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Maternal Sensitivity and Language in Infancy Each Promotes Child Core Language Skill in Preschool

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Abstract

Supporting language skills in the early years is important because children who begin school with stronger language skills continue to perform well later in their language as well as academic and socioemotional growth. This three-wave longitudinal study of 50 mother-infant dyads reveals that maternal sensitivity and maternal language at 5 months each uniquely predicts child language at 49 months, controlling for age, education, and maternal verbal IQ as well as maternal supportive presence at 49 months. These findings reinforce the importance of maternal sensitivity and maternal language in infancy for child language development and specify that early maternal sensitivity and language, apart from maternal age, education, and IQ as well as later sensitivity, contribute to child language development.

Keywords

maternal sensitivity; maternal language; maternal age; maternal IQ; child language

Children who begin school with stronger language skills continue to perform better than their peers throughout their formal education (Dickinson, Golinkoff, & Hirsh-Pasek, 2010; Duncan et al., 2007). For example, stronger oral language and code-related skills in pre-kindergarten predict stronger language and literacy development (Walker, Greenwood, Hart, & Carta, 1994) as well as reading comprehension ability (Chiu, 2018). Reciprocally, early language deficits play a role in poor later behavioral adjustment (Bornstein, Hahn, & Suwalsky, 2013; Chow, Ekholm, & Coleman, 2018). These findings attest to the importance of supporting early language development in children. Children grow in their language

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abilities over the first years of life, but there is substantial individual variation in the amount and rate of their growth in acquiring language (Bates, Dale, & Thal, 1995). This variation is, in part, attributable to differences in environmental supports of language development (Gathercole & Hoff, 2007). In early childhood, much of children's environmental exposure to language occurs through interactions with responsive caregivers (Tamis-LeMonda & Bornstein, 2002; Tamis-LeMonda, Bornstein, & Baumwell, 2001). As children learn language in the context of verbal and social interactions, it is important to ask about the unique contributions to language development of early and concurrent experiences of both kinds. This study was designed to address that question.

The "intentionality model" of language development asserts that children achieve language through interpersonal interactions (Bloom & Tinker, 2001); that is, language acquisition is a collaborative process (Tamis-LeMonda & Bornstein, 2015). According to this model, language development follows the child's agenda, and language-learning scenarios are co-constructed with children's personal experiences of language (Bloom & Tinker, 2011; see also Huttenlocher et al., 1991). After all, one hundred percent of children's vocabulary is learned through exposure to the ambient target language.

Early social experiences constitute a complementary source of language acquisition. One social characteristic of interaction which has been implicated in child language development is parental sensitivity. Sensitivity, operationalized as accurate, prompt, and contingent didactic and affective responses to children's signals, cooperation with the children, accessibility to children, and expressions of positive feelings and emotions toward children, may thus promote children's understanding of the role of language in communication. (Ainsworth, Bell, & Stayton, 1974; Bornstein, 1989; Bornstein, Tamis-LeMonda, Hahn, & Haynes, 2008; Nicely, Tamis-LeMonda, & Bornstein 1999). Notably, parental sensitivity or responsiveness has been shown to promote children's communication skills as early as the first year of life. For example, when mothers were instructed to respond to their infant's babbling, the phonological structure of infants' babbling mirrored mothers' input (Goldstein & Schwade, 2008). A host of studies has documented the relatively short-term positive effects of parental sensitivity for child language acquisition over the second and third years of life as well (Leigh, Nievar, & Nathans, 2011; Paavola et al., 2006; Tamis-LeMonda, Bornstein, & Baumwell, 2001). Three analyses of the NICHD Study of Early Childcare and Youth Development indicate that sensitivity of both mothers and nonfamilial caregivers early in the child's life relates to children's language achievements at the start of formal schooling (Belsky & Pasco Fearon, 2002; Hirsch-Pasek & Birchinal, 2006; Leigh et al., 2011). Although the effects of maternal cognitive stimulation on children's vocabulary development increase with age, the effects of sensitivity asymptote at 14 months of age and remain stable onwards (Vallotton, Mastergeorge, Foster, Decker, & Ayoub, 2017). Together, these studies provide evidence for the importance of maternal sensitivity in the early development of children's language.

Researchers vary in their hypotheses regarding processes that might underlie associations between maternal sensitivity and child language development. For example, some suggest that parental responsiveness facilitates children's understanding of language as a tool to share intentions (Tamis-LeMonda, Kuchirko, & Song, 2014). This suggestion accords with the intentionality model of language development, as it posits that children's language development is fueled by their understanding of language as a means to communicate their intentions (Bloom & Tinker, 2001). Furthermore, findings reported by Paavola and colleagues (2006) support this association, revealing that maternal sensitivity at 10 months is linked to children's intentional communication at 12 months.

There are conceivably several other potential pathways to consider in explicating the relation between maternal sensitivity and child language development, most saliently a pathway that relies on attachment as a mediator. Maternal sensitivity has long been linked to secure attachment (e.g., De Wolff & Van IJzendoorn, 1997; Meins, Fernyhough, Fradley & Tuckey, 2001; Pederson, Moran, Sitko, Campbell, Ghesquire & Acton, 1990) and secure attachment in turn to language development (e.g., van IJzendoorn, Dijkstra & Bus, 1995; Murray & Yingling, 2000). It makes sense that children who are secure in their belief that the world around them, and those caring for them, are reliably responsive would be more inclined to regularly engage in intentional communication, knowing that their intentions will likely be heard and responded to.

That said, the literature is equivocal on whether and how child language development is differentially impacted by maternal sensitivity, verbal input, age, education, and intelligence as well as how early and how far into development each may be effective. The present study examines how maternal sensitivity and maternal language in early infancy predict child language in preschool, controlling maternal age, education, verbal intelligence, and later concurrent maternal sensitivity.

Methods

Participants

The sample consisted of 50 European American mother-child dyads (50% mothers and daughters). Mothers were recruited via mailing lists of births in the Washington, DC, metropolitan area, including the suburbs of Maryland, Virginia, and West Virginia, with a letter describing the study and an invitation to contact the researchers if interested in learning more. Infants weighed 3467.45 g (SD = 444.66) at birth, and 98.0% were term (the one non-term infant was healthy and not an outlier on any measure and was therefore retained in the sample). Children averaged 5.38 months (SD = .23, n = 50) at the first observation, 20.10 months (SD = .28, n = 37) at the second observation, and 49.10 months (SD = 1.11, n = 29) at the third observation.

Mothers averaged 27.48 years of age (SD = 6.92) at the first observation and varied in educational achievement (18% had not completed high school, 16% completed high school, 20% partially completed college, 26% completed college or university, and 20% completed university graduate programs). At the first observation, 86% of mothers were married. Mothers and children lived in families that varied in socioeconomic status across a broad range (SES; Hollingshead, 1975; M = 48.39, SD = 13.93, range = 19–66). The sample was socioeconomically diverse, but ethnically homogenous, to enable examination of maternal sensitivity's relations with child language eschewing ethnicity as a confounding or moderating variable (Bornstein, Jager, & Putnick, 2013; Jager, Putnick, & Bornstein, 2017).

That is, an ethnically homogenous sample was chosen as a first step in understanding the association between maternal sensitivity and language with child language before embarking on more complex studies and analyses with ethnically diverse samples because parenting and child development are known to vary with ethnicity (Bornstein, 2015; Murry, Hill, Witherspoon, Berkel, & Bartz, 2015). Family recruitment and the conduct of this research were approved by the NICHD IRB under Protocol #:88-CH-0032, Specificity of Mother-Infant Interaction: The Influence of Maternal Age, Employment Status, and Parenthood Status.

Procedures

Mothers first completed a demographic questionnaire about the infant, mother, and family. At 5 months, each mother-infant dyad was visited in the home by a single female filmer to videorecord naturalistic mother and infant behavior. Before recording began, mothers reviewed and signed informed consents. The filmer stated that she was interested in the infant's usual activities and asked mothers to carry on as they normally would. The filmer refrained from making eye contact with or interacting with the mother and the infant. After a period of acclimation to the recording equipment and the presence of the observer, recording commenced. A total of one hour of interaction was recorded. At 20 months, mothers were administered a test of verbal intelligence. At 49 months, mothers completed a questionnaire assessing demographic information and were recorded while completing three tasks with their children: a joint picture book, a challenging puzzle, and a drawing of their home. Children were administered a standardized intelligence test, and a language sample was collected from a storytelling task (Bornstein & Putnick, 2019). Approximately 1 month after the 49-month visit, mothers were interviewed by telephone about their children's adaptive communication behaviors.

Measures

5-month mother sensitivity.—To obtain a stable estimate of maternal sensitivity, we used two measures: the Ainsworth Maternal Sensitivity Scales (AMSS; Ainsworth, 1969) and the Maternal Behaviour Q-Sort (MBQS; Moran, Pederson & Bento, 2009). The first 20 min of the mother-infant naturalistic interaction at 5 months were coded with the AMSS and MBQS independently.

The AMSS consist of four subscales, each rated from 1 to 9. The Sensitivity to the infant's signals scale assesses the caregiver's capacity to be aware of, to interpret, and to respond to the infant's signals appropriately and promptly. The Cooperation with infant's ongoing behavior scale assesses the caregiver's degree and frequency of physical cooperation (and lack of interference) with the infant's activity. The physical and psychological Availability scale assesses the caregiver's accessibility in terms of responsiveness to the infant. The Acceptance of the infant's needs scale assesses the caregiver's balance of positive and negative feelings about the infant. Coder reliability, assessed by Intraclass Correlation Coefficients (*ICC*s), was computed on 20% of the interactions and ranged from .92 to .94. The four Ainsworth subscales were highly correlated and were therefore averaged to create a total scale, α = .95.

The Mini MBQS-VR is a short form of the original 90-item MBQS card set, consisting of 25 items (Tarabulsy et al., 2008). The Mini MBQS-VR focuses on specific sensitive caregiver behaviors in relation to the infant, including Monitors the baby's activities during visit, Speaks to the baby directly, and Praises the baby. The items are *sorted* into five groups, with five items per group. Items are designated as *most like* (+2), *like* (+1), neutral (0), *unlike* (−1), or *most unlike* (−2) the behaviors observed in the caregiver. The total score obtained for a given caregiver is then correlated with the developers' criterion sort for the prototypically sensitive caregiver, generating a global sensitivity score. Scores vary from −1.0 (*least like the prototypically sensitive caregiver)* to 1.0 (*most like the prototypically sensitive caregiver*). Coder ICC, computed on 22% of the interactions, was .98.

5-month mother language.—Mother's speech to infant was coded sec-by-sec in real time from the first 50 min of interaction on the videorecords. Continuous and comprehensive real-time observational procedures provide measures of behavioral frequency and duration from the uninterrupted natural interaction. Mother's speech to infant was computed as the mean *z*-score ($M = 0$, $SD = 1$) of the number of times (frequency) and total duration the mother spoke to her infant. Coder reliability (*kappa)* for agreement on each sec of interaction, based on 25% of double-coded interactions, was $k = .69$, 89% agreement.

20-month mother verbal intelligence.—Mothers were administered the Peabody Picture Vocabulary Test-Revised (PPVT-R Form L; Dunn & Dunn, 1981) when their children were 20 months old. Up to 175 vocabulary words were presented verbally by a trained administrator, and for each word presented the mother chose one of four pictures to indicate the meaning of the word. Standard scores with a possible range of 40 to 160 ($M = 100$, $SD = 15$) were obtained based on the mother's age. The PPVT-R measures receptive vocabulary and is predictive of intelligence and scholastic achievement. The median split-half reliability coefficient for the standardization sample of 828 adults was .82. The PPVT-R standard score has strong stability over 1 month and alternate forms median $r = .78$.

49-month mother sensitive supportive presence.—Mothers and their children were invited to sit together in a large comfortable chair or on chairs at a low table and asked to "read" a picture book entitled *Good Dog, Carl* (Day, 1996) together as they would normally do. This picture book has no written text except for single sentences on the first and last pages. Immediately following the book reading task, mothers and children were asked to sit at a low table together and were given a challenging 20-piece picture puzzle. The researcher made sure that the child saw and understood the picture on the puzzle, disassembled it while the child watched, and instructed the child to put it back together again. The mother was told to help the child however she thought best. Immediately following the picture puzzle task, mothers and children, still seated at the low table, were given a piece of drawing paper and colored markers. The child was asked to draw a picture of his/her house, and the mother was told to help the child however she thought best.

Videorecords of the three mother-child tasks were coded using the Teaching Tasks Scales (Egeland et al., 1995). Maternal Supportive Presence ranges from 1 to 7 and measures maternal involvement and acting as a secure base for the child, concepts similar to maternal sensitivity. A single score was assigned based on interaction across all three tasks. Coders reached reliability with a coder trained by the authors of the system, and *ICC*s ranged from .86 to .94. All interactions were double-coded (*ICC*s = .69–.85), and scores within 1 point were averaged; discrepant scores were coded by consensus to achieve agreement.

49-month child language.—To obtain a stable estimate of child language, we used three measures from distinct sources: a standardized test, an observed measure, and a maternal report.

The Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R; Wechsler, 1989) is a standardized test of intelligence in children from 3 years to 6.5 years. Three Verbal subtests – Information, Arithmetic, and Similarities – were chosen to be administered on the basis of their contents and correlations with Verbal IQ scores. The prorated Verbal IQ scale was used.

To collect an observed measure of child language, children were asked to “tell a story about a bear family – a story with a beginning, a middle, and an end.” An administrator introduced and verbally labeled a group of props in a consistent order (bear family, living room, kitchen, park with rabbit and duck, and policeman and doctor). The props were arranged in a standard configuration on a table, within easy reach of the child to aid storytelling. If children did not produce a story, the administrator used three standard prompts to elicit a story. The child’s verbalizations were transcribed verbatim by professional transcribers naïve to all factors in the study. Each transcript was then checked for accuracy against the videorecord by two different independent coders. Utterances that were unintelligible to transcribers or whose contents transcribers could not agree on were marked. Following the conventions of the Codes for the Human Analysis of Transcripts (CHAT), transcripts were then coded using the MOR and POST procedures within the Computerized Language Analysis (CLAN) program (MacWhinney, 2000). Mean length of utterance (MLU) based on a count of morphemes in the child’s complete and intelligible utterances was used to index speech complexity.

The Vineland Adaptive Behavior Scales – Interview Edition, Survey Form (VABS; Sparrow et al., 1984) were used to obtain mothers’ estimates of their children’s receptive, expressive, and written communication skills. The VABS interview focuses on children’s overt and concrete behaviors and developmental milestones that are obvious and that parents are likely to notice. Mothers indicate whether each behavior is performed 2 *yes, usually*, 1 *sometimes or partially*, or 0 *no, never*. Validity of the VABS is well supported. Sparrow and Cichetti (1978) reported very high correlations between primary caregivers’ estimates of children’s adaptive behavior and independent assessments of those behaviors. Test-retest reliability of the overall Communication Domain used in this study was .86 for 74 children between 36 and 59 months of age (Sparrow et al., 1984).

Power Analysis

To determine whether we had adequate power to detect a medium or large effect, we computed a power analysis using G*Power 3.1.9.2 (Faul, Erdfelder, Lang, & Buchner, 2007). The planned structural equation model is similar to a multiple linear regression with 4 predictors (maternal sensitivity and maternal language at 5 months and 49 months) and child language as the dependent variable. For a medium effect size ($f^2 = .15$), $N = 50$, and $\alpha = .05$, the power estimate was .76, and for a large effect size ($f^2 = .30$) the power estimate was .97, suggesting moderate power to detect a medium effect and strong power to detect a large effect.

Results

Preliminary Analyses and Analytic Plan

First, we examined all variables for outliers and deviations from univariate normality. Standard transformations were applied as needed for variables to approximate normal distributions. We considered maternal age and education as potential covariates, but they were highly correlated, $r(48) = .74$, $p < .001$, and maternal age had stronger relations with maternal sensitivity and language, so to be conservative we chose maternal age as the covariate. Next, we used M*plus* version 8.0 (Muthén & Muthén, 2017) to model the effects of maternal sensitivity and language at 5 months on child language at 49 months, controlling maternal verbal IQ at 20 months and maternal sensitive supportive presence at 49 months. The AMSS and MBQS at 5 months were modeled as a latent variable indicating maternal sensitivity because they were highly correlated, $r(48) = .95$, $p < .001$. Similarly, the three measures of child language at 49 months were correlated, *r*s(27) = .29 to .61, *p*s = .128 to .001, and were modeled as a latent variable. Next, we added maternal age to the model as a control on all variables to determine whether effects would remain significant. A model was considered to have good fit if the χ^2 test was nonsignificant ($p > .05$) and the CFI was .95 or higher (Marsh, Balla, & Hau, 1996). In all models, missing data (19% of data points, missing completely at random, Little's MCAR $\chi^2(72) = 79.19$, $p = .263$) were handled using full information maximum likelihood (FIML; Arbuckle, 1996) within M*plus*.

Maternal Sensitivity and Language and Child Language

Estimated means and their standard errors, and the estimated correlation matrix based on FIML data, are presented in Table 1. Figure 1 presents the standardized model of maternal sensitivity and language at 5 months on child language at 49 months, controlling maternal verbal IQ at 20 months and maternal sensitive supportive presence at 49 months. Model fit was good, $\chi^2(13) = 19.16$, $p = .118$, CFI = .96. Although correlated, maternal sensitivity and language at 5 months each uniquely predicted child language at 49 months.

Maternal Sensitivity and Language and Child Language, Controlling Maternal Age

Because maternal age was associated with maternal sensitivity and maternal language at 5 months and maternal supportive presence at 49 months (Table 1), we added maternal age to the model as an exogenous variable with relations to all constructs. This model (Figure 2) fit the data, $\chi^2(16) = 25.20$, $p = .066$, CFI = .95, and the effects of maternal sensitivity and language at 5 months on child language at 49 months remained significant separate and apart from maternal age (and by proxy education).

Discussion

Our strong and conservative methodological approach to the prediction of child language yielded several noteworthy results. Two independent measures of maternal sensitivity, the AMSS and MBQS, formed a latent variable of maternal sensitivity at 5 months. Three measures of child language, including tested verbal IQ, spontaneous speech, and reported communication abilities, formed a latent variable of child core language skill at 49 months. The three-wave longitudinal analysis then revealed that (the latent variable of) maternal sensitivity and maternal language at 5 months uniquely and independently predicted (the latent variable of) child language at 49 months. Finally, in controlled analyses, maternal sensitivity and maternal language in infancy uniquely and independently predicted child language in preschool separate and apart from maternal age (and by proxy education) and later maternal sensitivity. In essence mothers' sensitive behaviors with and language to their young infants reverberated 4 years later in their children's core language skill separate and apart from mothers' sociodemographics, verbal intelligence, and concurrent supportive parenting. These findings reinforce the relation of early maternal language to child language, underscore the importance of maternal sensitivity for child language, and help to elucidate how maternal sensitivity, language, age, education, and IQ each contributes to child language development.

The robustness of sensitivity as a predictor of child language is in evidence in its predictive validity. Maternal sensitivity clearly facilitates child language development and is important if only because language skills that develop early in life have implications for later language and literacy development (Walker et al., 1994) as well as behavioral adjustment (Bornstein et al., 2013). However, the reach of sensitivity is not uniform and the construct may be dynamic in effectiveness. Early maternal sensitivity may be a better predictor of later child language than concurrent child language (Leigh et al., 2011): Maternal sensitivity at 9 months is a stronger predictor of 13-month language than concurrent 9-month language (Baumwell et al., 1997). Children's expressive language outcomes also appear to improve when mothers increase in sensitivity between 6 months and 54 months (Hirsh-Pasek & Burchinal, 2006).

Strengths and Limitations

This study contributes to the developmental and language literatures in a number of novel ways. First, the study started earlier (around 5 months) and ended later (around 4 years) than most previous studies (e.g., Nozadi et al., 2013). At 5 months of age, infants are in a relatively stable period of development, marked by intentionality and flexibility in behavioural organization (Bornstein, Arterberry, & Lamb, 2014). They are alert for extended periods of time, are becoming regulated in their emotions, increasingly initiate interactions using directed social behaviors like gaze, actively participate in reciprocal exchanges, and actively explore their environment visually and tactually. Notably, the study began in this period of primary subjectivity when rudimentary turn taking is common in mother-infant vocal interaction (Bornstein, Putnick, Cote, Haynes, & Suwalsky, 2015; Trevarthen, 2011). This period also marks an optimal opportunity to explore maternal sensitivity as dyadic interaction begins to take on meaning for the infant (Tamis-LeMonda et al., 2014). The study ended at 49 months of age, when children are typically sophisticated both as individuals and as social partners, possessing the ability to communicate verbally about their thoughts, beliefs, and desires but have not yet experienced the homogenizing influences, intellectual demands, and social rigors of institutional schooling (Bornstein & Putnick, 2019). Thus, we deemed this age period as optimal for assessing and comparing the long-term contributions of maternal sensitivity and maternal language on child language. As a second strength, the study was designed to avoid shared method variance. Here, maternal sensitivity was based on coded observations of maternal parenting practices rather than maternal reports, and core language skill in preschool children was accessed via the convergence of the three main paths to assessing child language, namely, direct assessment, spontaneous observation, and maternal report. Third, maternal sensitivity was evaluated and accounted for at the endline as well as the baseline in the study design. Fourth, analyses took into consideration maternal age, education, and verbal IQ. Fifth, the study sample consisted of participants with a wide range of educational achievement, SES, and age.

That said, the sample was ethnically homogeneous. Rather than combine ethnic groups and possibly cloud the findings relative to any one group, we studied a single ethnic group to have clearer (but more limited) generalizability (Bornstein, Jager, & Putnick, 2013; Jager, Putnick, & Bornstein, 2017). Thus, the implications of this study generalize only to European American mother-child dyads until the findings are replicated in other ethnic groups. This study also focused on maternal sensitivity; however, infants receive sensitivity from multiple caregivers (Mesman, Minter, & Angnged, 2016), and future research might also ascertain the robustness of sensitivity-to-language relations in children's other caregivers. The sample size in this study was also relatively small, and we only had the power to detect medium to large effects. Still, the model was well controlled for maternal age (and education) as well as maternal verbal intelligence and concurrent maternal supportive presence. These controls allowed us to focus on early maternal sensitivity and language input and rule out stability in maternal sensitivity as well as maternal age, education, and IQ as alternative explanations for the sensitivity-to-language predictive findings.

We determined that maternal sensitivity predicted child language, but not how sensitivity works. It could be that caregiver sensitivity promotes confidence and independence in children that in turn promote language learning in children or that sensitive caregivers also engage in joint attention with or attuned responsiveness to their children's affect expressiveness, which are caregiving strategies known to promote child language acquisition (Baldwin, 1995; Nicely et al., 1999). Caregiver sensitivity might also influence child language development by facilitating meaning in social interactions (see Tamis-LeMonda et al., 2014). Toward isolating the effective ingredient(s) in sensitivity, extant research indicates that sensitivity is more effective than stimulation (Vallotton et al., 2017) or attachment status (Belsky & Fearon Pasco, 2002). Future research should attempt to "unpackage" sensitivity to explore which specific aspects of sensitivity (e.g., contingency, joint attention, positive emotion) promote child language. The current study used the Mini MBQS-VR, a coding system to assess maternal sensitivity (i.e., the quality of maternal interactive behavior) by deriving a global score based on 25 specific behavior items (Tarabulsy et al., 2008). It is noteworthy that many items either explicitly involve a verbal quality to the dyadic interaction (e.g., "Speaks to Baby directly", "Repeats words carefully and slowly to Baby as if teaching meaning" or "labelling an activity or object") or imply verbal interactions (e.g., "Responds to Baby's signals") (Moran et al., 2009), which may help to explain predictive relations identified in this study. In essence, verbal interactions may constitute a significant aspect of sensitivity. It will be important for future researchers also to consider other factors, such as child characteristics (i.e., temperament, attention; Dixon & Smith, 2000; Macroy-Higgins & Montemarano, 2016; Pérez-Pereira, Fernández, Resches, & Gómez-Taibo, 2016; Salley, Panneton, & Colombo, 2013) and life circumstances (Hoff & Laursen, 2019), that may interact with sensitivity over the course of language development and lead to different outcomes among children.

Implications

Finally, results of this study may have implications for the development of interventions for infants at risk for language delays or disabilities. If early maternal sensitivity and language have predictive validity for later child language, it is reasonable to examine whether experientially promoting maternal sensitivity and speech in infancy would promote later child language. In support of this point, interventions that target parental sensitivity have been reported to enhance children's language skills (Landry, Smith, Swank, & Guttentag, 2008). For example, Yoder and Warren (2002) tested two treatment options for increasing prelinguistic communication in infancy; the more effective treatment varied depending on the responsiveness of children's mothers. Yoder and Warren's (2002) study involved children with intellectual disabilities aged 22–23 months, but still illustrates how intervening in sensitivity might promote child language development whether in stand-alone parenting education or in interventions that are offered as adjunct to speech and language therapies. These results coupled with our own findings suggest that tailoring interventions to target maternal sensitivity and language earlier in infancy offers the potential to support families with concerns regarding their child's early or future communication abilities.

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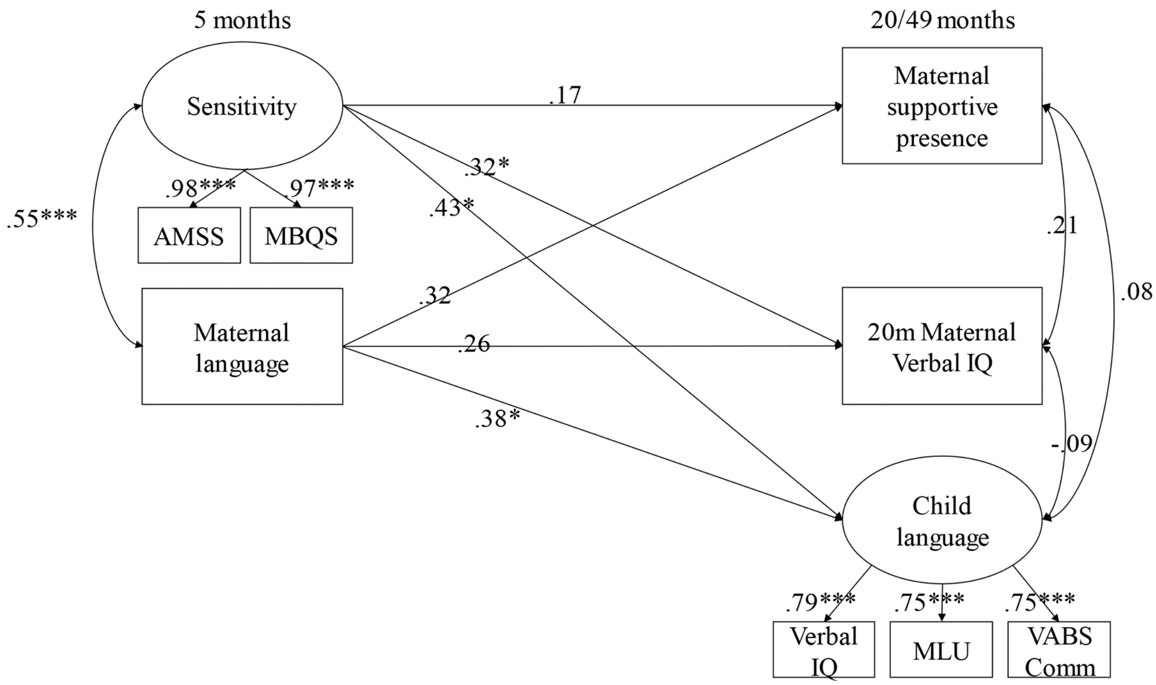

Figure 1.
Model of 5-month sensitivity predicting 49-month child language, controlling stability in maternal sensitivity and language. * $p < .05$. *** $p < .001$.

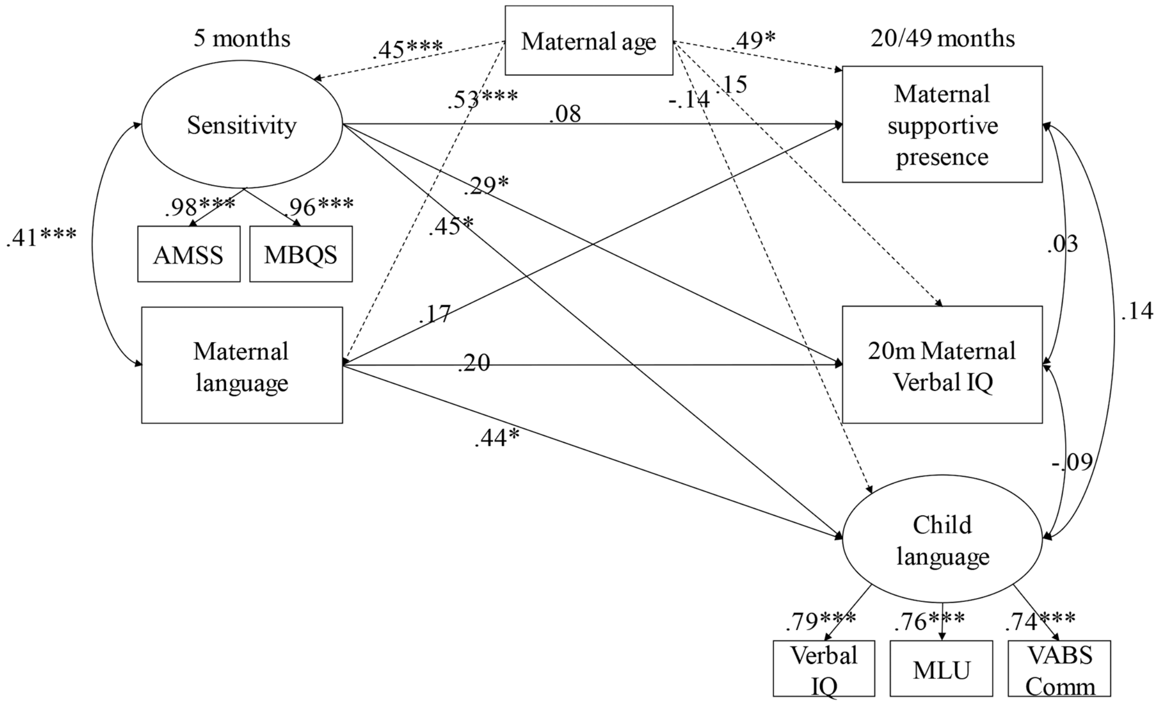

Figure 2.

Model of 5-month sensitivity predicting 49-month child language, controlling stability in maternal sensitivity, language, and age. * $p < .05$. *** $p < .001$.

Table 1

FIML estimated means and standard deviations of the sensitivity and language measures

	M	*SD*
5-month maternal sensitivity latent variable	.00	1.00
AMSS (square root transformed)	1.99	.58
MBQS (square root transformed)	.81	.34
5- month maternal language	−.02	.91
49- month maternal supportive presence	4.67	1.61
20- month maternal language	104.55	20.04
49- month child language latent variable	.00	1.00
Verbal IQ	109.64	18.10
MLU	5.41	1.24
VABS Communication	107.27	9.53
Maternal age	27.48	6.85

Table 2

FIML correlation matrix of the sensitivity and language measures

	1	2	3	4	5
1. 5-month maternal sensitivity latent variable					
2. 5-month maternal language	.55***				
3. 49-month maternal supportive presence	.40**	.48***			
4. 20-month maternal language	.47*	.44†	.32		
5. 49-month child language latent variable	.63***	.61***	.38†	.30	
6. Maternal age	.45***	.53***	.62***	.39	.30†

† $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.