13
			Other	6	5
			Education		
			High school diploma or less	24	20
			Some college	53	44
			College degree or higher	43	36
			Marital status		
			Single/never married	76	63
			Married	33	28
			Divorced	5	4
			Separated	6	5
			First pregnancy	36	30

Note: Some columns add up to greater than 100% due to rounding.

posting of flyers in areas accessed by low-income women (e.g., social service offices, community baby showers) and other locations including public health clinics. Participants were first assessed during the third trimester of pregnancy with additional assessments at 3 months ($n = 119$, 99% retained), 1 year ($n = 114$, 95% retained), and 2 years postpartum ($n = 99$, 83% retained). Participants were predominantly economically disadvantaged and diverse in terms of race, education, and marital status (see Table 1 for further demographic information). Of the participants, 73% reported receiving services from the Women, Infants, and Children (WIC) program, 52% were receiving food stamps, 75% were receiving public health insurance, and 17% were receiving supplemental income. At the time of the first interview, 45% of the participants were employed. This was a non-treatment-seeking, community sample; only 11.7% reported having sought mental health services in the past year.

Procedures

Data from assessment waves during pregnancy and 1 and 2 years postpartum were used in the present study. Questionnaire and observational data were collected during in-home interviews. Consent for participation was obtained at each wave of data collection. The larger study was approved by the institutional review board at the institution where the data were collected.

Measures

Disrupted prenatal maternal representations

Disrupted maternal representations of the child were coded from verbatim transcripts of WMCIs (Zeanah et al., 1994; Zeanah et al., 1996) obtained at T1 (the third trimester of pregnancy) using the WMCI-Disrupted (WMCI-D) coding scheme (Crawford & Benoit, 2009). The WMCI is a semi-structured interview that assesses a caregiver's perception and subjective experience of her infant, including her anticipated responses to her infant in various attachment-relevant situations, her perception of herself as a mother, and her perception of her relationship with her infant. It can be administered prenatally or postnatally, and is considered to be a valid and useful measure of maternal representations of the child (see Vreeswijk, Maas, & van Bakel, 2012 for a review).

The WMCI-D coding scheme was derived from the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE; Bronfman, Madigan, & Lyons-Ruth, 2009–2014) described later in the paper. It involves coding both the content of the WMCI transcript, as well as the process by which that content is communicated by the mother during the interview, along five dimensions using 7-point Likert-type scales. These five dimensions are affective communication errors, role/boundary confusion, fearfulness/dissociation/disorientation, intrusiveness/negativity, and withdrawal. Further details about what is coded within each dimension are available elsewhere (Crawford & Benoit, 2009). Although the existing psychometric properties of the WMCI-D coding scheme are limited, they have thus far demonstrated adequate validity. As would be expected, the WMCI-D classification is not associated with infant gestational age, child gender, or mother's residence, but it is associated with more parenting stress, the Adult Attachment Interview (AAI) unresolved classification, atypical and less sensitive maternal behavior, and both insecure and disorganized infant attachment (Crawford & Benoit, 2009; Hall et al., 2015; Niccols et al., 2015; Tooten et al., 2014).

Based on five dimensional scores coded from a transcript, an overall classification (disrupted or not disrupted) and an overall total score (level of disruption ranging from 1 = *not disrupted* to 7 = *severely disrupted*) are then given. In the current study, transcripts were coded by the second author, with Diane Benoit, PhD, double coding approximately 20% ($n = 24$) for inter-rater reliability (IRR). The IRR for the total/level of disruption score was assessed using intraclass correlation ($r = .70$). There was a

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96% match on the disrupted versus not disrupted representation classification between the two coders ($k = .65$). In the present study, the 1–7 total score of disruption was used in analyses.

Disrupted maternal caregiving behavior

Disrupted caregiving behavior was coded from videotaped mother–infant interactions at T3 (1 year postpartum) using the AMBIANCE (Bronfman et al., 2009–2014). As already noted, the AMBIANCE consists of five related, but distinct, dimensions of disrupted caregiving behavior: affective communication errors, role/boundary confusion, fearfulness/dissociation/disorientation, intrusiveness/negativity, and withdrawal. Further details about the behaviors coded within each dimension are available elsewhere (Lyons-Ruth et al., 1999). Disrupted caregiving behavior on the AMBIANCE has demonstrated consistent associations with past unresolved trauma and mother–infant attachment disorganization (Madigan et al., 2006a), as well as stability across early childhood (Madigan, Voci, & Benoit, 2011). A 7-point rating scale for each dimension is based on the frequency and severity of behaviors observed within each dimension, with higher values indicating more disrupted behaviors of each type. Based on the five dimensional ratings, a 1–7 total score is also assigned that captures the overall quality of caregiving behavior. Using the total score, caregivers are classified as not disrupted (with a score of 1–4) or disrupted (a score of 5–7).

In the present study, a 7-minute segment was coded from a larger 12-minute mother–infant interaction that included 10 minutes of free play followed by 2 minutes of cleanup (a mildly stressful condition). We began coding at the 5-minute mark of the interaction to allow the dyad to adjust to the paradigm, thus 5 minutes of free play and the 2-minute cleanup were coded as one 7-minute segment. The interaction was filmed in the home (with infrequent exception of filming in the research office (about 6%)). Parents were instructed to play and interact with their children as they normally would. They were instructed on when to begin the cleanup portion, but were otherwise not given further instruction during the interaction. Coding using the AMBIANCE has been previously supported in free play settings with mild stressors such as a cleanup (Guyon-Harris, Madigan, Bronfman, Romero, & Huth-Bocks, 2020) and a no-toys paradigm (Madigan, Moran, & Pederson, 2006b).

Videotaped mother–infant interactions were coded by the first author, with Elisa Bronfman, PhD, double coding approximately 33% ($n = 35$) for IRR. The IRR for the total/level of disrupted caregiving behavior score was assessed using intraclass correlation ($r = .86$). There was 97% match on the disrupted versus not disrupted classification between the two coders ($k = .94$). In the present study, the 1–7 total score of disrupted caregiving behavior across dimensions was used in analyses.

Mother-reported toddler social–emotional functioning

The Brief Infant–Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006) was used to assess mothers' perceptions of toddler social–emotional problems at age 1 and 2 years. In this assessment, 42 items are used to assess social–emotional problems or delays and social–emotional competence in young children aged 12–36 months on a 3-point scale (0 = *not true/rarely*, 1 = *somewhat true/sometimes*, 2 = *very true/often*). The BITSEA total problem score (31 items) was used in the present study. Higher scores indicate more maternal perception of toddler social–emotional problems. Various studies have assessed the psychometric properties of the BITSEA and found that it has strong reliability and validity (Briggs-Gowan & Carter, 2007; Briggs-Gowan, Carter, Irwin, Wachtel, & Cicchetti, 2004; Karabekiroglu et al., 2010). Internal consistency was excellent in the present study ($\alpha = .83$). The BITSEA total problem score at age 1 year ($\alpha = .77$) was used as a control variable.

Data analysis

Bivariate associations between study variables were examined using correlations. The relation between prenatal disrupted maternal representations of the child and toddler social–emotional functioning was examined using regression. Then, disrupted maternal caregiving behavior was tested as a mediator of the relation between disrupted prenatal maternal representations of the child and mother-reported toddler social–emotional functioning at age 24 months. Direct effects from prenatal disrupted representations to disrupted caregiving behavior and toddler social–emotional functioning and from disrupted caregiving behavior to toddler social–emotional functioning were tested along with the indirect effect (mediation) of prenatal representations on toddler social–emotional functioning through disrupted caregiving behavior. Social–emotional functioning at age 12 months was included as a control variable to control for the effect of prior social–emotional functioning. This provided for a more robust test of the mediation of disrupted caregiving behavior in the relation between prenatal disrupted representations and toddler social–emotional functioning. All analyses were completed in Mplus version 7.4 with missing data estimated using maximum likelihood estimation with robust standard errors (MLR), a type of full information maximum likelihood (FIML) estimation.

Results

All the major study variables were normally distributed and did not require transformation. As detailed in Table 2, bivariate associations were revealed between the level of disruption in prenatal maternal representations of the child, the level of disruption in maternal behavior at age 12 months, and social–emotional functioning at both 12 and 24 months, supporting the testing of mediation. Of note, the relation between disrupted maternal behavioral at 12 months and infant social–emotional functioning at 12 months was not statistically significant at the $p < .05$ level. The strength of the association between the level of disruption in prenatal maternal representations of the child and mother-reported infant and toddler social–emotional problems appeared to increase over time; however, the increase (i.e., the difference in correlations) only trended toward statistical significance ($z = -1.48$, $p = .069$). A similar pattern emerged for the relation between disrupted caregiving behavior and mother-reported social–emotional problems from infancy to toddlerhood, but this time the difference in correlations was statistically significant ($z = -3.17$, $p < .001$); the correlation between disrupted caregiving behavior at 12 months postpartum and mother-reported social–emotional problems was significantly stronger at 24 months postpartum than at 12 months postpartum.

Associations between prenatal disrupted representations and mother-reported toddler social–emotional functioning were tested in a regression model (Table 3). As hypothesized, prenatal disrupted representations of the child predicted toddler social–emotional problems at age 24 months after accounting for prior infant social–emotional problems at age 12 months.

Prior to testing for mediation, bivariate associations between maternal age, child sex, and income-to-needs ratio (average

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Table 2. Bivariate associations between study variables

		1	2	3	4	5
1	Disrupted maternal representations of the child (prenatal)	1				
2	Disrupted maternal behavior (at 12 months)	.37***	1			
3	Infant social–emotional problems (at 12 months)	.22**	.18*	1		
4	Toddler social–emotional problems (at 24 months)	.31***	.33***	.72***	1	
5	Income-to-needs ratio (averaged)	−.35***	−.32***	−.04	−.13	1

*$p < .05$, **$p < .01$, ***$p < .001$.
Note: Income-to-needs ratio was averaged from pregnancy through 24 months postpartum.

Table 3. Regression model depicting disrupted prenatal representations of the child predicting toddler social–emotional problems

			Standardized coefficients	
	b	*SE*	β	95% CI
Intercept	−1.10	1.73	−.17	−0.69-0.35
Infant social–emotional problems (12 months)	0.75	0.07	.68***	.56-.80
Disrupted prenatal representations	0.80	0.34	.16*	.03-.30

*$p < .05$, ***$p < .001$.

score from pregnancy to 24 months postpartum) and disrupted maternal representations and behavior were examined to explore the potential for additional covariates beyond infant social–emotional problems. As a result, the income-to-needs ratio was included as a covariate in the mediation model due to significant associations with the WMCI-D ($r = -.35$, $p < .001$) and AMBIANCE ($r = -.32$, $p < .001$) total scores.

As hypothesized, disrupted maternal behavior mediated the relation between disrupted prenatal maternal representations and mother-reported toddler social–emotional problems (see Figure 1). Disrupted maternal behavior accounted for 32% of the effect of disrupted prenatal maternal representations on toddler social–emotional problems while controlling for associations between social–emotional problems at 24 and 12 months (i.e., those concurrent with the assessment of disrupted caregiving behavior) and between AMBIANCE total score and income-to-needs ratio. Of note, mediation was more strongly supported without the inclusion of covariates (indirect effect = 0.46, $p = .04$, 95% confidence interval (CI) [0.04, 0.87]).

Discussion

Pregnancy is a pivotal time for the development of mothers' thoughts and feelings about their unborn babies. The current study demonstrated that disrupted representations of an unborn child can have a cascading effect onto disrupted maternal behavior and, in turn, toddlers' social–emotional outcomes. Therefore, it will be important for future work to elucidate mechanisms for how disrupted representations both pre- and postnatally may lead to poor child outcomes, so that interventions that aim to change disrupted representations and caregiving behavior can be provided to mothers as they transition to parenthood.

A third of the relations between representations and toddler outcomes was explained by observable disrupted caregiving behavior. Although this is the first study to demonstrate such associations, the findings are not necessarily surprising, given similar findings by Hall et al. (2015) who reported that maternal insensitivity and intrusiveness mediated the relation between postnatal disrupted representations of the child and mother–infant attachment insecurity. However, the present study is unique in that it is the first to examine the construct of disrupted caregiving behavior (i.e., compared with more traditional forms of caregiving behavior) as a mechanism for the association between disrupted caregiver representations *assessed prenatally* and toddler social–emotional problems. Thus, the present study highlights a need for researchers and clinicians working with at-risk families to develop and utilize interventions that could target specific disrupted caregiver representations before the child is born and/or specific postnatal disrupted caregiver behaviors. Yet, two thirds of the associations between the level of disruption in mothers' representations and toddler social–emotional functioning remained unexplained, indicating the need to explore additional mechanisms.

Of note, the income-to-needs ratio was significantly correlated with both disrupted representations of the child and disrupted caregiving behavior. It may be that the added burden of economic strain and associated risk factors contribute to the emergence of disrupted representations and caregiving behavior, and thus play an important role alongside these variables on children's social–emotional functioning. Although extensive research has demonstrated the effects of economic strain and poverty on children's development, future work is needed to further understand the role of economic and other adversities in the development of disrupted caregiving. Variables not examined in the present study, such as perceived parenting stress or maternal mental health, could also help explain associations between disrupted caregiver representations and adverse toddler outcomes – parenting stress has been associated with both disrupted maternal representations (Niccols et al., 2015) and toddler social–emotional difficulties (Barroso, Hungerford, Garcia, Graziano, & Bagner, 2016; McDonald, Kehler, & Tough, 2018). Furthermore, maternal mental health, particularly symptoms of posttraumatic stress disorder (PTSD), may be an important mechanism between caregivers' disrupted representations and children's problematic social–emotional functioning. Although maternal PTSD symptoms have demonstrated associations with negative toddler social–emotional functioning in prior studies (Bosquet Enlow, Egeland, Carlson, Blood, & Wright, 2014; Bosquet Enlow et al., 2011) and nondisrupted categories of maternal representations (Schechter et al., 2005), we are not aware of any studies that

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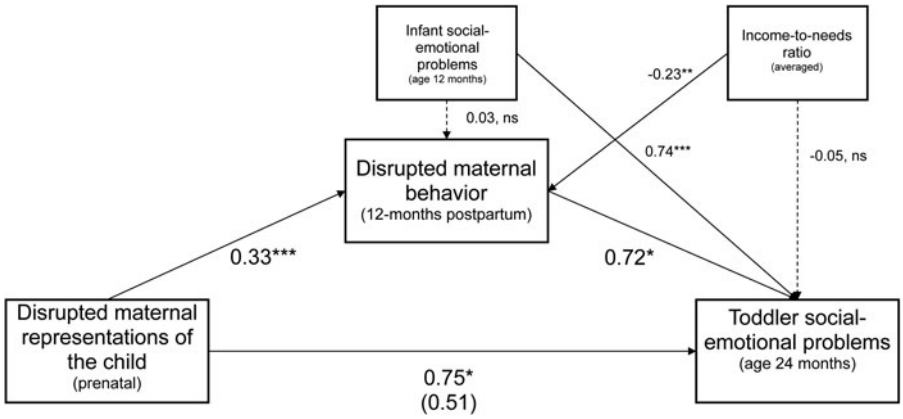

Figure 1. Disrupted maternal behavior at 12 months postpartum mediates the association between prenatal disrupted maternal representations of the child and mother-reported toddler social–emotional problems at 24 months postpartum. Indirect effect = 0.24, 95% CI [0.00, 0.48]. Mother-reported social–emotional problems at age 12 months postpartum and income-to-needs ratio (average from pregnancy through 24 months postpartum) were included as covariates; nonsignificant paths depicted by dashed lines were not included in the final model. Values are unstandardized. *p < .05, **p < .01, ***p < .001.

have demonstrated associations between maternal PTSD and maternal *disrupted* representations. Future studies are needed to examine these and other potential mechanisms to further explain how disrupted prenatal maternal representations are associated with later child outcomes. This continued line of work will also highlight additional intervention targets for reducing risk for poor toddler social–emotional outcomes.

The current study suggests that toddler social–emotional problems may be reduced and/or prevented by providing clinical interventions to women with disrupted representations during pregnancy and throughout the postpartum period. Furthermore, the relation between disrupted maternal behavior and mother-reported social–emotional problems may strengthen or become more entrenched with time, and therefore early intervention may be critical for mitigating risk. That is, when a mother has disrupted representations of her child prenatally and disrupted maternal behavior during the first year of the child's life, without intervention, the child's social–emotional problems may grow increasingly problematic and potentially impairing. Importantly, past work has demonstrated that attachment-based interventions delivered early in childhood can foster positive social–emotional outcomes for children in high-risk families, while preventing the progression of poor social–emotional functioning (Cicchetti, Rogosch, & Toth, 2006; Cicchetti, Toth, & Rogosch, 1999; Toth, Rogosch, Manly, & Cicchetti, 2006).

Prenatal identification of mothers with disrupted representations of the child is an important first step. However, there are challenges worth mentioning. Most notably, assessment of mothers using the WMCI (Zeanah et al., 1996; 1994) is time consuming and requires specialized training, as does the subsequent coding of the mother's responses using the disrupted coding scheme (WMCI-D; Crawford & Benoit, 2009). To move identification and prevention to a broader scale, more feasible assessments for the prenatal period that can be implemented with fidelity in broader settings (i.e., outside of research), such as primary care and community mental health, should be developed.

Assessment of disrupted maternal behavior using the AMBIANCE is also time consuming and requires specialized training (Bronfman et al., 2009–2014). To address this, Madigan and colleagues have recently developed the AMBIANCE-brief measure (Madigan, Bronfman, Haltigan, & Lyons-Ruth, 2018) for the detection of parents displaying disrupted caregiving behavior in broader applied settings, such as in child family services and primary care. The AMBIANCE-brief measure can be coded in "real-time" and provides a 90% reduction in coding time compared with the full AMBIANCE measure, making it more feasible for use in practice settings to identify targets for intervention (Cooke, Eirich, Racine, Lyons-Ruth, & Madigan, 2020).

One advantage of the full versions of AMBIANCE and the WMCI-D scale (an AMBIANCE-derived tool), however, is that they examine several dimensions of parental representations and behavior, and therefore identify specific aspects of caregiving that can assist clinicians in terms of pinpointing critical targets of intervention. Unfortunately, we are not aware of any interventions that have demonstrated reductions in disrupted maternal representations. Niccols et al. (2015) demonstrated the stability of disrupted representations across an 8-month period during infancy among participants receiving one of two interventions – a community parenting group or a supportive home visiting program. They noted that such interventions, while impactful in other areas, were not able to address disrupted representations, and astutely highlighted the need for interventions that specifically target disrupted representations in the service of improving social–emotional outcomes for infants and toddlers.

Only a few attachment-based interventions with the goal of improving caregiver–child relationships and child social–emotional outcomes have demonstrated reductions in disrupted caregiver behavior, including Attachment and Biobehavioral Catch-up (ABC; Dozier, Dozier, & Manni, 2002), Modified Interaction Guidance (Benoit, Madigan, Lecce, Shea, & Goldberg, 2001; McDonough, 2000), and the French infant mental health home visiting program CAPEDP (Saïas et al., 2013; Tereno et al., 2013; Tubach et al., 2012). Specifically, using randomized controlled trials (RCTs), the ABC and CAPEDP interventions have shown that reducing disruptive forms of caregiving behaviors can in turn reduce rates of disorganized attachment, highlighting that reducing disrupted caregiving behavior serves as an important mechanism in promoting optimal attachment outcomes for young children (Tereno et al., 2017; Yarger, Bronfman, Carlson, & Dozier, 2019). However, more RCTs are needed to replicate this work and to verify whether changes in disrupted caregiving can be attributed to intervention exposure.

Some limitations of the present study should be noted. First, our sample consisted only of high-risk mothers; therefore, the results are not generalizable to fathers or other significant caregivers in children's lives or to higher income families. Unfortunately, there is a dearth of research on fathers' representations, caregiving behaviors, and contributions to young children's social–emotional functioning, particularly in the perinatal period, although a few exceptions exist (e.g., Dayton et al., 2016; Tooten et al., 2014; Vreeswijk, Maas, Rijk, Braeken, & van Bakel, 2014a; Vreeswijk,

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Maas, Rijk, & van Bakel, 2014b). With regard to disrupted representations in particular, Tooten et al. (2014) identified disrupted and nondisrupted representations in a sample of mothers and fathers, and demonstrated that fathers too can have disrupted representations. Second, our sample size was small: future studies with larger samples with multiple types of primary caregivers are needed to increase confidence in our results through replication. Third, although we had strong, objective measures of prenatal disrupted representations and disrupted caregiving behavior, our social–emotional functioning outcome was mother-reported and thus may have been subject to biased interpretation. Future work is needed to replicate associations between disrupted prenatal representations and disrupted caregiving behavior and objective measures of toddler functioning, such as disorganized attachment behavior. These limitations aside, the strengths of the present study include a high retention of the sample over time and the use of gold-standard methods for reliably assessing the complex constructs of disrupted caregiver representations and behavior.

Several important future directions have been noted thus far, including identifying other important mechanisms that may help explain associations between disrupted caregiver representations, caregiving behavior, and toddler social–emotional functioning, such as caregivers' experiences of interpersonal trauma and mental health symptoms. The development of more feasible assessments for disrupted representations and behavior is also needed, as noted earlier in the paper. Another important future research direction is exploring potential buffers against harmful outcomes in the context of disrupted caregiver representations and/or behavior, given that not all caregivers with disrupted representations or behavior have children with serious social–emotional difficulties such as disorganized attachment. It is possible, for example, that factors such as social support or the presence of other caring, nurturing adults lessen the burden of caregiver disruption on child outcomes: social support is often reported as a buffer against various negative outcomes related to caregiving and the caregiver–child relationship in the context of experiencing interpersonal trauma and/or suffering from PTSD symptoms (Aspelmeier, Elliott, & Smith, 2007; Busuito, Huth-Bocks, & Puro, 2014; Guyon-Harris, Ahlfs-Dunn, & Huth-Bocks, 2017; Huth-Bocks, Levendosky, Bogat, & von Eye, 2004; Levendosky, Leahy, Bogat, Davidson, & von Eye, 2006).

In sum, this study is the first to examine pathways from disrupted maternal representations of the child during pregnancy to mother-reported toddler social–emotional functioning at 24 months. It was found that nearly a third of the impact is explained by disrupted maternal behavior observed at 12 months. The development of social–emotional problems in toddlerhood may be mitigated by providing clinical interventions to women with disrupted representations of the child during pregnancy and/or disrupted caregiving behavior in the postpartum period.

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References

Aspelmeier, J. E., Elliott, A. N., & Smith, C. H. (2007). Childhood sexual abuse, attachment, and trauma symptoms in college females: The moderating role of attachment. *Child Abuse & Neglect*, *31*, 549–566. doi:10.1016/J.CHIABU.2006.12.002

Ballen, N., Bernier, A., Moss, E., Tarabulsy, G. M., & St-Laurent, D. (2010). Insecure attachment states of mind and atypical caregiving behavior among foster mothers. *Journal of Applied Developmental Psychology*, *31*, 118–125. doi:10.1016/j.appdev.2009.10.001.

Barroso, N. E., Hungerford, G. M., Garcia, D., Graziano, P. A., & Bagner, D. M. (2016). Psychometric properties of the parenting stress index-short form (PSI-SF) in a high-risk sample of mothers and their infants. *Psychological Assessment*, *28*, 1331–1335. doi:10.1037/pas0000257

Benoit, D., Madigan, S., Lecce, S., Shea, B., & Goldberg, S. (2001). Atypical maternal behavior toward feeding-disordered infants before and after intervention. *Infant Mental Health Journal*, *22*, 611–626. doi:10.1002/imhj.1022

Benoit, D., Parker, K. C. H., & Zeanah, C. H. (1997a). Mothers' representations of their infants assessed prenatally: Stability and association with infants' attachment classifications. *Journal of Child Psychology and Psychiatry*, *38*, 307–313. doi:10.1111/j.1469-7610.1997.tb01515.x

Benoit, D., Zeanah, C. H., Parker, K. C., Nicholson, E., & Coolbear, J. (1997b). "Working Model of the Child Interview": Infant clinical status related to maternal perceptions. *Infant Mental Health Journal*, *18*, 107–121.

Bosquet Enlow, M., Egeland, B., Carlson, E., Blood, E., & Wright, R. J. (2014). Mother-infant attachment and the intergenerational transmission of posttraumatic stress disorder. *Development and Psychopathology*, *26*, 41–65. doi:10.1017/S0954579413000515

Bosquet Enlow, M., Kitts, R. L., Blood, E., Bizarro, A., Hofmeister, M., & Wright, R. J. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. *Infant Behavior & Development*, *34*, 487–503. doi:10.1016/j.infbeh.2011.07.007

Bowlby, J. (1983). *Attachment and loss. Volume I: Attachment* (2nd ed). New York, NY: Basic Books.

Bretherton, I., & Munholland, K. A. (2008). Internal working models in attachment relationships: Elaborating a central construct in attachment theory. In J. Cassidy & P. R. Shaver (Eds.), *Handbook of attachment: Theory, research and clinical applications* (pp. 102–127). New York, NY: Guilford Press.

Briggs-Gowan, KJ, & Carter, AS. (2006). *The Brief Infant–Toddler Social & Emotional Assessment (BITSEA)*. San Antonio, TX: Psychological Corporation, Harcourt Press.

Briggs-Gowan, M.J , & Carter, A.S. (2007). Applying the Infant-Toddler Social & Emotional Assessment (ITSEA) and Brief-ITSEA in early intervention. *Infant Mental Health Journal*, *28*(6), 564–583. doi:10.1002/imhj.20154.

Briggs-Gowan, M. J, Carter, A. S., Irwin, J. R., Wachtel, K., & Cicchetti, D. (2004). The Brief Infant-Toddler Social and Emotional Assessment: Screening for Social-Emotional Problems and Delays in Competence. *Journal of Pediatric Psychology*, *29*(2), 143–155. doi:10.1093/jpepsy/jsh017.

Bronfman, E., Madigan, S., & Lyons-Ruth, K. (2009–2014). *Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE): Manual for Coding Disrupted Affective Communication*. Unpublished manuscript. Harvard University Medical School.

Busuito, A., Huth-Bocks, A., & Puro, E. (2014). Romantic attachment as a moderator of the association between childhood abuse and posttraumatic stress disorder symptoms. *Journal of Family Violence*, *29*, 567–577. doi:10.1007/s10896-014-9611-8

Cicchetti, D., Rogosch, F., & Toth, S. (2006). Fostering secure attachment in infants in maltreating families through preventive interventions. *Development and Psychopathology*, *18*, 623–649. doi:10.1017/S0954579406060329

Cicchetti, D., Toth, S., & Rogosch, F. (1999). The efficacy of toddler-parent psychotherapy to increase attachment security in off-spring of depressed mothers. *Attachment and Human Development*, *1*, 34–66. doi:10.1080/14616739900134021

Cooke, J. E., Eirich, R., Racine, N., Lyons-Ruth, K., & Madigan, S. (2020). Validation of the AMBIANCE-brief: An observational screening instrument for disrupted caregiving. *Infant Mental Health Journal*, *41*, 299–312. doi:10.1002/imhj.21851.

Cowan, P. A., Cohn, D. A., Cowan, C. P., & Pearson, J. L. (1996). Parents' attachment histories and children's externalizing and internalizing behaviors: Exploring family systems models of linkage. *Journal of Consulting and Clinical Psychology*, *64*, 53–63. doi:10.1037/0022-006X.64.1.53

Crawford, A., & Benoit, D. (2009). Caregivers' disrupted representations of the unborn child predict later infant-caregiver disorganized attachment and disrupted interactions. *Infant Mental Health Journal*, *30*, 124–144. doi:10.1002/imhj.20207

Dayton, C. J., Buczkowski, R., Muzik, M., Goletz, J., Hicks, L., Walsh, T. B., & Bocknek, E. L. (2016). Expectant fathers' beliefs and expectations about fathering as they prepare to parent a new infant. *Social Work Research*, *40*, 225–236. doi:10.1093/swr/svw017

Dozier, M., Dozier, D., & Manni, M. (2002). Recognizing the special needs of infants' and toddlers' foster parents: Development of a relational intervention. *Zero to Three Bulletin*, *22*, 7–13.

George, C., & Solomon, J. (2008). The caregiving system: A behavioral systems approach to parenting. In J. Cassidy, & P. R. Shaver (Eds.), *Handbook of attachment* (2nd ed, pp. 833–856). New York, NY: Guilford Press.

Goldberg, S., Benoit, D., Blokland, K., & Madigan, S. (2003). Atypical maternal behavior, maternal representations, and infant disorganized attachment. *Development and Psychopathology*, *15*, 239–257. doi:10.1017/S0954579403000130.

Greenberg, M. T., Speltz, M. L., & Deklyen, M. (1993). The role of attachment in the early development of disruptive behavior problems. *Development and Psychopathology*, *5*, 191–213. doi:10.1017/S095457940000434X

Guyon-Harris, K. L., Ahlfs-Dunn, S., & Huth-Bocks, A. C. (2017). PTSD symptom trajectories among mothers reporting interpersonal trauma: Protective factors and parenting outcomes. *Journal of Family Violence*, *32*, 657–667. doi:10.1007/s10896-017-9934-3

Guyon-Harris, K. L., Madigan, S., Bronfman, E., Romero, G., & Huth-Bocks, A. C. (2020). Prenatal identification of risk for later disrupted parenting behavior using latent profiles of childhood maltreatment. *Journal of Interpersonal Violence*, doi:10.1177/0886260520906175

Hall, R. A. S., Hoffenkamp, H. N., Tooten, A., Braeken, J., Vingerhoets, A. J. J. M., & van Bakel, H. J. A. (2015). Longitudinal associations between maternal disrupted representations, maternal interactive behavior and infant attachment: A comparison between full-term and preterm dyads. *Child Psychiatry & Human Development*, *46*, 320–331. doi:10.1007/s10578-014-0473-3

Hesse, E., & Main, M. (2006). Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and Psychopathology*, *18*, 309–43. doi:10.1017/S0954579406060172

Huth-Bocks, A. C., Levendosky, A. A., Bogat, G. A., & von Eye, A. (2004). The impact of maternal characteristics and contextual variables on infant-mother attachment. *Child Development*, *75*, 480–496. doi:10.1111/j.1467-8624.2004.00688.x

Huth-Bocks, A. C., Theran, S. A., Levendosky, A. A., & Bogat, G. A. (2011). A social-contextual understanding of concordance and discordance between maternal prenatal representations of the infant and infant-mother attachment. *Infant Mental Health Journal*, *32*, 405–426. doi:10.1002/imhj.20304

Karabekiroglu, K., Briggs-Gowan, M. J., Carter, A. S., Rodopman-Arman, A., & Akbas, S. (2010). The clinical validity and reliability of the Brief Infant–Toddler Social and Emotional Assessment (BITSEA). *Infant Behavior and Development*, *33*(4), 503–509. doi:10.1016/j.infbeh.2010.07.001

Korja, R., Ahlqvist-Björkroth, S., Savonlahti, E., Stolt, S., Haataja, L., Lapinleimu, H., … Lehtonen, L. (2010). Relations between maternal attachment representations and the quality of mother-infant interaction in preterm and full-term infants. *Infant Behavior and Development*, *33*, 330–336. doi:10.1016/j.infbeh.2010.03.010

Levendosky, A. A., Leahy, K. L., Bogat, G. A., Davidson, W. S., & von Eye, A. (2006). Domestic violence, maternal parenting, maternal mental health, and infant externalizing behavior. *Journal of Family Psychology*, *20*, 544–552. https://psycnet.apa.org/buy/2006-22333-002

Lyons-Ruth, K., Alpern, L., & Repacholi, B. (1993). Disorganized infant attachment classification and maternal psychosocial problems as predictors of hostile-aggressive behavior in the preschool classroom. *Child Development*, *64*, 572–585. doi:10.1111/j.1467-8624.1993.tb02929.x

Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999). Atypical attachment in infancy and early childhood among children at developmental risk. IV. Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, *64*, 67–96. doi:10.1111/1540-5834.00034

Lyons-Ruth, K., Bureau, J.-F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013). Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research*, *206*, 273–281. doi:10.1016/J.PSYCHRES.2012.09.030

Madigan, S., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006a). Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment and Human Development*, *8*, 89–111. doi:10.1080/14616730600774458.

Madigan, S., Bronfman, E. T., Haltigan, J. D., & Lyons-Ruth, K. (2018). *Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE) – Brief measure*. Unpublished manuscript, University of Calgary.

Madigan, S., Hawkins, E., Goldberg, S., & Benoit, D. (2006b). Reduction of disrupted caregiver behavior using modified interaction guidance. *Infant Mental Health Journal*, *27*(5), 509–527. doi:10.1002/imhj.20102.

Madigan, S., Moran, G., & Pederson, D. R. (2006c). Unresolved states of mind, disorganized attachment relationships, and disrupted interactions of adolescent mothers and their infants. *Developmental Psychology*, *42*, 293–304. doi:10.1037/0012-1649.42.2.293

Madigan, S., Moran, G., Schuengel, C., Pederson, D. R., & Otten, R. (2007). Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: Links to toddler behavior problems. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, *48*, 1042–1050. doi:10.1111/j.1469-7610.2007.01805.x

Madigan, S., Voci, S., & Benoit, D. (2011). Stability of atypical caregiver behaviors over six years and associations with disorganized infant–caregiver attachment. *Attachment & Human Development*, *13*, 237–252. doi:10.1080/14616734.2011.562410

Main, M., & Goldwyn, R. (1984). *Adult Attachment Scoring and Classification System*. Unpublished manuscript. Berkeley: University of California. doi:10.1186/1752-0509-2-76.

Main, M., & Hesse, E. (1990). Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism? In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (Eds.), The John D. and Catherine T. MacArthur Foundation series on mental health and development. *Attachment in the preschool years: Theory, research, and intervention* (pp. 161–182). Chicago: University of Chicago Press.

McDonald, S. W., Kehler, H. L., & Tough, S. C. (2018). Risk factors for delayed social-emotional development and behavior problems at age two: Results from the All Our Babies/Families (AOB/F) cohort. *Health Science Reports*, *1*, e82. doi:10.1002/hsr2.82

McDonough, S. (2000). Interaction guidance: An approach for difficult-to-engage families. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (2nd ed., pp. 485–493). New York, NY: Guilford Press.

Niccols, A., Smith, A., & Benoit, D. (2015). The Working Model of the Child Interview: Stability of the disrupted classification in a community intervention sample. *Infant Mental Health Journal*, *36*, 388–398. doi:10.1002/imhj.21522

O'connor, E., Bureau, J.-F., Mccartney, K., & Lyons-Ruth, K. (2011). Risks and outcomes associated with disorganized/controlling patterns of attachment at age three years in the national institute of child health & human development study of early child care and youth development. *Infant Mental Health Journal*, *32*, 450–472. doi:10.1002/imhj.20305

Rosenblum, K. L., McDonough, S., Muzik, M., Miller, A., & Sameroff, A. (2002). Maternal representations of the infant: Associations with infant response to the still face. *Child Development*, *73*, 999–1015. doi:10.1111/1467-8624.00453

Saïas, T., Greacen, T., Tubach, F., Dugravier, R., Marcault, E., Tereno, S., … Guédeney, A. (2013). Supporting families in challenging contexts: The CAPEDP project. *Global Health Promotion*, *20*, 66–70. doi:10.1177/1757975913483335

Schechter, D. S., Coots, T., Zeanah, C. H., Davies, M., Coates, S. W., Trabka, K. A., … Myers, M. M. (2005). Maternal mental representations of the child in

an inner-city clinical sample: Violence-related posttraumatic stress and reflective functioning. *Attachment and Human Development*, *7*, 313–331. doi:10.1080/14616730500246011

Shi, Z., Bureau, J. F., Easterbrooks, M. A., Zhao, X., & Lyons-Ruth, K. (2012). Childhood maltreatment and prospectively observed quality of early care as predictors of antisocial personality disorder features. *Infant Mental Health Journal*, *33*, 55–69. doi:10.1002/imhj.20295.

Slade, A., & Sadler, L. S. (2019). Pregnancy and infant mental health. In C. H. Zeanah (Ed.), *Handbook of infant mental health* (pp. 25–40). New York, NY: Guilford Press.

Solomon, J., & George, C. (1996). Defining the caregiving system: Toward a theory of caregiving. *Infant Mental Health Journal*, *17*, 183–197. doi:10.1002/(SICI)1097-0355(199623)17:3<183::AID-IMHJ1>3.0.CO;2-Q

Tereno, S., Guedeney, N., Dugravier, R., Greacen, T., Saïas, T., Tubach, F., & Guédeney, A. (2013). Implementation and assessment of an early home-based intervention on infant attachment organisation: The CAPEDP attachment study in France. *Global Health Promotion*, *20*, 71–75. doi:10.1177/1757975913483337

Tereno, S., Madigan, S., Lyons-Ruth, K., Plamondon, A., Atkinson, L., Guedeney, N., … Guedeney, A. (2017). Assessing a change mechanism in a randomized home-visiting trial: Reducing disrupted maternal communication decreases infant disorganization. *Development and Psychopathology*, *29*, 637–649. doi:10.1017/S0954579417000232

Tooten, A., Hall, R. A. S., Hoffenkamp, H. N., Braeken, J., Vingerhoets, A. J. J. M., & van Bakel, H. J. A. (2014). Maternal and paternal infant representations: A comparison between parents of term and preterm infants. *Infant Behavior and Development*, *37*, 366–379. doi:10.1016/J.INFBEH.2014.05.004

Toth, S., Rogosch, F., Manly, J., & Cicchetti, D. (2006). The efficacy of toddler-parent psychotherapy to reorganize attachment in the young offspring of mothers with major depressive disorder: A randomized preventive trial. *Journal of Consulting and Clinical Psychology*, *74*, 1006–1016. doi:10.1037/0022-006X.74.6.1006

Tubach, F., Greacen, T., Saïas, T., Dugravier, R., Guedeney, N., Ravaud, P., … Guedeney, A. (2012). A home-visiting intervention targeting determinants of infant mental health: The study protocol for the CAPEDP randomized controlled trial in France. *BMC Public Health*, *12*, 648. doi:10.1186/1471-2458-12-648

van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999). Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, *11*, 225–250. doi:10.1017/s0954579499002035

Vreeswijk, C. M. J. M., Maas, A. J. B. M., Rijk, C. H. A. M., Braeken, J., & van Bakel, H. J. A. (2014a). Stability of fathers' representations of their infants during the transition to parenthood. *Attachment & Human Development*, *16*, 292–306. doi:10.1080/14616734.2014.900095

Vreeswijk, C. M. J. M., Maas, A. J. B. M., Rijk, C. H. A. M., & van Bakel, H. J. A. (2014b). Fathers' experiences during pregnancy: Paternal prenatal attachment and representations of the fetus. *Psychology of Men & Masculinity*, *15*, 129–137. doi:10.1037/a0033070

Vreeswijk, C. M. J. M., Maas, A. J. B. M., & van Bakel, H. J. A. (2012). Parental representations: A systematic review of the working model of the child interview. *Infant Mental Health Journal*, *33*(3), 314–328. doi:10.1002/imhj.20337.

Yarger, H. A., Bronfman, E., Carlson, E., & Dozier, M. (2019). Intervening with attachment and biobehavioral catch-up to decrease disrupted parenting behavior and attachment disorganization: The role of parental withdrawal. *Development and Psychopathology*, *32*, 1139–1148. doi:10.1017/s0954579419000786.

Zeanah, C. H., Benoit, D., Barton, M. L., & Hirshberg, L. (1996). *Working Model of the Child Interview Coding Manual*. Unpublished manuscript. New Orleans: Louisiana State University School of Medicine.

Zeanah, C. H., Benoit, D., Hirshberg, L., Barton, M. L., & Regan, C. (1994). Mothers' representations of their infants are concordant with infant attachment classifications. *Developmental Issues in Psychiatry and Psychology*, *1*, 9–18.