

Maternal Intrusiveness and Infant Affect:
Transactional Relations and Effects on Toddler Internalizing Problems

by

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ABSTRACT

Maternal intrusiveness is an important predictor of child mental health problems. Evidence links high levels of maternal intrusiveness to later infant negativity, and child internalizing problems. However, children also influence the manner in which parents interact with them. For example, infants that show more negative emotionality elicit less positive parenting in their caregivers. Infant affect is also associated with later child internalizing difficulties. Although previous research has demonstrated that maternal intrusiveness is related to infant affect and child internalizing symptomatology, and that infant affect is a predictor of internalizing problems and parenting, no studies have looked at the transactional relations between early maternal intrusiveness and infant affect, and whether these relations in infancy predict later childhood internalizing symptomatology. The present study investigates young children's risk for internalizing problems as a function of the interplay between maternal intrusiveness and infant affect during the early infancy period in a low-income, Mexican-American sample. Participants included 323 Mexican-American women and their infants. Data were collected when the infants were 12, 18, 24, and 52 weeks old. Mothers were asked to interact with their infants in semi-structured tasks, and mother and infant behaviors were coded at 12, 18, and 24 weeks. Maternal intrusiveness was globally rated, and duration of infant negative- and positive affect was recorded. Mother reports of child Internalizing symptomatology were obtained at 52 weeks. Findings suggest that there are transactional relations between early maternal intrusiveness and infant negative affect, while the relations between infant positive affect and maternal intrusiveness are unidirectional, in that infant positivity influences parenting but not vice versa. Further, findings also imply that neither maternal

intrusiveness, nor infant affect, influence later toddler internalizing symptomatology. Identifying risk processes in a Mexican-American sample adds to our understanding of emerging infant difficulties in this population, and may have implications for early interventions.

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INTRODUCTION

Social-emotional and behavioral problems are prevalent in young children, stress family systems, and are associated with a variety of problematic outcomes for children (e.g., Briggs-Gowan, Carter, Moye Skuban, & McCue Horwitz, 2001; Jaspers et al., 2012; Rutherford, Quinn, & Mathur, 2004; Sterba, Prinstein, & Cox, 2007). Although internalizing difficulties are observed in young children, they have received less research attention compared to externalizing problems in early childhood. One reason for this difference is that child externalizing problems are more disruptive in nature, whereas children with internalizing problems are often perceived as being less burdensome for parents (Angold et al., 1998), and therefore often go unnoticed. However, both internalizing and externalizing problems tend to be persistent, and often lead to more severe mental health issues, and more specific diagnoses as the child grows older (e.g., Briggs-Gowan & Carter, 2008). Given poor trajectories associated with internalizing difficulties, and the relative lack of attention these problems have historically received, identifying the developmental processes that lead to such internalizing symptomatology is critically important. If such mechanisms can be identified, they can provide specific targets in prevention and early intervention programs for young children at risk of developing anxiety and/or depression.

Early in life, infants are completely dependent on their caregivers, and the infant-caregiver relationship is vital for healthy developmental functioning. The quality of interaction between infants and caregivers is associated with a wide range of child outcomes, including later attachment security (e.g., Sroufe, 1985) and social-emotional and behavioral competence (e.g., Mäntymaa, Puura, Luoma, Salmelin, & Tamminen,

2004). Although it is well accepted that parenting in general is an important influence on child behavior and well-being, less is known regarding the processes by which specific parenting behaviors lead to particular child behaviors and problems. One parenting behavior that has received attention in the context of the mother-child relationship is intrusiveness. Maternal intrusiveness is characterized by parent-child interactions that are overly parent-driven, wherein mothers may overstimulate their infant, misinterpret important cues, and interrupt or derail ongoing infant activity to create an attentional shift. Given these defining characteristics, it is not surprising that maternal intrusiveness has been associated with greater infant negative emotionality (e.g., Ispa et al., 2004), lower levels of reactive control (Graziano, Keane, & Calkins, 2010) and child anxiety problems (e.g., Hudson & Rapee, 2001).

While maternal behavior influences infant well-being and behavior, infants also influence maternal behavior. Infant affect, and particularly infant negativity, may be especially important as it has been associated with a variety of later child problems, especially internalizing problems. For example, greater infant negative affect has been linked to later childhood depressive symptoms (e.g., O'Connor, 2001), as well as anxiety problems (Bosquet & Egeland, 2006). Although affect in infancy is partially determined by the temperamental style of the infant, it is also clear that contextual parenting influences, such as maternal intrusiveness, may influence the infant's expressions of positive and negative affect over time. In turn, infant affect may influence consecutive maternal behavior. For example, infant negativity may promote greater intrusiveness from the mother over time, creating a feedback loop that heightens risk for poorer infant mental health outcomes. As such, investigations of the mother-infant relationship should

employ transactional frameworks whereby the dynamic ways in which mothers and infants influence each other reciprocally across interactions can be captured in the moment, as well as over time.

The current study investigated young toddlers' risk of developing internalizing problems as a function of the transactional relations between maternal intrusiveness and infant affect over time (see Figure 1 for the full proposed model). It was expected that there would be bidirectional linkages such that infants who exhibited more negative affect and less positive affect over time would have mothers who were more intrusive over the early infancy period of 3 to 6 months. Also, greater infant negativity and lower positivity in combination with greater maternal intrusiveness was expected to be associated with increased risk of early internalizing problems later in the infancy period.

Internalizing Problems in Early Childhood

Social-emotional and behavioral problems are prevalent in young children and comprise a wide variety of mental health problems that often arise in early childhood, including aggression, defiance, over-activity, negative emotionality, anxiety, and withdrawal (Briggs-Gowan & Carter, 2008). In a study that followed a representative community sample of toddlers residing in Connecticut, 33% of children exhibited social-emotional concerns according to parental reports (Briggs-Gowan & Carter, 2008). Early social-emotional and behavioral problems are also often persistent. Studies indicate moderate stability of social-emotional problems in toddlerhood, with approximately 50% of children showing continued significant mental health issues years later (Briggs-Gowan & Carter, 2008; Campbell, 1995; Luby, Si, Belden, Tandon, & Spitznagel, 2009). However, whether these early problems manifest themselves in more distinct forms, such

as discrete internalizing or externalizing problems is somewhat unclear. Although some studies find early predictions to distinct internalizing and/or externalizing problems (Moore, Cohn, & Campbell, 2001), others fail to find predictable distinctions for precursors to internalizing versus externalizing disorders in the first few years of a child's life. For example, Shaw, Keenan, Vondra, Delliquadri, and Giovannelli (1997) found predictable early infant precursors to preschool internalizing problems (e.g. infant negative emotionality, disorganized attachment classification, and presence of negative life events), but those same factors were shown to also predict later externalizing problems.

One of the major challenges in the attempt to identify mechanisms that differentially predict internalizing and externalizing behaviors is that these two facets tend to be highly comorbid in childhood (Fanti & Henrich, 2010). Further, comorbidities within internalizing disorders of childhood, such as between anxiety and depression, are also prevalent. Up to 70% of children with depression also suffer from anxiety, and anxiety tends to precede the emergence of depressive symptoms (Brady & Kendall, 1992; Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). The high comorbidity rate between different internalizing disorders is especially common in toddlerhood, although specific diagnoses are usually not determined this early. Instead, research relies on early symptom counts of internalizing and/or externalizing problems. Nevertheless, research indicates that those children who experience internalizing problems from a very early age are at greater risk for more severe problems later in development than are those who exhibit internalizing symptoms later (Sterba, et al., 2007). Such indications create the imperative

to further investigate those processes in early developmental periods that put children at risk of developing internalizing symptomatology.

Epidemiological studies indicate that internalizing disorders developing throughout childhood are relatively common. It has been estimated that the prevalence of certain anxiety disorders, such as separation anxiety, social anxiety, and specific phobias, show a prevalence rate of approximately 7-10% in childhood (Beesdo, Knappe, & Pine, 2009). Similarly, the 12 month prevalence rate of mood disorders for children and adolescents is around 2.5% (Merikangas et al., 2010). Although children who develop internalizing problems early have the worst prognosis, and internalizing disorders are quite prevalent in later childhood, relatively little is known still with respect to early trajectories that lead to such symptomatology. Many pathways to early internalizing problems have been proposed, but there is a lack of empirically established explanatory models.

A wealth of evidence suggests that early mother-infant interactions predict later social-emotional and behavioral problems (Leerkes, Blankson, & O'Brien, 2009; Mäntymaa et al., 2004). Maternal behaviors of particular importance in the development of general social-emotional problems and competencies include maternal hostility and intrusiveness (Mäntymaa et al., 2004), maternal sensitivity, which is of particular importance during times of infant distress (Leerkes et al., 2009), and maternal responsiveness (Brophy-Herb et al., 2011). With regard to internalizing outcomes specifically, a variety of parenting practices have been linked to later child anxiety and depression symptoms. Research in this area has often focused on two dimensions of parenting: rejection (i.e., parental withdrawal, lack of warmth, and aversiveness/hostility)

and control (i.e., over-involvement, parental interference, intrusiveness, and low autonomy granting). In a meta-analysis examining the association between parenting and childhood anxiety (McLeod, Wood, & Weisz, 2007), it was found that the aforementioned parenting practices accounted for 4% of the variance in child anxiety. Further, the dimension of parental control accounted for more variance than did parental warmth and rejection. The findings that parental control is associated with childhood anxiety disorder, while rejection is more related to childhood depression, has emerged in other meta-analyses investigating the relationship between childrearing and childhood internalizing problems as well (e.g., Rapee, 1997). It should be noted however that most studies included in these meta-analyses were cross-sectional. Hence, while these studies show that parental control and rejection are associated with children's internalizing problems, the directionality of these relations cannot be determined.

Overall, although many pathways to early internalizing problems have been investigated to greater or lesser extent, few studies have explored maternal factors that may lead to infant emotional problems at multiple time-points. Further, most studies fail to take child characteristics into account when studying maternal behaviors and later symptomatology. Therefore, greater attention to transactional processes that explicate the reciprocal mother-child processes in the emergence of internalizing problems is needed. Likewise, longitudinal strategies are necessary to disentangle the complex nature of these transactional relations between specific parenting behaviors, child characteristics, and subsequent internalizing symptoms of childhood.

Infant Affect

The ability to regulate emotions begins during infancy. Due to increases in attentional control and self-soothing behaviors, a decline in infant negative affect over the first year of an infant's life is expected (Kopp, 2002). Infants also start to exhibit more positive affect as they develop, as infants become more responsive to adults' initiations and become increasingly more likely to spontaneously initiate positive communication with adults (Kaye & Fogel, 1980).

The extent to which an infant exhibits certain types of affect depends both on individual biological, innate, temperamental differences in the ability to modulate affective states (Rothbart & Ahady, 1994), and environmental factors (e.g., Kaitz, Maytal, Devor, Bergman, & Mankuta, 2010). That environmental factors influence infant affect can be seen in studies that report discontinuities in infants' expressions of affective states over time. For example, Moore et al. (2001) found that the extent to which infants expressed negative and positive affect in response to the Still Face procedure was relatively unstable from 2 to 6 months of age. Similarly, Rothbart (1986) found stability in negative affect over a 3-month periods, but not over longer periods of time.

Infant affect is not only influenced by environmental factors, but has also been shown to affect the child's own environment. For example, infant affect predicts the manner in which mothers interact with their child. An infant that shows more negative emotionality elicits less positivity in the caregiver (O'Connor, Sigman, & Kasari, 1992). Similarly, infant positive affectivity is linked with specific activities in the brain of the mother, which in turn are thought to contribute to the ways she responds to the child (Strathearn, Li, Fonagy, & Montague, 2008). Maternal behaviors toward infants' early

affective expressions may in turn partly predict later infant affect as well as mediate the relationship between infant affect and later mental health problems. More specifically, the extent to which mothers respond sensitively to infants with difficult temperaments, particularly during times of distress, has been shown to predict later social-emotional outcomes (Leerkes et al., 2009).

Not only does infant affective behavior predict subsequent maternal behavior, but it has also been associated with a variety of disorders in later childhood and adolescence. There has been relatively greater attention given to infant negative affect than the lack of positive affect, although both appear to predict later problems. Some evidence shows that a lack of infant positive affect may be more predictive of later externalizing problems, whereas heightened infant negative affect is associated with later internalizing difficulties (Moore et al., 2001; Shaw et al., 1997). Further, while negative affect is a feature in both depression and anxiety, lower positive affect is more uniquely linked to depression, but not anxiety (O'Connor, 2001; Goodyer, Ashby, Altham, Vize, & Cooper, 1993; Zahn-Waxler et al., 2000). However, in order to gain a deeper understanding of how a variety of infant affective states may predict later problems, more research that includes both infant negativity and positivity as potential predictors to symptomatology is needed.

In sum, infant affect shows important associations to later developmental functioning. Lower positive affect as well as higher negative affect are linked to later maladaptive functioning and internalizing problems. Although infants have innate biological predispositions that partly determine reactivity and likelihood to express certain affective states, it is also apparent that environmental factors, such as parenting, play a critical role in the extent to which infants experience negative and positive

affective states. Furthermore, infants' affective states likely elicit certain behaviors in mothers, highlighting the bidirectionality between parenting behavior and infant affect.

Maternal Intrusiveness

Parenting is associated with children's development of internalizing problems. Also, parenting has particular importance during infancy given that infants are completely dependent on their caregivers. One specific parenting behavior that has been studied in relation to child internalizing problems is maternal intrusiveness. Components of maternal intrusiveness include whether the mother-infant interactions are overly parent-driven or not, and the extent to which the mother interrupts the child's initiations. Intrusive mothers provide high levels of structure on their child's activities and use strategies that range from direct, harsh commands to physical restraint. Further, the parent may make developmentally inappropriate demands, which may in turn lead to incongruence between the mother and child. In infancy specifically, signs of maternal intrusiveness also include overstimulation, misinterpretation of important infant cues, and ill-timed, over-controlled, and asynchronous responses towards the child.

Maternal intrusiveness has been associated with infant negativity (Braungart-Rieker, Garwood, Powers, & Notaro, 1998). Further, intrusiveness predicts infant negative emotionality months later, even after controlling for infant negative emotionality at baseline (Fish, Stifter, & Belsky, 1991; Ispa et al., 2004). These findings tend to hold true across a wide range of ethnicities, although the association between maternal intrusiveness and child negativity is moderated by maternal warmth in African American samples (Ispa et al., 2004). The findings that maternal intrusiveness predicts infant

negative emotionality and self-regulation indicate that maternal intrusiveness might facilitate maladaptive outcomes (e.g., anxiety and mood disorders).

Although little is known regarding the long-term effects of maternal intrusiveness during interactions with infants, more is known regarding maternal intrusiveness with older children. As mentioned previously, in a meta-analysis conducted by McLeod et al. (2007), parental control and intrusiveness were shown to predict child anxiety disorders. To build on the aforementioned meta-analysis, van der Bruggen, Stams, and Bogels (2008) conducted a meta-analysis that focused solely on parental control/intrusiveness. The 23 studies included in this meta-analysis yielded an overall medium-to-large effect-size for the association between parental control and child anxiety. Similarly to the meta-analyses mentioned above, Wood, McLeod, Sigman, Hwang, and Chu (2003) reviewed the empirical findings for predictors of child anxiety disorders. They found that parental controlling behaviors measured observationally were significantly associated with child anxiety symptoms, whereas self-reported parental control in general failed to show significant associations between the two.

Most research that addresses maternal intrusiveness has been cross sectional in nature. Although longitudinal studies are necessary to assess long-term change, and predict to critical outcomes, other methods can provide important insight. For example, Hudson and Rapee (2005) investigated parental overprotection, a construct closely related to parental intrusiveness. One group of families had one child with an identified anxiety disorder, and one child with no identified disorder. In the comparison group of families, all children were nonclinical. Results showed that parents disclosed more overprotectiveness with their anxious child than the nonclinical child. Further, these

parents reported being no more overprotective of their nonclinical child than parents of two nonclinical children, indicating that parents may engage in more overprotective parenting behaviors as a response to a child with anxiety problems.

To assess whether maternal intrusiveness actually predicts child internalizing symptoms, longitudinal methods are necessary. Although longitudinal studies of parental intrusiveness and child internalizing problems are rare, a few studies have shown some interesting, although mixed results. In studies conducted by Rubin, Nelson, Hastings, and Asendorpf (1999) and Rubin, Burgess, and Hastings (2002), it was shown that two year old children's shy behaviors predicted maternal control two years later, but maternal control did not predict later shyness. However, behavioral inhibition at child age 2 years predicted children's socially withdrawn behaviors in response to peers at age 4 years only when maternal intrusiveness was high. Hence, parental intrusiveness moderated the association between the children's behavioral inhibition and their later reserved behaviors.

Although evidence exists to indicate that maternal intrusiveness is associated with anxiety symptoms, it may be that intrusiveness is more associated with particular anxiety symptoms (separation- and social anxiety) than other types of anxiety symptoms (Wood, 2006). This stronger association may manifest itself because when a parent acts in an overly intrusive manner, the child may not earn a sense of mastery of age-appropriate tasks, and the child may not develop sufficient self-efficacy.

It seems apparent that parental intrusiveness predicts infant affectivity and maladaptive functioning, although the long-term effects of maternal intrusiveness on child internalizing problems remain unclear. In older children, there appears to be a link

between maternal intrusiveness and child anxiety disorders, but less is known about whether similar associations exist for childhood depression. Because much of this research is cross-sectional, critical questions regarding direction of effect have yet to be answered. Also, although maternal intrusiveness has been linked to childhood internalizing problems, this relation has mainly been investigated in later childhood. Nevertheless, there is suggestive evidence to support the importance of exploring maternal intrusiveness and internalizing symptomatology much earlier in development.

Transactional Model: Maternal Intrusiveness and Infant Affect predicting Early Internalizing Problems

Transactional perspectives seek to explain how children and contexts shape each other bidirectionally over time and over multiple social settings that contribute to developmental progress (Sameroff, 1975). From a transactional perspective, the nature of the bidirectionality between maternal intrusiveness and infant affect across the early infancy period remains to be adequately explored. Indeed, little is currently known regarding the parallel trajectories of the two constructs during this period. However, maternal intrusiveness and infant affect likely transact over time such that higher maternal intrusiveness provokes higher negative emotionality and less positive affect in the child. In much the same way, an infant who shows higher negativity may elicit higher maternal intrusiveness than infants who exhibit more positive or neutral affect. Whether lower infant positive affect also elicits maternal intrusiveness has yet to be tested empirically. Although lower infant positive affect may lead to a mother engaging in more intrusive behaviors in order to elicit a response from the child, it is unlikely that infant degree of positive affect is as predictive of maternal intrusiveness as infant negativity is.

Although infants and mothers are expected to affect each other reciprocally, maternal intrusiveness is likely to influence infant affect to a greater extent than infant affect will influence maternal intrusiveness. Despite the fact that the balance of power in mother-infant dyads may differ depending on certain child characteristics (Dumas, LaFreniere, & Serketich, 1995), the balance of power is generally in favor of the mother. Mothers are better skilled to provide infants with information, and are evolutionarily primed to take care of a child. The infant has no such agenda, is much more dependent, and is therefore less likely to affect maternal behaviors to the same extent.

Finally, although it has been shown that both maternal intrusiveness and infant affect independently predict early childhood internalizing symptomatology, infant affect may at least partially mediate the relation between maternal intrusiveness and internalizing behaviors. Maternal intrusiveness is linked to infant negative emotionality (e.g., Fish et al., 1991; Ispa et al., 2004), and infant negative emotionality is both integral to and predictive of internalizing problems (e.g., O'Connor, 2001; Goodyer et al., 1993; Zahn-Waxler et al., 2000). Given that the link between infant affect and early internalizing problems is more well-established than is that for maternal intrusiveness and later internalizing symptomatology, it seems likely that the connection between maternal intrusiveness and child internalizing problems flow through early infant affective response.

Current Study

This study aimed to examine young children's risk for internalizing problems as a function of the interplay between maternal intrusiveness and infant affect during the early infancy period. Greater infant negativity, lower positivity, and higher maternal

intrusiveness were expected to be associated with greater internalizing problems later. The hypotheses of interest were tested using data from a larger longitudinal study of Mexican-American mothers and their young children. With respect to cultural considerations, previous research indicates that the frequency of maternal intrusiveness may significantly differ as a function of ethnicity (e.g., Moreno, 1997). Further, although research is limited in this area, some findings indicate that the link between maternal intrusiveness and negative outcomes, such as child disengagement, might be weaker or non-significant in minority samples (Isapa et al., 2004). Nevertheless, the link between maternal intrusiveness and child negativity has been established in Mexican American samples (Isapa et al., 2004), and it is likely that the early processes hypothesized to link maternal intrusiveness, infant affect, and young children's internalizing symptomatology are similar for Mexican-Americans as for European American samples.

The data that were used for this study included observations of infant affect and maternal intrusiveness in mother-infant free play and teaching tasks (respectively) at infants' ages 12, 18, and 24 weeks, and assessment of toddler internalizing problems, measured by maternal report of toddler behavior at child age of 12 months. This study examined four interrelated hypotheses addressing the proposed model (see Figure 1); each of which explored elements of the relations between ongoing maternal intrusiveness and infant affect in the prediction of early childhood internalizing problems. The following four hypotheses were examined:

1. Infant affect and maternal intrusiveness were expected to show bidirectional relations over time. Higher levels of maternal intrusiveness were expected to predict more infant negative affect and less positive affect six weeks later.

Similarly, infant affect, particularly negative affect, was predicted to relate to later maternal intrusiveness in the same manner.

2. Maternal intrusiveness was expected to be more strongly related to later infant affect than was infant affect to later maternal intrusiveness.
3. Greater infant negative affect, lower positive affect, and higher maternal intrusiveness were hypothesized to predict more toddler internalizing problems at 12 months.
4. The effect of early maternal intrusiveness on later child internalizing problems was expected to be partially mediated by infant affect.

METHODS

Participants

The participants for the study included 304 infants and their mothers, drawn from a larger longitudinal study, Las Madres Nuevas (LMN). The larger LMN study prospectively explores mother and infant processes in low-income Mexican-American families, with a particular focus on maternal postpartum depression and mother-infant co-regulation. The overall study followed mother-infant dyads from the prenatal period to child age 3 years old. Participants were recruited to the larger LMN study through the Maricopa Integrated Health System (MIHS), a health care provider for low-income families in Maricopa County, Arizona, during one of their prenatal visits. Eligible women were fluent in English and/or Spanish, self-identified as Mexican-American, expected singletons, and were at less than 34 weeks' gestation. All participating families also had an annual income of below \$25,000 and/or were eligible for Medicaid. The larger LMN study currently has an overall retention rate of 89%.

Mothers in the overall LMN study are generally born in Mexico (86.1%) and speak Spanish as their primary language (82.1%). At the time of the first visit, conducted prenatally, mothers were on average 28 years old ($M=27.84$, $SD=6.5$), had gone through 10 years of education (mean=10.16, $SD=3.21$), were not working outside the home (83.6%), were unmarried but living with a romantic partner (45.4%), had lived in the United States 12 years ($M=11.87$, $SD=5.97$), and had an annual household income of \$5,000 – \$15,000 (46.8%).

Procedures

Eligible pregnant women were invited to participate in the study during one of their prenatal care visits at MIHS. At the time, informed consent and contact information were obtained and the prenatal visit was scheduled. In the larger LMN study, one prenatal home visit (at between 34 and 37 weeks of gestation) was conducted, as well as four home visits with both the mother and infant (at infant age 6, 12, 18, and 24 weeks), four laboratory visits with mother and child (at child age 12, 18, 24, and 36 months), and several phone interviews throughout the study. The time-points were corrected for prematurity as necessary. All recruitment efforts and interviews were conducted by bilingual, female interviewers. The larger LMN study utilized a planned missingness design, so that each participating mother-infant dyad only completed two of the three last home visits (i.e., participants would either miss the 12, 18, or 24 week home visit). The current study used data obtained at four time points, including the 12, 18, and 24 week home visit, as well as the 12 month data time point.

Home and Laboratory Interviews. Interviews were conducted in the participant's language of choice. All interview questions were read out loud to the participant, and the answers were recorded on a computer. The interviews included both self-report measures and structured mental-health assessments. For this study, demographic information was drawn from the prenatal visit interview.

Interaction tasks. During the home visits after the birth of the child, the mother and infant participated in several interaction tasks (Free Play, Arm Restraint, Soothing, Teaching, and Peak-a-boo), which provided the study's observational data. These interaction tasks were recorded with two cameras (one camera was more focused on the

mother and the other camera was more focused on the child) so that they later could be coded by research assistants. The current study used observational data obtained from the Free Play interaction task and the Teaching interaction task at 12, 18, and 24 weeks. For the Free Play task, mothers were provided a set of age appropriate toys and were asked to play with their child the way they normally do for five minutes. For the Teaching task, mothers were asked to teach the infant a novel and challenging task for five minutes. The teaching task differed for each home visit, to account for infant developmental progress. The nature of the challenge was such that tasks were chosen to be beyond the infant's developmental capability, so that the infant would not yet be able to perform what the mothers were trying to teach them.

Coding of Data. For the larger LMN study, infant- and mother behaviors are coded using several different coding systems. For the current study, mother behaviors were coded using the Emotional Availability Scales (EAS; Biringen, 2008) and infant behaviors were coded using a microanalytic scoring system developed specifically for coding of LMN observational data. Four undergraduate coders coded maternal behaviors using the EAS system and twelve undergraduate research assistants coded infant behaviors micro-analytically. All coders were blind to the study hypotheses and were supervised by graduate research assistants. The overall EAS coding system coded four dimensions of maternal behavior (sensitivity, structuring, non-intrusiveness, and non-hostility). Inter-rater reliability was calculated for 20% of each coder's videotapes to calculate percent agreement, with adequate inter-rater reliability set at 70% perfect agreement. The overall infant micro-analytic scoring system included three dimensions of infant behaviors (affect, engagement, and self-comforting behaviors). Inter-rater

reliability was calculated for 20% of all coders' videos, using Cohen's kappa that corrects for agreement by chance. It examined the rate to which agreement was reached in observing the same infant states at the same period of time, to the nearest 2 seconds. Adequate inter-rater reliability was set at .60 kappa.

Phone Interviews. Phone interviews were carried out throughout the course of the larger LMN study. These interviews were meant to supplement the home- and laboratory visits in order to minimize the time participants had to spend in the visits at each time point, as well as to enable the collection of longitudinal data more frequently than was otherwise feasible. Participants were called by bilingual and female interviewers and asked to complete some brief questionnaires over the phone. The current study used data obtained from the 12 month phone interview.

Measures

Maternal Intrusiveness. The Emotional Availability Scales (EAS; Biringen, 2008) is a global coding system that focuses on observed mother and infant behaviors. Maternal intrusiveness, which is one sub-scale of the coding system, was coded from videotapes recorded in the home during a 5 minute teaching activity with the mother-infant dyad. Overall maternal non-intrusiveness was coded on a 1 to 7 scale, with 1 indicating that the mother was highly intrusive and 7 indicating that the mother was nonintrusive but yet emotionally present and available. Further, several sub-items of maternal intrusiveness were rated separately in a similar manner. These sub-items included an assessment of the mother's abilities to follow the child's lead, engage in didactic teaching, engage in non-interruptive ports of entry into interactions with the infant, commanding, directing, and adult talking towards the child, physical and verbal

interferences, and an overall assessment of whether the mother was made to “feel” or “seem” intrusive in her interactions with the child (based on the child's reactions to the mother's behaviors towards him or her). Although these sub-items were not summed to obtain the overall score of maternal intrusiveness, they did guide the coders in how to think about their overall impression of the interaction in terms of the construct to be rated (EAS; Biringen, 2008).

Infant Affect. Infant affect was measured using a micro-coding system for infant behaviors developed specifically for LMN. Infants were coded to engage in one of the mutually exclusive affective states of positive- (smiling and/or positive sounds), neutral-, negative-fussy- (negative facial expressions and/or whining), or negative-cry affect at all times throughout the 5-minute free play activity with the mother. Two variables were thereafter created. One variable assessed the total proportion of time of infant positive affect, and the other variable assessed the total proportion of time of infant negative affect (fussiness and/or crying) throughout the task. The proportion scores adjusted for unscorable moments (e.g., if the infant's face was not being captured by the camera). Hence, the final variable represented the proportion of infant positive- and negative affect (respectively) out of total scoreable time of the five minute Free Play task for each participant. All microanalytical coders were reliable ($\kappa > .60$).

Infant Internalizing Problems. Maternal report of the infant's overall social and emotional problems was obtained through the Brief Infant-Toddler Social and Emotional Assessment (BITSEA; Briggs-Gowan & Carter, 2006). The BITSEA was administered over the phone at the child's age of 12 months. The BITSEA is a 42-item questionnaire developed from the longer Infant-Toddler Social and Emotional Assessment (ITSEA).

The BITSEA addresses a wide variety of social-emotional problems common in the age range of 12 to 36 months of age. The mother is asked to rate the child's behavior in the last month. Items address mental health symptoms including internalizing-, externalizing-, and dysregulation problems, as well as symptoms indicative of autism spectrum disorders and other psychopathologies. Each item was rated on a scale from 0 (not true/rarely) to 2 (very true/often). Of the 42 items, 8 items address internalizing problems and behaviors (see Table 1). In general, the BITSEA is considered to have adequate internal consistency and construct validity. In the current sample, the Alpha scale reliability for the 8-item internalizing sub-scale of the BITSEA was .55 and Omega was .56. To increase the Alpha scale reliability, one item was dropped ("Cries or hangs onto you when you try to leave"). With this item dropped, the Alpha scale reliability increased to .69. Hence, the sum score of these 7 items was used for the analyses in this study, in order to gauge overall infant internalizing symptoms.

Data Analytic Plan

Preliminary analyses. Descriptive statistics and frequencies, including means, standard deviations, outliers, and normality were assessed for all demographic data as well as the variables of interest (maternal intrusiveness, infant affect, and toddler internalizing symptoms). Further, correlations were run on all variables of interests and demographic data.

Hypothesis testing. Two cross-lagged path models (one that included infant negative affect and the other that included infant positive affect) in Mplus 6 (Muthén & Muthén, 2010) examined all hypotheses concerning the trajectories of infant affect and maternal intrusiveness over time, as well as the nature of their contribution to later child

internalizing problems. Model fit was first assessed using χ^2 test of fit (good fit defined as $p > .05$). If the χ^2 test of fit was significant ($p < .05$), model fit was further evaluated by using root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and the comparative fit index (CFI). An indication of good fit for these indices was set at the following: RMSEA values $\leq .06$, SRMR values $\leq .08$, and CFI values $\geq .95$ (Hu & Bentler, 1999). Finally, nested model testing was carried out to compare paths within models.

Missing Data Handling. The larger LMN study utilized a planned missingness design. Data for the current study included missing data due to planned missingness implemented at the 12, 18, and 24 week time points. Further, there was missing data due to the status of data collection and randomization of videos to be coded. Finally, for coded observations of maternal intrusiveness, missing data also included dyads in which infants were asleep during the teaching task. Hence, data was treated as Missing At Random (MAR; Rubin, 1976). When data is missing at random, the recommendation is to use corrections for missing data techniques (e.g., full information maximum likelihood) in order to include all possible data points (Enders & Bandalos, 2001). Using this technique maximizes power as well as avoids bias introduced by listwise deletion techniques (Schafer & Graham, 2002). Hence, full information maximum likelihood modeling (FIML) was carried out. Data available for each variable of interest before the correction is presented in Table 2. After the utilization of maximum likelihood estimates, the overall sample included 304 participants.

RESULTS

Preliminary Analyses

Descriptive statistics for demographics, as well as study variables are presented in Table 3. Further, relations between demographics and the study variables (maternal intrusiveness, infant positive- and negative affect, and toddler internalizing problems) were tested using Pearson correlations in Mplus 6.0 and are presented in Table 4. Although two demographic variables, Country Born and Mother's Education, showed some significant relations to Infant Positive Affect and Infant Negative Affect respectively, these relations were small and not systematic (correlated only at one time-point each). No other demographic variables related to any of the study variables. Hence, no demographic variables were added as covariates in the models analyzed.

The distributions of all variables of interest were examined at each time-point. Because the distributions of some variables were leptokurtic and skewed, all models were tested using maximum likelihood estimation with robust standard errors, which adjusts for non-normality. Further, due to the non-normality of the data, the Satorra-Bentler adjusted chi-square was used for nested model testing (Satorra & Bentler, 2001). The kurtosis and skewness of each variable of interest are presented in Table 5.

Model 1 – Maternal Intrusiveness, Infant Negative Affect, and Toddler Internalizing Problems

A cross-lagged path analysis was conducted in Mplus 6.0 to investigate the bidirectional effects of early maternal intrusiveness and infant negative affect and whether they predict toddler's internalizing problems. The dependent variables included maternal intrusiveness and infant negative affect at 18 and 24 weeks postnatally, and

toddler internalizing problems at 52 weeks postnatally. The predictor variables were maternal intrusiveness and infant negative affect from the previous time-point (e.g., maternal intrusiveness and infant negative affect at 12 weeks postnatally predicted 18 week maternal intrusiveness and infant negative affect). All coefficients presented are standardized beta coefficients.

The full cross-lagged path model is shown in Figure 2. The Chi-square goodness of fit index indicated that the model fit the data well: $\chi^2(10) = 15.191, p = .13$. Maternal intrusiveness did not show stability between 12 and 18 weeks, but showed significant stability between 18 and 24 weeks ($\beta = .318, p < .05$). Stability coefficients for infant negative affect were non-significant throughout. In the model, the cross-lagged effect from infant negative affect at 12 weeks to maternal intrusiveness at 18 weeks was significant ($\beta = .440, p < .05$). Hence, more negative affect at 12 weeks predicted higher maternal intrusiveness at 18 weeks. The cross-lagged effect from infant negative affect at 18 weeks to maternal intrusiveness at 24 weeks was non-significant. In contrast, the cross-lagged effect from maternal intrusiveness at 12 weeks to infant negative affect at 18 weeks was not significant, but the effect from maternal intrusiveness at 18 weeks to infant negative affect at 24 weeks was significant ($\beta = .434, p < .05$). Hence, higher levels of maternal intrusiveness at 18 weeks predicted more infant negative affect at 24 weeks.

Since child and mother both significantly influenced each other's behavior, but did so at different time points, there was no evidence that maternal intrusiveness was more strongly related to later infant negative affect than was infant negative affect to later maternal intrusiveness. Further, constraining the model and fixing the paths from infant negative affect to later maternal intrusiveness to zero resulted in a significantly poorer fit

of the model ($\chi^2 (2) = 6.433, p < .05$). However, there was no significant difference in fit of the model when constraining the paths between early maternal intrusiveness to later infant negative affect to zero while keeping the paths from early infant negative affect to later maternal intrusiveness in the model ($\chi^2 (2) = 2.796, p = .25$).

Neither early maternal intrusiveness nor early infant negative affect significantly predicted internalizing problems at 52 weeks. In the absence of such relations, there was no evidence that infant negative affect mediated the influence of early maternal intrusiveness on later childhood internalizing symptoms. Further, the indirect effect of maternal intrusiveness at 18 weeks to child internalizing symptoms at 52 weeks that flowed through infant negative affect at 24 weeks was non-significant ($\beta = -.008, p = .83$).

Model 2 – Maternal Intrusiveness, Infant Positive Affect, and Toddler Internalizing Problems

Just as for Model 1, a cross-lagged path analysis was conducted to investigate the bidirectional effects of early maternal intrusiveness and infant positive affect and whether they predict toddler's internalizing problems. Similar to Model 1, the dependent variables included maternal intrusiveness and infant positive affect at 18 and 24 weeks postnatally, and toddler internalizing problems at 52 weeks postnatally. The predictor variables were maternal intrusiveness and infant positive affect from the previous time-point (e.g., maternal intrusiveness and infant positive affect at 12 weeks predicted 18 week maternal intrusiveness and infant positive affect). Again, all coefficients presented below are standardized beta coefficients.

The proposed model did not fit the data well: $\chi^2 (10) = 17.243, p < .05$; RMSEA=.062; SRMR = .104; CFI = .049. Investigating the local fit indices, it became

evident that a path between infant positive affect at 12 weeks and maternal intrusiveness at 24 weeks would improve the fit of the model (normalized residual = -3.299, Model Modification Index = 7.248). With this path added, the model fit the data well: $\chi^2(9) = 7.668, p = .57$.

The full cross-lagged path model, with the added path between infant positive affect at 12 weeks and maternal intrusiveness at 24 weeks is shown in Figure 3. Again, maternal intrusiveness did not show stability between 12 and 18 weeks, but showed significant stability between 18 and 24 weeks ($\beta = .417, p < .01$). Stability coefficients for infant positive affect were non-significant throughout. In the model, the cross-lagged effect from infant positive affect at 12 weeks to maternal intrusiveness at 18 weeks was not significant. However, the cross-lagged effect from infant positive affect at 18 weeks to maternal intrusiveness at 24 weeks was significant ($\beta = -.296, p < .05$). Hence, more positive affect at 18 weeks predicted lower maternal intrusiveness at 24 weeks. Further, the cross-lagged effect from infant positive affect at 12 weeks to maternal intrusiveness at 24 weeks was also significant, but in the opposite direction ($\beta = .521, p < .001$). Hence, more positive affect at 12 weeks predicted higher maternal intrusiveness at 24 weeks.

Neither of the cross-lagged effects from early maternal intrusiveness to later infant positive affect was significant. Hence, there was no evidence of maternal intrusiveness predicting infant positive affect to a greater degree than infant positive affect predicting later maternal intrusiveness. Additionally, when the model was constrained and the paths from infant positive affect to later maternal intrusiveness were fixed to zero, there was a significantly poorer model fit ($\chi^2(3) = 20.713, p < .001$). However, when the paths from early maternal intrusiveness to later infant positive affect

were fixed to zero, the model fit was not significantly different from the model including both paths from maternal intrusiveness to later infant positive affect and infant positive affect to later maternal intrusiveness ($\chi^2(2) = 2.095, p = .35$).

Neither early maternal intrusiveness nor early infant positive affect significantly predicted child internalizing problems at 52 weeks. Finally, because there was no evidence of a relation between early maternal intrusiveness and/or infant positive affect and later internalizing problems, there was no evidence to support a mediated effect of infant positive affect on the relations between early maternal intrusiveness to early childhood internalizing problems. Further, the indirect effect of maternal intrusiveness at 18 weeks to child internalizing symptoms at 52 weeks that flowed through infant positive affect at 24 weeks was non-significant ($\beta = -.007, p = .72$).

DISCUSSION

Past research has suggested that there are links between maternal intrusiveness, infant affect, and child internalizing problems, although no study to date has investigated the relations between these constructs at multiple time-points in infancy. In an attempt to expand the literature on early parenting, child effects, and emerging psychopathology, the present study examined the potential transactional relations between infant affect and maternal intrusiveness in infancy, and their relations to later child internalizing problems. Findings showed evidence of early transactional relations between maternal intrusiveness and infant negative affect, but only unidirectional influences from infant positive affect to maternal intrusiveness. Further, these early parenting- and child effects showed no linkages to later child internalizing problems.

Transactional Relations between Infant Affect and Maternal Intrusiveness

Maternal intrusiveness and infant affect were expected to influence each other reciprocally over time, but results differed depending on whether infant negative- or positive affect was the primary construct of interest. Infant negative affect and maternal intrusiveness showed partial transactional relations. More infant negative affect expressed early in development was linked to higher levels of later maternal intrusiveness. However, later in development, higher levels of maternal intrusiveness was linked to later infant negative affect, while the reverse relation was no longer found.

The fact that results indicated that maternal intrusiveness was linked to infant negative affect is consistent with previous literature. For example, Ispa et al. (2004) found that maternal intrusiveness expressed when children were 15 months old predicted increases in child negativity 10 months later. This was true for participants with low

socioeconomic status, and across a variety of ethnic backgrounds, including Mexican-American mothers and children. Further, just as the findings from the current study suggested, previous studies have also found influences in the direction from child characteristics to mothers' behaviors. For example, Russel (1997) found that positive characteristics in children 6-7 years old predicted positive parenting, although these relations were only tested cross-sectionally. Also, Rubin et al. (1999) showed that 2-year old children's shy behavior influenced maternal control 2 years later. Nevertheless, to date, few studies have investigated the specific influence of child negativity on maternal intrusiveness over time. One exception was Lee and Bates (1985), who reported that children's difficult temperament assessed at ages 6 and 13 months, defined in large part as frequent crying and fussing, was modestly correlated with maternal intrusiveness at 24 months.

The fact that maternal intrusiveness and infant negative affect did not show reciprocal relations across all time-points in the present study may have several explanations. First, although maternal intrusiveness, and parenting in general, consistently predicts childhood behaviors and symptomatology, the strength of these relations are often modest. For example, while maternal intrusiveness has been linked to both child depression and anxiety, the proportion of variance accounted for by maternal intrusiveness in childhood internalizing problems has been relatively small, ranging from small to medium effect sizes (McLeod, Weisz, & Wood, 2007a; McLeod et al., 2007b). Given that negative affect is also an integral part of internalizing symptomatology, it may not be surprising that maternal intrusiveness failed to predict infant negative affect at some of the time-points assessed. Secondly, there is some evidence that early childhood

negativity does not predict parenting longitudinally (e.g., Dilworth-Bart, Miller, & Hane, 2012), suggesting inconsistencies in whether child negativity is a solid predictor of parenting in general, and maternal intrusiveness in particular. Finally, infant affect in the early postnatal period was unstable in the present study, something that has been found in previous studies as well (e.g., Moore et al., 2001). This may shed some light on the varying pathways that emerged in the current study, as infants' early negative affect may influence the development of mothers' parenting styles. However, once those styles have been developed, maternal intrusiveness may become more stabilized and in turn influence later infant negative affect. The present study provides some evidence of these developmental processes in that stability was low for maternal intrusiveness between 12 and 18 weeks but much more apparent for maternal intrusiveness between 18 and 24 weeks. Further explication of the transactional processes between maternal intrusiveness and child affect awaits more study, with a particular focus on developmentally sensitive periods for child effects.

Unlike the reciprocity found between infant negativity and maternal intrusiveness, the relations between infant positive affect and maternal intrusiveness were unidirectional, but inconsistent. Infant positive affect, both at 12 and 18 weeks, predicted later maternal intrusiveness but in opposite directions depending on the time-point when infant positive affect was assessed. As expected, more infant positive affect at 18 weeks predicted lower maternal intrusiveness at 24 weeks, but the valence of the prediction was switched for the 12 week prediction, confounding expectations and existing conceptual frameworks.

A wealth of previous research supports the notion that infant positive affect

influences parenting. For example, Strathearn et al. (2008) found that mothers responded differently to their own infants smiling than to their own infants neutral or negative affect. The infant's smile elicited a network in the mother's brain to become activated. This brain network may in turn influence parental behaviors in interactions with their infants. While there is evidence of infant positive affect impacting parenting, less is known regarding its effect on maternal intrusiveness in particular. Although speculative, infant positive affect may elicit higher levels of intrusiveness due to the fact that a positive infant appears more engaged and hence may encourage the mother to become even more involved in the interaction. This in turn may potentially lead to intrusive behavior. Alternatively, infant positive affect may influence maternal intrusiveness in that infants' positivity elicits lower levels of maternal intrusiveness because mothers may struggle less to engage positive infants compared to more neutral or negative infants. Related, low infant positivity may elicit higher levels of maternal intrusiveness in attempts to provoke more positive affectivity in the child.

The failure to find links between maternal intrusiveness and later infant positive affect is inconsistent with previous studies that have shown that maternal intrusiveness influences infant affect (e.g., Ispa et al., 2004). However, previous studies have typically not included positive affect, instead focusing almost exclusively on negative affect. The present study is among the first to investigate such positive affect relations more thoroughly. Although directional hypotheses were advanced, the analyses were considered more exploratory in nature. Due to the uncertainties whether maternal intrusiveness ever influences infant positivity, and the fact that the results of the current study show evidence of both positive and negative relations between infant positive affect

and maternal intrusiveness, future studies should continue to investigate the relations between these constructs, and the ways in which infant positive affect may influence maternal intrusiveness differently at different developmental stages.

Another goal of this study was to explore whether the links between maternal intrusiveness and infant affect would be more parent-driven than child driven. The findings suggest that the linkages are more complex than consistently parent-driven. Indeed, infant affect appeared overall to be a stronger predictor of maternal intrusiveness than maternal intrusiveness was of infant affect. It is commonly believed that a mother has more of an agenda in interactions with her child than the child has, and although some research has shown that mothers more influence children's behavior than vice versa, there is evidence that the opposite may be true as well. For example, research shows that child externalizing behavior problems tend to influence later parenting, such as maternal negativity, more than mothers influence child externalizing problems. Such influences also tend to increase with age (Zadeh, Jenkins, & Pepler, 2010; Georgiou & Fanti, 2014). In light of these findings, the results of this study coincide with the studies detailing the connections between child externalizing behavior and parenting. Nevertheless, given that this study focused on the infancy period, it is surprising that mothers did not influence their children to a greater extent than the children affected their mothers' behavior. Finally, this study is the first to empirically assess whether maternal intrusiveness or infant affect influences the other to a greater extent. The somewhat unexpected results suggest that replication is warranted. If this finding is robust across studies, it could aid in the development of early childhood prevention and/or intervention parenting programs by targeting families with excessively negative or fussy children as well as noting that a lack

of infant positive affect may also be problematic, because of its influence on parenting.

Relations between Infant Affect and Maternal Intrusiveness to Toddler

Internalizing Problems

It was hypothesized that higher levels of maternal intrusiveness and greater infant negative affect would be associated with more child internalizing problems and that more infant positive affect would be associated with less internalizing symptoms at 12 months. Findings, however, generally did not support study expectations, although maternal intrusiveness did trend in the expected direction. Few, if any, previous studies have investigated the potential influence of maternal intrusiveness on childhood internalizing problems longitudinally, starting in infancy. Existing literature suggests linkages between maternal intrusiveness and childhood internalizing problems in later development periods. For example, Wood et al. (2003) conducted a meta-analysis investigating studies with child participants between 2 and 20 years of age. The results of this meta-analysis showed that parental control measured observationally was consistently linked to child and adolescent anxiety. Further, Hudson and Rapee (2001) found that over-involvement, which is closely linked to maternal control and intrusiveness, predicted child internalizing problems for children between 7 and 15 years old. However, most of these studies again fail to assess the directionality of the effect of maternal intrusiveness on child internalizing problems. Even though a connection between maternal intrusiveness and internalizing problems has been established, the fact that the present study found only trends may be due to the relatively small effect parenting appears to have on child internalizing problems, especially at this age. More specifically, parenting is thought to account for approximately 8% of the variance in childhood depression, and the effect size

for parental control specifically tends to be small (McLeod et al., 2007b). Further, McLeod et al. (2007a) found that parenting accounts for approximately 4% of the variance in childhood anxiety, although the effect size for parental control tends to be of medium size. Nonetheless, it may be too early for mothers to report on their child's internalizing symptomatology accurately at the child's age of 12 months. As implied in the terminology, internalizing symptomatology represents inner psychological states compared to other more externalized problem behaviors. Hence, it may be difficult for mothers to discern their toddler's internalizing problems, especially before children can verbally express their emotions. That being said, the measure used in this study (BITSEA) transforms the underlying internalizing symptoms into more observable symptoms in order for parents to be able to answer the items accurately. Thus, such interpretations should be made with caution.

Despite the reasons listed above, it may well be that early in development, maternal intrusiveness is not linked to child internalizing problems. Indeed, some previous literature is suggestive in this regard. Rubin et al. (1999) found that in early childhood, while shy behavior predicted maternal control two years later, maternal control did not predict later child shy behavior. Still, the trend apparent in the current study suggests that continued research is warranted.

As with maternal intrusiveness, infant negative affect had no association with later child internalizing problems, contradicting previous research. Studies have found that less crying longitudinally predicts fewer internalizing problems (Moore et al., 2001), that infant negative emotionality is predictive of internalizing problems in preschool (Shaw et al., 1997), and that negative affect at 1 year is linked with childhood depressive

features at 6 years (O'Connor, 2001). Further, heightened neonatal bio-behavioral reactivity and poor regulation has been associated with emotion regulation difficulties in preschool and anxiety in childhood (Bosquet & Egeland, 2006). Therefore, it is surprising that the present study did not replicate the finding that infant negativity is a strong predictor to childhood internalizing symptomatology. However, these relations have not been thoroughly tested in a Hispanic population before. Hence, there might be cultural differences that influence the connections between infant negative affect and internalizing problems. Also, research shows that there are several facets of child negativity, including sadness, anger, and fear, and that these predict internalizing- and externalizing disorders to different extents (Eisenberg et al., 2001). Child negativity was not differentially assessed in this study. Thus, if these sub-facets (sadness, anger, and fear) of negativity had been separated out, some facets (e.g., sadness and fear), may have predicted later child internalizing symptomatology.

Similar to infant negative affect, infant positive affect was not related to child internalizing problems. However, while the relation between infant negative affect and child internalizing disorders has been well established in the literature, the same is not true for positive affect and internalizing symptomatology. On the contrary, some research has found that positive affect is not linked to child internalizing problems. For example, Moore et al. (2001) found that while less infant positive affect longitudinally influenced externalizing symptoms, its effect on internalizing symptomatology was not significant. This finding corroborates the finding in our study. Due to the unexpected results that neither infant positive- nor negative affect appeared to influence later internalizing problems, research focusing on the early infancy period, and on Mexican-American

children is needed in order to fully understand the role of early affective states in the development of internalizing symptomatology in this particular population. Related, future research should investigate whether there are certain developmentally sensitive periods for when early affect is an important indicator of later child psychopathology.

Finally, this study addressed whether infant affect acted as a mediator between maternal intrusiveness and child internalizing problems. However, as no relation between maternal intrusiveness and internalizing symptomatology was found, and because no relation was found between infant affect and internalizing problems either, no mediating process was relevant. As mentioned previously, past studies have found that maternal intrusiveness and infant affect individually predict child internalizing problems (e.g., Moore et al., 2001; McLeod et al., 2007a; McLeod et al., 2007b). However, few, if any, previous investigations have investigated this potential mediation effect.

Study Limitations

Although the present study had many strengths, some limitations also merit discussion. First, although this study focused solely on maternal intrusiveness, there are other parenting factors that have been shown to play important roles in fostering child development and minimizing the risk of developing childhood psychopathology. Further, these other parenting factors have shown to be somewhat related to maternal intrusiveness. Taken to the extreme, some studies even operationally define intrusiveness and sensitivity as opposites of a continuum (e.g., Braungart-Rieker, Garwood, Powers, & Notaro, 1998). Nevertheless, in our sample, maternal intrusiveness, although significantly related to maternal sensitivity, hostility, and structuring, was the one construct indicating

the most unique variance, compared with the other parenting constructs assessed.

A second limitation of the present study was that internalizing symptoms were infrequently reported by mothers when children were 12 months old. It may be that parents have difficulties identifying internalizing problems this early in development. Hence, it might have been a more accurate representation of the effect of maternal intrusiveness and early infant affective states on children's psychological wellbeing to investigate their effects on overall psychological problems when children are as young as 12 months. This is particularly true due to the fact that the internal consistency of the internalizing problems subscale used in this study was slightly low.

Finally, maternal intrusiveness may be more adaptive in certain situations than in others. In this study, maternal intrusiveness was assessed during a Teaching task. It may be that maternal intrusion is more adaptive, or less harmful, in these situations than if a mother is intrusive in more general situations. Hence, future studies should investigate the effect of maternal intrusiveness shown in more general situations on child outcomes. If a mother shows high levels of intrusiveness even in more open-ended tasks, and not only when given clear instructions on a specific task that she should carry out with the infant, that may be more indicative of later childhood problem behaviors.

Summary and Conclusions

Findings from this study highlight the importance of testing direction of effect in parent-infant relationships, and contribute to our understanding of early parent-infant processes and their influence on later functioning by testing reciprocal relations between maternal intrusiveness and infant affect across early infancy, in a low income Mexican-American sample. As these early interactions failed to influence internalizing problems at

12 months, future studies should explore their relations to internalizing symptomatology later in development to examine whether the associations among maternal intrusiveness and infant affect on internalizing problems emerge later. This is particularly important as internalizing problems become more pronounced and prevalent later in development. Because infant affect and maternal intrusiveness only influenced each other at some time-points and not others, future studies should also investigate potential sensitive periods when child effects on parenting are more influential, and when parenting effects on child outcomes are greater. A third area for future research is to evaluate the effect of maternal intrusiveness in conjunction with other potentially important parenting factors influencing infant affect and internalizing symptomatology. Finally, relations among parent and infant factors require explication in more diverse samples, including different socio-economic statuses and ethnic backgrounds.

The results of the present study have implications for early infant parenting intervention programs. The fact that a bidirectional relationship between maternal intrusiveness and infant negative affect emerged highlights the opportunity to target both these behaviors in intervention programs. For example, interventions may focus on teaching parents ways to interact with their infants in less intrusive manners, as well as target other factors that have been found to influence infant negative affect which in turn also may reduce maternal intrusiveness.

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Figure 1. Conceptual Model

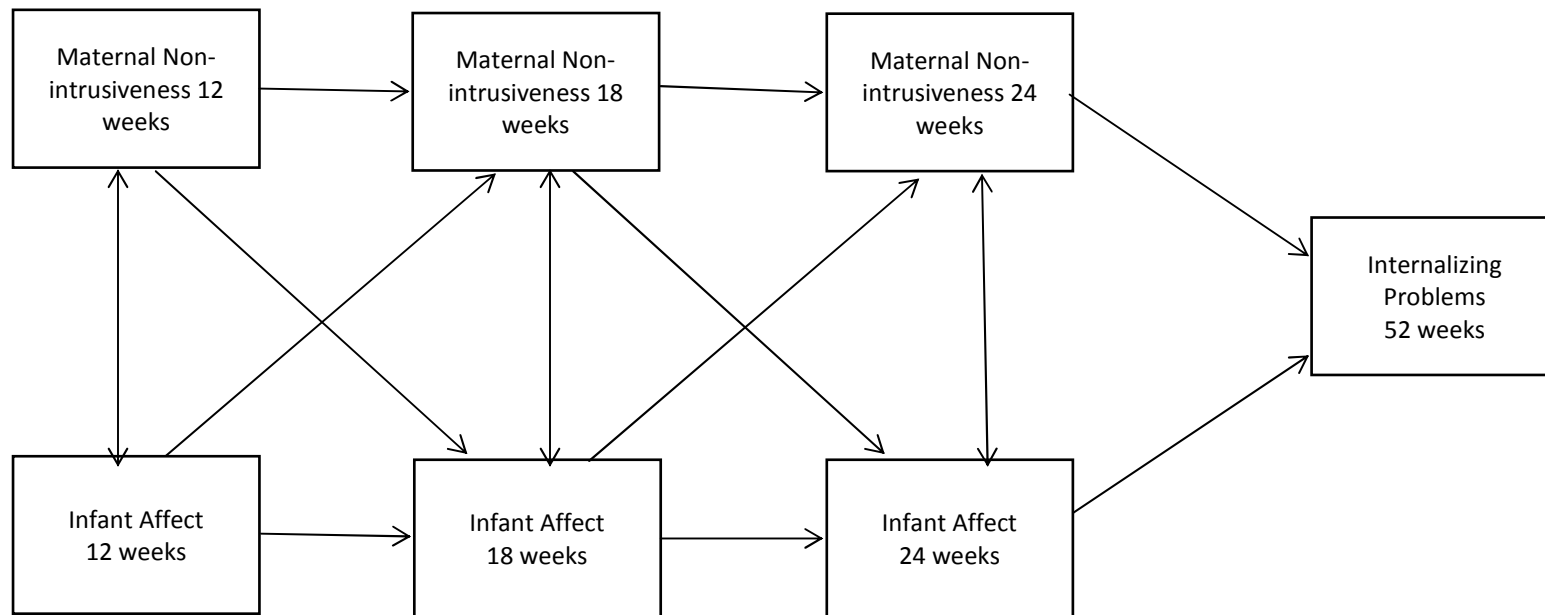


Table 1

Brief Infant Toddler Social-Emotional Assessment (BITSEA) Items

Internalizing Items

- Seems nervous, tense or fearful
- Is afraid of certain places, animals or things
- Has less fun than other children
- Cries or hangs onto you when you try to leave
- Worries a lot or is very serious
- Seems very unhappy, sad, depressed, or withdrawn
- Does not make eye contact
- Avoids physical contact

Table 2

<i>Study Variables</i>	<i>N</i>
Maternal Intrusiveness (12 weeks)	81
Maternal Intrusiveness (18 weeks)	73
Maternal Intrusiveness (24 weeks)	68
Proportion Infant Positive Affect (12 weeks)	188
Proportion Infant Positive Affect (18 weeks)	100
Proportion Infant Positive Affect (24 weeks)	101
Proportion Infant Negative Affect (12 weeks)	188
Proportion Infant Negative Affect (18 weeks)	100
Proportion Infant Negative Affect (24 weeks)	101
Child Internalizing Problems (52 weeks)	187

Table 3

Demographic and Descriptive Characteristics

Mother's age (Mean, SD)	27.8 (6.5)
Country of Origin	
% United States	13.6%
% Mexico	86.1%
Preferred Language (% Spanish)	82.1%
Marital Status (% Married or Living Together)	77.5%
Mother's years of education (Mean, SD)	10.2 (3.2)
Median annual income	\$10,001 - 15,000
years in the U.S. if born elsewhere (Mean, SD)	11.9 (6.0)
Work Status (% Working outside home)	16.3%
<i>Key Study Variables</i>	
	<i>M (SD)</i>
Maternal Intrusiveness (12 weeks)	4.5 (1.1)
Maternal Intrusiveness (18 weeks)	4.0 (1.0)
Maternal Intrusiveness (24 weeks)	4.1 (.9)
Proportion Infant Positive Affect (12 weeks)	.07 (.1)
Proportion Infant Positive Affect (18 weeks)	.04 (.1)
Proportion Infant Positive Affect (24 weeks)	.07 (.1)
Proportion Infant Negative Affect (12 weeks)	.11 (.2)
Proportion Infant Negative Affect (18 weeks)	.13 (.2)
Proportion Infant Negative Affect (24 weeks)	.11 (.2)
Child Internalizing Problems (52 weeks)	1.7 (1.6)

Table 4

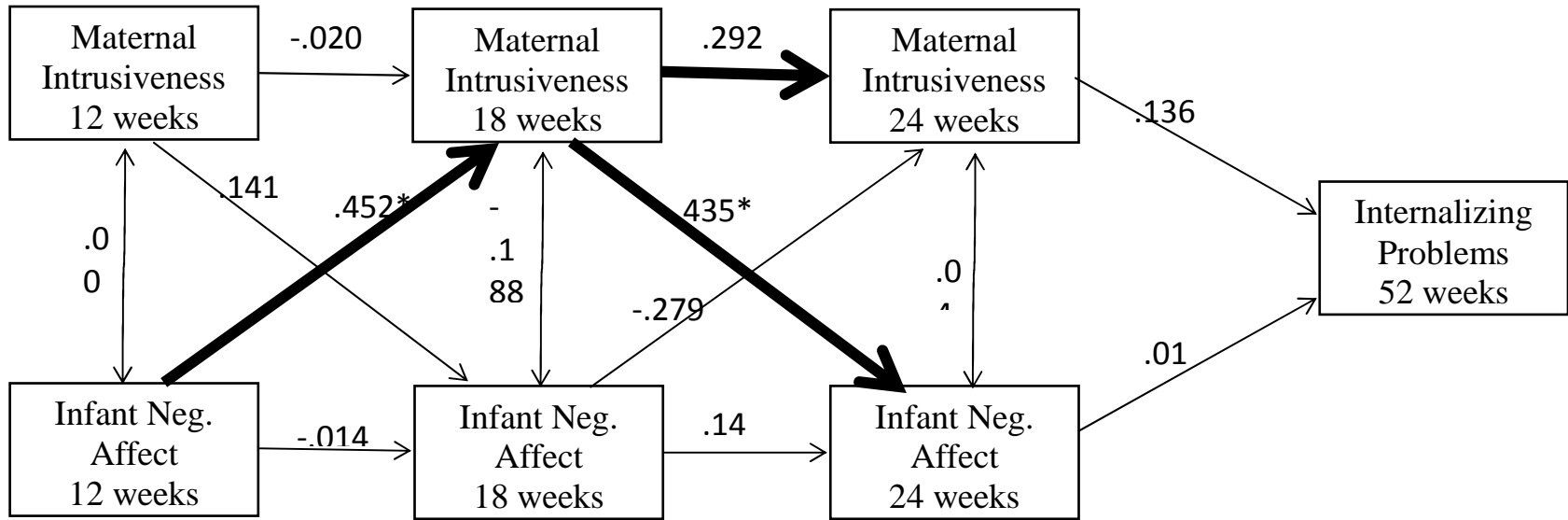
Correlations

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Demographics</i>																		
1. Mother's Age	-	.33	.14	.37	-.15	-.27	.06	.04	-.13	-.02	-.08	.03	-.11	.18	.01	-.07	-.11	.08
2. Country Born (0=US)		-	-	.68	-.15	-.19	-.05	-.04	-.16	.14	-.05	-.17	-.20	.07	.05	-.01	-.16	.03
3. Years in US			-	-.24	-.14	-.04	-.01	.06	.08	-.04	-.13	.07	-.16	.08	-.01	.12	-.11	-.08
4. Preferred Language (0=English)				-	-.17	-.23	-.10	.10	.18	-.04	-.04	-.09	-.20	.13	.04	-.03	-.05	-.02
5. Marital Status (0=Married or Living together)					-	-.01	-.18	.14	.13	-.05	-.05	-.06	-.01	-.06	.09	.05	.06	.05
6. Mother's Education						-	.25	-.17	-.03	.01	.11	-.05	.05	.09	-.03	.13	.11	.01
7. Family's Annual Income							-	.18	-.07	-.21	.11	.02	-.13	-.01	-.06	-.08	.02	-.05
8. Mother's Work (0=No work)								-	.14	-.06	-.11	-.14	-.15	.15	.04	.08	-.08	-.03
<i>Key Study Variables</i>																		
9. Maternal Intrusiveness T1									-	-.11	-.19	.09	.01	.13	-.00	.18	.08	.05
10. Maternal Intrusiveness T2										-	.29	-.14	-.11	-.13	.21	-.18	.03	.00
11. Maternal Intrusiveness T3											-	.44	-.19	-.22	.13	-.25	.13	.16
12. Infant Positive Affect T1												-	.22	-.15	-.18	-.06	.05	.01
13. Infant Positive Affect T2													-	.00	-.07	-.19	-.04	-.07
14. Infant Positive Affect T3														-	.00	.04	-.17	-.03
15. Infant Negative Affect T1															-	-.04	.40	.30
16. Infant Negative Affect T2																-	.11	.01
17. Infant Negative Affect T3																	-	.14
18. Internalizing Problems T4																		-

Table 5
Descriptive Statistics – Normality Assessment

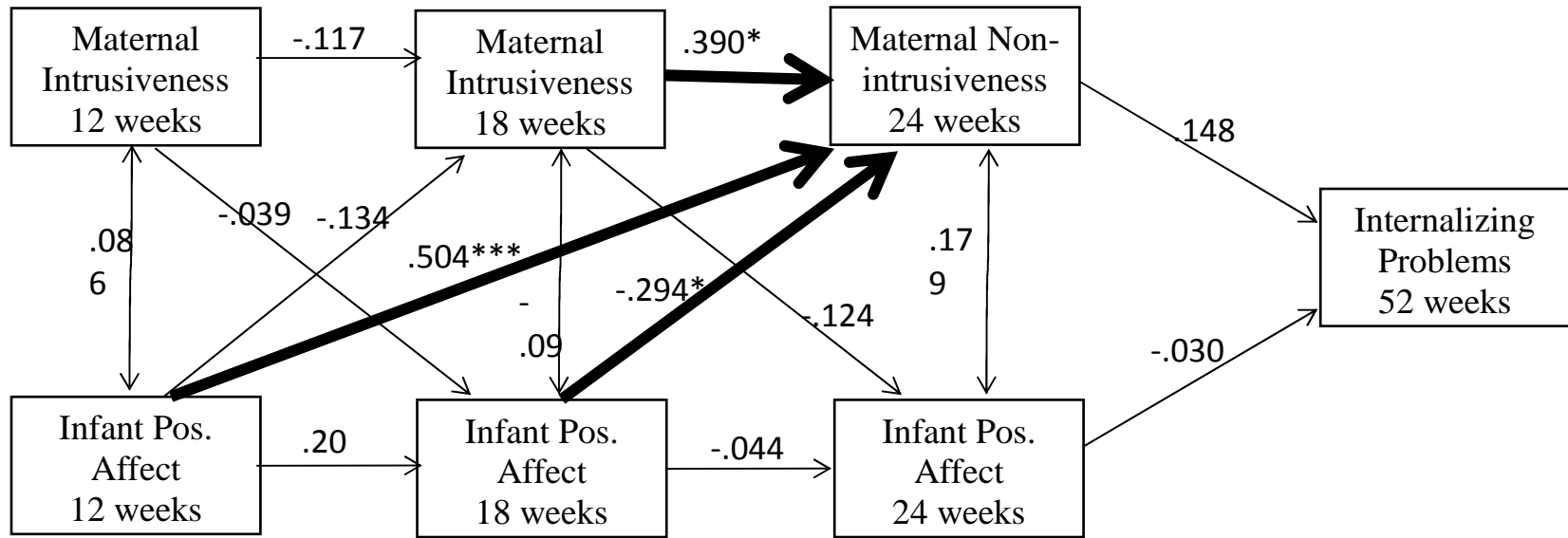
Key Study Variables	Skewness Statistic (S.E.)	Kurtosis Statistic (S.E.)
Maternal Intrusiveness (12 weeks)	-.26 (.3)	.48 (.5)
Maternal Intrusiveness (18 weeks)	-.25 (.3)	.56 (.6)
Maternal Intrusiveness (24 weeks)	-.08 (.3)	.14 (.6)
Proportion Infant Positive Affect (12 weeks)	2.57 (.2)	6.54 (.4)
Proportion Infant Positive Affect (18 weeks)	3.67 (.2)	17.18 (.5)
Proportion Infant Positive Affect (24 weeks)	1.87 (.3)	2.64 (.5)
Proportion Infant Negative Affect (12 weeks)	2.77 (.2)	8.67 (.4)
Proportion Infant Negative Affect (18 weeks)	1.85 (.2)	2.89 (.5)
Proportion Infant Negative Affect (24 weeks)	2.23 (.2)	4.85 (.5)
Child Internalizing Problems (52 weeks)	2.23 (.2)	9.18 (.4)

Figure 2. Model 1 Results



†	p < .10
*	p < .05
**	p < .01
***	p < .001

Figure 3. Model 2 Results



†	p < .10
*	p < .05
**	p < .01
***	p < .001