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## Parental Synchrony and Nurturance as Targets in an Attachment Based Intervention: Building Upon Mary Ainsworth's Insights About Mother-Infant Interaction

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### Abstract

As an astute observer of parent-infant interaction, Mary Ainsworth described and assessed facets of maternal sensitivity, including responsiveness to conditions of infant distress and non-distress. In this paper, we consider the importance of distinguishing between parental sensitivity to children's distress cues (which we refer to as nurturance) and parental sensitivity to children's non-distress cues (which we refer to as synchrony). Observations of parents in our intervention, Attachment and Biobehavioral Catch-up (ABC), have led us to believe that distress and non-distress represent distinct contexts in which parents can be differentially sensitive or insensitive in responding. Thus, we have conceptualized nurturance and synchrony as distinct targets of the ABC intervention, and, in deciding how to assess parental sensitivity, we have chosen measures that distinguish between nurturance and synchrony. We describe the strengths and weaknesses of different approaches we have taken to assess parental sensitivity, including diary methodology that we developed for assessing parental nurturance and global measures that we have used for assessing parental synchrony. Finally, we describe a frequency-based coding system that we developed for assessing parental nurturance and synchrony from videotaped intervention sessions.

### Keywords

sensitivity; intervention; nurturance; synchrony; attachment

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Following Bowlby's assertions that attachment is shaped by real experience, Mary Ainsworth sought to identify specific characteristics of parenting behavior that were relevant for mother-infant attachment. In her study in Uganda, Ainsworth immersed herself in the lives of 28 babies and their families and recorded detailed observations about everything that seemed to matter: feeding, sleeping arrangements, shared caregiving, quantity of contact with caregivers, etc. (Ainsworth, 1967). Amongst the range of variables she examined, Ainsworth believed that the *quality* of mother-infant interactions was critical to distinguishing between infants who were securely attached from those who were insecurely attached. In her Baltimore study, Ainsworth and colleagues further examined individual differences in the quality of maternal care by visiting 26 families 18 times each (for four hours each time) within each baby's first year (Ainsworth, Blehar, Waters, & Wall, 1978). Based on these intensive observations, Ainsworth defined four scales describing facets of maternal responsiveness that she believed to be important to mother-infant attachment: sensitivity-insensitivity, cooperation-interference, availability-ignoring, and acceptance-rejection. Indeed, these global scales proved to be remarkably predictive of infants' attachment classifications. Ainsworth's conceptualization of these key aspects of maternal

behavior continues to be central to how we, as a field, measure maternal sensitivity and design interventions that enhance maternal sensitivity.

Since Ainsworth's seminal studies, researchers have continued to examine maternal sensitivity as a key construct. Within the field of developmental psychology, however, we have struggled to consistently demonstrate the strong predictive validity of maternal sensitivity that Ainsworth reported, perhaps in part due to differences in practices for measurement. Ainsworth's findings that maternal sensitivity plays a critical role in predicting attachment quality became an important part of attachment theory when Bowlby incorporated them into his trilogy (1969/82, 1973). In a meta-analysis of 66 such studies, De Wolff and van IJzendoorn (1997) were able to confirm significant associations between parental sensitivity and attachment security, but the correlations were inconsistent and considerably more moderate overall than those reported by Ainsworth. No single measure or approach represented in the meta-analysis stood out as stronger than others in its predictive validity for attachment security. A number of factors may explain why parental sensitivity did not consistently emerge as a strong predictor of attachment quality (see Cassidy et al., 2005; Lindhiem, Bernard, & Dozier, 2011; Pederson, Gleason, Moran, & Bento, 1998). Although we have a gold-standard tool for assessing attachment security (i.e., Strange Situation; Ainsworth et al., 1978), parental sensitivity measures vary the amount of time used for observations, the nature of the tasks (e.g., play, teaching, distress), the instruments used for coding (e.g., global rating scales, micro-level frequency counts, Q-sort methodology), and the characteristics of the child and dyad (e.g., child age).

## Sensitivity as a Multi-dimensional Construct

In Ainsworth's original scale for sensitivity vs. insensitivity to the baby's signals, she defined sensitivity as "the mother's ability to perceive and to interpret accurately the signals and communications implicit in her infant's behavior, and given this understanding, to respond to them appropriately and promptly" (Ainsworth et al., 1978). Ainsworth's definition of maternal sensitivity takes into account how the mother responds to children's signals of distress as well as social cues across contexts of feeding, play, and other daily experiences.

In line with this definition, we developed an intervention program that aims to enhance parental sensitivity across these contexts. In our efforts to coach parents to respond more sensitively to children's cues and to measure intervention effectiveness, we have found value in distinguishing parents' sensitivity to children's distress from sensitivity to non-distress. These constructs, which we will refer to as 'nurturance' and 'synchrony,' respectively, are likely separable, may be predicted by different variables, and may show differential effects on children's outcomes (Leerkes, Blankson, & O'Brien, 2009; McElwain & Booth-LaForce, 2006). For example, bids for reassurance from a distressed child may trigger different issues from parents than bids to engage in play. In particular, soothing a distressed child is likely to call up a parent's own attachment experiences to a greater extent than responding to a non-distressed child. We expect that attachment state of mind, or the way in which adults organize and interpret attachment-related experiences is especially relevant to the way in which parents respond to their child's distress. Attachment state of mind is assessed with the Adult Attachment Interview (George, Kaplan, & Main, 1986; Hesse, 2008). In our view, autonomous parents may be able to respond in a more nurturing way to children's distress than non-autonomous parents. Attachment state of mind may not be especially relevant, however, to parents' ability to respond in synchronous ways to children's non-distress behaviors.

We suggest that using definitions of sensitivity that distinguish between sensitivity in distress and non-distress situations will enhance our ability to clearly target these behaviors in early interventions and to delineate potential mechanisms of intervention effectiveness. Below, we define nurturance and synchrony, presenting a rationale for why these constructs represent unique dimensions of parental sensitivity. After describing each construct, we report our attempts at measuring it in our work. Next, we describe how distinguishing nurturance and synchrony has been useful in our attachment-based intervention (i.e., Attachment and Biobehavioral Catch-up: ABC, Dozier & The Infant Caregiver Project Lab, 2012) aimed at enhancing parental responsiveness to infants and toddlers. We present case examples depicting parents with differential strength in the two dimensions of sensitivity, and then describe a frequency-based coding system that we developed to measure these dimensions within intervention sessions.

## Nurturance

We define nurturance in terms of how parents respond when children are distressed. Ainsworth et al. (1978) emphasized the importance of the caregiver serving a protective role in the face of threat or danger. Nurturance, as we have defined it, describes the parent's role in providing a "haven of safety" (Bowlby, 1969/1982). Some have argued for a narrow definition of attachment, in which parental protection is the critical component for promoting a secure parent-child relationship (e.g., Goldberg, Grusec, & Jenkins, 1999). Many studies, however, examine parental responsiveness more generally, without differentiating between sensitive responsiveness in distress and non-distress contexts.

Parental nurturance carries particular relevance to children's developing expectations of their parents' availability during times of distress. Using data from the NICHD Study of Early Child Care, McElwain and Booth-LaForce (2006) compared maternal sensitivity to infant distress versus maternal sensitivity to non-distress cues (both coded during the same play interaction task) in predicting attachment security in the Strange Situation. Greater sensitivity to distress at 6 months, but not sensitivity to non-distress, was associated with increased odds of a secure attachment classification at 15 months. Similarly, Leerkes (2011) rated maternal sensitivity in different contexts when infants were 6 months old: two distress tasks (i.e., fear task using loud remote-control truck, frustration task using arm-restraint procedure) and a non-arousing free play task. Only maternal sensitivity during the distressing tasks predicted attachment security in the Strange Situation. Thus, nurturance to children's distress may be especially important in promoting children's attachment security.

**Assessing nurturance**—Measuring responsiveness to children's distress can be challenging because it requires very long observation periods allowing multiple occasions for parental response to distress, or, alternatively, a context or paradigm that elicits distress. In her work developing the Strange Situation (Ainsworth et al., 1978), Ainsworth discovered a context that reliably elicits infant distress and reveals stable individual differences in how infants use their parents to manage their distress. The Strange Situation has been a powerful paradigm that made assessment of infant attachment readily accessible. It is hard to imagine a more powerful paradigm.

In our lab, we were interested in changes in attachment behaviors and parent responsiveness during the first weeks and months of a foster placement. Given that the Strange Situation cannot be repeated at frequent intervals because the infant's response likely changes by virtue of repeated exposure and/or it would be ethically questionable, we had to develop an alternative approach to measuring attachment behavior. Thus, we developed a diary method to assess children's response to distress and parent responsiveness on a more frequent basis than is possible with the Strange Situation. Parents' reports tend to be systematically biased

(De Los Reyes & Kazdin, 2005; Youngstrom, Izard, & Ackerman, 1999), as are self-reports of generalized behaviors and attitudes (Schwarz, 1996). We expected that a diary methodology would diminish the influence of such biases if parents were asked to describe *specific* examples from each day.

The Parent Attachment Diary (Dozier & Stovall, 1997) was designed to capture children's attachment behaviors during times of distress and parents' subsequent responses. Parents are asked to complete a daily entry at the end of each day, in which they record incidents when the child is hurt, frightened, and separated. After describing the incident in a brief narrative, the parent completes a checklist of attachment behaviors displayed by the child (e.g., "Cried," "Acted as if nothing was wrong"). Parents record the sequence of the child's behaviors by numbering them in the order that they occur. Parents also record their own behavioral response to the child's distress. We used the Parent Attachment Diary for assessing the development of attachment behaviors in new foster care placements (Stovall-McClough & Dozier, 2004). We found that during the first two months of a new foster placement, infants placed at younger ages with foster parents assessed as autonomous during the AAI, showed higher levels of secure behavior, less avoidant behavior, and more consistent attachment strategies, relative to infants placed with non-autonomous foster parents (Stovall-McClough & Dozier, 2004). Further, we (Stovall & Dozier, 2000) were able to plot the trajectory of change over time in children's attachment behaviors.

Despite some strengths of this diary methodology, we increasingly became concerned about the extent to which reporting of children's attachment behaviors and parents' responses were affected systematically by parental biases. Our concerns were based primarily on anecdotal evidence suggesting that parents were biased in their observations of children's distress. As part of our intervention, for example, we show parents video clips of children during a separation episode and reunion episode of the Strange Situation. Parents vary widely in their interpretations of children's responses, with some noting that a crying child was "not really upset" and others recognizing even subtle signs of child distress, such as diminished quality of play. As we considered the potential biases involved in reporting of attachment situations, we were most concerned that responses were filtered through the lens of the parent's attachment state of mind. For example, an autonomous parent, who is comfortable with her child's distress and values her role in providing support, may be more likely than a non-autonomous parent to report her child's displays of distress and also her subsequent attempts to provide nurturance. In contrast, a parent who has a dismissive state of mind may not interpret her child as in distress even though others would not share that impression. In the diary, she might indicate that her child "appeared fine" after falling down a step and that she did not then do anything to help the child. Thus, findings from our diary studies that indicate that children of dismissing parents show more avoidant behaviors than children of autonomous parents following potentially distressing situations (Stovall-McClough & Dozier, 2004) could be the result of avoidance among such children, or a tendency of dismissing parents to under-report distress. The conflation of these two factors makes this diary method problematic.

In view of the potential biases of self-report, we subsequently decided to rely more on observational measures. For example, we have used the Maternal Behavior Q-Sort (MBQS; Pederson & Moran, 1998) in order to assess maternal sensitivity following observations. Ninety items (or 25 in the shortened version; Tarabulsky et al., 2009) that describe various aspects of maternal behavior are sorted into categories from least descriptive to most descriptive of the parent. The items of the resulting forced distribution sorting are scored according to their placement. Scores are correlated with a criterion sort that describes the prototypically sensitive parent. The measure is designed for use following observations during which the parent's attention is divided, usually lasting 1 to 2 hours. For example, a

number of studies have used the Maternal Behavior Q-sort during research visits in families' homes, during which parents are completing questionnaires or being interviewed (Van IJzendoorn, Vereijken, Bakermans-Kranenburg, & Riksen-Walraven, 2004). The added challenge on the infant's ability to access the parent and the parent's ability to monitor and respond to child cues in the face of competing demands is expected to enhance the opportunity to observe variability in sensitivity. We have used the 25-item shortened version of the Maternal Behavior Q-Sort as a way to measure global responsiveness across intervention sessions, and found it to work well for this purpose. Specifically, coders observed maternal behavior during videotaped intervention sessions, which lasted approximately 1 hour each. After watching and taking detailed notes of each videotaped intervention session, two independent coders sorted MBQS items and overall sensitivity scores were averaged. In a sample of high-risk mother-infant dyads participating in a 10-session control (non-attachment based) intervention, we examined whether increasing numbers of observations (i.e., more sessions) led to larger effect sizes between MBQS scores and constructs of interest. As expected, we found that as the number of observations increased, the association between state of mind and sensitivity increased (from  $r = .37$  to  $r = .54$ ) (Lindheim et al., 2011).

However, as we have become increasingly interested in distinguishing between parental sensitivity to distress versus sensitivity to non-distress cues, one of the issues with relying on the Maternal Behavior Q-Sort is that it does not distinguish between nurturance and synchrony. Items that describe the prototypically sensitive parent relate both to how parents respond to distress (e.g., "Responds accurately to signals of distress") as well as how parents respond to non-distress cues, such as through contingent responsiveness (e.g., "Builds on the focus of baby's attention"). Although studies have found the Maternal Behavior Q-Sort to be predictive of attachment security, it is not fully satisfactory in helping us parse potentially unique aspects of nurturance versus synchrony.

The challenge of measuring nurturance as a parent's responses to child distress is that distress is a relatively low frequency behavior in typical observation contexts, such as free play, and even in longer home observations. Thus, most recently, we have begun to measure nurturance in situations that elicit distress. For example, as part of a recent study, we pricked preschool-age children's fingers to collect blood spot samples. Consistent with our expectations that this was a good context for assessing nurturance, analyses examining whether parents' attachment state of mind predicted nurturance revealed a large effect size (Simons, Bernard, & Dozier, 2013), with autonomous parents showing higher levels of nurturance than dismissing parents.

Although we have explored the possibility of coding nurturance during the Strange Situation, as others have done (e.g., Behrens, Parker, & Haltigan, 2011), we are cautious for several reasons. First, the Strange Situation instructions themselves are intended to reduce variability in parents' behavior (i.e., by limiting responsiveness). Second, differences in children's attachment strategies are associated with differences in the likelihood that they show distress. For example, an avoidant child is less likely than other children to show distress, perhaps further contributing to how responsive a parent is likely to appear. Thus, opportunities to respond to distress may vary systematically by attachment classification. Finally, if our interest is to examine the association between parental nurturance and infant attachment, it is not ideal to assess both within the same context. Our attempts to identify contexts in which we can specifically assess nurturance parallel efforts by other researchers who distinguish between sensitivity to distress versus sensitivity to non-distress (e.g., Leerkes, Weaver, & O'Brien, 2012).

Our frequency-based coding system, described in more detail in a later section, involves coding nurturing parental responses to episodes of child distress that occur naturally during home intervention sessions. Relative to methods that rely on global sensitivity ratings in contexts that may or may not involve child distress, we expect that our frequency-based coding system will provide a stronger measurement of nurturance as it considers how a parent responds to each behavioral indication of child distress as it occurs during an intervention session.

## Synchrony

We define synchrony as the parent's following the child's lead in interactions, or the parent's responding to the child's behavior in ways that maintain the child's perspective and goals, referred to by Blehar, Lieberman, & Ainsworth (1977) as "contingent responsiveness." Shonkoff and Bales (2011) use a "serve and return" metaphor, illustrating the different roles for the parent and child in synchronous interaction, with the child serving, and the parent returning the serve. Our definition of synchrony focuses on whether the parent contingently responds to ("returns") a child's bid ("serve"). We believe that this specificity allows us to most effectively target and measure opportunities for synchronous behavior during intervention sessions. However, we recognize that parents may initiate interactions at times, and these initiations are not necessarily incompatible with ongoing synchronous interactions.

Parental synchrony has been linked to a host of physiological and behavioral regulatory outcomes, with early co-regulation of physiology hypothesized as a mediator (Feldman, 2012). Although the field of developmental psychology has conceptualized synchrony in various ways, including as a quality of the dyad, here we highlight work that measured synchrony as parental contingent responsiveness to non-distress cues and linked it to regulatory outcomes. For example, Feldman, Greenbaum and Yirmiya (1999) found that "infant-leads-mother-follows" synchrony at 3 months was predictive of child self-control at two years of age, measured in compliance and delay tasks. The time lag between infant behavior and mother response at 3 months served as an additional predictor of self-control in this study. Bornstein and Tamis-LeMonda (1997) found that maternal responsiveness to non-distress cues at 5 months, measured as the proportion of mother responses to infant non-distress signals, predicted attention span at 13 months, whereas maternal responsiveness to distress did not. Recent findings from our lab even suggest that children in high-risk environments may be buffered from telomere shortening, a marker of cellular aging, if they have mothers who interact synchronously with them (Asok, Bernard, Roth, Rosen, & Dozier, in press). Thus, whereas nurturance seems particularly important in children's development of attachment security, parent synchrony, in contrast, may be particularly influential in children's development of behavioral and physiological regulation.

**Assessing synchrony**—Currently, we assess synchrony in ways that relate to Ainsworth's conceptual definition of maternal sensitivity (Ainsworth & Bell, 1969; Blehar et al., 1977). Most overlapping between our and Ainsworth's conceptualizations of this construct is the focus on the attunement and timing/pacing of the mother's responses to her child's social cues. However, Ainsworth's conceptualization of sensitivity is more inclusive than our conceptualization of synchrony as she also considered mothers' responsiveness to distress cues.

We use rating scales from the NICHD's Observational Record of the Caregiving Environment (ORCE; NICHD ECCRN, 1996) to assess various qualities of parent interaction during semi-structured play activities. NICHD studies often use the ORCE to create a composite construct of sensitivity, taking into account several scales, including

positive regard and reverse-coded intrusiveness. To assess the specific construct of synchrony, we use the ORCE sensitivity/responsiveness to non-distress scale, and to assess constructs of non-synchrony, we use the intrusiveness scale and the detachment/disengagement scale. The sensitivity/responsiveness to non-distress scale closely matches our definition of synchrony, as it focuses on how the parent “follows the child’s lead.” The ORCE scales represent global ratings of how the parent tends to respond to specific child behaviors. Although the scales are 4-point scales, we have adapted them to allow greater variability with 5-point ratings. A low score (1) on the sensitivity/responsiveness to non-distress scale reflects a parent who rarely responds appropriately to child cues, and may be predominately detached or intrusive. A high score (5) on the scale reflects a parent who nearly always responds contingently to the child’s gestures, vocalizations, and expressions, and maintains “child-centered” interactions. This description of a highly sensitive parent closely matches phrasing used by Ainsworth in her conceptualization: “attuned to B’s signals; and responds to them promptly and appropriately,” “she makes her responses temporally contingent upon B’s signals and communications” (Ainsworth et al., 1978). We have used the ORCE scales to measure parent behavior in various play contexts, including a three box task, and play across ages with toys geared to different developmental levels. We have found preliminary evidence that the scales are sensitive to intervention effects (Dozier, Meade, Wallin & Bernard, 2013; Wallin, Dozier, Bernard & Meade, 2013).

Constructs inversely related to synchrony include intrusiveness and detached/unresponsive parenting, which we also code from play interactions using the NICHD ORCE scales. Given that a parent may score low on synchrony by showing either intrusive or detached behavior, we find it useful to code these constructs separately. Intrusiveness is defined as a controlling, overstimulating interactional style in which the parent imposes his or her agenda on the child and does not modulate behavior based on the child’s responses. An example of intrusive behavior would be a parent repeatedly asking the child to identify the colors or shapes of blocks, even though the child appears to be trying to build a tower with the blocks instead. Detachment is defined as an uninterested, disengaged interactional style in which the parent fails to respond to the child’s bids and behaviors. Both intrusiveness and detachment reflect failures to follow the child’s lead in synchronous ways. These conceptualizations of intrusiveness and detachment are similar to Ainsworth’s scales of interference (vs. cooperation) and ignoring and neglecting (vs. accessibility), respectively.

Our frequency-based coding system, described in more detail in a later section, involves coding parental synchrony as it occurs naturally during home intervention sessions. This provides a complementary method to assessing synchrony during a structured play task, as it captures how the parent interacts with the child when faced with competing demands (e.g., conversation with parent coach).

## **Attachment and Biobehavioral Catch-up Intervention**

### **“In the Moment” Coaching: Nurturance and Synchrony**

As mentioned previously, our rationale for distinguishing between nurturance and synchrony has been driven by experiences with our intervention program. The Attachment and Biobehavioral Catch-up Intervention (ABC; Dozier & The Infant Caregiver Project Lab) was developed to target the needs of infants and toddlers who experience early adversity, such as placement in foster care or living with neglecting birth parents. We have found significant ABC intervention effects on both attachment (lower rates of disorganized attachments, Bernard et al., 2012) and biological and behavioral regulation (e.g., more normative diurnal cortisol slope, Dozier, Bernard, Bick & Gordon, 2013; greater cognitive flexibility, Lewis-Morrarty, Dozier, Bernard, Terraciano & Moore, 2012).

The ABC intervention is a manualized, 10-session program delivered by a coach in families' homes, and videorecorded with a stationary camera. We see the intervention as following from Mary Ainsworth's seminal work on maternal sensitivity. Two of the primary intervention targets include increasing nurturing behavior in response to children's distress cues and increasing synchronous behavior in response to children's non-distress cues. The primary method of enhancing these behavioral responses is through providing "In the Moment" comments. Opportunities for synchronous or nurturing responses serve as triggers for parent coach comments. The parent coach is expected to comment when such opportunities for nurturance or synchrony occur, highlighting specifically how the parent responded to the child (e.g., "He started to cry and you reached out to pick him up"), labeling the intervention target (e.g., "That's a great example of providing him with nurturance"), and linking the parent's behavior to possible child outcomes (e.g., "That is letting him know that he can trust you when he's upset"). When parents fail to recognize, or respond inappropriately to, opportunities for synchronous or nurturing behavior, the parent coach is expected to support the parent in engaging in synchronous or nurturing behaviors, even though these behaviors may come less naturally to the parent (e.g., "He looks pretty upset. This seems like one of those times when he may need your reassurance.").

This In the Moment coaching is expected to make the behavioral targets of the intervention very clear to the parents and support parents in engaging in these behaviors. Thus, In the Moment commenting is similar to video feedback, which we and others (e.g., Circle of Security; Hoffman, Marvin, Cooper & Powell, 2006) also use to provide feedback about behavior to parents. However, In the Moment comments differ in their frequency, as they are expected to occur at a rate of at least once per minute during the session, and their transactional, "in the moment" nature, as they often result in cascades of positive parent behaviors and additional comments. In this respect, In the Moment comments support parents in practicing target behaviors during intervention sessions, and result in increased parental comfort and ease engaging in these behaviors. Comments about parents' positive behaviors vastly outnumber comments about parents' negative behaviors, leading parents to feel effective in their parenting and develop strong rapport with the parent coach. The comments resemble the live coaching of other interventions for parents and children (e.g., Parent Child Interaction Therapy, McNeil & Hembree-Kigin, 1995/2011).

As we have worked to enhance this In the Moment coaching component of the intervention, we have increasingly come to realize the importance of being specific in how we conceptualize and comment on parents' behavior. Specificity, and distinguishing between synchrony and nurturance, allows parent coaches and parents to communicate clearly about how to respond to children in situations of distress and non-distress. Anecdotally, we see that parents who demonstrate strengths in providing nurturance do not necessarily show strengths in synchronous interactions, and vice versa. Although we do not yet have data to examine the frequency of such discrepancies, our current methodology of differentially assessing nurturance and synchrony will allow us to examine this in the future. Here we describe two case examples that help illustrate the distinction:

**Case example 1: Nurturance as a strength**—Joanne was a high-risk birth parent identified by Child Protective Services due to risk of neglect. She was 17 years old and living with her mother when we started seeing her for the ABC intervention. During the first session, Joanne held her 12-month-old baby Arianna in her lap for the full hour. When Arianna fussed, Joanne readjusted her position and quietly whispered, "You okay?" Her responses to Arianna's distress were well timed, and Arianna was easily soothed by her mother. The parent trainer was able to repeatedly point out how nurturing Joanne was to her child's cues of distress. In subsequent sessions, Joanne's nurturing behavior continued, but it became clear that Joanne was less comfortable during interactions that called for her to

follow Arianna's lead in play. For example, when playing with a book with pull-out shapes, Joanne asked Arianna questions about the content repeatedly and went at her own pace. For example, she asked Arianna, "Which one is the blue one? Which one is the cat? Oh, you know that. Point to it." She allowed Arianna to pick up and chew on the shapes, but did little to respond contingently to her actions. Throughout the remaining sessions, the parent coach helped Joanne notice opportunities to respond to Arianna in synchronous ways. The parent coach made suggestions about how Joanne could comment on Arianna's behaviors, respond to her vocalizations, and imitate her actions and expressions. Gradually, and with much practice and supportive feedback, Joanne became more comfortable following Arianna's cues.

**Case example 2: Synchrony as a strength**—Donna was a foster parent who had 16-month-old Shawn placed in her care shortly before starting the intervention sessions. Although Shawn did not cry frequently during early sessions, it was clear that Donna struggled to respond to Shawn's cues of distress. For example, during session 1, Shawn tripped over a toy, fell down, and continued playing seemingly unaffected; Donna glanced at Shawn and said "You're okay!" failing to acknowledge that Shawn may have been hurt. During discussions, Donna reported that Shawn "hardly ever cries," noting that "he is a good boy." When asked about her attempts to soothe him, Donna stated that she simply runs through all of his possible needs – "wet diaper, hungry, tired" – until something works. Taken together, her responses suggested that Donna might not easily recognize or be comfortable attending to Shawn's emotional needs. In the subsequent session, there were multiple opportunities to observe Donna's response to Shawn's distress. An older sibling repeatedly took toys from Shawn and played roughly with him, causing Shawn to fuss more frequently. In one instance, Donna said, "Oh stop it – be a big boy," and another time offered items to distract his attention. She commented to the parent coach, "He's so spoiled." Although Donna struggled to behave in nurturing ways, she was quite attentive and synchronous in non-distress interactions. During conversations with the parent coach, Donna interrupted frequently to respond to Shawn's bids for her attention; she imitated his sounds, took toys as he handed them to her, and clapped her hands as he looked at her with excitement. The parent coach enthusiastically supported Donna's ease with interacting synchronously by using frequent In the Moment comments to talk about these interactions. Given that Donna struggled more with nurturance and given that opportunities for nurturance occurred less frequently than opportunities for synchrony, the parent coach looked for every opportunity during sessions to address this. Even minor fusses that occurred once or twice during the session were used as opportunities to practice how to respond, and celebrate Donna's progress. Throughout the remaining sessions, Donna became more aware of her automatic ways of responding to distress, and she was supported in beginning to respond in a more sensitive manner.

Notably, some parents show strengths in both forms of sensitivity, whereas some struggle with nurturance, synchrony, or both. For this reason, we have found it critical to define these behaviors clearly for our parent coaches as well as for parents. In order to do this, we have developed a measure that allows us to assess nurturance and synchrony behaviorally through frequency-based coding of intervention sessions, which we describe next.

### Evaluating Nurturance and Synchrony Through In the Moment Coding

In the Moment coaching is considered a key component of the ABC intervention. In order to assess the fidelity of the intervention, we also developed a frequency-based coding system. Coders watch the video-taped intervention sessions in our laboratory and record each opportunity for nurturance or synchrony observed in a portion of the session, as well as the parent coach's response to each behavior (Meade & Dozier, 2012).

We also found In the Moment coding of video-clips from taped sessions to be a unique way to review and measure parent behavior. Coders are required to identify each intervention-relevant behavior as it occurs, which we consider to be a micro-analytic approach to the parent behaviors we target. Coders evaluate each sequential behavior separately and separate the components of mixed behaviors (e.g., picking a crying child up and patting his back, while saying “What are you crying for? You’re a big boy.”). One benefit to this micro-analytic approach is that patterns and frequencies of parent behaviors can be assessed; for example, two parents rated at the midpoint of a global scale of synchrony (indicating a mix of synchronous and non-synchronous behaviors) may differ greatly in the frequency in which they engage in these behaviors. Sequential coding of events can capture patterns of parent behavior that can be used to tailor subsequent intervention sessions to a parent’s specific need; for example, if a parent alternates repeatedly between synchrony and non-synchrony, this pattern may suggest to the parent coach that the parent is unaware of the difference between the two types of behaviors, and may need more support in recognizing this difference.

Assessing parents’ behavior from video-recorded intervention sessions at home offers several advantages. The home environment presents competing demands, including other children and adults, pets, phones, television, and so on. Parents must also divide attention between the child and the parent coach. In this way, intervention sessions present a naturalistic environment in which to assess parent behavior. In addition, because the sessions take place in the parent’s home, the parent may be more comfortable than she would be in a laboratory environment, and is more likely to behave as she usually does. Accordingly, parents’ behavior during intervention sessions varies widely, from talking exclusively with the parent coach and attending to the child only when he or she gets into trouble, to repeatedly interrupting the parent coach in order to respond to the child. Most especially, it is of greatest importance to change parental behavior in the home environment, and it is therefore critical that we assess change in this context.

### Method of In the Moment Coding

The In the Moment coding system assesses several aspects of parent behavior. Based on a child’s behavior, coders distinguish between opportunities for synchronous versus nurturing responses. For example, a child falling down and crying would represent an opportunity for a parent to provide a nurturing response (i.e., to a distress cue), whereas a child holding up a toy to show his mother would represent an opportunity to provide a synchronous response (i.e., to a non-distress cue). Thus, the system is set up such that specific child behaviors serve as triggers for the coding of subsequent parent behaviors.

In response to distress cues, parent behaviors are scored as nurturing or non-nurturing. Behaviors that are non-nurturing are further classified as “active” non-nurturance (i.e., inappropriate response) or passive non-nurturance (i.e., absence of response). Similarly, in response to non-distress cues, parent behaviors are scored as synchronous or non-synchronous, with non-synchronous behaviors further classified as active or passive. Further description of these categories and examples are presented below. Although parent coaches do not label insensitive behaviors as “active” or “passive” when providing In the Moment feedback to parents, we decided to make this distinction in our coding system. This specificity in our coding system will allow us to examine whether active versus passive types of insensitive responses are associated with unique child outcomes, predicted by distinct parent characteristics, or differentially amenable to change.

Different instances of parent behaviors are coded on separate lines of an Excel spreadsheet, which automatically tallies the number of instances of different parent behaviors. When two parents are present in the intervention session, a specialized version of the coding sheet is

used to separately tally each parent's engagement in the following behaviors. Behaviors are coded sequentially, such that any interruption in a parent behavior (e.g., talking to the parent coach, attending to another child, receiving an In the Moment comment) prompts coding on the subsequent line of the spreadsheet. The total number of parent behaviors in a 5-minute clip can range from 0 to over 30.

**Synchrony**—An instance of synchronous parent behavior is coded when the parent responds to the child's behavior in a contingent way. The parent may respond to a direct bid from the child, for example, giving the child a toy he was reaching for, taking a toy the child is handing to her, or repeating what the child says to her. The parent may also respond in a contingent way to what the child is doing autonomously, such as commenting on what the child is doing, or mimicking the child's manner of playing with a toy. Parent coaches would consider all of these examples as synchronous behaviors, and would label them as such when providing In the Moment feedback to the parent.

**Non-synchrony**—An instance of non-synchronous parent behavior is coded when the parent fails to respond to the child in a contingent way. Episodes of passive non-synchrony are distinguished from active non-synchrony. Passive non-synchrony is coded when the parent ignores a child's direct bid or takes longer than 5 seconds to respond to a child's bid. Examples of passive non-synchrony include failure to notice that the child is trying to hand the parent a toy, and responding to the child, who has said "Mama" several times in an attempt to get the parent's attention, after a lengthy delay. Passive non-synchrony is also coded when the parent fails to interact with a child who makes no bids for attention for longer than 60 seconds. We realize that this criterion may seem overly strict, considering that children sometimes engage in independent exploration for periods of time during a typical home visit. In the context of our intervention sessions, however, we encourage parents to remain responsive to their children's behaviors even while engaged in discussions with the parent coach. Parent coaches frequently pause during discussions to encourage parents to attend to their children in ways we consider synchronous, even for just a momentary check-in (e.g., commenting on a child's activity). Additionally, passive non-synchrony is coded less stringently when multiple children are present in the session, placing multiple demands on the parent's attention. When two parents are present in the session, passive non-synchrony is only coded when both parents fail to attend to the child. Importantly, we would not consider a parent insensitive for receiving occasional ratings of passive non-synchrony. Rather, we consider patterns of ratings across sessions to identify areas for improvement. If a parent is consistently being scored for passive non-synchronous behaviors, this may reflect a pattern of detached, unresponsive parenting. Thus, a parent coach would help the parent notice opportunities to attend to the child in ways that followed the child's lead.

Active non-synchrony is coded when the parent responds to the child or initiates interaction with the child in a non-contingent way. Examples of active non-synchrony include correcting the child's speech or way of playing with a toy, and introducing a new toy when the child is already engaged with a toy. Over-stimulating and physically intrusive behavior, such as tickling and poking the child, is coded as a separate category of active non-synchronous behavior. For our purposes, we code any tickling not requested by the child as active non-synchrony. This decision does not account for whether the child appears to enjoy the tickling or whether the tickling is clearly intrusive. We have observed that it can be difficult for parents and parent coaches to know when tickling becomes intrusive, particularly because children's cues may be subtle (e.g., gently turning away) or confusing (e.g., laughing when over-stimulated). Thus, our restricted definition helps parent coaches deliver a simple and clear message to parents.

Notably, there are other important constructs (e.g., autonomy support) that assess how mothers respond to their children's non-distress cues. Although these constructs may differ from our restricted conceptualization of synchrony, we do not consider them incompatible with sensitive parenting more generally. For example, autonomy support is defined as supporting children's goals in a noncontrolling manner; it is often measured in problem-solving tasks, and includes elements of scaffolding, encouragement, perspective taking, flexibility, and allowing the child to set the pace (Grolnick, Gurland, DeCoursey & Jacob, 2002; Whipple et al., 2011). Our conceptualization of synchrony is more restrictive than autonomy support, with scaffolding and encouragement (to do other than what the child is already doing) not considered behaviors that we would code as synchronous. For example, if a child banged blocks together and the parent said, "Oh, you're banging the blocks together," we would consider the response synchronous, whereas if she said, "Bang them harder, bang them harder" or "I'm going to put one here. What would happen if you put yours on top?" the response would not be considered synchronous (but would be considered encouraging and scaffolding, respectively, in these other systems). Our restricted focus on "synchrony," as we define it, enables us to focus on a limited number of specific, concise behavioral targets in the context of a brief intervention. Although other constructs, such as scaffolding, are compatible with Ainsworth's conceptualization of sensitivity, our very clear and specific definition of synchrony allows us to successfully train parent coaches and communicate to parents about these behaviors.

**Nurturance**—Nurturing behavior is coded in two types of situations: a parent response to a child's distress and a response to a child's bid for physical affection or closeness. We are not certain whether a response to a child's bid for physical affection truly belongs within the nurturance construct, given that it occurs when a child is not distressed, and thus may be less related to attachment state of mind and attachment security than to other constructs. Rather, responding warmly to a bid for physical affection may instead be part of the synchrony construct. These associations remain to be tested, and in order to examine these relationships in the future, we code these two categories of nurturance separately. A nurturing response to distress is coded when the child seems hurt, sad, scared, tired, worried or sick, and the parent shows the child that she is concerned and available. The parent's behavior may be verbal, such as asking if the child is okay, empathizing with the child's emotions, or making comforting statements like "Aww, honey, Mommy's here." The parent's behavior may also be physical, such as picking the child up, hugging or kissing the child, patting the child's back, and holding or rocking the child. A nurturing response to a child's bid for physical affection is coded when the child approaches the parent looking for physical proximity or affection, and the parent responds in a way that communicates comfort and reciprocity. Because young children sometimes use physical proximity with their parents as a means to an end (e.g., putting a hand on the parent's shoulder as a support while reaching for a toy; sitting in the parent's lap to better view and reach a computer or cell phone), a nurturing response is only coded when it seems that the child just wants to be close to the parent. In addition, we only code times when the child initiates physical affection or proximity. In response to a parent's response to a child's bid for physical affection or to a child's distress cue, the parent coach would provide In the Moment feedback specific to nurturance.

**Non-nurturance**—Non-nurturing behavior is coded when the parent fails to respond in a nurturing way to the child's distress. As with non-synchronous behavior, active non-nurturing behavior is distinguished from passive non-nurturing behavior. Passive non-nurturing behavior is coded when the parent fails to notice or ignores the child's distress. One example of passive non-nurturing behavior is ignoring a child's cries. Because children who have experienced early adversity do not always signal distress clearly, passive non-nurturing behavior is also coded at times when the child has a high likelihood of being hurt

(e.g., falls on face, bangs head on table) but does not show signs of distress, and the parent does not respond to the event. Active non-nurturing behavior is coded when the parent responds to the child's distress in a way that rejects or expresses discomfort with the child's need to be reassured. Examples of verbal non-nurturing behaviors include statements such as, "You're fine," "You're a big boy, don't cry," "I told you not to climb on that chair," and "Ugh! Why are you so whiny today?" Parents may also engage in physical behaviors, such as attempting to distract the child with a toy, or putting a pacifier in the child's mouth without providing any other type of support. Non-nurturing behavior may be communicated simply by tone; for example, a parent may say "Shhhh" in a way that communicates that the parent wants the child to stop crying and be quiet.

### Preliminary Findings and Future Directions

Most of our work with the In the Moment coding system has involved coding 5-minute video-clips of intervention sessions, and we have found that this amount of time allows us to successfully measure synchronous interactions. In one study, we found that the number of parent synchronous behaviors increased from session 3 to session 9, and that the number of behaviors in session 9 was predicted by the frequency of parent coach comments in session 3, even when controlling for parent synchrony in session 3 (Meade & Dozier, 2012). Interrater reliability for synchrony was acceptable (ICC = .79) and a moderate correlation ( $r = .40$ ) between synchrony in sessions 3 and 9 suggested some stability. In future work, we plan to assess test-retest reliability using assessments that are closer together in time. In addition, we plan to examine the optimal time needed for coding various behaviors, which is expected to differ for different types of parent behavior. For example, nurturing behavior occurs much less frequently than synchronous and non-synchronous behavior, and will likely require a longer amount of time coded in order to achieve high sensitivity to detecting reliable and valid differences between parents. Future work will also examine the correlation between nurturance and synchrony, and whether these constructs serve as differential predictors of attachment security and physiological/behavioral regulation, respectively, in our sample.

### Conclusions

Mary Ainsworth's contributions have forever changed the landscape of developmental psychology. Her ability to observe critical features of parent-child interaction formed the basis of our current understanding of what matters regarding parental responsiveness and child attachment. We relied heavily on our observations of parent-child interactions in the context of our intervention to inform our decisions about how to measure sensitivity.

Our approach to assessing sensitivity builds upon Ainsworth's approach, in which she assessed both responsiveness to distress and non-distress cues in her conceptualization of maternal sensitivity. However, we have come to believe that nurturance and synchrony may differentially contribute to attachment and other outcomes, and have therefore pursued several methods of uniquely assessing nurturance and synchrony. Our current assessment of nurturance includes coding from observations that elicit distress, and our current assessment of synchrony includes semi-structured play interactions. In addition, we have developed a frequency-based coding system to examine nurturing behaviors and synchronous behaviors during intervention sessions. We expect this tool to be important in tailoring the intervention to the unique needs of each parent, in examining the process of change in both dimensions of sensitivity, and in uniquely predicting child outcomes. Given our multi-method approaches to examining nurturance and synchrony, we can also examine whether frequency-based coding during sessions is associated with other more global assessments outside of the intervention context, as well as with other gold-standard attachment instruments (e.g., Adult Attachment Interview and the Strange Situation). We have found it

critical to be attentive to issues around defining and assessing sensitivity in ways that will optimize our ability to intervene with families and to evaluate intervention outcomes effectively.

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