
RESEARCH ARTICLE

A brief play intervention to improve synchronous interactions and play skills in low income mother-child dyads.

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Interaction synchrony defines how well a parent and child relate, with lower levels of synchrony associated with poor child outcomes. A 10-minute Parent-Child Interaction Therapy (PCIT) was tested in a pre-posttest design for improving interactional synchrony in 40 low-income mothers and preschool children (Half of the mothers watched a child nutrition video and served as a control group). As a group, the mother-child synchrony levels were low-to-average. Mothers in the PCIT group were taught five skills (PRIDE) to use when playing with their children: praise, reflect, imitate, describe, enthusiasm. The PRIDE group improved in interactional synchrony, whereas the control group did not. Mothers in the PRIDE group also used more child-directed techniques and their children were coded as offering their mothers toys more frequently. The findings suggest that a brief intervention may improve the interactional synchrony of low-income mothers and their preschool children, which may enhance preschool age children's social skills.

Keywords: low-income, preschool children, synchrony, play, interaction

Interactional parent-child synchrony has been defined in the literature as reciprocal, mutually responsive, focused, and rewarding interactions (Harrist, Pettit, Dodge, & Bates, 1994; Mize & Pettit, 1997). Synchrony requires that both partners in a dyad assimilate themselves into the flow of the other's behaviors and responses (Feldman, Greenbaum, & Yirmiya, 1999). Parents seem

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to have the most important role in synchronous dyads, in part because synchrony is contingent on the parents' interactions with and responses to the child, such as empathizing, understanding, and appropriately reacting to their child's emotional and mental states (Maccoby, 1992). Because synchrony is the result of a history of positive and mutually responsive interactions between the dyad (Mize & Pettit, 1997), it is often difficult to assess. Thus, interaction styles are often assessed as the overall parent-child dyad relationship, typically measured during parental discipline or instructing, caretaking, and playing with the child (Harrist et al., 1994).

Synchronous dyads are characterized by three critical elements: engagement, affective tone, and connectedness. Engagement includes the length (i.e. in seconds) and depth of exchanges during the interaction, as measured by the number of back-and-forth exchanges (i.e. turn-taking.) Affective tone includes the severity of the emotions expressed and reciprocated within the interaction, such as positive or negative affect. Connectedness encompasses the mutuality, reciprocity, and balance of attention (i.e. shared focus) and participation (i.e. shared involvement and leader-follower roles) during the interaction. Parent-child dyads who exhibit high levels of these three elements during their interactions are considered to be highly synchronous (Harrist et al., 1994). Indeed, synchrony can be thought of as a type of dance or cycle, with both members influencing and shaping the other's responses and affect through carefully timed stages (Feldman et al., 1999). This dance of joint activity and behavior depends on each partner's reciprocity and coordination after each action. However, many of those who have studied parent-child synchrony and interactions have come to the conclusion that continued synchrony is mostly dependent on the parent's actions and commitment to the interactions, especially in dyads involving young children who lack the skills to initiate synchronous interactions without assistance (Isabella & Belsky, 1991; Isabella, Belsky, & von Eye, 1989; Lundy, 2002; Maccoby, 1992). Warmth and affection, such as when a parent shows positive affect toward their child, and mutual gratification, such as when a parent and child share positive affect during an interaction, allow the socialization of children through synchrony to be more effective. Consistency, as shown in responsiveness to a child's needs and desires, is also key in mediating parent-child synchrony (Mize & Pettit, 1997).

IMPORTANCE OF SYNCHRONY

For the most part, research supports that positive parent-child interactions and synchrony predict emotionally well-adjusted children (Feldman, et al., 1999) who have secure attachments to their parents (De Wolff & Ijzendoorn, 1997) and who develop healthy social skills (Lindsey, Mize, & Pettit, 1997) and cognitive competence (Kirsh, Crnic, & Greenberg, 1995). When parents display negative affect and coercive behaviors during parent-child interactions, children are found to be more aggressive with their peers. Low levels of mother-infant synchrony predict low levels of social-emotional adjustment later in life (Feldman & Eidelmann, 2004). In addition, children who experience parent-child interactions that are imbalanced, low in connectedness, and frequently involve coercion are more anxious, avoidant, and depressed (Harrist et al., 1994).

Synchrony has also been linked with the dimension of contingency, that is the sequential or temporal relation between occurring events. In microanalytical video studies of mothers and infants interacting face-to-face, mothers were found to very rapidly respond to, and match, their infants behaviors and actions (cf. Beebe, et al., 2010; Keller, Lohaus, Volker, Cappenberg, &

Chasiotis, 1999; Malatesta & Haviland, 1982). For example, within a fraction of a second, mothers' facial expressions change contingent on their infants' facial expression (Malatesta & Haviland, 1982). Interestingly, in some studies, when mothers were insensitive to their infants' cues, infants became hyper vigilant in their gaze towards their mothers (cf. Beebe et al., 2010). In such instances, high infant gazing at mother is not considered optimal and may reflect low connectedness. Beebe and colleagues (Beebe, et al., 2011; Beebe, et al., 2008) and others (Blatt & Hommann, 1992) have also discerned differences in contingency patterns for anxious and depressed mothers and their infants, particularly for mothers who suffer from excessive lack of self-worth (self-criticism profile) and those who are excessively preoccupied with maintaining relationships (dependency profile). For the self-critical mothers, their infants show both lower and higher levels of self-contingency, which may indicate communicative stress (Beebe, et al., 2007; Jaffe et al., 2001). Researchers who work with mothers with personality profiles (i.e., self-criticism; dependency) conclude that optimum interactions may require a more moderate balance between the mother and child. Thus, an alternate model for depressive and/or anxious mothers with very young infants may be to aim for a midrange model of contingency (Beebe, et al., 2008). It is unclear if the same midrange model would apply to toddlers or preschool age children, especially as they develop language and become mobile.

SYNCHRONY AND ATTACHMENT

Interactional synchrony and attachment are closely intertwined aspects of a parent-child relationship (Isabella & Belsky, 1985). Synchrony is just as important as parental sensitivity in the development of secure attachment (De Wolff & van Ijzendoorn, 1997). Secure parent-child attachment is characterized by a strong, affectionate, reciprocal relationship where both parent and child gain some comfort and enjoyment from their interactions. It is at the core of the development of children's social competencies, self-regulation, and cognitive competencies (Bowlby, 1982). When a child is securely attached to a caregiver in an "interactive duet," the child practices and learns reciprocal and turn-taking behaviors that the child can continue to use when interacting with the caregiver, as well as use in other relationships, thus helping the child develop social competencies. Securely attached and synchronous parent-infant interactions are the context in which infants learn to self-regulate their emotions in a healthy way. Parents who respond to, and share, the emotional cues of their child, can teach the child how to regulate emotions (Schore, 1996, 2001). Children who are securely attached to their parents have more competence in language skills than insecurely attached children, which may be because securely attached mothers and children have a synchronous relationship (van IJzendoorn, Dijkstra, & Bus, 1995). Secure attachment of the child to the parent largely depends on the appropriate responsiveness of the parent to the child's bids for attention and assistance, which is an important aspect of interactional synchrony (Isabella, Belsky, & von Eye, 1989; Lundy, 2002; Maccoby, 1992). Positive interactional synchrony, through mutually rewarding turn-taking interactions, has been shown to increase secure attachment of children to both their mothers (De Wolff & van Ijzendoorn, 1997) and fathers (Lundy, 2002). Thus, positive parent-child synchrony, which is one mechanism through which secure parent-child attachment is formed, further leads to the child's developmental competence.

In the same vein, while the literature does not explicitly state that attachment improves synchrony, arguably, a securely attached child is likely to continue to seek or elicit contingent

responses from his/her caregiver. A child who seeks and gains dependable responses from the caregiver, and/or a caregiver who is sensitive to the child's signals and responds in a predictable or reliable manner, is in essence a dyad pursuing synchrony. For such dyads, it is conceivable that the continued secure attachment style strengthens the synchrony of the child-caregiver relationship. In contrast, when a child is insecurely attached, it is probable that dyadic interactions are asynchronous. For example, a child who presents with an anxious/avoidant pattern of attachment is likely receiving inconsistent cues from the caregiver or the caregiver may be overly protective. These children may display hypervigilant behavior toward the caregiver or low connectedness (cf. Beebe, et al., 2010). Thus, asynchronous interactions are likely to be common occurrences between insecurely attached children and their caregivers. In sum, attachment styles may influence the interactional synchronous level of the dyad and interactional synchrony may strengthen the attachment bond in reciprocal relations.

SYNCHRONY IN LOW-INCOME SAMPLES

The majority of studies on parent-child synchrony have been conducted on mother-child dyads from middle and upper socioeconomic status (Haden, Reese, & Fivush, 1996; Harrist et al., 1994; Isabella et al., 1989; Lundy, 2002; Mize & Pettit, 1997; Tomasello & Farrar, 1986). In the United States, approximately one in five children classify as low income and approximately one in three children are raised by a single parent, typically the mother (Childstats.gov, 2011). Studies that have included lower-income mother-child dyads reveal that high levels of mother-child synchrony are associated with high levels of maternal nurturance and child language development (Skuban, Shaw, Gardner, Supplee, & Nichols, 2006). In a study that examined synchrony between low-income mothers and their 10 year old children, highly synchronous dyads were found to have high levels of parent-child openness, low levels of parent-child conflict, low levels of child antisocial behavior, and high levels of child social skills (Criss, Shaw, & Ingoldsby, 2003). Prolonged joint attention between mothers and their 2-year-old children during free play was related to children's use of self-regulatory skills in a low-income sample (Raver, 1996). Low income parent-toddler dyads were observed in a study that linked mothers' use of constructive verbal scaffolding strategies during feeding to dyadic reciprocity and joint attention in a play session (Hustedt & Raver, 2002). While these studies report on the benefits of synchronous interactions for low-income parent-child dyads, no studies were found that examined how to increase interactional synchrony in low-income parents with preschool age children.

One reason for developing methods to assist low-income parents to improve their interactions with their children, such as by elevating their level of synchrony during play, is that low-income mothers often experience greater aggression, depression, and daily hassles (encompassing anxiety and stress from low social support) (Brooks-Gunn & Furstenberg, 1986; Ceballo & McLoyd, 2002; Pearlin & Johnson, 1977). These negative moods have a negative effect on a mother's ability to have positive synchronous interactions with her child. Aggressive mothers tend to display negative affect, and reciprocate negative affect from their children during interactions (Clark, Kochanska, & Ready, 2000). Mothers with low levels of social support often use negative and rejecting forms of parenting, which are in direct opposition to parent-child synchrony (Ceballo & McLoyd, 2002). Depressed mothers are likely to misinterpret their child's

cues during interactions and either over-stimulate or under stimulate their child, which disrupts interactional synchrony and reduces the enjoyment of the interaction for the child (Field, Healy, Goldstein, & Guthertz, 1990). Mothers who express many and frequent depressive symptoms participate in fewer synchronous exchanges with their infants than non-depressed mothers and also show low attachment to their child (Lundy, 2002). Anxious mothers are likely to misinterpret their child's cues during interactions, and thus interrupt the flow of synchrony and make the interaction less enjoyable for the child (Feldman, 2007). In other words, parental stress factors, such as being low-income, may compromise the mother's ability to use healthy parenting practices when interacting with her child, and thus reduce the level of synchrony during parent-child interactions (Skuban et al., 2006). As already mentioned, synchronous parent-children interactions are associated with better child outcomes.

PARENT-CHILD INTERACTION THERAPY

One intervention that has been effective in increasing synchrony and positive interactions is the Parent-Child Interaction Therapy (PCIT) (Herschell, Calzada, Eyberg & McNeil, 2002; Zisser & Eyberg, 2010). This intervention, which typically requires 10- to 16-weeks of therapy, focuses on teaching parents how to increase positive child behaviors and make the child feel more secure and positive. PCIT also aims to help caregivers feel more competent in their parenting abilities. Even though PCIT is an empirically supported treatment that has been shown to improve synchrony and enhance parent-child interactions, the intervention is lengthy and time-consuming. For low income parents, attempting to complete a long-term therapy, such as PCIT, has its own unique challenges (Lyons-Ruth, Connell, Grunebaum, & Botein, 1990). Limited financial, travel, and child care resources, or the inability to take time off from work or school can keep these families from participating in interventions that may directly benefit the caregiver and child.

Despite efforts to engage families and help address and overcome barriers to treatment, research reveals high dropout rates for traditional PCIT, sometimes ranging as high as 40% to 60% (Boggs, et al., 2004; Wierzbicki & Pekarik, 1993). Barriers to completing long-term interventions are part of the rationale for advocating the testing of brief interventions, especially for low-income families. Abbreviated interventions may be less stressful for parents if they pose fewer barriers. As already mentioned, low-income mothers experience many stressors, and stressed parents may not be as sensitive to their children's needs or their behaviors during play or interactions. Parental stress has been implicated in less positive interactions between parents and children (Coyle, Roggman, & Newland, 2002; Nitz, Ketterlinus, & Brandt, 1995) and has been reported to predict parent and child behavior and dyadic interaction (Crnic, Gaze & Hoffman, 2005). Thus, the study of brief interventions for low-income parents is needed, especially because if they are feasible and effective, they may improve parent-child relations while reducing parental burden and stress for low-income families.

Recent research has shown that PCIT is also effective in reducing parental stress (Lanier, Kohl, Benz, Swinger, Mousette & Drake, 2011; Pearl, Thielen, Olafson, Boat, Connelly, Barnes & Putnam, 2012; Timmer, Zebell, Culver & Urquiza, 2010). While reducing parental stress is not the goal of PCIT, that this intervention has a positive impact on parents' mood is another reason for examining the efficacy and effectiveness of an abbreviated PCIT. In sum, PCIT interventions that are brief, that enhance parent-child synchrony and reduce caregiver stress are

needed, especially for low-income families, and should be studied. These needs provided the impetus for the current study.

The play-based intervention utilized for this study is a modified and simplified portion of PCIT, taken from the PCIT handbook that focuses on Child-Directed Interactions (CDI). CDI is based on attachment theory and aims to add warmth to parent-child interactions by including techniques that foster positive, nurturing interaction patterns, such as using praise, reflection, imitation, description, and enthusiasm (hence, the acronym PRIDE,) and avoiding criticism and commands. Theoretically, training parents on child-directed techniques should strengthen the caregiver-child relationship by fostering positive interactions and improving the dyad's synchrony. Empirically, PCIT has been shown to reduce maternal stress. Thus, it is possible that an abbreviated PCIT intervention may be more appropriate, feasible and effective for low-income parents to complete.

In CDI training, parents are taught the skills via examples and told the rationale for their use, and then instructed to play with their child using the newly learned skills. CDI's theoretical base in strengthening the parent-child relationship, its effectiveness in reducing maternal stress, and providing the mothers with well-defined play skills made it a good fit for the current research. The overarching study aim was to assess whether in one brief session, mothers could be taught child-directed techniques from the PCIT manual, and if their application of the techniques during play would improve the parent-child interactional synchrony. To date, we know of no other research that has examined brief PCIT for improving synchrony for low-income parent-child dyads.

PURPOSE OF CURRENT STUDY

In the current study, we recorded the interactions of low-income/at risk mothers and their typically-developing preschool age children (2 to 5 year olds) to examine interactional synchrony during a play session. Because mothers were low-income and expected to be stressed, we assessed mothers for symptoms of mood disorders. We hypothesized that negative mood would relate to the dyad's baseline synchrony level and further reduce the mother's focus on the child during interactions. The primary purpose of the study was to evaluate if a brief PCIT that focused on teaching mothers' five basic child-directed techniques would improve the dyad's synchrony and the mother's focus on the child. The brief PCIT was expected to be feasible for low-income mothers and effective in improving her interactions with her child.

METHOD

Participants

A quota (convenience) sampling method of 40 mothers and preschool age children (20 mother-child dyads) participated. The mothers and their children were recruited from a center that manages the child care subsidy for 12 counties in west-central Alabama. Subsidies help cover the costs of child care for low-income working parents or parents in approved job training and educational programs, parents receiving family assistance through the Department of Human

Resources, and parents who are at risk for child abuse and neglect. The population from which the sample was drawn was considered to be low-income and/or at risk. For the current study, we only inquired about the socioeconomic status of the mothers' household. Mothers in the center were approached about participating in the study, and if interested were consented, enrolled and scheduled for testing within 10 days. The parent-child pair was randomly assigned to either the intervention or the control group using an on-line randomizer software (Research Randomizer Form at Randomizer.org.).

Procedures

Overview of study. On the day of the scheduled appointment, the mother-child dyad was greeted by a researcher and brought into an interaction room. The study was explained to the mother, including 1) that the study involved three sessions, 2) that the dyad would be videotaped playing in the first and last sessions, 3) where the mother and child would sit during the videotaped play/interaction sessions, and 4) what would occur during the middle session, which involved participating in either a brief intervention (PRIDE) or watching an educational video on child nutrition. After the mother had an opportunity to ask questions, the researcher asked her to complete a background form and several brief questionnaires (see Measures below). Afterwards, the researcher instructed the mother where to sit with her child, brought out toys specific for the study, and the dyad participated in three sequential sessions (see Study Sessions below). The first and last sessions were each 5 minutes long and consisted of videotaping the dyad playing face-to-face. The first 5-minute session served as the pretest (or baseline play session) and the last 5-minute session was the posttest. The middle session was approximately 10-minutes long and involved the mother either participating in a brief child-directed intervention (if assigned to the PRIDE intervention group) or watching an educational video on child nutrition (if assigned to the control group). The main aim of the study was to examine the effects of the intervention versus control condition on the dyad's pre-post interaction behaviors, including synchrony and mothers' use of child-directed strategies. A secondary aim was to examine the dyad's pretest behaviors in relation to the questionnaires the mothers completed. The third aim focused on examining if the children's behaviors changed as a result of the intervention.

The Study Sessions

Pretest or first session. All dyads participated in the pretest, which was conducted in a brightly lit interaction room. The dyad was asked to sit side-by-side, and face-to-face, at a square table with two chairs (a booster seat was provided for the children) so that their play interactions could be videotaped for later coding. The interaction room was equipped with: two walls of one-way mirrors; small inconspicuous microphones dropping from the ceiling to record audio; a camcorder on a tripod behind a one-way mirrored wall that was focused on the child's face and body; and a separate hidden-dome camera that focused on the mother's face and torso. Videotaped recordings of the dyad were later synchronized and coded using a split screen technique. A wooden modular block set and a plastic wild animal toy set was placed on a chair between the dyad to provide manipulatives to use during play. After positioning the dyad face-to-face at the table and bringing out the manipulatives, the researcher simply asked the mother to

play as she would at home with her child using the provided toys. The researcher informed the mother that she would return after 5 minutes. The researcher closed the door to the interaction room and the dyad was videotaped playing for 5 minutes.

Middle session: control or PRIDE intervention

After the 5-minute pretest session, the researcher entered the interaction room and announced to the dyad that they would take a short break. The dyad was brought into an adjoining room where a female researcher offered the young child a snack of crackers and a juice box. While the child was having the snack and juice, the mother participated in the middle session.

Control group. The middle session for the control group consisted of watching an educational video on child nutrition. The mother faced a computer screen, and the researcher turned on the video. The control group was included to examine whether from pre-to-post sessions, the dyadic interaction would be enhanced simply from the mother and child spending time playing. The middle session was about 10 minutes long.

PRIDE Intervention group. Mothers assigned to the intervention group participated in a brief, modified, play-based intervention derived from the Parent-Child Interaction Therapy (PCIT) (Eyberg, 1999; Herschell et al., 2002). The intervention was taken from the Child-Directed Interactions (CDI) portion of the PCIT manual (Eyberg, 1999) and was conducted by a graduate student (herein referred to as the interventionist) who had a strong foundation in child development and knowledge of developmentally appropriate practices for young children. CDI is intended to teach caregivers skills that promote positive and nurturing interactions. The session began by explaining to the caregiver that play interactions with young children can be improved by following the child's lead as opposed to directing or commanding the child during play.

The interventionist gave the mother a white sheet of paper on which the acronym PRIDE was written vertically in large bold letters to help her remember the 5 skills. Each PRIDE letter spelled out a skill, and each skill was described and reviewed with the caregiver. The five PRIDE skills are to: 1) **Praise** the child when the child plays appropriately, such as stating "You are making such a nice tower out of those blocks!" (specific praise) or "Good job!" (non-specific praise). The caregiver was encouraged to use specific and non-specific praise to help the child know what she liked about the child's behavior; 2) **Reflect** on the child's verbal comments, such as repeating, paraphrasing, or building on the child's vocalizations. For example, if the child said "Fence" when lining blocks up next to each other, the mother might respond with "Yes, that's a fence you're building." The caregiver was informed that reflecting on the child's language would help her pay attention to what the child was saying and would help her learn to wait for the child to speak and lead the interaction; 3) **Imitate** the child's play or do the same thing the child is doing. Imitating her child during play was described as another skill that would help the mother learn to let the child lead the play interaction. In addition, imitating the child was reviewed as a skill that: a) would permit the mother to focus on what the child was interested in doing, b) makes the play session more peer-like and fun for the child, and 3) signals to the child that the mother approves of the child's play behavior; An example provided for the mother was that if the child started stacking a block tower, she should also start stacking a block tower. If the child

made neighing sounds while making a toy horse jump, the mother could make a roaring sound while making her toy lion jump; 4) **Describe** what the child is doing. For this skill, it was suggested that the mother narrate what the child was doing during play. For example, if the child is stacking a block tower, the mother might say “I see that you are putting blocks on top of one another. First you put down the square block, next you put the rectangle block.” The mother was told that she could think of the skill as being like a sports announcer that would comment play-by-play on what the child was doing; and, 5) be **Enthusiastic**, such as letting her voice show excitement about the child’s behavior. It was suggested that the mother could show enthusiasm by raising the pitch of her voice, such as by saying “You are being SO nice to share with me!” or “OH! I like THAT! The rationale that using these 5 PRIDE skills helps promote better parent-child interactions with children during play was again emphasized at the end of the session. The brief PRIDE intervention session was 10 minutes long.

Posttest or last session

Following the intervention or control period, the dyad was escorted back to the interaction room for the posttest play session. The posttest session was conducted exactly as the pretest session and lasted 5 minutes. All mothers were given \$10 to compensate them for their time and costs associated with traveling to and from the study site.

Measures

Background questionnaire. Background information on the participants was collected using a brief questionnaire that asked about the child’s age and gender, the number of siblings living in the house, mother’s and father’s ages, ethnicity, and the mother’s marital status. The socioeconomic status (SES) of the family was computed using the Hollingshead Two Factor Index (Hollingshead, 1978) based on information provided by the mother about parental education and parental occupation.

Depression. The mothers completed the Center for Epidemiological Studies Depression Scale (CESD; Radloff & Teri, 1986,) to assess if they were experiencing depressive symptoms. The CESD is comprised of 20 questions and examines frequency and intensity of depressive symptoms, such as loneliness, difficulty sleeping, eating disturbances, and depressed mood. The possible responses are on a Likert scale ranging from “rarely” (0) to “most of the time” (3). A score of 16 on the CES-D is considered the cut-point for depressive symptomatology; a score between 13 and 15 is considered borderline depression, and a score between 3 and 12 is considered non-depressed. Individuals who score between 0 and 2 are typically not included in studies as they are considered “faking good” (Field, et al., 1991). Previous research has shown the CESD to be a reliable and valid method of assessing or screening for depressive symptomatology in adults (Radloff & Teri, 1986). The 20 item depression scale was found to be reliable ($\alpha = .81$).

Anxiety. To assess maternal anxiety, the mothers completed the State Trait Anxiety Inventory (STAI; Spielberger et al., 1970). This scale is comprised of 20 questions and assesses

anxious symptoms, such as nervousness, worrying, and being tense. The possible responses are on a Likert scale ranging from “not at all” (1) to “very much so” (4) with regard to how they generally feel. A score of 48 on the STAI is considered the cut-point for high anxiety, a score between 37 and 45 is considered moderate anxiety, and a score of 36 or less is considered low anxiety, with scores ranging from 20 to 80. Previous research has shown the STAI to be a reliable and valid method of determining anxiety in adults (Spielberger et al., 1970). The Cronbach alpha attained for this 20 item anxiety scale was .67.

Anger. The short version of the State Trait Anger Expression Inventory (STAXI; Spielberger, 1988) was used to assess the experience, expression, and control of anger in the mothers. The STAXI contains 10 questions rated on a Likert scale, ranging from “almost never” (1) to “almost always” (4) with regard to how they generally feel or act. Questions included “when I get frustrated, I feel like hitting someone,” “I fly off the handle,” and “I feel annoyed when I am not given recognition for doing good work.” Raw scores are converted into percentile ranks and then compared to normative tables. Scores between the 25th and 75th percentiles are considered normal. Scores above the 75th percentile are considered high in anger. Scores at or above the 90th percentile are considered very high in anger. Previous research has shown the STAXI to be a reliable and valid method of determining anger in adults (Spielberger, 1988). This 10 item anger scale was found to be highly reliable ($\alpha = .86$).

Daily Hassles. A modified version of a questionnaire that has been used to assess daily hassles (Field, Hernandez-Reif, & Diego, 2006) was given to the mothers to examine the frequency and types of hassles they experience. The original Daily Hassles questionnaire was designed for use with low-income, at risk, depressed and non-depressed mothers with infants and toddlers (Field, et al., 2006). For the current research, we deleted the questions from the Daily Hassles that referred to drug use, social workers, and probation officers because these were deemed irrelevant for this study. In addition, the word “baby” was replaced with “child” to be relevant to the participants, as the children in the current study were between 2 and 5 years of age. The modified questionnaire, comprised of 31 questions, indicates the mother’s self-reported daily stress and social support. Some sample Daily Hassle questions are: “getting people to help with my child,” “when my child doesn’t listen to me,” and “keeping my cool.” The possible responses are on a Likert-type scale ranging from “is no hassle” (0) to “is a big hassle (3). Higher scores indicate higher levels of daily hassles, with scores ranging from 0 to 93. This daily hassles scale was found to be reliable (31 items; $\alpha = .82$).

Video coding schemes. The researchers involved in the coding of the videos were blind as to the condition of the dyad. The researchers were graduate students and were trained to code the videos by the senior authors of the paper.

Coding mother-child synchrony during interactions

The Synchrony and Control Ratings scale used by Mize and Pettit (1997) was used to rate the parent-child synchrony via the videotapes made during the pretest and posttest play interactions (sessions 1 and 2). Synchrony was coded every 30 seconds on an extensively anchored 6-point

scale, with each point on the scale having specific exemplars of behavior that reflect the different levels of synchrony. A coding manual with detailed behaviors and numerous examples was created and used to train the coders. In this section, we outline a few of the main behaviors of each point scale. A code of 0 was given if there was no interaction whatsoever between the mother and child (e.g., mother plays with blocks while child plays with toy animals; they do not talk or mingle toys); a code of 1 reflected when the interaction focused on materials and, there was no shared focus. For example, both members are playing with the same types of materials but neither is reacting to the others' comments (one partner may talk about an alligator while the other may talk about the lion); For a code of 2, the partners interact with each other during the 30-second interval, but there are a lot of miscues (e.g., not responding to most of the partner's comments). A code of 2 is also given if one member of the dyad dominates the interaction and/or the focus is mostly on the materials rather than on the actions or affect of the partner (e.g., child rolls a car and the mother comments on a car crash). In this category, little shared affect and little eye contact are typical; Code 3 is the most basic level of synchrony, where there is some, but not perfect, turn-taking. However, in this category, there is very little, if any, shared positive affect (e.g., little if any laughter). To earn a code of 3, both members in the dyad must be engaged in the same activity and have a joint focus, noting cues that the partner may be offering (e.g., parent and child toss a ball back and forth and comment on each other's actions). The interaction may be positive, but does not need to be, and both partners must be responsive to each other. A code of 4 is given when there is evident and frequent eye contact, the partners are engaged in the same activity, and there is physical contact or physical closeness; also, a code of 4 requires there to be considerable balance in leading, following and responding to each other's comments, as well as some shared affect (e.g., both looking surprised if a block tower falls or looking at each other and laughing when tossing the ball). This coding reflects a hint of peer-like activity, such as the parent appearing to be child-like when playing, although this may only be for a brief interval. A code of 5 is the highest level of synchrony and is reserved for partners who are engaged in the same activity, have comparable turns in leading and following leads, are mutually responsive to one another, and appear joyful and playful; each member of the dyad shares the responsibility for playing and maintaining the interaction. In addition, in a code of 5 there is frequent eye contact and frequent shared affect. For example, the partners may building a house for the toy animals, making eye contact, laughing together and/or making animal noises as the animals chase each other in play. The interaction is described as child-like and peer-like and there is physical closeness; Responsiveness of both partners and suggestions by both partners are evident throughout the interaction. The synchrony scores given to each dyad across the 30-second intervals were averaged to compute a mean synchrony score. The mean synchrony scores were then averaged across each group to derive scores for the pre-test and separately for the post-test interactions. Interobserver reliability on synchrony scores for two trained researchers who coded the videotapes for synchrony was assessed on 15% of the videotapes using Pearson Product moment correlation and reached 92% agreement.

Coding maternal behaviors during interactions

A video coding scheme was developed to assess the mother's use of child-directed techniques during the pretest and posttest interaction sessions with her child. The coding scheme included operational definitions and examples derived from the PCIT manual. The videotape coding was

expected to support that mothers in the intervention group could learn and apply the child-directed techniques (PRIDE skills) during the posttest interaction session.

In a second pass of the video, the 5-minute pretest and the 5-minute posttest interaction videotapes were again coded in 30 second intervals, but this time for maternal frequency of using: 1) praise (both specific, such as "You are making such a nice tower!", and non-specific, such as "Good job!"), 2) reflection (repeating, paraphrasing, or building on a child's vocalizations,) 3) imitation (doing the same thing the child is doing,), 4) description (talking about or narrating what the child is doing,) and 5) enthusiasm (letting voice or body language show excitement.). After being trained on the coding scheme, one researcher (primary coder) was responsible for coding all the videos for maternal interaction skills. For the purpose of calculating interobserver reliability, the other researcher (secondary coder) was asked to code 15% of the videos, which were chosen at random. A Pearson product-moment correlation coefficient was computed to assess the relationship between the primary and secondary coders' on maternal frequency of using the five child-directed (PRIDE) skills. The positive correlation was robust, $r = .98, p = 0.002$.

Coding children's behaviors during interactions

Children's behaviors during the pre- and posttest interactions were also coded. Specifically, the videos were coded in a third pass focusing only on the child. Variables were operationally defined (a list of these variable and their definitions can be obtained from the second author) and videos were coded pre- and post the intervention or control period every 30 seconds for the following child behaviors: 1) Affect: positive facial expression (smiling, alert expression, happy chatter); 2) Activity level: low (slow movements, slow at engaging mother; lack of exploration; not playing), moderate (playing in the designated area with toys; neither low nor high activity) or high activity (very active, quick movements, tries to leave seat; high exploration); and 3) specific examples of child-directed attempts to interact with mother: asks questions, offers toy to mother, looks at mother. As in the other coding schemes, one coder was primarily responsible for coding all videos and the other coded 15% of the videos. The Pearson Product moment correlation reached 90% agreement.

RESULTS

Demographic Characteristics of the Sample

Forty mothers and children participated in this study (20 mother-child dyads). Mothers were on average 25.35 years old ($SD = 5.21$), came from predominantly lower-middle socio-economic status (75%), and the majority were African-American (65%). Their children were on average 3.5 years old ($M\ age = 42\ months$; range = 28.6 – 67 months) and predominantly male (75%). Only 15% of the mothers lived with their husbands and 25% reported living with their significant other. The majority of the mothers were unwed (85%) and 50% had at least two or more

children. Chi-square and t-test analyses revealed no group differences between the intervention and control groups on the demographic data.

Maternal Mood and Daily Hassles Findings

Maternal incidence of mood disorders. On the CES-D Depression Scale, 35% of mothers scored greater than, or equal to, 16 points, which is the cut-off for depressive symptomatology. While the mean CESD score for the sample ($M = 11.75$, $SD = 7.70$) was within the non-depressed range (i.e., 3-12), the mean score was high and close to borderline clinical depression (i.e., 13-15). Mothers' responses on the STAI Anxiety Questionnaire indicated that 35% of them experienced moderate to high levels of anxiety ($M = 34.80$, $SD = 8.64$.) The STAXI Anger Questionnaire revealed that 49% of the mothers reported moderate to high levels of anger ($M = 14.45$, $SD = 4.37$.) An ANOVA to examine the scores for the three mood scales failed to reveal group differences, suggesting that the two groups entered the study with similar mood states (all $ps > .05$).

Specific daily hassles. An independent sample t-test on the intervention versus the control group for the total score of the Daily Hassles questionnaire failed to reach significance, suggesting that the two groups reported experiencing a similar number of daily hassles. The mean score on the Daily Hassles Questionnaire was 23 ($SD = 10.15$.) with a total range of possible scores from 0 to 93. As a result of the high levels of depression, anxiety and anger in this sample, the responses on the Daily Hassles questionnaire were examined item-by-item to determine the severity and frequency of specific hassles reported by mothers related to their children, finances, others, anger, and self. Frequently reported daily hassles were identified with a 50th percentile score (reported as a 3 or 4 on the 4-point Daily Hassles scale.) Most of the highly-ranked items fell under the child category with 55% of mothers reporting their greatest hassle being that their child "doesn't listen to them" and 40% reporting that it is a hassle when their "child acts spoiled". Under the finance category, 50% of mothers reported "getting money" to be a hassle. Forty-five percent of mothers also indicated that it was a hassle "getting time for myself". Surprisingly, only 25% of the mothers reported the child's father and 30% reported their employer as hassles in their daily lives.

Maternal Interactions with Children

Baseline levels of mother-child synchrony during play. The distribution of the synchrony data was examined, and the pretest mean synchrony score was computed (as rated on the Synchrony and Control Ratings scale by Mize and Pettit, 1997) to examine the dyads' level of synchrony at baseline. Half of the mothers displayed less than a 3 on the synchrony scale, while only 30% scored 4 or higher on synchrony (M baseline synchrony for the sample = 3.1, $SD = 0.87$.) suggesting that overall mothers in the sample had a low-to-average level of synchrony with their child during the baseline (pretest) play session. The two groups did not differ on the pretest Synchrony scores.

Mothers natural use of child-directed strategies (PRIDE) when playing with child. The pretest (baseline) frequency data revealed that during the initial 5-minute mother-child interaction session, 95% of the mothers gave their children no specific praise ($M = 0.2$; $SD =$

0.67,) and 55% gave their children no non-specific praise ($M = 1.4$, $SD = 2.28$). Half of the mothers reflected (i.e., paraphrased or built on) their children's vocalizations 0 to 9 times and the other half reflected 12 to 22 times ($M = 10.5$, $SD = 6.57$.) Seventy percent of the mothers imitated their children 0 to 3 times ($M = 2.5$, $SD = 2.46$.) and 80% described what their child was doing during play 0 to 3 times ($M = 1.8$, $SD = 2.04$.) Seventy-five percent of the mothers were coded as being enthusiastic at least once during the baseline session ($M = 13.9$, $SD = 10.52$). In sum, the descriptive statistics for the pretest mother-child play interaction revealed that overall the mothers rarely praised, imitated or described their children's activities during play. However, most mothers were enthusiastic at least once and frequently used reflection when playing with their children. The two groups (intervention and control) did not differ on frequency of use of child-directed strategies (PRIDE) at baseline (all $ps > .05$).

Relationships between mood, daily hassles and mother-child interactions. To examine the relationship between maternal mood, maternal perceived daily hassles and mother-child interaction behavior, bivariate correlations were conducted on the questionnaire totals and baseline synchrony and the mothers' use of child-directed techniques (PRIDE). The correlational analysis revealed that: 1) Daily Hassles total score positively correlated with Anger (STAXI), $r = .45$, $p < .05$, suggesting that mothers with higher levels of daily hassles also reported higher levels of anger; 2) Depression scores (CESD) positively correlated with Daily Hassles, $r = .58$, $p < .01$, Anxiety (STAI), $r = .48$, $p < .05$, and with Anger (STAXI), $r = .59$, $p < .01$, suggesting that mothers who reported more depressed symptoms also scored higher on daily hassles, anxiety and anger; 3) Baseline synchrony positively and highly correlated with overall PRIDE skills, $r = .89$, $p < .01$, suggesting that mothers who used more child-directed skills when interacting with their children had more synchronous mother-child interaction scores. The high correlation ($R^2 = .79$) between synchrony and maternal use of child-directed techniques (PRIDE) revealed that 79% of the variance in the dyad's synchronous interaction could be predicted from the mothers' use of child-directed interaction skills (i.e., PRIDE skills).

Bivariate correlations were also conducted on the baseline synchrony and individual PRIDE skills and revealed that: 1) Maternal specific praise during play positively correlated with Daily Hassles items "when my child needs to be watched," $r = .48$, $p = .03$ and "when my child squirms and wiggles," $r = .55$, $p < .05$, suggesting that mothers who have children who need to be watched or have high energy levels were more likely to give specific praise to their child in play interactions; 2) Maternal non-specific praise during play negatively correlated with the Daily Hassles Child Subscale total, $r = -.50$, $p = .02$, and Daily Hassles item "when my child is sick," $r = -.46$, $p = .04$, suggesting that mothers who self-reported that their child was a daily hassle, specifically when their child is ill, were less likely to praise their children during play interactions; 3) Maternal imitation of child during play negatively correlated with Depression, $r = -.49$, $p = .03$, and Anxiety total score, $r = -.45$, $p = .05$, suggesting that mothers with elevated depressive and anxiety symptoms were less likely to imitate their children during play interactions; and, 4) Maternal description of child activity during play negatively correlated with Depression, $r = -.48$, $p = .03$, and the Daily Hassles item "when my child smells bad," $r = -.63$, $p = .004$, suggesting that mothers with elevated depression, and mothers who perceived their children as smelling bad as a hassle, were less likely to describe what their children were doing during play.

Outcome of intervention on: maternal child synchrony scores and maternal use of child-directed techniques (PRIDE) during play interactions. An inspection of the pre and post-test data revealed normal distributions and comparable standard deviations across the two groups. To assess the effects of the intervention, a 2 (Group: PRIDE vs Control) by 2 (Interaction Session: Pretest versus Posttest) repeated measures MANOVA, with *group* as the between-subjects factor and interaction time (pretest, posttest) as the repeated measure, was conducted on maternal frequency of using child-directed techniques during play (i.e., PRIDE: Praise, Reflect, Imitate, Describe, and Enthusiasm) the dyad's Synchrony scores (0-5). The analysis revealed a significant group by time interaction effect, $F(8, 11) = 8.68, p < .001, \eta^2 = .863$. Subsequent ANOVAs were conducted and revealed differences between the intervention and control group means for Synchrony scores and maternal use of child-directed techniques (PRIDE) from pre-to posttest (see Table 1). Post-hoc paired sample t-tests to determine where the differences laid revealed significant increases for the intervention group from pretest to posttest on Synchrony and all of the coded child-directed techniques (PRIDE) (all $ps < .01$) except for giving children specific praise or reflecting on their behavior. The control group significantly decreased in repeating/rephrasing their child's vocalizations (i.e., Reflect) from pre-to post play interaction ($p < .01$). No other significant pre-to-posttest difference was found for the Control group (see Table 1). In sum, the findings suggest that the mothers in the intervention group learned the child-directed techniques, and then applied the techniques in the posttest mother-child play interaction session. In addition, the intervention dyads were coded as improved in synchrony from pre-to-post intervention session.

TABLE 1
 Mean Mother-Child Synchrony Scores and Mean Frequency with which Mothers used Child-Directed Techniques (PRIDE) during Play Interactions with their Preschool Child from Pre- to-Posttest for the Intervention and Control Group

Variables	Groups				Repeated MANOVA		
	Intervention		Control		F	p	η^2
	Pretest	Posttest	Pretest	Posttest			
Synchrony	3.0 (0.8) _a	3.8 (0.7) _b **	3.2 (1.0) _a	3.3 (1.1) _a	9.02	0.01	0.33
PRIDE (total)	26.6 (14.2) _a	52.7 (16.8) _b **	33.6 (17.8) _a	27.6 (15.2) _a	49.89	0.001	0.74
Specific Praise	0 (0) _a	0.7 (1.1) _a	0.3 (0.9) _a	0 (0) _a	4.95	0.04	0.22
Non-specific Praise	1.8 (2.9) _a	5.2 (3.3) _b **	0.9 (1.3) _a	0.3 (0.7) _a	17.39	0.001	0.49
Reflect	9.2 (5.9) _a	12.2 (6.2) _a	11.8 (7.3) _a	7.1 (4.9) _b **	13.40	0.002	0.43
Imitate	1.3 (1.4) _a	8.1 (2.8) _b **	3.6 (2.8) _a	2.9 (2.5) _a	39.03	0.001	0.68
Describe	1.3 (1.7) _a	4.8 (3.4) _b **	2.3 (2.3) _a	1.8 (1.8) _a	11.29	0.003	0.39
Enthusiasm	13.0 (12.) _a	21.7 (12.1) _b **	14.7 (9.4) _a	15.5 (9.3) _a	6.09	0.02	0.25

Note. Values enclosed in parentheses represent Standard Deviations. Means within each group (intervention or control) that do not share subscripts differ at * $p < .05$, ** $p < .01$; η^2 = partial eta square (.10 = small effect size; .25 = medium effect size; .50 = large effect size.)

Predicting Mother-Child Synchrony from Maternal Child-Directed Techniques

To examine which child-directed technique(s) predicted mother-child synchrony, a multiple regression was conducted with maternal child-directed behaviors (PRIDE) as predictor variables: praising the child during interactions (non-specific and specific), reflecting on the child's play actions, imitating the child's play, describing the child's play behavior, or being enthusiastic. The model produced an R^2 of .83, for the pretest data, which was statistically significant, $F(6, 19) = 10.25, p < .001$. Maternal use of reflection and being enthusiastic with her child during the play interactions predicted mother-child synchrony (see Table 2).

TABLE 2
Predictors of Mother-Child during play

Predictors	Mother-Child Synchrony		
	<i>B</i>	<i>t</i>	<i>p</i>
Constant		7.73	0.001
Praise (specific)	-0.04	-0.35	0.74
Praise (non-specific)	0.002	0.02	0.98
Reflecting	0.369	2.24	0.04
Imitating	0.182	1.14	0.27
Describing	-0.031	-0.22	0.83
Enthusiasm	0.588	4.31	0.001

Child behaviors in relation to group assignment. Children's affect (positive facial expressions), activity level (low, moderate, or high) and specific interactions with mothers (asks questions, offers toy to mother, looks at mother) were also examined at play time 1 and 2 (i.e., pretest and posttest) by group assignment (i.e., intervention vs. control group). A group effect was obtained only for offering mother a toy, $F(1,15) = 7.57, p = .015, \eta^2 = .335$, revealing that children in the intervention group offered toys to their mothers more often than children in the control group. Post hoc paired sample *t*-tests revealed that children in the intervention group increased nearly 3 fold in the frequency with which they offered their mothers a toy from play session 1 ($M = .44, SD = 1.01$) to play session 2 ($M = 1.38, SD = 1.50$), although the frequency scores were low and the increase was only marginally significant, $t(8) = 2.20, p = .06$. In contrast, children in the control group were not observed offering their mothers a toy in either play session 1 ($M = 0$) or play session 2 ($M = 0$).

DISCUSSION

In this study, assessments were made of maternal mood and play interactions of low-income mothers and their typically-developing preschool age children (2 to 5 year olds). The play sessions of the dyad were recorded before and after a brief intervention or control period. The intervention, an abbreviated Parent-Child Interaction Therapy (PCIT), was aimed at helping the

intervention mothers learn five child-directed techniques (PRIDE: praise, reflect, imitate, describe, enthusiasm) that were expected to enhance the synchrony, or improve the interactions, of the parent-child dyad during a play session. The baseline interactions were expected to be low in synchrony because low-income mothers typically experience a greater level of stress, and based on the literature, these mothers often display more negative mood and report greater hassles (Brooks-Gunn & Furstenberg, 1986; Ceballo & McLoyd, 2002; Pearlin & Johnson, 1977). Greater depression, anxiety, anger, and daily hassles were expected to be negatively correlated with mother-child synchrony and maternal use of child-directed skills that foster positive interactions (PRIDE skills.)

As expected, the low-income mother-child dyads in the current study had a low-to-average level of synchrony during the baseline play session. The baseline synchrony score of the dyads in the current study is considered the lowest level of positive synchrony where there is some, but not perfect, turn-taking and very little, if any, commenting or shared positive affect between the mother and child. Half of the dyads scored below the minimum positive synchrony score, indicating even lower than average synchrony or no synchrony for some. These lower scores reflected behaviors of dyads that had little or no common focus, that placed emphasis on the materials available during the interaction rather than on each other's actions, that abruptly changed topics, or dyads that were unresponsive to their partner during play. The baseline observations of the mothers playing with their children also revealed that they did not frequently praise, imitate or describe what their children were doing. Adult use of child-directed techniques, such as praising, reflecting, imitating, describing and being enthusiastic during interactions (i.e., PRIDE skills), has been shown to enhance parent-child synchrony, build healthy parent-child relationships, help develop children's social skills and reduce problem behaviors (Boggs et al., 2004; Dombrowski, Timmer & Zebell, 2008). Interestingly, at baseline, the low-income mothers in the current study were frequently enthusiastic and often repeated or reflected (i.e., paraphrased) what their children did during play. Those two child-directed behaviors by the mothers (i.e., reflecting and being enthusiastic) largely predicted the synchrony scores of the dyad. Another interesting finding was that use of child-directed techniques and baseline synchrony scores were positively and strongly correlated, suggesting that the mother-child dyad was more "in tune" or synchronous during play when mothers used more of the child-directed (PRIDE) techniques.

Surprisingly, maternal mood and perceived daily hassles were not related to mother-child baseline synchrony scores. Perhaps this relates to the baseline synchrony scores of the mothers being mid-range, or the small sample size. Not surprising was the finding that mothers' scores on the mood and daily hassles questionnaires were related. Depressed symptoms positively correlated with anger, anxiety, and daily hassles, suggesting that mothers who reported more depressive symptoms also reported more anger, anxiety, and daily hassles. Relationships between depression and anger, anxiety, and daily hassles are well documented in the literature (Dobson, 1985; Field, 2010; Sher, 2004; Tavris, 1989). Maternal reports of daily hassles were also positively correlated with anger, suggesting that mothers with higher daily hassles reported being more angry. The relationship between daily hassles and anger is also supported by the literature (Farabaugh et al., 2004; Field, et al., 2010; Painuly, Sharan, & Mattoo, 2007; Sedlar & Hansen, 2001).

In the current study, maternal mood and perceived daily hassles were related to mothers' use of child-directed techniques at baseline. Specifically, mothers who reported more depressive

symptoms imitated and described their children's actions less during the baseline play session. These findings suggest that depressed mothers may be less in tune with their children during play activities, less interested in their children's play, or less interested in playing with their children. This is supported by the literature on depressed mothers (cf. Field, 2010). Mothers who express many and frequent depressive symptoms participate in fewer synchronous exchanges with their children than non-depressed mothers and also show low attachment to their child (Lundy, 2002). Depressed mothers may not be able to focus on, or respond to, their children during play because of their negative mood state. They may also misinterpret their child's cues during interactions and either over-stimulate or under stimulate their child, which disrupts interactional synchrony and reduces the enjoyment of the interaction for the child (Field et al., 1990). Thus, brief interventions that focus on depressed mothers are needed to help elevate the level of interactional synchrony and help them appropriately engage with their child during play.

Like the depressed mothers, anxious mothers in the current study also imitated their children less during the baseline play session. This suggests that anxious mothers are less likely to follow their child's cues or lead in play interactions. Similarly to depressed mothers, anxious mothers are also likely to misinterpret their child's cues during interactions, which may interrupt the flow of synchrony and make the interaction less enjoyable for the child (Feldman, 2007). Again, brief interventions are needed that are aimed at mothers with mood disorders to help them have more positive and synchronous interactions with their children during play.

Mothers who reported more daily hassles regarding their children praised their children less during the baseline play session. This suggests that mothers who regularly perceive their children as being a hassle may be less positive of their children during play. In one study, parents who described their children as "stubborn," "noisy," "impulsive," and "restless" were coded as low in synchrony during parent-child play interactions (Vizziello, Ferrero, & Musicco, 2000). It may be that mothers who report greater daily hassles have less social support, and mothers with low levels of social support often use negative and rejecting forms of parenting, which are in direct opposition to parent-child synchrony (Ceballo & McLoyd, 2002). Or perhaps it may be that mothers who have negative views of their children and are hassled by their behaviors avoid their children more during play, thus they are less engaged or interactive with them. They may be so focused on the negative behaviors of the child that they do not focus on the positive behaviors and fail to praise those positive behaviors when they occur. In sum, maternal negative mood is associated with less optimal parent-child relations and less focus on the child. Maternal negative mood may be exacerbated in low-income families by the daily stressors they face. In sum, research is needed on brief interventions that are manageable for these stressed mothers who experience mood disorders and are disadvantaged because of their low-income status.

Future research is also needed on the relation of perceived daily hassles, maternal mood, and parent-child interactions for low-income mothers with a focus on the child's developmental status (e.g., infants versus toddlers versus preschool age children, etc). Studies by Beebe and colleagues suggest that infants of depressed mothers demonstrate a mid-range of self-comfort and vigilance (cf. Beebe, et al., 2010; Marquette, Helbraun, Beebe & Jaffe, 1998). It is unclear if these infant behaviors persist to the toddler and preschool period or if brief PCIT techniques are appropriate across all ages of the early childhood period.

Being assigned to the intervention group was expected to elevate the synchrony of the dyad and lead to greater maternal use of child-directed strategies (i.e., praising, reflecting, imitating, describing and enthusiasm) from baseline to post intervention. These hypotheses were

supported in the current study. Mothers in the intervention group significantly increased from pre- to post-intervention in the overall use of child-directed techniques, specifically in the frequency of praising (non-specific), imitating, describing what their child was doing and in being enthusiastic. In addition, the mother-child dyad's synchrony score for the intervention group increased significantly from the baseline play session to the post-intervention play session. The only two child-directed strategies that did not increase for the intervention mothers were the use of specific praise and reflection. Both specific praise and reflection require the mothers to make explicit comments on their child's behavior or vocalizations, which may be something that the mothers were unaccustomed to doing. Learning to overtly commend her child and/or reflect or rephrase the child's play behaviors may require practice and/or an additional coaching sessions for low income mothers.

Perhaps not surprising, mothers in the control group showed a decrease in reflecting on the children's vocalizations from the first to the second play session. The two play sessions were only separated by a 10 minute period. This supports that low-income mothers may have difficulty reflecting on their children's play. Overtime, these mothers' interactions with their children may deteriorate. Reflecting or paraphrasing children's vocalizations is one way of enhancing the language development of young children. Early language development is grounded in the interactions that adults, particularly caregivers, have with young children. Promoting language skills in young children during social interactions is related to later school readiness (Lucchese & Taims-LeMonda, 2007). Preschool children from low-income families score markedly lower on language skills, which is a risk factor that has been associated with the negative effects of poverty (Stanton-Chapman, Chapman, Kaiser & Hancock, 2004). Thus, interventions are needed that teach low-income mothers how to promote young children's vocalizations and/or language skills. No other significant differences were found for the control group.

Interestingly, while mothers in the intervention group did not show an increase in paraphrasing their children's vocalizations or speech during play, they also did not decrease in reflecting from the pre-to the posttest play session like the control group. In addition, children in the intervention group were found to offer their mothers a toy more often than children in the control group. Perhaps, the intervention children were attempting to increase turn-taking or reward their mothers who were being more focused on them. This finding warrants further research and may reflect the preschool age children's attempt to improve interactional synchrony with their mothers.

Taken together, these findings support that the brief PRIDE intervention was effective in teaching low-income, and/or at risk mothers, a few basic child-directed strategies that have been shown to strengthen parent-child relations. Additionally, the findings also reveal that maternal use of child-directed techniques during play is related to improved mother-child synchrony. The majority of the mothers in our group were low-income, unwed, African American single mothers who were parenting, on average, two children. One-third to one-half of the low-income/at risk mothers presented with symptoms associated with severe mood disorders. Developmental researchers advocate for research that identifies patterns of maternal risks associated with low-income populations and to examine how those maternal risks affect or relate to preschool age children's development and competencies (Perry & Fantuzzo, 2010). Studies that focus on brief interventions for low-income mothers with mood disorders are needed to examine if short therapies, like the abbreviated PCIT we used in the current study, strengthens the parent-child

relation and has long term positive effects on children's social development. The children's increase in offering their mother a toy is a positive social gesture that should be encouraged and a step in further developing young children's social skills.

In conclusion, the brief child-directed intervention we tested was successful as it was conducted in one session and revealed an immediate and powerful change in mothers' behaviors towards their children during play, as measured by the dyads' improved synchronous interactions and the mothers' greater use of child-directed strategies. The success of the intervention can also be measured by the robust effect sizes, which emphasized the magnitude of the difference between the intervention and control group. The intervention appeared to be feasible for this group of low-income mothers, evident by them being able to: 1) learn the child-directed (PRIDE) techniques in a brief 10 minute session, 2) remember the techniques, and 3) use most of the techniques in a subsequent interaction with their child. The findings from this study are encouraging as they support that brief interventions may be feasible and effective for helping low-income mothers learn techniques to strengthen their interactions with their preschool age children. Improving parent-child relations is likely to enhance children's social development and may help them become school ready.

Limitations & Future Study. One limitation of the current study is that because no follow-up studies were conducted, it is unknown if the brief intervention has lasting effects. In the current study, mothers participated in one 10 minute intervention and the effects of the therapy were assessed immediately after and on the same day. Thus, further study is needed to evaluate if the brief intervention has long-term effects on synchrony and parent-child interactions. A future study should also examine if the brief intervention is effective in the natural setting, such as in the home. Comparing the intervention outcome for the laboratory versus the natural context might reveal if the effects of the brief therapy are valid or are the result of experimental manipulation or priming. The small sample size of the study may be considered another limitation. However, given the robustness (i.e., the large and mostly moderate effect sizes) of the intervention effects on maternal use of child directed techniques, the findings are expected to be replicable.

A future study might also include a more diverse sample of parents and perhaps test the effectiveness of the intervention with fathers. While the majority of our mothers were unwed, the brief intervention may have additive effects if delivered to low-income intact families where both parents may benefit from learning child-directed strategies to use when interacting with their children. Additionally, it is important to also examine the intervention effects for different early childhood ages (e.g., two year olds, versus three, four or five year olds).

Implications. There is little literature on the practical application of parent-child interactional synchrony for preschool age children and their caregiver. Improving synchrony in parent-child dyads has been associated with stronger parent-child relations and enhanced social development for children. Strengthening the parent-child bond and helping young children develop social skills are important measures of parenting success, especially for low-income families who are stressed.

Those who have attempted interventions to increase synchrony have focused mostly on mother-infant dyads (Harrist & Waugh, 2002). The traditional PCIT as already mentioned is intensive in terms of time commitment and associated with a high attrition rate. There is a

paucity of research on brief interventions for low-income samples, especially for mothers of preschool age children. Brief interventions may be more feasible for busy parents, or those with few resources to participate in extended therapy sessions. Brief interventions that are feasible and effective may have important implications for helping preschool children become school ready such as by enhancing their social skills through parent interactions that are child focused. Finally, brief interventions may be implemented in waiting rooms of pediatric clinics, pediatrician offices, taught more formally in a parent education class, or put into a handout to be distributed to parents of children in Head Start. This intervention may also be useful for Head Start Teachers. While the long-term effect of this brief intervention is unknown, this study is a first step towards research on increasing synchrony in low-income mother-preschool dyads or teacher-child dyads in Head Start. Considering all of the positive outcomes associated with parent-child synchrony, research in this area is important for parents, children, educators, researchers, and anyone who works with young children and families.

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