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Family relationships during infancy and later mother and father vocabulary use with young children

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Abstract

Very little previous research has considered the contributions of family relationships and interactions on the language input of mothers and fathers to their young children. This study examined the contributions of marital love and conflict, and broader family-level conflict, cohesion, and expressiveness to mother and father vocabulary in triadic interactions with their young children in 70 dual-earner families. It was found that after controlling for parent sensitivity and parent directive behavior, marital love and family conflict when children were 12 months of age were significant predictors of both father vocabulary and mother vocabulary to children at 24 months of age. In families with higher levels of marital love when children were 12 months of age, mothers and fathers used a more diverse vocabulary with their 24 month-old children. In families with lower levels of family conflict when children were 12 months of age, mothers and fathers used a more diverse vocabulary with their 24 month-old children.

Introduction

The family environment of the home, as measured by the quality of parent/child interactions, parental language, and the provision of stimulating/sensitive caregiving, has been found to be an important proximal predictor of children's development (Bradley, Corwyn, Burchinal, Pipes-McAdoo, & Garcia Coll, 2001; Hoff-Ginsberg, 1991; Pan, Rowe, Singer, & Snow, 2005; Pancsofar & Vernon-Feagans, 2006; Tamis-Lemonda, Shannon, Cabrera, & Lamb, 2004). These studies have generally shown, through observation and questionnaires, that mothers who are more sensitive and engaging to their children during interactions and provide a more stimulating home environment, have children who are more skilled cognitively, linguistically, and socially. Although the mother is critically important in predicting child outcomes, family systems theory (Cox & Paley, 1997; Minuchin, 1985, Pancsofar & Vernon-

Feagans, 2006) postulates that all members within a family influence each other over time, and that these family relationships are especially important in understanding children's development. This framework argues for the measurement of specific family processes that include the entire family, including in many families, the mother, father, and child.

Recent evidence suggests that parental language input, in particular, from both mothers and fathers may be important for children's later language development, in terms of more complex child language and vocabulary (Bornstein, Haynes, & Painter, 1998; Hart & Risley, 1995; Hoff, 2003; Hoff-Ginsberg, 1991; Pan et al., 2005; Pancsofar & Vernon-Feagans, 2006; Weizman & Snow, 2001). However, there is little research that examines the predictors of high quality language input to children beyond SES. The purpose of this study is to investigate what family process variables, including the mother-father relationship and mother/father/child interactions in early childhood, predict later parental language input.

Parental Language Input

Most studies of parental language input have focused exclusively on mothers. The characteristics of mothers' talk to children have been well documented. Many studies have reported that mothers modify their speech to their young children in ways that support their early language learning through, for example, simplified language that is less complex grammatically, more redundant, and with a higher pitch and exaggerated intonation pattern (Fernald, 1989; Kavanaugh & Jirkovsky, 1982; Kitamura & Burnham, 2003; McRoberts & Best, 1997; Rondal, 1980; Snow, 1977). Numerous studies have found that the diversity of maternal vocabulary may be particularly important in predicting children's later language development and literacy (Bornstein et al., 1998; Hart & Risley, 1995; Hoff-Ginsberg, 1991; Hoff, 2003; Pan et al., 2005; Weizman & Snow, 2001).

While many studies have found that characteristics of maternal language input are related to child language, there is very limited research looking at predictors of maternal language input. Previous research has found that mothers from lower SES backgrounds may use a less diverse vocabulary when interacting with their children than mothers from higher SES backgrounds (Bornstein et al., 1998; Hoff, 2003; Pan et al., 2005; Rowe, Coker, & Pan, 2004; Vernon-Feagans, Pancsofar, Willoughby, Odom, Quade, & The Family Life Project Investigators, in press). Very few studies have looked at the impact of family-level processes on maternal language input. A recent study of 1292 families in rural communities found that the impact of family SES characteristics on maternal language input to infants was partially mediated by the parenting environment, as measured by maternal knowledge of child development and observed mother-child engagement (Vernon-Feagans et al., in press).

Only recently have fathers been included in studies of children's early development, but some key characteristics of fathers have been shown to play an important role in children's early language development. Children may benefit from interacting with multiple caregivers, providing them with a diversity of stimulation (Gleason, 1975; Lamb & Tamis-LeMonda, 2004). High-quality father-child interactions that are responsive, stimulating, and engaging have been found to positively predict better cognitive and language outcomes for young children during the first 3 years of life (Roopnarine, 2004; Shannon, Tamis-LeMonda, London, & Cabrera, 2002; Tamis-LeMonda, et al., 2004). In one of the few studies to consider the contributions of father language input to early child language development, Pancsofar and Vernon-Feagans (2006) found that dual-earner fathers' vocabulary during triadic mother-father-child free-play interactions made a significant and unique contribution to children's expressive language development at 36 months of age, beyond the contribution of mother language input. While this recent study suggests that father vocabulary to young children during early childhood may significantly impact children's expressive language development, very few, if any, studies have specifically considered predictors of paternal vocabulary.

The language input of parents in dyadic and triadic interactions with their young children has been linked to later child language outcomes across SES groups (Bornstein et al., 1998; Hart & Risley, 1995; Hoff-Ginsberg, 1991; Hoff, 2003; Pan et al., 2005; Pancsofar & Vernon-Feagans, 2006; Weizman & Snow, 2001). However, there has been little research into the predictors of variability in parental language use with children. Theory and research suggest that familial interactions in the home may be linked to parental language input in meaningful ways.

Family relationships and interactions

Family systems theory provides a framework for understanding the ways in which family relationships and interactions in the home may influence how parents interact and talk with their children (Cox & Paley, 1997; Minuchin, 1985). According to family systems theory, the family is comprised of smaller interdependent subsystems, which influence one another. In this way, the quality of the adult-adult subsystem can support or stress the functioning of the parent-child subsystem. Minuchin (1985) argues that patterns of interactions associated with marital conflict can either provide complementary and cooperative resources for parenting or they can be a source of parenting difficulties. For example, mother-father relationships characterized by high levels of conflict may contribute to parents being distracted and less responsive and stimulating in their interactions with their children. Alternatively, positive qualities of the mother-father relationship, such as high levels of marital love, may contribute to supportive and stimulating parenting strategies (Lamb & Tamis-LeMonda, 2004; Wilson & Gottman, 2002).

An extensive body of research links characteristics of the mother-father relationship during early childhood to the quality of parent-child interactions for both mothers and fathers. It has been well-documented that mothers and fathers in more harmonious, satisfied, and low-conflict marriages during children's infancy have more positive attitudes toward their children, participate in more caregiving activities, report greater satisfaction in parenting, and demonstrate more engagement, responsiveness, warmth, and support in parent-child interactions in dyadic and triadic family contexts (Belsky, Youngblade, Rovine, & Volling, 1991; Cox, Owen, Lewis, & Henderson, 1989; Feldman, Nash, & Aschenbrenner, 1983; Goldberg & Easterbrooks, 1984; Grych, 2002; Kitzmann, 2000; Volling & Belsky, 1991).

Links between the quality of the marital relationship and parent-child interactions have been found to be especially important during the transition to parenting (Belsky et al., 1991; Feldman et al., 1983). Cox et al. (1989) found that when parents were in close/confiding marriages prenatally, mothers were warmer and more sensitive in interactions with their three-month old infants and fathers held more positive attitudes toward infants and their roles as parents. Volling and Belsky (1991) found that fathers who reported more marital conflict prenatally were less responsive and stimulating in interactions with their infants one year later. Research has also linked the quality of the marital relationship to triadic family interactions during early childhood. Lindahl, Clements, and Markman (1997) found that early negative marital affect before the child was born was predictive of parents' negative tone and affect in later triadic interactions with their young children.

Fewer studies have considered links between marital quality and parental language input, and these existing studies have looked at families with preschool or school-aged children. Pratt, Kerig, Cowan, and Cowan (1992) measured marital satisfaction and mother and father language input during dyadic play sessions with children at three years of age. Using a sample of predominantly middle-class two-parent families, Pratt et al. (1992) found that mother and father conversational styles were similar, but that more satisfied parents spoke in longer utterances. Brody, Pellegrini, and Sigel (1986) also considered the relationship between marital quality and parent language input in a sample of Caucasian two-parent middle- to upper-middle

class families. Brody et al. (1986) looked at marital stress and dyadic teaching interactions with mothers and fathers with children five to seven years of age. The authors found that in nondistressed families, there were no differences in the language used by mothers and fathers. In distressed families, fathers provided more negative verbal feedback and asked fewer questions than mothers. Fathers in distressed families gave less positive feedback and were more intrusive in father-child interactions than were fathers in nondistressed families. Mothers in distressed families used more questions and provided more positive feedback than did mothers in nonstressed families.

The extant literature on the impact of the quality of the mother-father relationship on parental language input suggest that distress and dissatisfaction in marital relationships during early childhood may have a detrimental impact on the way parents talk to their children. This limited body of research indicates the need to look more closely at the quality of marital and broader familial relationships as they relate to parent language input during the first two years of life.

Parent-child interactions

The kind of language used by parents in interactions with their young children may be related to the quality of parent-child interactions. Research has linked parent sensitivity and directiveness to numerous early childhood outcomes. Parental sensitivity can be understood as an awareness of the child's verbal and nonverbal cues (Wallace, Roberts, & Ladder, 1998). Research has consistently indicated that maternal and paternal sensitivity is positively linked to young children's language development during the infant and toddler years (Baumwell, Tamis-LeMonda, & Bornstein, 1997; Fish & Pinkerman, 2003; Tamis-LeMonda et al., 2004).

Parental directiveness can be understood as attempts to command or control children's behavior or attention (Masur, Flynn, & Eichorst, 2005). While some previous work has found maternal directiveness to be negatively related to children's language development (Hampson & Nelson, 1993; Tomasello & Farrar, 1986), other research has found positive associations (Akhtar, Dunham, & Dunham, 1991; Barnes, Gutfreund, Satterly, & Wells, 1983). Such contradictory findings may speak to the fact that parents may use directives in interactions with their children in different ways that may be supportive or intrusive. Akhtar et al. (1991) found that maternal directives that followed children's attentional focus were positively associated with children's later vocabulary development, while maternal directives that redirected children's attention negatively predicted later vocabulary development. Similarly, Masur et al. (2005) found that during the second year of life, maternal supportive directiveness, which attempted to follow and extend the child's current activity, was positively associated with child vocabulary, while more intrusive directiveness was negatively associated with child vocabulary.

Existing research suggests that important links may exist between parental sensitivity and parental language input. Specifically, maternal sensitivity during infancy has been positively correlated with measures of maternal verbal stimulation (Keown, Woodward, & Field, 2001; Wallace et al., 1998). Guzell and Vernon-Feagans (2004) found that parents of infants who used more directive parenting strategies were less sensitive in their interactions with young children, and that for fathers, low perceived control over caregiving outcomes was associated with more directive parenting. In attempts to understand the impact of family relationships on parent language input, it may be important to control for the quality of parent-child interactions, which may be meaningfully correlated with the way parents talk to their children.

Summary

Existing research suggests that the quality of early family relationships, including the mother-father-child relationship as well as the mother-father relationship may impact the way parents

interact with their children (Belsky et al., 1991; Brody et al., 1986; Cox et al., 1989; Grych, 2002; Lindahl et al., 1997; Pratt et al., 1992; Volling & Belsky, 1991), however, it is necessary to extend this research to specifically consider the vocabulary used by parents in interactions with their younger language-learning children.

This study extends previous work to consider links between familial relationships and parent vocabulary in families with very young children. Over the past 25 years, the biggest increase in workforce participation has occurred among mothers with children under the age of three (U.S. Department of Labor, 2004). Dual-earner families with young children may experience a variety of stressors on family relationships and interaction patterns, such as potentially conflicting demands from two careers, as well as heavy demands of caregiving (Belsky, Spanier, & Rovine, 1983; Crouter, Perry-Jenkins, Huston, & McHale, 1987; Menaghan & Parcel, 1990; Milkie & Peltola, 1999; Perry-Jenkin, Repetti, & Crouter, 2000; Story & Repetti, 2006). This study uses a sample of dual-earner families to investigate how family process variables, including the mother-father relationship and mother-father-child interactions in early childhood, relate to later parental language input.

Previous research using a similar sample of middle-class dual-earner families has shown that parents in these families spent more time, on average, per week in triadic interactions with their spouse and child than in dyadic interactions alone with their child (Lee, Vernon-Feagans, Vazquez, & Kolak, 2003; Manlove & Vernon-Feagans, 2002). The vocabulary used by parents in triadic family interactions during early childhood has been linked to children's later language development (Pancsofar & Vernon-Feagans, 2006). Such triadic contexts allow researchers to observe parents functioning as both spouses and parents and may provide informative data about the processes by which conflicted marital and family relationships impact parenting (Cox & Paley, 1997).

This study hypothesizes that the quality of the mother-father relationship and the quality of broader family-level relationships during infancy will be positively related to the way both mothers and fathers talk to their children, as measured by parental vocabulary at two years of age. In examining the impact of these familial relationships on parent language input, analyses will control for possible links between parental language input and parent sensitivity and directiveness. This research is unique in that it considers triadic interactions with a large sample of two-parent families with very young children.

Method

Participants

This study used data from the Penn State Health and Development Project, which followed 120 children from center childcare entry during the first year of life through three years of age (Vernon-Feagans & Manlove, 2005). Families were recruited from 11 childcare centers before the children were one year of age. All children attended their childcare center at least 15 hours per week. The childcare centers were located in two counties in central Pennsylvania and represented 31% of all centers enrolling infants in the two counties. Families included in this analysis were married, with both parents living in the home. Ninety-three percent of families enrolled in this study at 12 months had both parents living in the home. Some data were missing from families because they withdrew their children from child care, were unable to finish their home visit within 6 weeks of their child's 24 month birth date, or videotape data were unusable. Videotaped triadic interactions were transcribable for 92 families at 24-months. Of these families, 74 had complete data available for analyses at the 12-month timepoint.

These 74 families were not found to differ significantly from the original 120 families in terms of parent level of education, hours per week spent in child care, or quality of family

relationships. All 74 children had language abilities that fell within the range of typical development at 12 months, as measured using the Sequenced Inventory of Communication Development-Revised (SICD-R; Hedrick, Prather, & Tobin, 1984), a standardized measure of children's expressive and receptive language development during the first four years of life.

Home visits were conducted with families within 6 weeks of their child's 12- and 24-month birth dates. During each home visit, mothers and fathers independently completed separate interviews, in which they provided information about education, income, child care, and family composition. While there was some range in levels of education and income, overall, parents in this sample were well educated, with middle-class incomes. All mothers in this sample were high school graduates and 78% of mothers held four-year college or advanced degrees. Ninety-nine percent of fathers in this sample were high school graduates and 70% of fathers held four-year college or advanced degrees. The average total household income for families in this study was \$79,143 ($sd = 34,787$). English was the primary language spoken in all of the homes.

Procedure

The data for this study were obtained from family home visits when the children were 12 and 24 months of age. At both time points, families were visited in their homes for approximately two hours. Mothers and fathers were interviewed separately, and they independently completed a number of questionnaires about themselves and their children. Triadic free-play sessions that included the mother, father, and child were videotaped in the families' homes at both the 12-month and the 24-month visits. For these interactions each family was asked to sit on a large mat that was placed on the floor with a set of age-appropriate toys. Parents were asked to help their child to play with each of the toys. At 12 months, the toys included a shape sorter, blocks, toy telephone, plastic tool set, doll, and toy car. At 24 months, the toys included a Legos farm theme package, a large wooden puzzle, and a lock box. The puzzle had handles that made it easier for young children to manipulate the pieces. The lock box consisted of 20 doors that could be opened by manipulating a variety of different latches, hooks, and buttons. There were stickers inside of each door. These toys had been pilot tested with parents in this community to ensure that they were engaging for mothers, fathers, and young children.

Children wore a vest that contained a wireless microphone so that optimal sound was available for transcription. These play sessions were approximately 20 minutes in length. After 15-minutes of play, parents were asked to help their child end the task by cleaning up the area. Families varied somewhat in the amount of time they spent in this portion of the interaction, therefore the total time of the interactions had some variation ($M = 18.9$ minutes, $sd = 2.02$). However, because the length of play session during 24-month visits was not found to significantly correlate with mother vocabulary ($r = 0.11$, $p = 0.34$) or father vocabulary ($r = -0.05$, $p = 0.67$) total time of task was not included in any analyses.

Videotaped free-play interactions were transcribed into computer files using the Systematic Analysis of Language Transcripts (SALT) v.8 software program (Miller & Chapman, 1985). Free play sessions at 12 months were coded for quality of parent-child interactions by highly trained graduate students.

Measures

Parent demographics—During an interview at 12 months, mothers and fathers provided their *age* in years and were asked to identify the category that best described the highest *level of education* they had attained. Categories included “less than high school,” “high school graduate,” “some college/associate's degree or technical/trade degree,” “college graduate,” “master's degree,” and “Ph.D., M.D., or J.D.” Categories were later assigned a numeric value (less than high school = 1; Ph.D., M.D., or J.D. = 6).

Child care—During the interview at 12 months, parents were asked to provide information about their child care use. The following variables were derived from these interviews: *hours/week in center-based childcare, child age of entry into childcare*.

Parent-child interaction codes—Parent behavior during videotaped triadic free-play interactions when children were 12 months were coded for mother and father *sensitivity*, and *directive behavior* (Guzell & Vernon-Feagans, 2004). This coding system was distinct from coding systems designed for use with older children and is consistent with the way in which parent-infant relations have been measured by infant researchers. Because parents and infants typically required a few minutes to adjust to the presence of the camera, the first 5 minutes of each play session were not coded. The remaining 15 minutes of the play session were divided into sixty 15-second segments. Codes for parent characteristics were entered separately for mothers and fathers. Coding of the videotapes was completed by trained observers. Percentage of agreement was computed on 33 videotapes, with kappa coefficients ranging from 0.64 to 0.87 ($M = 0.78$) for sensitivity and 0.73 to 0.89 ($M = 0.82$) for directive behavior.

For mother and father *sensitivity* and *directive behavior*, each 15-second cell was coded on a Likert Scale, ranging from 0 (no instances of the behavior) to 3 (more extreme or many instances of the behavior). Mother and father verbal and nonverbal behavior was coded as sensitive when the parent exhibited either verbal or nonverbal positive affect, encouragement, interest or empathy toward the child. Sensitive behaviors included physical affects, positive statements and tone of voice, frequency of parents' smiling and laughter during interactions and extending the child's play with comments or facilitative questions. Mother and father verbal and nonverbal behavior was coded as directive when it was primarily adult centered and did not reinforce the child's interests. Directive behaviors included doing something for the child that the child could and might be trying to do, suggesting the child do something, removing a toy from the child while the child was playing with it, and asking questions that were not child focused, but rather required the child to attend to the interest of the parent.

Marital Interactions Scale—The Marital Interactions Scale (MIN; Braiker & Kelly, 1979) measures the functioning and quality of a romantic relationship, including the nature of the interdependence and the kinds of conflict experienced. The MIN has two subscales: love (10 items) and conflict (5 items). The conflict subscale is a measure of overt behavioral conflict and communication of negative affect. Examples of questions on the conflict subscale include "How often do you and your partner argue with one another?" "How often do you feel angry or resentful toward your partner?" and "To what extent do you try to change things about your partner that bother you?" The marital love subscale measures the respondent's feelings of belonging, love, closeness, and attachment toward the partner. Examples of questions on the love subscale include "To what extent do you have a sense of belonging with your partner?" "How much do you feel you give to the relationship?" "To what extent do you love your partner at this stage?" "How attached do you feel to your partner?" and "How much do you need your partner at this stage?"

Mothers and fathers independently completed the MIN during 12-month interviews. Parents scored items on a 9-point Likert scale (1=not at all, 9=very much). Cronbach's alphas on the love subscale in this study were 0.84 for mothers and 0.86 for fathers. Cronbach's alphas on the conflict subscale in this study were 0.75 for mothers and 0.65 for fathers. Mother and father scores for each subscale were summed to comprise a composite score for each conceptual domain: *marital love* and *marital conflict*.

Family Environment Scale—The Family Environment Scale (FES; Moos & Moos, 1981) measures the social and environmental characteristics of families by looking at three domains: relationships, personal growth, and system management. Mothers and fathers

independently completed the FES during 12-month interviews. This study used FES subscales measuring family relationships, which included cohesion, expressiveness, and conflict. Each subscale consisted of 9 items. Parents scored items on a 5-point Likert scale (1=strongly disagree, 5=strongly agree). Examples of questions on the cohesion subscale include “Family members really help and support one another” and “We put a lot of energy into what we do at home.” Examples of questions on the expressiveness subscale include “We say anything we want around home” and “There are a lot of spontaneous discussions in our family.” Examples of questions on the conflict subscale include “We fight a lot in our family” and “Family members sometimes get so angry they throw things.”

Cronbach’s alphas on the cohesion subscale in this study were 0.62 for mothers and 0.68 for fathers. Cronbach’s alphas on the expressiveness subscale in this study were 0.62 for mothers and 0.58 for fathers. Cronbach’s alphas on the conflict subscale in this study were 0.66 for mothers and 0.68 for fathers. Mother and father scores for each subscale were summed to comprise a family-level composite score for each conceptual domain: *family cohesion*, *family expressiveness*, and *family conflict*.

Parent Vocabulary—The software Systematic Analysis of Language Transcripts (SALT) (Miller & Chapman, 1985) was used to transcribe all of the DVDs. Highly trained students transcribed the language directed to the child during the session. From the SALT variables that were created from the transcripts, *number of different word roots* was determined on the basis of unique free morphemes used by mothers and fathers during 24-month free play sessions. Unintelligible words rarely occurred with parents in this sample, but these rare instances were omitted in calculating this variable. Variations in the words were not counted as separate root words. For instance, *talk* and *talked* would be considered the same root word. Mother and father vocabulary in this sample were not found to significantly correlate with children’s expressive or receptive language abilities at 24 months, as measured by the SICD, or with children’s mean length of utterance during the free play sessions at 24 months.

Results

Preliminary Analyses

Preliminary analyses identified several outlying and influential cases. Influential cases were identified by examining Cook’s D values. After careful examination of these problematic cases, the decision was made to omit 4 cases from the final analyses. Upon review of the SALT transcripts, it was revealed that in one of these cases, the child was largely noncompliant during the task and spent extended periods of the interaction away from the task. The other omitted cases had a Cook’s D values that were extreme outliers for the regression analysis on father vocabulary. That is, the Cook’s D values associated with these cases were much higher than that of any other case in the dataset, indicating that these 3 cases were highly influential in results of this regression analysis. Final analyses were run on a dataset with 70 cases.

Descriptive statistics for the variables used in this analysis are presented in Table 1. Zero-order correlations were computed to investigate potential intercorrelations among the independent variables. This correlation matrix is presented in Table 2. A review of these correlations as well as variance inflation factors demonstrated that there were no issues of multicollinearity in the data.

Analysis Strategy

In order to test our hypotheses and to gain a better sense of how different aspects of family relationships contribute to parent vocabulary above and beyond the contributions of demographic variables, childcare use, and quality of parent-child interactions, we conducted

hierarchical linear regression analyses for each of the outcome variables: mother vocabulary and father vocabulary. For each regression model, parent level of education, parent age, hours/week in childcare, and age of child entry into childcare were entered in the first step of the regression to control for the potential influence of these demographic variables on parent vocabulary. The second step consisted of the variables measuring the quality of parent-child interaction (sensitivity, directive behavior). The third step consisted of marital relationship variables (marital conflict, marital love). The last step consisted of broader family-level relationship variables (family conflict, family cohesion, family expression).

Hierarchical Regression Analysis Predicting Maternal Vocabulary

Table 3 presents the results of the hierarchical regression analysis predicting mother vocabulary. Table 3 depicts co-efficient values and other statistical information for each step of the hierarchical regression analysis. Demographic control variables were entered in Step 1. Mother age was the only demographic variable to make a significant contribution to maternal vocabulary ($t = 2.20, p < 0.05$). Older mothers used a significantly more diverse vocabulary with their children at 24 months. Mother-child interaction variables were entered in Step 2 and were not associated with maternal vocabulary. The addition of marital relationship variables in Step 3 accounted for an additional 17% of the variance in maternal vocabulary ($\Delta R^2 F = 7.49, p < 0.01$). *Marital love* was the only marital relationship variable to make a significant independent prediction to maternal vocabulary ($t = 3.86, p < 0.001$). Mothers in marriages characterized as more loving when children were 12 months of age produced a more diverse vocabulary when children were 24 months of age. Finally, the addition of family relationship variables in Step 4 accounted for an additional 7% of the variance in maternal vocabulary ($\Delta R^2 F = 2.86, p < 0.05$). *Family conflict* was the only family relationship variable to make a significant independent prediction to maternal vocabulary ($t = -2.29, p < 0.05$). Mothers in families characterized by conflictual relationships when children were 12 months of age produced a less diverse vocabulary when children were 24 months of age. The final model, including all predictors, was significant ($F = 3.18, p < 0.01$) accounting for 26% of the variance in maternal vocabulary.

Hierarchical Regression Analysis Predicting Paternal Vocabulary

Table 4 presents the results of the hierarchical regression analysis predicting fathers' vocabulary. Table 4 depicts co-efficient values and other statistical information for each step of the hierarchical regression analysis. Demographic control variables were entered in Step 1 and were not significant in predicting paternal vocabulary. Father-child interaction variables were entered in Step 2 and accounted for 17% of the variance in paternal vocabulary ($\Delta R^2 F = 9.25, p < 0.001$). Paternal sensitivity ($t = 3.67, p < 0.001$) and paternal directive behavior ($t = 2.92, p < 0.01$) were significantly associated with father vocabulary. Fathers who were more sensitive and more directive in interactions with infants at 12 months also used a more diverse vocabulary with children at 24 months. The addition of marital relationship variables in Step 3 accounted for an additional 12% of the variance in paternal vocabulary ($\Delta R^2 F = 6.26, p < 0.01$). *Marital love* was the only marital relationship variable to make a significant independent prediction to paternal vocabulary ($t = 3.19, p < 0.01$). Fathers in marriages characterized as more loving when children were 12 months of age produced a more diverse vocabulary when children were 24 months of age. Finally, the addition of family relationship variables in Step 4 accounted for an additional 6% of the variance in paternal vocabulary ($\Delta R^2 F = 2.78, p < 0.05$). *Family conflict* was the only family relationship variable to make a significant independent prediction to paternal vocabulary ($t = -2.73, p < 0.01$). Fathers in families characterized by conflictual relationships when children were 12 months of age produced a less diverse vocabulary when children were 24 months of age. The final model, including all predictors, was significant ($F = 4.30, p < 0.0001$) accounting for 35% of the variance in paternal vocabulary.

Discussion

This study identified several important links between early family interactions and relationships when children were 12 months old and the vocabulary used by both mothers and fathers with their children one year later. This study considered mother and father vocabulary as separate outcomes, yet identified some similar trends in the associations between family relationships and mothers' and fathers' vocabulary. The quality of marital relationships and broader family relationships during infancy were meaningful predictors of later mother and father vocabulary use with their toddler.

The results suggested that marital love seemed to be an important predictor of both maternal and paternal vocabulary. In families characterized by higher levels of marital love when children were 12 months of age, mothers and fathers used a more diverse vocabulary with their children at 24 months of age. This finding was significant for both mothers and fathers, even after controlling for demographic characteristics and the overall quality of parent-child interactions during infancy. These findings are congruent with previous work with older preschool and school-aged children, which found that supportive and satisfying marital relationships during childhood were predictive of stimulating parent language input (Brody et al., 1986; Pratt et al., 1992). The findings of this study extend the existing knowledge to families with younger children, demonstrating that the quality of the marital relationship during infancy may be related to the language used by mothers and fathers during toddler years, a critical time for language development.

This study is unique in considering the contributions of broader family relationships to parental vocabulary, above and beyond the contributions of the quality of the marital relationship. This research is one of the only studies to consider such contributions of family-level relationships during infancy to characteristics of parental language input. The results indicate that in families with lower levels of family conflict when children were 12 months of age, mothers and fathers used a more diverse vocabulary with their 24 month-old children. It is important to note that the interpretation of these findings may be somewhat limited by the use of composite measures and the relatively low reliability of the *Family Environment Scale* in this sample. However, the quality of broader family-level relationships was significantly associated with the vocabulary used by both mothers and fathers in this study, highlighting the need for future studies to explore in more detail characteristics of broader family-level relationships in families with very young children.

For both mothers and fathers in this study, marital love and family conflict when their child was 12 months of age were related to their vocabulary use in interactions with their toddlers one year later. These results should be interpreted with a consideration of the triadic context from which the data were gathered. In these triadic interactions, mothers and fathers were engaging as parents and as spouses. They had to negotiate their interactions with their child, with two adults engaging their child in a toy play situation. Few studies have compared individual dyadic interactions compared to triadic interactions, but those existing studies have found significant differences in parental language/strategies as well as child behavior (Yont, Snow, & Vernon-Feagans, 2003; Keren, Feldman, Namdari-Weinbaum, Spitizer, & Tyano, 2005). Triadic free-play language interactions are only one context of parental language input and may differ in meaningful ways from the quality of language parents provide their children in daily dyadic interactions. However, it is important to note that parental language input in both dyadic and triadic familial contexts during early childhood has been found to significantly predict children's later expressive language development (Bornstein et al., 1998; Hart & Risley, 1995; Hoff-Ginsberg, 1991; Hoff, 2003; Pan et al., 2005; Pancsofar & Vernon-Feagans, 2006; Weizman & Snow, 2001).

The use of triadic interactions in research on family relationships has many advantages. Triadic contexts allow researchers to observe parents functioning as both spouses and parents and may provide more informative data about the processes by which conflicted marital and family relationships impact parenting (Cox & Paley, 1997). However, when studying aspects of parenting, such as parent language input, in triadic contexts, it is important to note that the actions of one parent may be constrained and influenced by the actions of the other. For example, by remaining silent, a mother may allow her partner the opportunity to engaged in in-depth language interactions with their child, or vice versa. The dynamics of such triadic family contexts including parent language and aspects of family relationships, such as love and conflict, may also be influenced by unmeasured factors, such as parents' personalities, mental health or communication styles.

This study also considered whether the quality of parent-child interactions when children were 12 months old was associated with parent language input to children at 24 months of age. The quality of father-child interactions at 12 months was related to fathers' vocabulary with children at 24 months. This is an important finding since fathering traditionally has been socially defined through financial, rather than caregiving, responsibilities (Cabrera, Tamis-LeMonda, Bradley, Hofferth, & Lamb, 2000; Coley & Chase-Lansdale, 1999; Marsiglio, Amato, Day, & Lamb, 2000). Specifically in this study, fathers who were more sensitive and directive in interactions with their 12 month-old children used a more diverse vocabulary with their children 1 year later.

The finding regarding father sensitivity supports some previous research demonstrating positive associations between parental sensitivity and parental language input (Keown et al., 2001; Wallace et al., 1998). Previous work on the impact of parental directiveness on child language development has had mixed findings (Akhtar et al., 1991; Barnes et al., 1983; Hampson & Nelson, 1993; Tomasello & Farrar, 1986). This study found positive associations between father directive behavior and later father vocabulary, which may be explained by several factors. Fathers on average in this sample were not very directive in interactions with their young children ($M = 0.43$; $sd = 0.30$), and the measure of directive behavior used in this study was oriented more toward adult-centered behavior, rather than intrusive behavior. It may be that fathers in this sample who were more directive were taking a more active role in family play time, which resulted in their use of a more diverse vocabulary. It also might be the case that early directive behavior with infants may have a different meaning or influence than directive behavior with older children. In a recent study (Landry, Smith, Swank, & Miller-Loncar, 2000) of children from two to four-and-a-half years, parental directiveness had a positive influence on children's cognitive and language development until three-and-a-half years of age. After that time, parental directiveness was negatively associated with children's development. Thus, early in life, children may need more supportive and directive behaviors by parents until they become more independent and need less direct support.

Unlike the findings for fathers, the quality of mother-child interactions during infancy did not relate to mother vocabulary. This is somewhat surprising since mothers have been shown to be the primary socializers and stimulators of their children's development. It may be the case that there is a threshold effect operating in this sample, such that after a certain level of sensitivity, there is no relationship to outcomes. In this study, mothers' sensitivity was almost one third greater than fathers' and thus increases beyond that level for mothers may not be associated with mothers' later vocabulary with her child. On the other hand, this finding may have been influenced by the triadic nature of our parenting measures. For example, more sensitive mothers may have allowed fathers more opportunities to interact with children in the context of these triadic family play interactions, thereby themselves talking less and using less different word roots than a less sensitive mother who may have dominated the interaction. More studies of two-parent families with young children that measure the quality of parent-

child interactions and parent language use in both dyadic and triadic interactions are needed to better understand these different patterns of relationships for mothers versus fathers.

The results of this study should be interpreted with regards to the constraints of this sample of families. Parents in this study were dual-earner, married, Caucasian, English-speaking, and largely middle-class with children enrolled in center-based infant care during the first year of life. Therefore, these results may not be generalizable to families who differ from the sample in terms of family SES, ethnicity, home language, and family composition. It remains unclear whether similar patterns of associations between family relationships and parental language input would be found for families experiencing greater stressors and risk factors, such as poverty. The limited previous research in this area has considered predictors of parental language input across different SES groups or within families considered at-risk due to their low-income status (Bornstein et al., 1998; Hoff, 2003; Pan et al., 2005; Rowe et al., 2004; Vernon-Feagans et al., in press). The results of this study provide some insight into the family-level predictors of variability in parental vocabulary within a restricted sample of low-risk middle-SES families.

This study considered the role of family relationships in understanding parental language input to young children. The results of this study show that even within a fairly homogenous middle-class sample, variance in family relationships was related to mother and father vocabulary to their young children. Future research on parents' language should consider the contributions of broader family relationships in more diverse samples of families from different cultural groups and income levels in order to better understand variations in family systems as they relate to parent language input and children's development. Future research also needs to more closely consider the role of individual parent characteristics, such as personality, mental health or communication styles in understanding these links between family relationships and parental language input during early childhood.

Summary

In this large sample of middle-class dual-earner families, the quality of marital relationships and broader family relationships during infancy were meaningful predictors of later parent vocabulary use. The findings suggest that processes within the marital dyad may be associated with the way mothers and fathers talk to their children in the parent-child triadic context. This study also evidenced that negative interactions in the broader-family context may relate to the way parents talk to their children.

This study has implications for professional practice and future research, specifically in highlighting the value of situating parental language input within the broader familial context. Practitioners and researchers interested in the way parents talk to children may need to extend their focus beyond the parent-child dyad to consider marital and broader family interactions. The findings of this study support family-centered practices aimed at reducing familial stress and interpersonal conflict within the family.

There is a need for future research that compares parent language in dyadic and triadic contexts as they relate to the quality of family relationships and to explore possible mediating and moderating variables, such as parenting stress, emotional well-being, communication styles, or depression. Future research should also extend these findings to examine how interactions in the family setting may influence developmental outcomes for children, such as early language and literacy development. Lastly, future research on parents' language input should also consider the contributions of broader family relationships in more diverse samples of families from different cultural groups and income levels in order to better understand variations in family systems and their relationship to parent language input and children's development.

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Table 1

Means and standard deviations for independent and dependent variables (n=70)

	Mean	SD
Father education	4.13	1.13
Mother education	4.24	1.12
Father age (in years)	34.96	4.86
Mother age (in years)	34.13	4.81
Hours/week in childcare	36.13	11.11
Age of entry in childcare (in months)	3.46	2.18
Mother sensitivity	1.49	0.50
Mother directive behavior	0.37	0.26
Father sensitivity	1.05	0.44
Father directive behavior	0.43	0.30
Marital conflict	6.81	1.73
Marital love	15.88	1.07
Family conflict	3.93	0.75
Family cohesion	8.33	0.72
Family expression	7.05	0.79
Father vocabulary	153.97	41.94
Mother vocabulary	193.47	41.50

Table 2

Correlation matrix (N = 70)

	1	2	3	4	5	6	7	8	9	10	11
F. vocab	1	.12	.23	.34***	.06	-.18	.33***	-.12	-.15	.25*	.17
M. vocab	2	1.00	-.15	-.03	.06	.11	.39***	-.08	-.36***	.39***	.14
F. directiveness	3		1.00	-.29*	.17	-.26*	-.03	.10	.40***	-.02	.10
F. sensitivity	4			1.00	-.22	.43***	-.05	.02	.04	-.01	-.10
M. directiveness	5				1.00	-.48***	.09	-.06	.01	-.01	.03
M. sensitivity	6					1.00	-.06	.08	-.02	-.04	-.18
Marital love	7						1.00	-.48***	-.37***	.48***	.37***
Marital conflict	8							1.00	.52***	-.22	-.07
Family conflict	9								1.00	-.53***	-.28*
Family cohesion	10									1.00	.42***
Family expression	11										1.00

* $p < .05$.

** $p < .01$.

*** $p < .001$.

**** $p < .0001$.

Table 3
Summary of hierarchical linear regression analysis for model predicting maternal vocabulary ($N = 70$)

Independent Variable	<i>B</i>	<i>SEB</i>	β	<i>t</i>
Step 1: Demographic controls				
Mother level of education	-1.06	5.06	-0.03	-0.21
Mother age	2.43	1.11	0.28	2.20*
Hours/week in childcare	-0.15	0.46	-0.04	-0.32
Age of entry in childcare	-1.58	2.37	-0.08	-0.67
$R^2 = .02$, $F(4, 65) = 1.43$				
Step 2: Quality Parent-child Interactions				
Maternal sensitivity	14.14	11.57	0.17	1.22
Maternal directive behavior	25.08	21.32	0.16	1.18
$R^2 = .02$, $F(6, 63) = 1.28$, $\Delta R^2 = 0$, F change (2, 63) = 0.97				
Step 3: Marital Relationship				
Marital conflict	5.37	3.20	0.22	1.68
Marital love	18.91	4.90	0.49	3.86***
$R^2 = .19$, $F(8, 61) = 3.03^{**}$, $\Delta R^2 = .17$, F change (2, 61) = 7.49**				
Step 4: Family Relationships				
Family conflict	-18.97	8.28	-0.34	-2.29*
Family cohesion	4.54	8.37	0.08	0.54
Family expression	-0.64	6.81	-0.01	-0.09
$R^2 = .26$, $F(11, 58) = 3.18$, ** $\Delta R^2 = .07$, F change (3, 58) = 2.86*				

* $p < .05$.

** $p < .01$.

*** $p < .001$.

**** $p < .0001$.

Table 4
Summary of hierarchical linear regression analysis for model predicting paternal vocabulary ($N = 70$)

Independent Variable	<i>B</i>	<i>SEB</i>	β	<i>t</i>
Step 1: Demographic controls				
Father level of education	1.75	4.79	0.05	0.37
Father age	-0.63	1.13	-0.07	-0.56
Hours/week in childcare	-0.01	0.48	-0.00	-0.01
Age of entry in childcare	-2.03	2.45	-0.11	-0.83
$R^2 = 0, F(4, 65) = 0.30$				
Step 2: Quality Parent-child Interactions				
Paternal sensitivity	43.71	11.91	0.45	3.67***
Paternal directive behavior	47.66	16.35	0.34	2.92**
$R^2 = .17, F(6, 63) = 3.34^{**}, \Delta R^2 = .17, F \text{ change } (2, 63) = 9.25^{***}$				
Step 3: Marital Relationship				
Marital conflict	1.12	3.05	0.05	0.37
Marital love	15.03	4.71	0.38	3.19**
$R^2 = .29, F(8, 61) = 4.48^{***}, \Delta R^2 = .12, F \text{ change } (2, 61) = 6.26^{**}$				
Step 4: Family Relationships				
Family conflict	-25.82	9.47	-0.46	-2.73**
Family cohesion	-5.85	8.09	-0.10	-0.72
Family expression	-1.77	6.72	-0.03	-0.26
$R^2 = .35, F(11, 58) = 4.30^{****}, \Delta R^2 = .06, F \text{ change } (3, 58) = 2.78^*$				

*
 $p < .05$.

**
 $p < .01$.

***
 $p < .001$.

****
 $p < .0001$.