FACTORS THAT CONTRIBUTE TO DYADIC SYNCHRONY AMONG YOUNG LATINA MOTHERS AND THEIR TODDLERS: THE ROLE OF MATERNAL BEHAVIOR AND CHILD CHARACTERISTICS

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Research on parenting has placed an increasing emphasis on bidirectional processes of parent-child interactions to more fully describe the quality of the parent-child relationship. A frequently examined bidirectional process is dyadic synchrony; an interactional style characterized by harmonious and mutually responsive behavioral and emotional exchanges. Despite the positive implications of dyadic synchrony, few studies have examined how both maternal behaviors and child characteristics contribute to this interactional style. Moreover, a majority of the research examining correlates of dyadic synchrony has been done with European American and low-risk families. Latina adolescent mothers are of particular interest, because they face higher levels of cumulative risk (e.g., low socioeconomic status, lack of knowledge about parenting and child development), yet are underrepresented in the literature. The current study tested how maternal sensitivity and child characteristics together contribute to dyadic synchrony displayed by young Latina mothers and their toddlers. Results indicated that although there were no gender differences in the level of dyadic synchrony, this interaction style likely has different precursors and correlates for girls and boys. Specifically, maternal sensitivity appears to be important for
the sample as whole, child temperament appeared to be important for mother-daughter interaction quality. Implications for future research and parent-child interventions are discussed.
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by

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Introduction

Research on parenting has placed an increasing emphasis on bidirectional processes of parent-child interactions to more fully describe the quality of the parent-child relationship (Harrist & Waugh, 2002). A frequently examined bidirectional process is dyadic synchrony; an interactional style characterized by harmonious and mutually responsive behavioral and emotional exchanges (Harrist & Waugh, 2002; Lindsey & Caldera, 2015). This style has been consistently associated with more optimal social and emotional development in young children, including higher levels of self-regulation, stronger cognitive and language abilities, and fewer behavioral problems (Lindsey, Cremeens, Colwell, & Caldera, 2009; Kim & Kochanska, 2012; Deater-Deckard, & Petrill, 2004; Lindsey, Mize, & Pettit, 1997; Skuban, Shaw, Gardner, Supplee, & Nichols, 2006). Nonetheless, little is known regarding factors that contribute to dyadic synchrony. Research, done primarily with European American (EA) adult mothers, has shown that both maternal behavior and child characteristics contribute to the nature and quality of dyadic synchrony, although studies have seldom examined maternal and child contributions simultaneously in predicting this interactional style (Deater-Deckard & O’Connor, 2000; Skuban et al., 2006). However, despite the fact that research suggests socialization practices among ethnic minorities overlap but also differ from socialization practices in the United States, the generalizability of these findings across different ethnic and cultural groups, or dyads including young mothers, has not been studied (McLoyd, Cauce, Takeuchi, & Wilson, 2000; Roosa, Morgan-Lopez, Cree, & Spenter, 2002).
Latina adolescent mothers are of particular interest because they have the highest adolescent birthrate in the U.S. and face high levels of cumulative risk, yet are underrepresented in the literature (Hoffman & Maynard, 2008; Martin, Hamilton, Osterman, Curtin, & Mathews, 2015). Knowledge about factors contributing to the quality of dyadic synchrony displayed by young Latina mothers and their toddlers would not only increase understanding of cultural variations in dyadic synchrony, but also inform intervention efforts for this at-risk population. Thus, our study examines how both maternal and child behavior and characteristics together contribute to dyadic synchrony among Latina adolescent mothers and their toddlers.

**Adolescent Parenting**

Adolescent mothers face a higher number of risk factors compared to adult mothers. For example, they are more likely to come from lower socioeconomic backgrounds, have less education, and lack adequate knowledge about parenting and child development (Black, Papas, Hussey, Dubowitz, Kotch, & Starr, 2002; Bornstein, Cote, Haynes, Hahn, & Park, 2010). Due to these risks, adolescent mothers are likely to experience high levels of distress, display less sensitive parenting, and have children who are at a higher risk for poor behavioral and developmental outcomes (Hans & Thulen, 2009; Whitman, Borkowski, Keogh, & Weed, 2001). These findings would suggest that adolescent mothers and their toddlers are also at an increased risk for less synchronous and mutually responsive interactions than adult mothers. While research has not yet directly examined differences in dyadic synchrony among adult and adolescent mother-child dyads, a few studies have demonstrated relevant group differences in mother-child interactive behaviors. Specifically, Hann, Osofsky, Barnard and Leonard’s (1994) found that adolescent EA mothers misread their toddler’s affective cues or responded negatively to their child’s negative affect more often than adult mothers. In a sample of primarily AA
families, adolescent mothers initiated interactions less often and interrupted child play more often than adult mothers; children of adolescent mothers also displayed fewer social initiations than those of adult mothers (Garner, Rennie, & Miner, 1996). Another study found that EA adolescent mothers smiled and vocalized less, and were rated as less appropriate in their interactions with their infants than adult mothers; infants of adolescent mothers exhibited less smiling and an absence of vocal responsiveness than infants of adult mothers (Barratt & Roach, 1995). These findings suggest that adolescent mothers and their children are at risk for misreading each other’s affect and initiating interactions less often, which may disrupt the dyad’s ability to sustain synchronous interactions.

**Factors that Contribute to Dyadic Synchrony**

Research on mother-child dyadic synchrony has been conceptualized from both the perspective of attachment theory as well as transactional theories of parent-child interactions and has emphasized the importance of both mothers’ and infants’ behaviors and characteristics (Deater-Deckard & O’Connor, 2000; Feldman, Greenbaum, & Yirmiya, 1999; Lengua, Wolchik, Sandler, & West, 2000). Specifically, both members of the dyad are thought to play an active role in the flow of behavior, the ongoing responses of their partner, and the changing inputs of the environment (Feldman et al., 1999). Maternal sensitivity, child temperament, and child gender are three factors thought to contribute to the quality of dyadic synchrony. Maternal sensitivity (e.g., a mother’s ability to accurately interpret her child’s cues and respond appropriately in a timely manner) has long been established as an important factor for positive early relationships and future socialization (Ainsworth, Bell, & Stayton, 1972; Isabella, 1993; Kochanska, Forman, & Coy, 1999). Additionally, research has also shown that children’s biologically based temperament (e.g., constitutionally based individual differences in reactivity...
to changes in stimulation; Rothbart & Posner, 2006), is intricately interwoven with their environment (e.g., parent-child relationships; Calkins, Smith, Gill, & Johnson, 1998; Eisenberg, Zhou, Spinrad, Valiente, Fabes, & Liew, 2005; Kim & Kochanska, 2012). Additionally, the literature also suggests that gender influences the mother-child relationship quality. Current theories of social roles and gender development suggest that boys and girls may be socialized differently, suggesting the importance of considering how child gender contributes to the manifestation of dyadic synchrony (Beall, 1993; Eagly, Wood, & Diekman, 2000). Furthermore, compared with EA families and other ethnic groups, many Latina families are more likely to have traditional views regarding distinct gender role expectations for boys and girls (Sanchez, Whittaker, Hamilton, & Arango, 2017). Thus, it is likely that culturally based beliefs and gender role expectations within Latina culture may impact the way maternal behavior and child characteristics are related to dyadic synchrony (Shields, 2000). Overall, while some research has examined these contributing factors, the majority has examined these factors among EA and low-risk families, focusing on either maternal behavior or child characteristics separately; none have empirically tested the role of both together among Latina families.

**Maternal Behavior.** Despite the fact that cultural differences and child-rearing practices can affect aspects of parent-child interactions, maternal sensitivity is considered a fundamental parenting behavior linked to children's positive development across cultures (Grau, Azmitia, & Quattlebaum, 2009). Overall, research among adult EA and Latina samples found that observed maternal sensitivity is positively associated with synchrony-related constructs. For example, two studies found that maternal sensitivity was associated with higher synchronized vocal exchanges and mutually responsive orientation (i.e., a positive, connected, close, mutually binding relationship) among EA adult mothers (Hane, Feldstein, & Dernetz, 2003; Kochanska, Forman,
& Coy, 1999). One study that examined these links in a Latina sample found that maternal warmth, a construct closely related to maternal sensitivity, was associated with increases in mother-toddler mutuality (e.g., reciprocity, comfort, and enjoyment between two members of a dyad) for both English- and Spanish-speaking Mexican Americans, as well as EA dyads (Ispa et al., 2004). One of the few studies to include adolescent mothers found that maternal sensitivity was positively associated with reciprocity and joint attention among African American (AA) and Puerto Rican (PR) adolescent mothers and their 12- to 20- month old toddlers (Raver & Leadbeater, 1995). Taken together, past findings and theories suggest that maternal sensitivity is an important factor for positive early relationships and future socialization (Kochanska et al., 1999).

Other studies that have included adolescent or Latina mothers examined self-reported maternal characteristics as predictors of dyadic synchrony rather than observed maternal behaviors. For example, one study found that young EA mothers who self-reported more depressive symptoms matched their children’s negative behavior states more often, and positive behavior states less often, than mothers reporting less symptoms (Field, Healy, Goldstein, & Guthertz, 1990). AA and PR adolescent mother-child dyads with depressed mothers also displayed less contingent responses than the non-depressed mother-child dyads (Field et al., 1990; Leadbeater, Bishop, & Raver, 1996; Raver & Leadbeater, 1995). Given the findings for adolescent mothers, we tested the contribution of maternal behavior above and beyond the contribution of maternal depressive symptoms.

Child characteristics. Child temperament and gender are two characteristics thought to impact dyadic synchrony (Harrist & Waugh, 2002). Temperament is often studied by means of negative reactivity (i.e., intense and frequent expressions of negative emotions across a variety of
contexts; Derryberry & Rothbart 1984) or positive reactivity (i.e., expressions of smiling, laughter, and excitement; Belsky & Isabella, 1991). Both positive and negative temperamental characteristics have been found to be differentially associated with dyadic synchrony-related constructs in EA families. Findings regarding the influence of child gender on dyadic synchrony however, are less clear. Some research suggests that girls initiate more social interactions than boys and are better able to regulate social behaviors, such as taking turns (Gunnar & Donahue, 1980; Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996). This suggests that girls may give their mothers more opportunities to achieve reciprocal interactions than sons.

Negative reactivity is considered a particularly important risk factor for mother-child interactional style given that children higher in negative reactivity spend a greater amount of time in dysregulated states making it more difficult for mothers to remain positively engaged (Calkins, 1994; Kim & Kochanska, 2012; Shaw & Bell, 1979). Overall, studies involving adult mothers and their children have found that negative reactivity is associated with lower dyadic synchrony. In a sample of EA mother-infant dyads, Kim and Kochanska (2012) found that children’s negative emotionality at 7 months was associated with lower mother-child mutually responsive orientation at 15 months. Another study found in a sample of Israeli families that infants higher in negative emotionality were more likely to have less synchronous mother-child interactions (Feldman, 2003). One study that included EA and AA families, found that among mothers and their two-year-old toddlers who were considered at risk for conduct problems, higher levels of child negative reactivity was associated with lower mother-child synchrony (Skuban et al., 2006). To our knowledge, research has not yet studied these links among adolescent mothers or Latina families. However, based on the overall negative impact this characteristic has on parent-child relationships among other groups, it is important to consider
negative reactivity with our sample of young Latina mothers, who may already have a more difficult time achieving dyadic synchrony.

Positive reactivity also has important implications for parent-child relationships (Bates, Schermerhorn, & Isaac, 2012). Putnam, Sanson, and Rothbart (2002), posit that children who are more positively reactive and display more interest and attention may be more likely to elicit positive maternal behavior. Therefore, positive temperamental characteristics may play an important role in the development of dyadic synchrony, yet only a couple of studies have examined their impact. One study found children’s positive emotionality (e.g., degree to which the child expressed positive emotions and few negative emotions) and task orientation (e.g., child’s interest and persistence) were related to higher mother-child mutuality (Deater-Deckard & O’Connor, 2000). Another study found that higher positive arousal (i.e., proportion of time an infant displayed positive affect during joint attention) and social orientation (i.e., infant’s positive arousal was focused on the parent’s face) were associated with higher dyadic mother-infant synchrony (Feldman, 2003). Overall, child temperament likely influences the quality of interactions between a mother and child. Research has yet to examine the contribution of both of these temperament styles in dyadic synchrony, making the relative role of both temperament styles unclear.

In regards to child gender, despite the fact that a majority of studies have either not tested for gender differences in dyadic synchrony-related constructs or found no differences between girls and boys (Lindsey & Mize, 2000), a few studies have reported differences. For example, two studies found no child gender differences in dyadic synchrony related constructs such as dyadic mutuality and mutually responsive orientation, using older children (i.e., preschool and middle school) and more global measures of synchrony related constructs (Deater-Deckard &
Petrill, 2004; Kochanska, 1997). Studies of infants have found child gender differences, although not always in the same direction. For example, Tronick (1989) found that for mothers and their infants, mother-son dyads were more likely than mother-daughter dyads to be in matching states and had higher levels of synchrony. In a study of EA mothers and their 15-month old toddlers, there were no differences in initiations and responses to parents between boys and girls (Lindsey et al., 2009). In contrast, three studies of mother-infant dyads found that mother-daughter dyads displayed a more optimal interaction style (i.e., shorter lags to responsiveness, more frequent mutual synchrony, and higher reciprocity) than mother-son dyads (Feldman, 2003; Lindsey & Caldera, 2015; Raver & Leadbeater, 1995). Previous research regarding attunement and coordinated behaviors also found that mother-daughter dyads display higher levels than mother-son dyads (Bettes, 1988; Feldman et al., 1999).

Additionally, researchers have posited that traditional gender socialization practices in Latina cultures may account for gender differences found in the previous research. For example, some research has found that mothers encourage boys to be independent and explore their environment, and encourage girls to be dependent and remain close to their mothers and families (Raffaelli & Ontai, 2004). Thus, it is possible that mother-daughter and mother-son dyads may either achieve different levels of dyadic synchrony or achieve similar levels, but in different ways (e.g., different levels of mutual emotion or reciprocal behaviors). Furthermore, given the literature that suggests mother-daughter dyads achieve higher levels of reciprocity and coordinated behaviors, it is possible that boys and girls achieve different levels of the individual components of dyadic synchrony. Taken together, the limited and mixed research along with gender-based socialization practices in Latino families, our study extends the existing literature by testing differences in dyadic synchrony between boys and girls in Latina families.
Additive Effects of Parenting and Child Characteristics

Modern theory and research recognizes that while parenting behavior affects children’s behavior and adjustment, children can also influence the behavior of parents (Sameroff, 2009; Schermerhorn & Cummings, 2008). The active tendencies of the mother and child evolve with one another and culminate in reciprocal patterns that signify harmony in the interaction (Reyna & Pickler, 2009). Research has yet to examine how both maternal behaviors and child characteristics together contribute to dyadic synchrony. However, research has examined these factors as contributors to mother-child attachment, a representation of the quality of the mother-child relationship, which has been strongly associated with mutuality and synchrony (Wolff and Ijzendoorn, 1997). Attachment research has well established that children of more sensitive parents are more likely to develop secure rather than insecure attachment relationships (Wolff & IJzendoorn, 1997). Attachment research has focused on the contribution of temperament style to attachment less often, but has demonstrated some links. For example, some research has demonstrated that broad temperament styles such as negative reactivity are related to sub-classifications of attachment style (e.g., Belsky & Rovine, 1987; Marshall & Fox, 2005; van IJzendoorn & Bakermans-Kranenberg, 2004). Although some research suggests that child temperament is uniquely associated with attachment quality, the combined contributions of maternal sensitivity and temperament style have not been adequately studied. Therefore, their relative contribution to relationship quality remains unclear. However, some research suggests that child temperament is uniquely associated with sub-classifications of attachment after accounting for the influence of maternal sensitivity (Susman-Stillman, Kalkoske, Egeland & Waldman, 1996). Therefore, maternal sensitivity and children’s temperament style may each have unique contributions to dyadic synchrony.
Moderating Role of Child Gender on Maternal Sensitivity and Child Temperament

In addition to the overall contribution of both maternal behavior and child characteristics, research also suggests that child gender may influence how certain maternal behaviors and child temperament characteristics influence dyadic synchrony. In regards to maternal behavior, research generally suggests that maternal sensitivity is associated with measures of relationship quality equally between boys and girls (Biringen, Robinson, & Emde, 1994). However, there is also evidence that suggests that due to gender differences in irritability during infancy and toddlerhood, mothers respond differently to sons and daughters. For example, some research has found that mothers yield to boys’ negative expressions less often than girls’ negative expressions (Malatesta & Haviland, 1982; Radke-Yarrow & Kochanska, 1990). Furthermore, previous research has shown that maternal characteristics (i.e., maternal sensitivity and depression) may be differentially related to outcomes for boys and girls in ethnic minority families. For example, some research has shown that in a Latina sample, maternal sensitivity was related to larger decreases in externalizing problems among boys that among girls (Caughy, Peredo, Owen, & Mills, 2016).

Child gender may also influence how children’s temperament style contributes to dyadic synchrony. Gender-based emotion socialization theories suggest that mothers are more accepting of the expression of negative reactivity from boys than girls, and expect and encourage positivity and empathy from girls more than boys (Biringen, Robinson, & Emde, 1994; Gunnar & Donahue, 1980; Wasserman & Lewis, 1985). Consistent with these theoretical predictions, Feldman (2003) found that the relation between five-month-olds’ negative emotionality and affective synchrony was more pronounced in mother-daughter than mother-son dyads. Thus, individual variations in negative and positive reactivity may influence dyadic synchrony
differently in mother-daughter than mother-son dyads, with child reactivity playing a larger role for mother-daughter dyads. Gender-role expectations are more pronounced in traditional Latina cultures and are an important organizing factor for family member roles (Azmitia & Brown, 2000; Umana-Taylor & Updegraff, 2013; Updegraff, Delgado & Wheeler, 2009). Therefore, gender effects may be larger in Latina families and are particularly important to study. Overall, prior research and theory suggests that child gender may influence how maternal behavior and child temperament influence dyadic synchrony.

The Current Study

The overall goal of our study was to extend the literature by using a more comprehensive approach to understanding maternal and child factors that contribute to dyadic synchrony. We were interested in exploring factors that contribute to a global measure of dyadic synchrony that reflects a highly competent interaction style characterized by the simultaneous display of shared positive affect and reciprocal behaviors, as well as its individual components. Examining the nuances in dyadic synchrony in an underrepresented population will provide insight whether findings from EA mothers are generalized to this population of young Latina mothers. Additionally, we were interested in testing these associations during toddlerhood, a development period during which children experience an increase in autonomy seeking behaviors (Forman, 2007). These changes may be especially challenging for young mothers who are themselves dealing with the development of their own sense of autonomy, making it harder for them to appropriately and consistently maintain focus on their children’s behavior and affect.

The first aim of our study was to examine the additive contribution of maternal sensitivity and child temperament on dyadic synchrony above and beyond the influence of maternal depressive symptoms. We expected maternal sensitivity to be positively associated with dyadic
synchrony. Additionally, we expected the child temperament would have a unique association with dyadic synchrony such that positive reactivity would be positively associated with dyadic synchrony and negative reactivity would be negatively associated with dyadic synchrony.

The second aim of our study was to examine the moderating role of child gender on the associations between contributing factors and dyadic synchrony. Because a majority of the literature has reported little to no gender differences in the role of maternal sensitivity, we did not have specific hypotheses for this interaction. Nonetheless we were interested in exploring potential gender differences across all contributing factors. Regarding child temperament, based on previous literature and gender-based expectations among Latina families, we expected that daughters’ temperamental style would affect dyadic synchrony more than boys’ temperamental style. Specifically, we expected that mothers may be more likely to achieve dyadic synchrony with positively reactive daughters and less likely to achieve dyadic synchrony with negatively reactive daughters. Additionally, we expected that neither temperament style would not impact the ability for mother-son dyads to achieve dyadic synchrony.

The third aim of our study was to explore correlations between maternal behavior and child characteristics and individual components of dyadic synchrony given the inconsistency in measurement of dyadic synchrony (e.g., some use global measures that include shared emotion and behavior reciprocity while others use only individual components; Harrist, Pettit, Dodge, & Bates, 1994; Isabella & Belsky, 1991; Lindsey et al., 2008; Lindsey & Mize, 2000; Mize & Pettit, 1997). Due to the exploratory nature of this aim, we did not have specific hypotheses regarding these correlations.
Method

Participants

Participants for our study included 170 adolescent Latina mothers and their toddlers who participated when the children were 18 months. The mothers’ mean age was 17.9 years (SD = 1.3) at the child’s birth and 19.5 years (SD 1.35) at the time of participation. The mean age for children was 18.2 months (SD=.94). Of the 170 children, 45.9% were female, and 84.7% were their mother’s first or only child. The majority of the mothers were of PR origin (82.8%); the rest were of Mexican (7.1%), and Central or South American (10.1%) origin. When the children were 18-months, 9.5% of mothers had completed schooling up to the eighth grade, 58.2% completed 9th—12th grade, 32.4% had completed high school or had some post-secondary education. Additionally, 25.9% of mothers were attending school and 41.2% were employed. Approximately 55% of the mothers were born in the United States. Families were from low income neighborhoods and most (89.4%) reported receiving government assistance. Due to equipment malfunction or low recording quality, five participants had missing data on one of the observed variables; these five data points were replaced with the sample mean for the respective variable. Thus, the complete sample was retained for the analyses.

Procedure

The study received Institutional Review Board approval. Participants were recruited in pediatric clinics (78.2%) in low-income Latina neighborhoods in a Midwestern city or were referred by friends, self, or professionals (21.8%). Mothers were considered eligible if they were 19-years-old or younger at the birth of the child, and they were enrolled and followed until their
children reached age criteria. Families were excluded if children were born prematurely or with major physical or medical problems.

Two female researchers (at least one was bilingual) conducted home visits and obtained informed consent from the participant (Appendix A). If a participant was a minor, informed consent was obtained from her parent or guardian. Researchers administered a standardized developmental test to the children, assisted mothers with questionnaires, and guided mother-child dyads through several video-recorded interactions.

**Measures**

*Demographic variables.* Fixed-format questions were used to collect demographic information including, child age and gender; mothers’ age, school status, work status, educational level, receipt of government assistance, generation in the US, partner/marital status, length of romantic relationship, and work status; partners’ age, generation in the US, ethnicity, educational level, work/school status, paternity of child, and financial support of child (Appendix B).

*Maternal depressive symptoms.* Depressive symptoms were measured using the 13-item depression subscale of the Symptom Checklist-90-R self-report inventory (SCL-90-R; Derogatis, 1994; Appendix C). Participants were asked how distressed they felt by depressive symptoms (e.g., feeling low in energy, crying easily, feeling blue) in the last two weeks. Responses range from ‘not at all’ (0) to ‘extremely’ (4). Adequate reliability \( \alpha = .90 \) for this scale was found in the normative sample (Derogatis, 1994; Soto & Shaver, 1982 for Puerto Rican adult women) and in studies with young Latina mothers; Contreras, López et al., 1999; López & Contreras, 2005). In our sample, the internal consistency reliability of this scale was .89; and .86 and .91 for English and Spanish respondents, respectively. Mean levels of maternal depressive symptoms in
the current sample (M = .71, SD = .66) indicated that mothers experience slightly lower levels of symptoms than the adolescent non-patient norm (M = .95, SD = .72) and slightly higher than the adult non-patient norm (M = .46, SD = .52).

**Coding of maternal sensitivity.** Maternal sensitivity was assessed using a 9-point scale derived from Isabella (1993) and adapted for the current population (Contreras 2004; Contreras & Mangelsdorf et al., 1999; Appendix H). The sensitivity scale measured the timing and appropriateness of the mothers’ responses to their toddler’s signals. Observations took place during a social play episode (5 min) where mothers were asked to play with their child as they normally would without toys (Appendix G). Previous studies with Latina adolescent mothers demonstrated adequate variability in behavior and conceptually meaningful relations with predictors of parenting (e.g., social support variables) and child behavior (Contreras, 2004; Contreras & Mangelsdorf et al., 1999).

**Coding and reliability.** Maternal sensitivity was coded by three research assistants who were blind to other participant data. Coders overlapped on 25% of the observations (n=46) to assess agreement, which was calculated using intra-class coefficients (ICC; Shrout & Fleiss, 1979; Appendices I-J). Coders achieved sufficient reliability (ICC = .70). Higher scores reflect more sensitive and involved maternal behavior.

**Coding of child temperament characteristics.** Child temperamental characteristics were coded from video recordings of the administration of a cognitive assessment using seven of the Bayley Infant Behavior Record scales (IBR; Bayley, 1993; Appendix D). These subscales were chosen based on previous research. For example, Adaptation to Change in Test Materials and Frustration with Inability to Complete Tasks have been used in order to examine negative reactivity-related temperament constructs (Gaertner, Spinard, & Eisenberg, 2008; Goodrich,
Mudrick, & Robinson, 2015). Additionally, Interest in Test Materials and Stimuli, Initiative with Tasks, Attention to Tasks, Persistence in Attempting to Complete Tasks, and Enthusiasm Toward Tasks have been used to examine more positive temperament constructs (Lemery-Chalfant et al., 2008; Roth, Eisenberg, & Sell, 1984).

**Coding and reliability.** Temperament characteristics were coded by research assistants who were blind to other participant data. Coders overlapped on 22% of the observations (n = 37) to assess agreement, which was calculated using intra-class coefficients (Appendices E-F). Interrater agreement was adequate for all temperament variables and is presented in Table 1.

**Derivation of temperament composites.** To derive positive and negative temperament styles, the seven IBR scales were submitted to a principal axis factoring analysis with a direct oblimin rotation (O’Rourke et al., 2013). Two factors emerged with Eigenvalues greater than one: one clearly depicting negative reactivity and one depicting positive reactivity (Table 2). The first factor (42% of variance, eigenvalue 2.94) had positive loadings for the scales, initiation toward tasks (.79), interest in tasks (.77), attention toward tasks (.50), and enthusiasm toward tasks (.40). The second factor (16.9% of variance, eigenvalue 1.19) reflected a child’s negative reactivity to their environment. The scale adaptation to change loaded positively (.71), as did frustration with inability to complete tasks (.67) and attention toward tasks (.41). Due to the scale attention toward tasks having a stronger loading on the first factor, as well as a larger conceptual association with positive reactivity, it was retained on the first factor. Therefore, the first factor reflected children who spontaneously displayed initiative, concentration, and excitement or delight in exploring their environment, whereas the second factor reflected children who became easily frustrated when unable to complete tasks or were not successful at coping with transitions in their environment. Persistence in attempting to complete tasks did not load onto either factor.
and was not included in analyses. Positive reactivity and negative reactivity were moderately correlated ($r(168) = -.39, p < .001$).

Coding of mother-child dyadic synchrony. Behavioral reciprocity and mother and child emotion were coded from an unstructured free play episode (e.g., mothers were asked to play with their toddlers as they normally would with a set of developmentally appropriate toys for a period of ten minutes) in 30-second intervals using two five-point ratings scales developed by Lindsey and colleagues (Lindsey, Colwell, Frabutt, Chambers, & MacKinnon-Lewis 2008; Lindsey et al., 1997; Appendices K-O). These scales assess bidirectional aspects of mother and child interaction style and shared emotion.

Mother-child behavioral reciprocity. Behavioral reciprocity was characterized by the extent to which mother and child were engaged in mutually focused, reciprocal, harmonious exchanges. A rating of ‘5’ was assigned if the dyad displayed smooth-flowing interactions and responsiveness to the other’s cues during the entire 30-second segment. A rating of ‘1’ was assigned if the dyad did not share a common focus, or if either partner ignored the other for the entire segment. Moderate amounts of smooth-flowing interactions and joint attention could be considered for a rating of at least ‘3’ or higher. Following procedures based on previous work, ratings were then dichotomized to identify the dyad’s display of behavioral reciprocity (Hane, Feldstein, & Dernetz, 2003; Lindsey et al., 2008), such that segments that did not show at least some level of dyadic synchrony were coded a ‘0’, whereas segments that showed at least moderate amounts of smooth flowing interactions (i.e., a ‘3’ or higher) received a ‘1’.

Mother-child positive affect. Mother-child positive affect was characterized by the presence of positive emotion. For both mothers and children, a rating of ‘5’ was assigned if the member demonstrated intense and sustained positive affect for the duration of the segment (e.g.,
smiling, laughter, affectionate behavior). A rating of ‘1’ was assigned if the member demonstrated an absence of positive emotion. Small instances of positive emotion (e.g., soft/affectionate tone) could be considered for a rating of at least ‘2’ or higher. Ratings were again dichotomized to identify each member’s expression of positive emotions, such that segments that did not show any positive affect were coded a ‘0’, whereas segments that showed at least some enjoyment from the member (i.e., ‘2’ or higher) received a ‘1’.

**Coding and reliability.** Three sets of coders who were blind to other participant data rated each mother-child dyad, one pair for behavioral reciprocity, one pair for mother emotion, and one pair for child emotion in 30-second intervals. To assess agreement, coders overlapped on 21% of the observations for behavioral reciprocity (n = 33), 24% for mother positive affect (n = 39), and 26% for child positive affect (n = 43). Interrater agreement was adequate for all dyadic synchrony variables (ICC = .70, .78, .80 respectively).

**Derivation of dyadic synchrony composite.** Previous research has examined patterns of emotional expressiveness between mother and child by calculating the proportion of intervals in which both mother and child expressed positive affect out of the total number of intervals in the interaction (Lindsey et al., 2008). However, patterns of behavioral reciprocity were kept separate. We were interested in examining a highly competent parenting style in which the mother and child display positive affect simultaneously as well as display harmonious and reciprocal behavior. In order to operationalize this competent dyad style, a composite was calculated using the behavioral reciprocity and positive affect variables. The composite was calculated by summing the number of segments the dyad achieved a score of ‘3’ or higher on behavioral reciprocity and both mothers and children displayed at least some positive affect (i.e., ‘2’ or higher), and then dividing by the total number of segments. This resulted in a variable that
represented the percentage of segments the mother and child had synchronous and affectively positive interactions.
Results

Overview of Analyses

We first provide descriptive information regarding the main study variables and the intercorrelations among predictor variables and individual components of dyadic synchrony. We then describe preliminary analyses used to determine the need to include control variables in the main analyses. Next, we present hierarchical regression analyses examining the associations between maternal sensitivity, child characteristics and dyadic synchrony. Additionally, to examine the moderating role of child gender, maternal sensitivity, positive reactivity, and negative reactivity were centered and interaction terms with child gender were included. First, we tested the moderating role of child gender on the association between maternal sensitivity and dyadic synchrony. Second, we tested the moderating role of child gender on the association between negative reactivity and dyadic synchrony. Finally, we tested the moderating role of child gender on the association between positive reactivity and dyadic synchrony. Each interaction was tested individually while controlling for all other study variables. Significant interactions were probed using the PROCESS computational tool that estimates the simple slopes for each value of the moderator (Hayes, 2012; Hayes & Matthews, 2009). Additionally, in order to further explore the nuances of our measurement of dyadic synchrony, we explored how maternal behavior and child temperament were associated with individual components of dyadic synchrony for the sample as a whole and by gender.
Descriptive Information

Descriptive information and bivariate correlations for main study variables are displayed in Table 3. Mean levels of behavioral reciprocity (M = .53, SD = .20, Range = .00 – .89) indicated that dyads displayed at least moderate levels of reciprocity (i.e., a score of ‘3’ or higher) in 53% of intervals. Mean levels of mutual positive affect (M = .42, SD = .22, Range = .00 -.95) indicated that, on average, mother-child dyads demonstrated mutual positive emotion, warmth, and affection, about 42% of the time. Mean levels of dyadic synchrony (M = .25, SD = .17, Range = .00 -.74) indicated that, on average, mother-child dyads displayed this highly competent interaction style 25% of the time. Bivariate correlations examined associations among behavioral reciprocity and mutual positive affect. Consistent with previous research, behavioral reciprocity was correlated with mutual positive affect (r = .20, p = .008) such that dyads that shared positive affect more often were also engaged in at least moderate levels of behavioral reciprocity more often. In regards to mean levels differences among main study variables, a few differences were found. T-tests indicated that mothers displayed more sensitivity toward girls (M = 5.13, SD = 1.14) than boys (M = 4.77, SD = 1.13), t(168) = -2.03, p = .04. Additionally, mother-daughter dyads (M = .57, SD = .20) achieved moderate levels of behavioral reciprocity more often than mother-son dyads (M = .51, SD = .20), t(168) = -2.02, p = .05. No other significant mean level differences were found.

In regards to bivariate correlations between main study variables, results indicated that child gender was not significantly correlated with dyadic synchrony and maternal sensitivity was positively correlated with dyadic synchrony (r = .29, p < .001). Children’s negative reactivity was not correlated with dyadic synchrony, whereas children’s positive reactivity was positively correlated with dyadic synchrony (r = .17, p = .03). Additionally, negative reactivity was
negatively correlated with positive reactivity ($r = -0.39, p < 0.001$), and maternal sensitivity was not correlated with either temperament variable.

**Selection of Control Variables**

Based on previous literature, we examined potential control variables for inclusion in the main analyses. In order to best isolate the associations between maternal behavior and child characteristics and dyadic synchrony variables, covariates representing child characteristics (i.e., age), and maternal characteristics (i.e., depressive symptoms, age, and education) were included. Analyses revealed that only maternal depression was marginally associated with dyadic synchrony ($r = -0.14, p = 0.07$) and was thus included in the main analyses.

**Multivariate Associations Between Maternal Sensitivity, Child Characteristics and Dyadic Synchrony**

The results of the hierarchical regression examining the main effects of control variables, maternal sensitivity, and child characteristics on dyadic synchrony are described next. To test the unique effects of maternal behavior and child temperament while controlling for maternal depressive symptoms and child gender, maternal depressive symptoms and child gender, were entered at step 1, maternal sensitivity was entered at step 2, and child temperament characteristics were entered at step 3 (Table 4). Results indicated that association between maternal depressive symptoms and dyadic synchrony approached significance ($\beta = -0.13, p = 0.07$) and child gender was not associated with dyadic synchrony ($\beta = -0.05, p = 0.47$); these variables accounted for 2% of the variance in the model. Maternal sensitivity was positively associated with dyadic synchrony ($\beta = 0.29, p < 0.001$), accounting for an additional 8% of the variance in the model. Positive reactivity was also positively associated with dyadic synchrony ($\beta = 0.16, p = 0.04$).
.04), and negative reactivity was not ($\beta = -.03, p = .71$); the addition of temperament variables accounted an additional 3% of the variance in the model.

Next, we tested the moderating role of child gender on maternal sensitivity and child temperament style. The interaction between child gender and maternal sensitivity was not significant ($\beta = -.16, p = .12$) and thus presented the tables. The interactions between child gender and each temperamental characteristic were significant above and beyond maternal sensitivity (negative reactivity: $\beta = -.21, p = .04$; positive reactivity $\beta = .26, p = .008$; Tables 5 and 6). Simple slope analyses for the interaction between child gender and negative reactivity (Figure 2) revealed that the slopes for boys and girls were in opposite directions, but the association between negative reactivity and dyadic synchrony was not significantly different from zero for boys or girls ($t(163) = 1.17, p = .24$; $t(163) = -1.63, p = .11$ respectively). In regards to positive reactivity, simple slope analyses (Figure 3) revealed that positive reactivity was significantly associated with higher dyadic synchrony for mother-daughter dyads ($t(163) = 3.37, p = .001$) and not mother-son dyads ($t(163) = 1.17, p = .86$) and explained an additional 4% of the variance in the model. Taken together, these results indicate that positive reactivity is associated with dyadic synchrony for mother-daughter dyads above and beyond the unique effect of maternal sensitivity.

**Exploration of Individual Components of Dyadic Synchrony**

Previous research has measured dyadic synchrony in different ways, making it unclear how factors may relate to individual components of dyadic synchrony, thus, we explored these associations (displayed in Table 3). Additionally, due to significant interactions between gender and temperament style, we also explored the associations by gender (displayed in Table 7). For the sample as a whole, maternal depressive symptoms were related to mutual positive affect ($r = \ldots$)
.22, p < .001) and not behavioral reciprocity. However, correlations by gender indicated that depressive symptoms were related to mutual positive affect for boys (r = -.34, p = .001) and not girls. The difference between these correlations approached significance, z = -1.88, p = .06.

Maternal sensitivity was positively correlated with both mutual positive affect (r = .21, p < .001) and behavioral reciprocity (r = .23, p < .001) for the sample as whole.

In regards to child temperament style, negative reactivity was associated with lower levels of mutual positive affect (r = -.28, p = .01) for mother-daughter dyads and not mother-son dyads and the difference between the correlations was significant, z = 2.03, p = .04. Negative reactivity was not related to behavioral reciprocity for either gender. Positive reactivity was associated with higher levels of mutual positive affect (r = .46, p < .001) for mother-daughter dyads and not mother-son dyads, and the difference between these correlations was significant, z = -3.24, p = .001. Positive reactivity was not related to behavioral reciprocity for either gender.
Discussion

Our findings extend over two decades of research on bi-directional parent-child interactions by providing valuable information regarding individual differences in the manifestation of dyadic synchrony in an at-risk population that has received little attention in the literature. Additionally, our study provided some evidence of generalization of previous findings for EA families to young Latina mothers and their toddlers. Overall, we found that, although there were no gender differences in the level of dyadic synchrony, despite mother-daughter dyads achieving higher levels of behavioral reciprocity, this interaction style is likely to have different precursors and correlates for girls and boys. Specifically, the role of parenting behavior appeared to be important for both mother-son and mother-daughter interaction quality whereas child temperament appeared to be important only for mother-daughter interaction quality. Additionally, by examining the individual components of dyadic synchrony, we found that behavioral reciprocity and mutual positive affect are overlapping but separate constructs that are both important to consider in samples of young Latina mothers and toddlers. Our findings have important implications for future research on dyadic synchrony and parent-child interventions for young Latina mothers and their children. Additionally, our findings provided information regarding the generalizability of prior dyadic synchrony findings which were based primarily on EA and low-risk samples.

Maternal Contributions

Maternal Sensitivity and Dyadic Synchrony. Consistent with our hypothesis and
previous research, maternal sensitivity was associated with dyadic synchrony similarly for mother-son and mother-daughter dyads, despite the fact that mothers displayed more sensitivity toward girls than boys. Thus, mothers that were more sensitive during social play with their toddlers displayed dyadic synchrony more frequently during free-play than less sensitive mothers. Importantly, maternal sensitivity was associated to higher levels of dyadic synchrony after accounting for maternal depressive symptoms and child characteristics. To our knowledge, our study is the first to test the moderating role of gender on the relation between maternal sensitivity and dyadic synchrony; therefore, we are unable to compare our findings directly to other studies. However, this finding is consistent with the idea that maternal sensitivity generally plays a positive role in the development of high-quality relationships across cultures. Our findings regarding mean level differences in maternal sensitivity are also consistent with previous research in both EA and AA families that has found mothers to display more sensitivity toward daughters than sons (Lovas, 2005; Tamis-LeMonda, Briggs, McClowry, & Snow, 2009).

Given that previous research on dyadic synchrony used a variety of different measures (e.g., behavioral-only, affective-only, or global measures), it is unclear specifically how maternal characteristics and other factors relate to individual components of dyadic synchrony. We found that maternal sensitivity was associated with both components of dyadic synchrony (i.e., higher levels of behavioral reciprocity and mutual positive affect). Additionally, due to gender differences that were found in the main analyses and previous literature that suggests that gender influences maternal behavior toward infants, we also explored whether factors were associated with dyadic synchrony differently for boys and girls. Consistent with conceptualizations and previous research with maternal sensitivity, we found that maternal sensitivity was associated with both components of dyadic synchrony similarly for boys and girls. Overall, it appears that
maternal sensitivity is important for boys and girls to not only match one another's positive expressions, but also interact with one another in mutually reciprocal patterns.

*Maternal Depressive Symptoms and Dyadic Synchrony.* We were interested in examining the role of other maternal characteristics that contribute to dyadic synchrony, specifically the role of maternal depressive symptoms. Based on previous literature, we expected that maternal depressive symptoms would be associated with lower levels of dyadic synchrony. Partially consistent with our hypothesis and previous literature among Latina and adolescent mothers, we found that maternal depressive symptoms had a small association with dyadic synchrony even at the relatively low levels reported in our sample (Field, Healy, Goldstein, & Guthertz, 1990; Leadbeater et al., 1996; Raver & Leadbeater, 1995). Additionally, we found that depressive symptoms were associated with lower levels of mutual positive affect for mother-son dyads and not mother-daughter dyads, although the difference between these correlations by gender only approached significance. This finding is consistent with previous research that found a stronger associated between maternal depressive symptoms and measures of dyadic synchrony that emphasize matching positive affective states rather than reciprocity (Field, Healy, Goldstein, & Guthertz, 1990). Taken together, it appears that maternal depressive symptoms, despite the relatively low levels reported in our sample, negatively influences relationship quality for both mother-daughter and mother-son dyads.

Overall, the findings for maternal characteristics suggest that maternal sensitivity is particularly important to consider in understanding the manifestation of dyadic synchrony for both mother-son and mother-daughter dyads. Additionally, our findings suggest that maternal depressive symptoms may be especially important for the ability for the dyad to match each other’s positive affective states rather than each other’s behavioral states. It is also important to
note that while some small child gender differences emerged, the role of maternal depressive symptoms and maternal sensitivity appear to be important for boys and girls.

**Child Contributions**

*Child Gender and Dyadic Synchrony.* Although mother-son and mother-daughter dyads displayed similar levels of dyadic synchrony and mutual positive affect, mother-daughter dyads spent more time in reciprocal behavioral exchanges than mother-son dyads. Our findings are consistent with some previous work that found mother-daughter dyads achieved higher levels of mutually engaged joint attention (i.e., a construct related to behavioral reciprocity) and more object matches than mother-son dyads (Lindsey et al., 2008; Raver & Leadbeater, 1995; Weinberg, Tronick, Cohn, & Olson, 1999). However, in contrast, some research has found that mothers and their sons were more likely to match each other's emotional states than were mothers and daughters (Tronick & Cohn, 1989). Our results and the previous mixed literature suggest that there may be different forms of behavioral turn-taking and emotional attunement between mothers and their daughters compared to mothers and their sons. Thus, it is possible that boys and girls exhibit different strengths in the context of interaction and thus achieve different levels of reciprocity, or it could be that mothers are following boys' behaviors and affective states differently than they do girls'.

*Negative Reactivity and Dyadic Synchrony.* Our hypothesis regarding the moderating role of child gender on the association between negative reactivity and dyadic synchrony was not supported. Specifically, despite a significant interaction between gender and negative reactivity, simple slopes analyses indicated that negative reactivity was not significantly associated with dyadic synchrony for either gender. We also found that negative reactivity was associated with mutual positive affect for mother-daughter dyads and not mother-son dyads. This is consistent
with previous research that has demonstrated the association between negative emotionality and affective synchrony in mother-daughter dyads to be more pronounced than mother-son dyads (Feldman, 2003). Our findings our also in line with the idea that due to traditional gender roles, Latina mothers are more responsive to positivity and submission from daughters, making it more difficult for more negatively reactive daughters to achieve dyadic synchrony with mothers compared to more negatively reactive sons. Thus, it appears that a negative temperament style may be important to consider for the ability of mother-daughter dyads to match each other’s positive affective states, but not for their ability to engage in reciprocal exchanges. This is consistent with the idea that mothers tend to respond negatively to daughter’s negative expressions and less negatively (or neutrally) to son’s negative expressions, suggesting that a negatively reactive temperament style may be more detrimental for girls than boys (Malatesta & Haviland, 1982). Future research should replicate our findings as well as consider the social consequences of, and caregiving responses to girls’ negative reactivity in Latina families.

Positive Reactivity and Dyadic Synchrony. Consistent with our hypothesis, we found that, while accounting for maternal behavior and other child characteristics, positive reactivity was associated with higher levels of dyadic synchrony for mother-daughter dyads and not mother-son dyads, despite the fact that boys and girls displayed similar levels of positive reactivity. Additionally, a positive temperament style appeared to be important for the affective quality, and less important for the behavioral quality of the relationship for mother-daughter dyads only. Due to the limited research, it is unclear how our findings fit within the context of individual components of dyadic synchrony. However, Latina gender role expectations support the idea that a positively reactive temperament style may be more important for mother-daughter dyads’ ability to match each other’s positive affect compared to boys. Regarding our finding that
mothers displayed more sensitivity toward girls than boys, it is unclear what role this difference is playing in the contribution of child characteristics to dyadic synchrony and its components. However, some research suggests boys and girls derive different benefits from maternal sensitivity (Aber and Baker 1990). Specifically, because Latina mothers encourage more autonomy-seeking and independence in boys (Raffaelli, & Ontai, 2004), they may display slightly different aspects of maternal sensitivity toward boys compared to girls (Aber and Baker 1990; Richman, Miller & LeVine, 1992). Taken together, our findings regarding maternal sensitivity and positive reactivity are consistent with previous research and conceptualizations that suggest positively reactive children may elicit more positive parenting behaviors (Bell & Chapman, 1986; Tamis-LeMonda et al., 2009).

Our findings provide information regarding generalizability of the idea that child characteristics are important to consider in addition to maternal behavior, when examining parent-child relationships. Specifically, our study found that while boys and girls achieved the same levels of dyadic synchrony, mother-daughter dyads did so with higher levels of behavioral reciprocity than mother-son dyads. Additionally, positive temperament style appeared to play an important role for the affective quality of relationships for the sample as a whole, but may be especially important for mother-daughter dyads. Furthermore, negative temperament style may be important to consider for mother-daughter relationships, specifically the affective component. Our study revealed more pronounced gender differences in the manifestation of mother-child relationships than previous literature with EA families. While we cannot determine whether our findings are due to the specific ethnicity and/or age range of mothers in our sample, it is possible that the differential findings by gender may be due to common gender socialization practices in Latina families. That is, traditional gender socialization practices in Latina families emphasize
stronger differentiations in expectations and roles between boys and girls. Future research should examine more specifically the role of culture and socialization in how differences in gender contribute to quality of mother-child relationships.

**Limitations and Future Directions**

While no study is without its limitations, our results also suggest directions for future research. First, the cross-sectional design limits the ability to determine direction and causality of the associations. Thus, it is impossible to draw causal conclusions. Additionally, based on transactional theories of parent-child interactions, it is also possible that aspects of the dyadic interaction influence maternal sensitivity and child temperament style. Future studies should examine the associations over time while controlling for the effects of baselines measures. This would allow for better isolation of the effects of maternal sensitivity and child temperament. Our study used a commonly used method of operationalizing dyadic synchrony by creating frequency scores to represent the proportion of synchronous interactions across a 10-minute unstructured free play interaction. Furthermore, our measurement of dyadic synchrony shed light on the importance of including multiple components of dyadic synchrony (i.e., behavioral and affective). However, our study was the first to examine the proportion of time mother-toddler dyads spend in both affectively positive and behaviorally reciprocal interactions. Thus, it is unclear how this way of measuring dyadic synchrony is associated with future child adjustment. Research examining the association of our global measurement of dyadic synchrony as well as its individual components, with child adjustment would provide further validity and information regarding aspects of mother-child relationships that important for child outcomes. Future studies would also benefit from considering changes in dyadic synchrony over the progression of an
observational task, providing information about moment-by-moment exchanges and how mother-toddler dyads respond to each other's behavioral and affective cues across time. Future research should also examine the contingencies that drive behavioral and emotional responses within a dyad. This would shed light on how mother-daughter and mother-son dyads establish approximately the same overall levels of dyadic synchrony but display different levels of behavioral reciprocity and experience differential benefits from temperament style. It is possible that gender influences how members of the dyad respond to each other’s behavioral and affective cues. This idea is consistent with previous research that demonstrates that mothers tend to respond differently to sons’ and daughters’ negative expressions during infancy (Malatesta & Haviland, 1982).

Additionally, although we provided some evidence of generalizability of previous findings to Latina and adolescent mothers, as well as information regarding gender differences among toddler-aged children, our sample was still relatively homogenous (e.g., largely Puerto Rican and from low-income neighborhoods in Cleveland) making it difficult to generalize our findings across a wide variety of Latina and SES. Future research should include recruitment of participants from a broader area to increase the opportunity to include families from a diverse Latina background. Furthermore, all of the families in our study were from neighborhoods in Cleveland, Ohio, although predominantly populated by ethnic minorities, it is unclear whether our findings generalize to Latina families living in areas with greater ethnic minority populations.

While our study's measure of temperament was aimed to capture the child's interactional style without the direct influence of maternal behavior, future research should use assessment of temperament during structured, multitrial paradigms that employ emotion-eliciting stimuli
designed to elicit specific emotions within broad temperament styles (e.g., anger, fear, joy).

Adaptations of several laboratory assessments intended to do this are now available for use in the home or other natural play settings (e.g., LAB-TAB; Goldsmith & Rothbart, 1996).

Lastly, it would be of interest to determine how maternal behaviors and child characteristics contribute to dyadic synchrony in a variety of settings by including a variety of interactive contexts (e.g., play vs. teaching) in future research. It is likely that these factors may have different roles in components of dyadic synchrony across interactive settings. For example, Lindsey et al., (2008) suggests that the expression of gender-typed behavior can depend on the prescribed roles within a context. Furthermore, even during toddlerhood, boys and girls appear sensitive to differences in interactional settings and adjust their behavior according to the nature of the situation (Lindsey et al., 2008). Fourth, future research should also explore the optimal level of dyadic synchrony, and how the balance changes through children's development. For example, Hane, et al., (2003), found that moderate levels of dyadic synchrony when infants were 4-months old were the most optimal. However, while this finding could be consistent across samples, the balance of the interactants' roles most likely changes as the child ages.

In summary, our study achieved its overall goal in providing insight regarding factors that contribute to a highly competent interaction style among Latina adolescent mothers and their toddlers. In doing so, our findings provided information about specific maternal behaviors and child temperament styles that are related to the manifestation of dyadic synchrony as well as generalization of dyadic synchrony across a different culture. Given that Latinos are the largest minority group in the United States but remain extremely underrepresented in the literature, our results extend the literature by highlighting both positive and negative factors that may influence the ability for young Latina mothers and their toddlers to achieve and maintain high quality
interactions (Hoffman & Maynard, 2008; Kochanska, 1997; Maccoby, 1992; Martin, et al., 2015). Our study produced results that highlight the importance of maternal sensitivity for both mother-son and mother-daughter girls, as well as the importance of temperament style in mother-daughter interactions. The study suggests that future research and interventions continue to consider not only the role of maternal sensitivity and temperament styles of the child while conceptualizing dyadic interactions, but also the traditional cultural values and gender roles that influence the differential effects of these factors.
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Table 1. *Intraclass correlations for each temperament characteristic* (*n* = 37)

<table>
<thead>
<tr>
<th>Variables</th>
<th>ICC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adaptation to change</td>
<td>.73</td>
</tr>
<tr>
<td>2. Frustration with inability to complete tasks</td>
<td>.74</td>
</tr>
<tr>
<td>3. Persistence to complete tasks</td>
<td>.76</td>
</tr>
<tr>
<td>4. Initiative with tasks</td>
<td>.75</td>
</tr>
<tr>
<td>5. Interest in stimuli</td>
<td>.67</td>
</tr>
<tr>
<td>6. Attention to tasks</td>
<td>.83</td>
</tr>
<tr>
<td>7. Enthusiasm toward tasks</td>
<td>.85</td>
</tr>
</tbody>
</table>

Table 2. *Two-factor solution and item factor loadings for seven temperament characteristics* (*n* = 170)

<table>
<thead>
<tr>
<th>Temperament Characteristics</th>
<th>Factor 1</th>
<th>Factor 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Adaptation to change</td>
<td>.71</td>
<td></td>
</tr>
<tr>
<td>2. Frustration tolerance</td>
<td>.67</td>
<td></td>
</tr>
<tr>
<td>3. Persistence</td>
<td></td>
<td>.79</td>
</tr>
<tr>
<td>4. Initiation toward tasks</td>
<td></td>
<td>.77</td>
</tr>
<tr>
<td>5. Interest in tasks</td>
<td>.41</td>
<td>.50</td>
</tr>
<tr>
<td>6. Attention toward tasks</td>
<td></td>
<td>.40</td>
</tr>
<tr>
<td>7. Enthusiasm toward tasks</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Eigenvalue                 | 2.94     | 1.19     |
| Percentage of variance explained | 41.97 | 16.95 |

*Note.* Only factor loadings ≥ .40 are presented in the table.
Table 3. Descriptive Information and Bivariate Correlations Among Main Variables and Control Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>.71</td>
<td>-</td>
<td>4.93</td>
<td>3.62</td>
<td>1.73</td>
<td>.42</td>
<td>.53</td>
<td>.25</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>.66</td>
<td>-</td>
<td>1.15</td>
<td>.56</td>
<td>.73</td>
<td>.22</td>
<td>.20</td>
<td>.17</td>
</tr>
<tr>
<td>Range</td>
<td>0-3.15</td>
<td>-</td>
<td>3-8</td>
<td>2-4.75</td>
<td>1-4</td>
<td>.00-.89</td>
<td>.00-.95</td>
<td>.00-.74</td>
</tr>
</tbody>
</table>

Note. *variables measured as proportions. †p<.10; *p<.05; **p<.01; ***p<.001.
Table 4. *Hierarchical regression predicting Dyadic Synchrony from Maternal Sensitivity and child temperament style*

<table>
<thead>
<tr>
<th>Variables</th>
<th>$R^2$</th>
<th>$B$</th>
<th>$SE$</th>
<th>$\beta$</th>
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<tr>
<td>Step 1</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Depressive Symptoms</td>
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<td>.01</td>
<td>-.14</td>
<td>.10</td>
</tr>
<tr>
<td>Child Gender</td>
<td>.00</td>
<td>.03</td>
<td>-01</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.08***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>-.02</td>
<td>.01</td>
<td>-.14</td>
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<td>Child Gender</td>
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<td>Maternal Sensitivity</td>
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</tr>
<tr>
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<td>.01</td>
<td>-02</td>
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</tr>
<tr>
<td>Positive Reactivity</td>
<td>.03</td>
<td>.01</td>
<td>.16</td>
<td>.05</td>
</tr>
</tbody>
</table>

†$p<.10$; *$p<.05$; **$p<.01$; ***$p<.001$. 
Table 5. Hierarchical regression predicting Dyadic Synchrony from Negative Reactivity, moderated by Child Gender

<table>
<thead>
<tr>
<th>Variables</th>
<th>$R^2\Delta$</th>
<th>$B$</th>
<th>$SE\ B$</th>
<th>$\beta$</th>
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<tr>
<td>Step 1</td>
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<td>.01</td>
<td>-.13†</td>
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<tr>
<td>Child Gender</td>
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<td>.03</td>
<td>-.05</td>
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<tr>
<td>Maternal Sensitivity</td>
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<td>.01</td>
<td>.29***</td>
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<tr>
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<td>-.02</td>
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<tr>
<td>Positive Reactivity</td>
<td>.03</td>
<td>.01</td>
<td>.16*</td>
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</tr>
<tr>
<td>Step 2</td>
<td>.02*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maternal Depressive Symptoms</td>
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<td>.01</td>
<td>-.14†</td>
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<td>Child Gender</td>
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<td>.03</td>
<td>-.05</td>
<td></td>
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<tr>
<td>Maternal Sensitivity</td>
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<td>.01</td>
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<td>Negative Reactivity</td>
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<td>.12</td>
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<td>.01</td>
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<td>NR x Child Gender</td>
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Note. NR = Negative Reactivity. †p<.10; *p<.05; **p<.01; ***p<.001.
Table 6. *Hierarchical regression predicting Dyadic Synchrony from Positive Reactivity, moderated by Child Gender*

<table>
<thead>
<tr>
<th>Variables</th>
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<tbody>
<tr>
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<td>.01</td>
<td>-.13†</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Maternal Sensitivity</td>
<td>.05</td>
<td>.01</td>
<td>.29***</td>
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<tr>
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<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>.04**</td>
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<tr>
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<td>.01</td>
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<td>-.03</td>
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</table>

*Note.* PR = Positive Reactivity. †p<.10; *p<.05; **p<.01; ***p<.001.
Table 7. Correlations Among Main Variables and Demographic Variables Separated by Gender

<table>
<thead>
<tr>
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<th>6</th>
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<td>2. Maternal sensitivity</td>
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<td>3. Negative reactivity</td>
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<td></td>
<td>-</td>
<td>-.33**</td>
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<td>4. Positive reactivity</td>
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<td>-.15</td>
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<td></td>
<td></td>
<td></td>
<td>-.28*</td>
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<td>5. Behavioral reciprocity</td>
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<td>.20†</td>
<td>.03</td>
<td></td>
<td>-.03</td>
<td></td>
<td></td>
<td>.20†</td>
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<td>6. Mutual positive affect</td>
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<td>.30**</td>
<td>.09</td>
<td></td>
<td>-.01</td>
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<td>7. Dyadic synchrony</td>
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<td>.66***</td>
<td>.80***</td>
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Notes. Correlations for females (n = 78) are presented above the diagonal, and correlations for males (n = 92) are presented below the diagonal. Means and standard deviations for females are presented in the vertical columns, and means and standard deviations for males are presented in the horizontal rows. Bolded correlations indicate significant Fisher r-to-z transformations and italicized correlations indicate marginally significant Fisher r-to-z transformations. †p<.10 *p<.05, **p<.01 ***p<.001.
Figure 1. *Moderation of Child Gender on Negative Reactivity and Dyadic Synchrony.*

Figure 2. *Moderation of Child Gender on Positive Reactivity and Dyadic Synchrony.*
Appendix A. Consent Forms

Project Title: Latina Adolescent Parenting Project

Investigator: Dr. Josefina Grau, Kent State University

Dear Participants and Parents:

Kent State University in collaboration with MetroHealth Medical Center is conducting a study of the factors influencing the well being of young Latina mothers and their children. We would like you to take part in this study. If you decide to participate, you will be asked to complete two home visits, one in the near future when your child is approximately 1 and ½ years old, and the other, six months later. The home visits will be scheduled at a time that is convenient to you and will be conducted by two female researchers. During each of the visits, one of the researchers will videotape your child while he/she is administered a developmental test. The researcher will then videotape you while you play with and teach your child. Finally, you will be interviewed individually about your own functioning (e.g., social and personal adjustment, relationships with family members) and your child’s behavior. The visit will take approximately 2 and ½ hours to complete. For your participation, you will receive $70.00, a copy of the videotape, and a small toy for your child at the end of each of the home visits.

All the information gathered through this study will remain strictly confidential within the limits of the law. This means that we are required by law to break confidentiality and report to local authorities if we find evidence of child (including you, if you are less than 18 years old) or elder abuse, or if we learn that you have suicidal or homicidal feelings. To maintain confidentiality, the information you provide to us will be identified only by a participant number (not your name) and will be examined only by Dr. Grau and qualified members of her research team at Kent State University. We will schedule the home visit at a time that is convenient to you, so that you can be videotaped and interviewed privately. Also, you will have the choice of responding to interview questions either aloud or by pointing to response options that will be printed in response cards. However, if you have confidentiality concerns because of the presence of a family member or someone else in your home while you are being videotaped or interviewed, we can interrupt the procedures or reschedule the home visit.
Personnel at MetroHealth Medical Center will not have access to the information you provide us. Similarly, Dr. Grau and her research team will not have access to medical or any other information that MetroHealth Medical Center may have about you. You may experience some discomfort when asked to answer personal questions, but our experience is that this discomfort is, at most, slight and short lived. If you experience more than mild discomfort, we encourage you to contact the Center for Behavioral Health, Child and Adolescent Services at MetroHealth Medical Center (216-778-3745). Alternatively, if you prefer, the interviewer can assist you with the referral.

You are under no obligation to complete this study even if you sign this consent form. You may skip questions or discontinue your participation at any time. You will be presented with another consent form for the second home visit. Participation is completely voluntary and refusing to participate will not affect in any way the services you receive at MetroHealth Medical Center.

If you have any questions regarding the study, please feel free to call Dr. Josefina Grau at (330) 672 3106 or (216) 212-9188. This project has been approved by Kent State University and MetroHealth Medical Center. If you have any questions about Kent State University’s rules for research, please call Dr. John L. West at (330) 672-3012. If you have any questions about your rights as a research participant, contact the MetroHealth Medical Center’s Institutional Review Board (which is a group of people who review the research to protect your rights) at (216) 778-2077.

By signing this form I acknowledge that I have read and understand this form, and have had any questions regarding this study satisfactorily answered, and I am voluntarily consenting to participate in this study.

________________________________________________
Participant's signature Date

Parent/Guardian Consent: I give my daughter permission to participate in this study.

________________________________________________
Parent or Guardian's Signature Date

________________________________________________
Researcher Signature Date
(Person obtaining consent)
HUMAN INVESTIGATION CONSENT FORM

The MetroHealth System
2500 MetroHealth Drive, Cleveland, Ohio 44109-1998

ATTACHMENT A

CONSENT FOR PHOTOGRAPHY,
AUDIO OR VIDEOTAPING (medical)

Request Type: □ Photography □ Audiotape □ Videotape □ Other: _____________

Photographs of the subjects(s) will be: □ Clothed □ Partially clothed □ Undressed

Permission is hereby given to photograph, audiotape, or videotape the following named person(s) ________________ with the understanding that such photographs, audiotapes or videotapes may be used for the following stated purposes:

- Medical Necessity/Diagnostic Purposes: Explain: __________________________

- Education: Explain intended purpose: __________________________

- Publication in medical and/or scientific journals: _______________________
  Journal Name

- Inclusion in Research Paper(s): Latina Adolescent Parenting Project
  Name of Study

- Other: __________________________
  Please Specify

The department requesting photos, videos, etc will be responsible for proper storage of the media as established by The MetroHealth System medical record retention requirements. Photographs, etc are not to be placed in the patient medical record. The department requesting photographs, video, etc is ______Research______:

Description of media requested: Videotaping of 1) mother while she teaches and plays with her child; 2) child while he/she is administered a developmental test.

Purpose of Request (describe how photographs, audiovisual or videotaped will be used):
Learn about factors influencing the well being of young Latina mothers and their children.
I, the undersigned, understand that this authorization is valid for a period of 60 days from the date of completion of this authorization, and may be revoked by me or my legal representative in writing at any time. However, I understand that if I do so, it will not have any effect on any actions that were taken before the revocation was received. I understand that for the revocation to be effective, I must do so in writing and send it to department who originally requested the photographs, etc. The revocation notices will be filed in the patient medical record after review by the originating department.

I further understand that once the media has been released, re-disclosure of my information by the recipient which may include protected health information may no longer be protected by law.

_________________________________   ____________
Signature of Participant                      Date/Time

_________________________________   ____________
Signature of parent/guardian                  Date/Time

____________________________________      ____________
Name of Photographer                             Date/Time                                Witness

For non-medical photographs, videotapes or audiotapes for non-medical purposes for use by The MetroHealth Foundation, Marketing or Media Relations, please refer to the form in Attachment B.

MHS FORM 031047901
4/05
Human Investigation Consent Form

CONSENTIMIENTO

Título del Proyecto: Latina Adolescent Parenting Project

Investigadora: Dra. Josefina Grau, Kent State University

Estimadas Participantes y Padres:

En colaboración con MetroHealth Medical Center, Kent State University está conduciendo un estudio acerca de los factores que influyen en el bienestar de madres Latinas jóvenes y sus hijos/as. Nos gustaría que participes en este estudio. Si decides participar, te visitaremos en tu casa dos veces, una vez en el futuro cercano cuando tu hijo/a tenga aproximadamente 1 año y medio, y la otra vez, seis meses más tarde. Las visitas serán fijadas para el día y la hora que a ti te convenga, y serán conducidas por dos investigadoras mujeres. Durante cada una de las visitas, una de las investigadoras filmará a tu hijo/a mientras le administra una prueba de su desarrollo. Después de eso, la investigadora te filmará mientras le enseñas y juegos con tu hijo/a. Finalmente, te entrevistaremos individualmente acerca de tu propio bienestar (por ejemplo, tu adaptación social y personal, tus relaciones con tu familia y amigos) y acerca del comportamiento de tu hijo/hija. La visita tomará aproximadamente 2 horas y 1/2. Al terminar cada visita, recibirás $70.00, una copia del video, y un juguete pequeño para tu hijo/a.

Toda la información que obtengamos a través de este estudio se mantendrá confidencial dentro de los límites de la ley. Esto significa que no podremos mantener confidencialidad y tendremos que reportar a las autoridades si encontramos evidencia de abuso de menores (incluyendo a ti, si es que eres menor de 18 años) o de ancianos, o si notamos que tienes deseos de cometer suicidio u homicidio. Para mantener la confidencialidad, la información que nos des será identificada solamente mediante un número (no tu nombre) y será examinada solo por la Dra. Grau y miembros calificados de su grupo de investigación en Kent State University. Para que seas filmada y entrevistada privadamente, las visitas serán fijadas para el día y la hora que sean convenientes para ti. También tendrás la opción de responder a las preguntas de la entrevista en voz alta o señalando las respuestas que estarán escritas en tarjetas al frente de ti. De todos modos, si cuando estás siendo filmada o entrevistada, hay alguien en tu casa que prefieres que no te escuche o vea, podemos interrumpir la filmación o entrevista por un rato, o hacer una cita para continuar la visita en otro momento.
El personal de MetroHealth no tendrá acceso a la información que nos des. Tampoco tendrá la Dra. Grau y su grupo de investigación acceso a cualquier información que MetroHealth Medical Center pueda tener acerca de ti.

Puede que te sientas incomoda cuando te hagamos preguntas acerca de cosas personales, pero nuestra experiencia es que esta incomodidad es, a lo más, leve y breve. Si tu sientes más que incomodidad leve, te recomendamos que llames al Center for Behavioral Health, Child and Adolescent Services en el MetroHealth Medical Center (216 778-3745). Si prefieres, la entrevistadora te puede ayudar a hacer una cita.

Tú no estás obligada a completar el estudio aunque firmes este consentimiento. Puedes saltarte preguntas o dejar de participar en cualquier momento. Te pediremos que firmes otro consentimiento cuando te visitemos la segunda vez. Tu participación es completamente voluntaria y los servicios que puedas estar recibiendo en MetroHealth Medical Center no van a ser afectados si te niegas a participar.

Si tiene preguntas acerca del estudio, por favor llama a la Doctora Josefina Grau al (330) 672-3106 or (216) 212-9188. Este estudio ha sido aprobado por Kent State University y MetroHealth Medical Center. Si tienes preguntas acerca de los reglamentos de investigación de Kent State University, por favor llama al Dr. John L. West al (330) 672 3012. Si tienes preguntas acerca de tus derechos como participante, por favor llama al Institutional Review Board del MetroHealth Medical Center (que es un grupo de personas que revisa las investigaciones para proteger tus derechos) al (216) 778-2077.

Mi firma indica que yo leí y entiendo este formulario, que mis preguntas acerca del estudio han sido contestadas satisfactoriamente, y he decidido participar voluntariamente en este estudio.

________________________________________________________________________
Firma de la Participante                                        Fecha

Autorización del padre/madre: Le doy permiso a mi hija para participar en el estudio.

________________________________________________________________________
Firma del Padre/Madre                                             Fecha

________________________________________________________________________
Firma de la investigadora                                    Fecha
(Individuo que obtuvo el consentimiento)
CONSENTIMIENTO DE FILMACION

Tipo: □ Fotografía  □ Grabación de voz/sonido  ■ Video tape  □ Otro: ________________

Las fotografías de las participantes se tomarán:  ■ Vestida  □ Parcialmente Vestida  □ Desnuda

Doy permiso para que mi hijo/a y yo, ________________________ seamos filmados con el entendimiento que el video tape puede ser usado para los siguientes propósitos

□ Necesidad médica/diagnostico: ________________________________

□ Educación: Explique: ________________________________

□ Publicación en revistas profesionales: _____________________________ Nombre de la Revista

■ Para reportes de investigación: Latina Adolescent Parenting Project  ___________________________ Nombre del Estudio

Otro: ____________________________ Especifique

El departamento que esta pidiendo el video va ha ser responsable de salvaguardarlo de acuerdo a los requisitos de MetroHealth System. Estos no serán puestos en la ficha médica del paciente. El departamento que esta pidiendo el video es __Investigación__

Descripción del video que se solicita: Filmación de 1) la madre mientras le enseña y juega con su hijo/a; el/la hijo/a mientras se le administra una prueba de su desarrollo.

Razón para la solicitud: El video será usado para aprender acerca de los factores que influyen en el bienestar de madres Latinas jóvenes y sus hijos/as.
Mi firma indica que yo entiendo que esta autorización es válida por 60 días, y puede ser revocada por mí o mi representante legal por escrito en cualquier momento. Entiendo que si revoco el permiso esto no tendrá ningún efecto en las acciones que se tomaron antes de recibir el pedido de revocación. Entiendo que para que la revocación sea efectiva, yo debo hacerlo por escrito y mandarla al departamento que pidió el video. La nota de revocación será puesta en la ficha médica después de ser evaluada por el departamento.

También entiendo que una vez difundida, puede que nuevas revelaciones de mi información, que puede incluir información médica que es protegida, ya no sea protegida por la ley.

<table>
<thead>
<tr>
<th>Firma de la participante</th>
<th>Fecha</th>
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</thead>
<tbody>
<tr>
<td>Firma del Padre/Madre de la participante</td>
<td>Fecha</td>
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<tr>
<td>Nombre de la persona tomando el video</td>
<td>Fecha</td>
</tr>
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</table>

MHS FORM 031047901
4/05
Appendix B. Maternal Demographic Questions

Language
(CHECK ONLY ONE ANSWER)

1. English
2. Spanish

With whom do you currently live?
(Check ALL THAT APPLY by moving the highlight bar to an answer and then PRESS THE SPACE BAR to toggle a check mark on and off)

1. Live with child
2. Live with child's father
3. Live with boyfriend/husband (not the child's father)
4. Live with mother
5. Live with father
6. Live with siblings
7. Live with paternal grandparents
8. Live with maternal grandparents
9. Live with boyfriend/husband's parents
10. Live with members of the boyfriend/husbands' family
11. Live with friends
12. Other <SPECIFY> (GO TO QUESTION 9)
13. DON'T KNOW
14. REFUSED

How far have you gotten in school?
(Read List. CHECK ONLY ONE ANSWER)

1. Less than seventh grade
2. Seventh grade
3. Eighth grade
4. Ninth grade
5. Tenth grade
6. Eleventh grade
7. Twelfth grade
8. High school diploma/GED
9. Partial college
10. College graduate
11. Other <SPECIFY> (GO TO QUESTION 15)
12. DON'T KNOW
13. REFUSED

Are you in school now?
(CHECK ONLY ONE ANSWER)

1. No (GO TO QUESTION 18)
2. Yes, part time/night school
3. Yes, full time
4. DON'T KNOW
Now, I’d like to find out a little bit about how you support yourself. Are YOU working at a job right now?

1. Yes, full time
2. Yes, part time
3. No (GO TO QUESTION 25)
4. DON'T KNOW (GO TO QUESTION 25)
5. REFUSED (GO TO QUESTION 25)

Do you receive any welfare benefits?

1. No
2. Food stamps only
3. Medical card only
4. Monthly check
5. Money for day care
6. Two or more of the above
7. DON'T KNOW
8. REFUSED

What is your marital or relationship status?

1. Never married / no current partner
2. Never married / has a current partner
3. Married, live with husband / child's bio father
4. Married, live with husband / not child's bio father
5. Married, separated from husband / no current partner
6. Married, separated from husband / has partner who is not husband
7. Divorced / no current partner
8. Divorced / has current partner
9. Widowed / no current partner
10. Widowed / has current partner
11. DON'T KNOW
12. REFUSED

Now I am going to ask you a few questions about your ethnic background.

What is the ethnicity of your child?

1. Hispanic / Latino
2. Mixed ethnicity - Latino & African American
3. Mixed ethnicity - Latino & European American
4. Mixed ethnicity - Latino & Other
5. Refused

In what country was your child born?

[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]

1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country was YOUR MOTHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]
1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country was the MOTHER OF YOUR MOTHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]
1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country was the FATHER OF YOUR MOTHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]
1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country was your FATHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]
1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED
In what country was the MOTHER OF YOUR FATHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]

1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country was the FATHER OF YOUR FATHER born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]

1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED

In what country were YOU born?
[ENTER PARTICIPANT'S ANSWER FOR COUNTRY.]

1. Mainland USA
2. Puerto Rico
3. Dominican Republic
4. Mexico
5. Other <SPECIFY>
6. DON'T KNOW
7. REFUSED
Appendix C. Maternal Depressive Symptoms Questionnaire

SCL-90-R

Now, I am going to read you a list of problems and complaints that people sometimes have. Please let me know how much discomfort each of these problems has caused you during the last TWO WEEKS.

How much were you distressed by...

1. Headaches?
   - 1. Not at all
   - 2. A little
   - 3. Some
   - 4. A lot (very)
   - 5. A huge amount (extremely)
   - 6. REFUSED

2. Nervousness or shakiness inside?

3. Faintness or dizziness?

4. Loss of sexual interest or pleasure?

5. Feeling easily annoyed or irritated?

6. Pains in heart or chest?

7. Feeling low in energy or slowed down?

8. Thoughts of ending your life?

9. Trembling?

10. Crying easily?

11. Feelings of being trapped or caught?

12. Suddenly scared for no reason?

13. Temper outbursts that you could not control?

14. Blaming yourself for things?

15. Pains in lower back?

16. Feeling lonely?

17. Feeling blue?

18. Worrying too much about things?

19. Feeling no interest in things?

20. Feeling fearful?

21. Heart pounding or racing?

22. Nausea or upset stomach?

23. Soreness of your muscles?

24. Trouble getting your breath?

25. Hot or cold spells?

26. Numbness or tingling in parts of your body?

27. A lump in your throat?

28. Feeling hopeless about the future?

29. Feeling weak in parts of your body?

30. Feeling tense or keyed up?

31. Heavy feelings in your arms or legs?

32. Having urges to beat, injure, or harm someone?

33. Having urges to break or smash things?
34. Feeling everything is an effort?
35. Spells of terror or panic?
36. Getting into frequent arguments?
37. Feeling so restless you couldn't sit still?
38. Feelings of worthlessness?
39. The feeling that something bad is going to happen to you?
40. Shouting or throwing things?
41. Thoughts and images of a frightening nature?
1. Adaptation to Change in Test Materials

The child’s ability to repeatedly relinquish material used for one item and accept the material for the next item. A child who has difficulty making the transition may become upset to varying degrees when the examiner tries to induce him or her to relinquish material. A child who easily makes the transition from one material to another will show interest in the new material, even though she or he was interested in what she or he was playing with, and readily relinquish the old material for the new material presented.

Consistently resists relinquishing materials/ refuses to accept new materials ……… 1
Typically resists relinquishing materials and/or refuses to accept new materials;
≈ 25% easy transitions ......................................................... 2
Makes poor transitions half the time; makes good transitions half the time ……… 3
Typically relinquishes materials and accepts new materials; ≈ 25% poor transitions…4
Consistently relinquishes materials and accepts new material............................. 5

2. Interest in Test Materials and Stimuli

The amount of interest the child displays in the materials or stimuli. This does not mean the amount of enthusiasm, persistence, or overall attention the child displays toward the materials; but rather, the degree to which the child initially attends to a material or the examiner during each item administration. Consider intensity. A child who shows generally flat/passive interest on 90% cannot get a 4.

Examples of interest: attentive looking or visual tracking of toys, reaching for or attempting to grab an object, moving or lunging forward, smiling when seeing object, eyes widening.

No interest ........................................................................................................................................ 1
Little interest (only about 25% of the tasks)...................................................................................... 2
Moderate interest (about ½ the time or 50%)..................................................................................... 3
Much interest (about 75% of the tasks).............................................................................................. 4
Constant interest (can’t get 5 if not interest on 1 or more, unless STRONG interest on EVERY other task.................................................................................................................. 5

3. Initiative with Tasks

The extent of the child’s initiative in exploring the materials or her or his environment. Consider intensity and prompting. Grabbing a toy, unless in frustration or to remove object, always counts as some initiative. 3 or more “no initiative” consider intensity of
other tasks; if mostly “some” go to “3”. 3 or more prompts to begin a task counts as “no initiative”.

Consistently shows no initiative ......................................................... 1
Typically shows no initiative; ≈ 25% instances of initiative .......................... 2
Shows initiative half the time .............................................................. 3
Typically shows initiative; ≈ 75% of initiative........................................ 4
Consistently shows initiative .............................................................. 5

4. Attention to Tasks

The degree to which the child remains focused on the tasks presented by the examiner; in other words, the degree to which the child sustains interest in the tasks. Pay attention to the times the examiner needs to refocus or bring the child back to task.

Constantly off task; does not attend .................................................. 1
Typically off task; attends only about 25% of the time ............................ 2
Off task half the time ........................................................................ 3
Typically attends; loses focus or interest 25% of the time......................... 4
Constantly attends ........................................................................... 5

5. Persistence in Attempting to Complete Tasks

The degree to which the child persists at tasks in attempting to complete them. Persistence should be distinguished from perseveration, in which the child repeats a part of the task without the aim of completing the entire task or moving task forward. Needing to use more than 1 strategy to complete a task counts as opportunity for persistence (difficult task). Persistence will be recognized even if task remains incomplete; child is engaged even if not doing the task in the correct way. If a lot of prompting is necessary this will lessen the score.

Consistently lacks persistence ............................................................. 1
Typically not persistent; only about 25% of persistence ............................ 2
Lacks persistence half the time ............................................................ 3
Typically persistent; lacks persistence in about 25%................................. 4
Consistently persistent ..................................................................... 5

6. Enthusiasm Toward Task

The degree to which the child exhibits deep concentration, coupled with excitement or delight, in the materials or tasks.

Consistently unenthusiastic (only 1 some/slight)......................................... 1
Typically unenthusiastic; enthusiastic $\approx 25\%$ instances ........................................ 2
Unenthusiastic half the time ................................................................. 3
Typically enthusiastic; unenthusiastic $\approx 25\%$ instances .......................... 4
Consistently enthusiastic ...................................................................... 5

7. Frustration with Inability to Complete Tasks

The degree to which the child becomes **frustrated** when she or he is unable to understand or complete a task. Frustration with the testing situation itself over multiple items (2 or more) cannot count as a 5. The **intensity** of the expression of frustration needs to also be considered, not just frequency.

<table>
<thead>
<tr>
<th>Consistently becomes frustrated</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typically becomes frustrated, $\approx 75%$ of the time he/she reacts with frustration</td>
<td>2</td>
</tr>
<tr>
<td>Occasionally becomes frustrated, half the time he/she reacts in frustration</td>
<td>3</td>
</tr>
<tr>
<td>Rarely ($\approx 25%$ of the time) becomes frustrated</td>
<td>4</td>
</tr>
<tr>
<td>Almost never becomes frustrated</td>
<td>5</td>
</tr>
</tbody>
</table>
## Appendix E. Bayley Rating Scale Coding Sheet

**Latina Mothers Project**  
Bayley Cognitive Child’s Behavior Coding Sheet

<table>
<thead>
<tr>
<th>Coder’s Name: __________________________</th>
<th>Date Coded: ______________</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>HV #</th>
<th>HV Date</th>
<th>Time</th>
<th>Tasks tested</th>
<th>Language</th>
</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>__Spanish __Mostly Spanish __Bilingual __Mostly English __English</td>
</tr>
</tbody>
</table>

1. Adaptation ____
2. Interest in Test Materials ____
3. Initiative with Tasks ____
4. Attention to Tasks ____
5. Persistence ____
6. Enthusiasm Toward Task ____
7. Frustration ____
Appendix F. Bayley Rating Scale Reliability Sheet

Latina Mothers Project
Bayley Cognitive Child’s Behavior Reliability Coding Sheet

HV #__168_    HV Date: _____4/24/10_____    Date: _6/3/10____
Language: __Spanish __Mostly Spanish __Bilingual __Mostly English __English

<table>
<thead>
<tr>
<th>Coder 1:</th>
<th>Coder 2:</th>
<th>Consensus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest</td>
<td>Interest</td>
<td>Interest</td>
</tr>
<tr>
<td>Persistence</td>
<td>Persistence</td>
<td>Persistence</td>
</tr>
<tr>
<td>Enthusiasm</td>
<td>Enthusiasm</td>
<td>Enthusiasm</td>
</tr>
<tr>
<td>Initiative</td>
<td>Initiative</td>
<td>Initiative</td>
</tr>
<tr>
<td>Attention</td>
<td>Attention</td>
<td>Attention</td>
</tr>
<tr>
<td>Adaptation</td>
<td>Adaptation</td>
<td>Adaptation</td>
</tr>
<tr>
<td>Frustration</td>
<td>Frustration</td>
<td>Frustration</td>
</tr>
</tbody>
</table>
Appendix G. Teaching Task Instructions

Instructions For All Mother-Child Interaction

We will now videotape the child interacting with you. We want to see how (s)he does during a series of different tasks. First you will play with him/her without toys and then we will give you a set of toys for you to play with and teach your child. Try not to worry about the camera. You can move around if you want, we can move the camera to follow you. We will let you know when we are done with each part.

Ahora vamos a hacer un video de tu niño/a jugando contigo. Queremos ver como él/ella actúa durante una serie de actividades diferentes. Primero vas a jugar con él/ella sin juguetes, y luego les daremos un grupo de juguetes con los que pueden jugar. No te preocupes por la cámara. Puedes moverte si quieres porque podemos ajustar la cámara para seguirte. Te avisaremos cuando termine cada parte.

Play Without Toys: (5 minutes)

Now we would like to videotape your child playing with you for 5 minutes. Play with him/her as you normally would when playing WITHOUT TOYS.

Ahora queremos grabar a tu niño/a jugando contigo por cinco minutos. Juega con él/ella como lo haces normalmente SIN JUGUETES.

Allow mother to decide where she will be videotaped. If there are toys or other items that can be used as toys in the area, ask the mother to take them away. If she starts using something as a toy, remind her that we would like to see how the child plays without toys and that later she will have a chance to play with toys. She can start wherever she wants.

After 5 minutes say: Good, let’s move to the next thing now. [Bien, continuemos con lo siguiente.] If they are in the middle of something (e.g., singing a song, talking about something), allow them to finish but don’t let it last too long.
Appendix H: Maternal Behavior Scales

Maternal Sensitivity

Maternal sensitivity/responsiveness is well-timed, and reflects empathy with the child's needs and feelings. Sensitivity reflects the mother's ability to perceive and accurately interpret the child's signals and to respond to them appropriately. Questions to ask yourself when coding maternal sensitivity: (1) Was mom responsive to child's needs when called upon by child? Was she accessible? (2) Did mom's reactions to child seem appropriate? What about the timing? Did she promptly respond to the child or did it take her a while? Is response contingent on child's behavior? (3) Did mom stimulate the child too much or too little? Was she alert to subtle cues of his behavior? (4) Was mom effective in soothing the child? Behaviors to watch for include mothers task setting (if Mom allows the child to initiate play or introduces child to activities), appropriately positioning the child to engage in the activity, engaging the child to get the activity started, the help she provides the child, and the actions taken by the mother to refocus the child.

The extent to which a mother is insensitive depends on the extent to which the mother ignores the child when the child is seeking/calling for attention. Take note that situations where the child seeks attentions vary in ratings: For instance, if the child clearly calls for her attention and the child is at least somewhat upset when the mother doesn’t respond would be considered highly insensitive. A mother that completely ignores the child, but the child is not upset or potentially in trouble would get a higher score (although still insensitive). A mother who is focused on presenting and keeping the task at the child’s appropriate level and meets the child’s needs immediately could be considered sensitive. A mother who interrupts the play/activity or tries to impose her agenda when the child really does not need her would be insensitive; with the level of insensitivity related to how much the mother intrudes on the child’s activity and distresses the child.

Also note that insensitive mothers (ratings 1-5) often are disengaged with their children. This is characterized as mothers who often respond to their children, but they are not fully present in the interaction. Examples of disengagement are mothers who verbally respond to their children, but they do not make eye contact. Or they respond to the immediate request of the child, but they do so quickly and without soothing the child and ensuring that the child can continue to play. In other words, insensitive mothers respond to the immediate “crisis” of the child, but the mom is not in tune with the other indirect needs of the child, such as the child wanting attention or soothing, but the child does not verbalize this desire.

An intermediate score for sensitivity would characterize moms who are as sensitive as they are insensitive. Sensitive mothers will settle their child into the task by ensuring that the child will be engaged enough to initiate play, and provide sufficient exploration time and assistance based on the cues of the child.
Sensitivity Addendum

1. **HIGHLY INSENSITIVE**
   *Responses are characteristically inappropriate to child’s signals*
   
   - Mom acts according to her own wishes, moods, and wants
   - Only responds to child’s signals if they are intense, prolonged, or repeated
     - Delayed response shows lack of sensitivity
     - Responses are inappropriate
   
   Examples:
   - rarely interacting with child, just sitting there and not playing or teaching child
   - doesn’t notice or react when child is enjoying something or having difficulty with something (e.g. if child is crying, Mom doesn’t try to comfort or pick the child up)
   - does not make eye contact, emotionally disengaged
   - overstimulates child (ex: overtickling – child screams and is irrelevant)
   - Transitions too quickly from one activity to the next

2. *Characteristically insensitive*
   - 1 demonstration of convenient sensitivity

   **Scoring note:** If more than 1 time of convenient sensitivity, bump up to score of 3

3. **INSENSITIVE/CONVENIENT SENSITIVITY**
   *Characteristically insensitive, may on occasion demonstrate sensitivity or react promptly because child’s needs/wishes/mood are not too different from Mom’s*
   
   - Inability to see things from her child’s perspective, take cues from her child, and then respond appropriately.
   - Can on occasion show some sensitivity if it only calls for slight adjustment of her own behaviors and goals

   **Scoring note:** Insensitivity is not as pervasive as a score of 1, demonstrates more “convenient sensitivity” than score of 2

   Examples of “convenient sensitivity”:
   - Mom stops an activity, not when child is distressed, but because she is becoming annoyed with child’s distress
   - Delayed response that is no longer appropriate to child’s state
   - Once child’s immediate need has been met, Mom disengages or switches activity

   Examples of insensitivity:
   - Mom is preoccupied or distracted by her environment
4. *More insensitive than sensitive *
   - At least one instance of nonconvenient sensitivity in the context of:
     1) a base level of low-sensitivity (global)
     2) more than a few instances of convenient sensitivity (slightly more specific), and/or
     3) the nonconvenient sensitivity is highly sensitive (specific).
   - Mom could be a little more prompt in her response to child’s cues, but this is not consistent throughout the interaction

**Scoring note:** If there is no instance of nonconvenient sensitivity, bump down to score of 3. If demonstrates combined convenient/nonconvenient sensitivity about as much as sensitivity, bump up to score of 5.

5. **INCONSISTENTLY SENSITIVE**
   *Switches between sensitive and nonsensitive behavior – one does not seem to outweigh the other*
   - Sometimes prompt and appropriate to child’s cues
   - Sometimes slow or disengaged
   - The intensity of sensitive behaviors balances out the intensity of insensitive behaviors

**Examples:**
   - Sometimes engaged, playful, and responsive to child’s cues
   - Overstimulation – tickling, chasing child around room until child’s laughter starts to have an edge/sob/scream
   - Once immediate need is met or crisis is resolved, Mom disengages
   - Sometimes doesn’t notice or respond when child is upset, having difficulty, or demonstrates a want

6. *More sensitive than insensitive, demonstrates some obvious inappropriate responses to child’s cues*
   - Mom mostly responds appropriately to child, is emotionally engaged and aware
   - There are moments where Mom’s response is delayed or incomplete

**Example:**
   - Overstimulation
   - Sometimes if child does express a need or a wish to play a game, Mom doesn’t listen or respond but acts according to her own agenda
   - Latent response to child being upset

**Scoring Note:** If moments of insensitivity seem more subtle (infrequent, little mismatches with child’s cues), bump up to a score of 7.

7. **SENSITIVE**
*Characteristically sensitive*, mother responds to child’s cues promptly and appropriately, with some subtle mismatches*

- Mom responds to all of child’s cues
- Mom is engaged *and* makes sure child is in a state to engage
- Mom gives child time to respond before stimulating child further (turn-taking)
- Infrequently, Mom misreads child’s cues or has a delayed response

**Examples:**
- Mom “checks in” with child after initiating activities
- If child doesn’t like a game or activity, Mom transitions quickly to a different activity
- Sometimes it may take her a few moments to figure out what the child wants, (e.g. if the child whimper and it takes Mom a few seconds to realize the child wants to be put down)
- “Po po” Mom

**Scoring note:** If Mom does not check in with child, or if Mom misreads cues more frequently, bump down to score of 6. If there are no little mismatches or misreading of child’s cues, bump up to score of 8.

8. *Characteristically sensitive, with no inappropriate responses*

- Mom is completely engaged and playful, encourages turn-taking
- Mom ensures the child is in a state to engage and checks in with child
- All of Mom’s responses are appropriate and prompt, but Mom does need to be prompted by a cue before she responds

**Examples:**
- Ring-Around-A-Rosie Mom

**Scoring note:** If there are any instances of latent or mismatched responses, bump down to a score of 7. If Mom is so in tune with child’s needs that she appears to predict them before the child’s cue, bump up to a score of 9.

9. **HIGHLY SENSITIVE**

*All of Mom’s responses are highly appropriate, prompt and sensitive to child’s needs*

- Mom attempts to prevent problems by predicting child’s moods and behaviors
- When she is not able to grant the child’s wishes (the child wants something he shouldn’t have), she acknowledges what he wants and offers an alternative
- Is able to settle child into activities so both child and mother are absorbed in their interaction

**Examples:**
- Mother changes the activity immediately when she starts to notice child getting distracted, before he has a chance to get upset
- Both mother and child are satisfied with interaction

**Scoring note: Insensitivity vs directiveness**

If Mom introduces an activity that is not in line with what the child wants, assess if she appears to be trying to structure the interaction (directive). Is she aware of the child’s distress/distraction?
If not aware, this action is insensitive.

If she is aware, how appropriate is the activity she is introducing to the child’s abilities/level of development/interests?

- If appropriate activity that engages the child – sensitive.
- If appropriate activity that does not engage the child, and Mom switches activities – sensitive.
- If appropriate activity that does not engage the child, and Mom does not switch activity – less sensitive.
- If inappropriate activity that engages the child – less sensitive
- If inappropriate activity that does not engage the child, and Mom switches activities – less sensitive.
- If inappropriate activity that does not engage the child, and Mom does not switch activities – insensitive.
Appendix I. Maternal Behavior Rating Sheets

Latina Mother’s Project

Play Without Toys Task

Maternal Behavior Coding Sheet

Coder’s Name: _________________________  Date Coded: ________________

Participant #: _________________________

Language: English ____ Mostly English ___ Mixed____ Mostly Spanish___  Spanish____

Sensitivity: ______

Positive Affect: ______

Negative Affect: ______

Detachment: ______

Cognitive Stimulation: ______

Repertoire: ______
Appendix J. Maternal Behavior Reliability Sheet

Latina Mother’s Project

Reliability Play Without Toy Task

Maternal Behavior Coding Sheet

Participant #: __________________________   Date Coded: ______________

<table>
<thead>
<tr>
<th>Teaching Task</th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Sensitivity:</td>
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<tr>
<td>Positive Affect:</td>
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<tr>
<td>Negative Affect:</td>
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<td>Detachment:</td>
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<td>Cog Stimulation:</td>
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<tr>
<td>Repertoire:</td>
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</tr>
</tbody>
</table>
Appendix K. Free Play with Toys Instructions

**Free Play with Toys**

**Free Play With Toys: (10 minutes)**  
**Toys:**  
Baby doll with bottle, spoon, plates, cups, comb, hairbrush, blanket  
Red car  
Chatter Telephone  
Puppet  
Wooden pound with hammer  
Duplo car-base with pieces  
Diego car, Diego, lemur, fox, trailer, green bear

Dump the toys in front of the child as you talk with mother.

*Now we would like you to play with (child’s name). Wait a minute to see what (s)he wants to do, then play with him/her as you normally do. In other words, let him/her take the lead.*

*Ahora, queremos que jueges con (nombre del niño/a). Espera un minuto para ver lo que él/ella quiere hacer, después juega con él/ella como lo haces normalmente. En otras palabras, déja que él/ella tome la iniciativa.*
Appendix L. Mother-Child Dyadic Synchrony Scales

**Synchrony**: The following scale will be used to rate partners’ synchrony. This scale will be used to measure interaction between the parent-child pair. Synchrony assesses the synchrony or harmony of the dyad, how smooth-flowing, coordinated and interdigitated the interaction is (e.g., smooth turn-taking or following the other’s lead). Turn-taking should be characterized by a balance between partners in leading and following the action sequence. That is, one partner does not dominate the interaction.

1. Play partners demonstrate no synchronous interaction during the 30-second segment. Interaction between partners is characterized as being asynchronous, disjointed, and non-contingent rather than smooth and interconnected. That is, the partners do not seem sensitive to each other, they are highly disconnected and may ignore one another’s cues, and there is a lack of balance in the interaction between the two partners (e.g., there is an awkwardness about the partner’s interaction, partners “talk over” one another, partner’s utterances do not match each other, one partner dominates the interaction, one partner ignores bids for attention made by the other partner, partners miss one another’s cues for interaction). One partner may be disengaged, passive, distracted or ignoring for most of the session (e.g., there are uncomfortable silences, parent looks at watch repeatedly, one or both partners spend time looking around and shifting position) or there may be lack of closure to interaction sequences (e.g., one partner moves abruptly to new activity).

2. Partners are usually disconnected and asynchronous, do not interact, or lack balance in their interaction, but they have brief periods of interactional synchrony during the segment. At the lowest level, minimal pattern of “check-ins” or attempts to engage with each other in the same activity (from both partners).

3. A rating of 3 is assigned to dyads who are typical in regards to synchrony or partners who display moderate amounts of interactional synchrony during the interaction. That is, partner’s interactions are characterized by equal amounts of smooth-flowing interaction and disjointed interaction. Partner’s are sensitive to each other, they follow one another’s cues and their actions are contingent on or follow from one another about half the time. There is a balance of participation between the two partners, but half the time one partner is disengaged, passive, distracted or ignoring during some of the segment, or one partner dominates the interaction half the time. There is some reciprocity between the partners, but one or both of the partners are not tuned in to each other about half of the time.

4. Partners demonstrate frequent periods interactional synchrony but have brief periods of being passive, distracted or ignoring during some of the segment.

5. Partners demonstrate interactional synchrony throughout the interaction episode. Partner’s are characterized as being sensitive, responsive, and contingent to one another’s cues throughout the entire session. The partners display high levels of mutual/reciprocal (simultaneous or turn-taking) behavior toward one another (e.g., there is a smooth back and forth congruity between father and child, there is an obvious exchange of behavior, the time a partner spends speaking and listening are balanced, partners’ appear comfortable with silences, both partners participate equally in interaction, conversation flows smoothly, one individual’s behavior is contingent on the behavior of their partner), with no instance in which one partner is disengaged, passive, distracted or ignoring during some of the segment (e.g., looking around, attention focused on some object other than partner, one individual does not respond to bids made by partner). The action of one partner follows from that of the other, and there is a real sense of smooth-flowing, balanced, reciprocal interaction.

0. A 0 will be recorded when there is no interaction between partners and coders have no information with which to code synchrony.
*Low Level:*

- “Passive Compliance” – child allows themselves to be soothed or held.
- Brief mimicry
- Joint attention
  - When one partner has back to camera and coder can’t see that partner’s line of vision, there needs to be obvious cue that partner is attentive to same object as the other partner (e.g., pointing, commenting on what partner is doing) to count as joint attention
  - Child needs to demonstrate at least some acknowledgement or awareness of mother (e.g., body language, gesture, check in, mimicry)
- Verbal/visual check-in

**Obvious Level:**

- One partner obeys other partner’s directive/command (“say hello!” “hello”; “pick that up”; child picks up)
- Turn taking
- Working together toward similar goal (singing song, dancing, building a tower)
- Conversation (“who is that?” “dora!”)
- Extensive mimicry
**Positive affect:** This scale rates a partner’s level of positive affect during a 30-s interaction segment. Positive affect refers to the expression of emotional states such as happiness, elation, affection and joy. Evidence of positive affect includes smiling, laughing, hugging, kissing, affectionate touching, giggling, chuckling, positive tone of voice, animated behavior, or any combination of these. Use of humor and amusement are included as components of positive affect as long as the humor is not negative or critical. That is, humor that is designed to be shared with the partner rather than humor that is at the expense of the partner. Positive feedback, such as “Good girl/boy.”, “You did great.”, “You’re good at that.” Are also signs of positive affect. **Terms of endearment count toward positive affect when accompanied by positive tone or actions.** However, any derogatory phrases such as “You little piglet” or “You turkey.”, even if they include positive affect or a positive tone, should be considered as negative affect rather than positive affect. **NOTE:** Positive and negative affect are coded separately, thus it is possible for a partner to receive a score of 3 for positive affect and a score of three for negative affect. However, it is not possible for a partner to receive a score higher than 3 on both scales. That is, if a partner gets a 4 on positive affect they can only have displayed a few instances of negative affect, at most. A partner cannot receive a score of 5 on either scale unless the other scale is scored as 1.

1) The partner displays no positive affect during the 30-second segment. The partner is characterized exclusively by flat, neutral facial expression and body language, or some combination of the two. There is no evidence of positive emotion in terms of facial expression, laughter, use of humor, or amusement. The partner offers no positive feedback or instance of affectionate behavior.

2) The partner displays some instance of positive affect, but is characterized predominately by a lack of affective expression or by negative affect.

3) The partner displays moderate amounts of positive affect during the 30-s segment. That is, the partner smiles, laughs, displays affection, uses humor, displays animated behavior or offers positive feedback for about half of the 30-s segment, but half the time the partner’s emotional expression is flat or negative. The partner displays equal amounts positive affect and flat or negative affect.

4) The partner demonstrates frequent evidence of positive affect, but has brief periods in which he/she displays flat or negative affect. In order to get a score of 4 or higher the partner must display some obvious sign of positive emotional display such as laughing, giggling, chuckling, or an exaggerated positive tone of voice.

5) The partner demonstrates positive affect throughout the 30-s segment. The partner’s emotional state is characterized exclusively by happiness, elation, affection and joy. The partner displays smiling, laughing, hugging, kissing, affectionate touching, giggling, chuckling, positive tone of voice, and/or animated behavior throughout the entire 30-s segment, with no instance of flat or negative affect.

0) A 0 will be recorded when there is no interaction between partners and coders have no information with which to code positive playfulness.
*Low Level:*
- Warm, excited, animated tone
- Weak chuckle
- Slight smile
- Play/babbling in a sing-song voice (less than 5 seconds)
- Full smile (less than 3 seconds)

**Obvious Level:**
- Positive feedback (e.g. thank you, good job, clapping)
- Laughing
- Affectionate behavior (kissing, hugging)—must be accompanied by clear positive affect
- Playful/animated behavior (jumping, dancing, playing with toy)
- Play/babbling in a sing-song voice, 3+ brief or prolonged span (5+ seconds)
- Full smile (3+ seconds)

1. If a play behavior is not interrupted by another play behavior/extended span of no play, it counts as one instance.
2. For “yay,” look to tone to determine whether or not it is low or obvious level.
3. For affectionate behavior, if the child is merely following a command it does not automatically count.
Appendix M. Mother-Child Dyadic Synchrony Visual Scale

<table>
<thead>
<tr>
<th>0 Sec</th>
<th>15 Sec</th>
<th>30 Sec</th>
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</thead>
<tbody>
<tr>
<td>2 = Low level (half of the segment or less; any instance)</td>
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<tr>
<td>3 = Obvious 1+ or prolonged (less than 15 seconds)</td>
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<tr>
<td>3 = Obvious 1+ or prolonged instance (less than 15 seconds)</td>
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<tr>
<td>4 = 3+ Obvious in combination with low level (must total at least 15 seconds)</td>
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<tr>
<td>4 = 1-2 Obvious plus an additional 15 seconds+ of low level</td>
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<tr>
<td>5 = Obvious level for at least 15 seconds + additional low level that makes up all of the segment</td>
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(any combination of obvious and half or less low level is still a three)
## Dyadic Synchrony Coding Sheet

Name __________________ Date_____________________

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<thead>
<tr>
<th>Segment</th>
<th>Time Start</th>
<th>Time End</th>
<th>Code</th>
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<tbody>
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<td>47:16</td>
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<tr>
<td>2</td>
<td>47:17</td>
<td>47:47</td>
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<tr>
<td>3</td>
<td>47:48</td>
<td>48:18</td>
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<td>5</td>
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<td>51:56</td>
<td>52:26</td>
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Appendix O. Dyadic Synchrony Reliability Sheet

**Dyadic Synchrony Reliability Sheet**

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<thead>
<tr>
<th>Segment</th>
<th>Coder 1:</th>
<th>Coder 2:</th>
<th>Final</th>
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