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THE EARLY PARENT-CHILD RELATIONSHIP AND AGGRESSION: THE MEDIATING  
ROLE OF LANGUAGE

by

CHRISTOPHER R. HARPER

Under the Direction of Christopher Henrich

ABSTRACT

Multiple theories suggest that the early parent-child relationship plays an important role in development. Past research has shown linkages between parenting style and aggression as well as between language and aggression. Emerging evidence suggests that attachment security is an important predictor of language development. It was hypothesized that there would be an effect of parent-child relationship quality at 36 months on aggression at school entry via language ability at 54 months. To test this hypothesis, path analysis in M-Plus was used. Data for this study were collected as a part of the NICHD, Study of Early Child Care and Youth Development (N = 1,364). Mediation was tested with bootstrapped estimates of indirect effects. The results did not support the hypothesized model. These findings are discussed in terms of their implications for early intervention.

INDEX WORDS: Aggressive behavior, Language, Attachment, Parent child relations, Early  
childhood development

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ROLE OF LANGUAGE

by

CHRISTOPHER R. HARPER

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Arts

In the College of Arts and Sciences

Georgia State University

2011

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2011

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ROLE OF LANGUAGE

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May 2011

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## 1 INTRODUCTION

Aggressive children are more susceptible to numerous aversive outcomes, including internalizing (Murray-Close, Ostrov, & Crick, 2007) and relationship problems (Pepler, Jiang, Craig, & Connolly, 2008). Furthermore, during adolescence, they are more likely to display antisocial conduct (Dodge, Coie, & Lynam, 2006). The costs associated with aggressive behavior extend beyond the individual. Each child with externalizing behavior problems is thought to cost society an additional \$2 million dollars compared with non aggressive peers (Foster & Jones, 2007). Estimates such as these have fueled research concerning the development of aggressive behavior problems. Studies on aggression in children has shown that development is influenced by multiple factors and processes, including temperament (Rothbart, 2007), socialization (Lochman, 2004), and contextual factors (Leventhal, & Brooks-Gunn, 2004; Lochman, 2004; DeRosier, Cillessen, Coie, & Dodge, 1994). Theorists have championed the interwoven nature of these factors in predicting behavioral outcomes. In particular, researchers have emphasized the mediating nature of social-cognitive deficits in early childhood (Dodge, Greenberg, Malone, & Conduct Problems Prevention Research Group, 2008; Fontaine, Yang, Dodge, Pettit, & Bates, 2009; Lochman & Dodge, 1994).

### *1.1 Social Cognitive and Attachment Theories of the Development of Aggressive Behavior Problems*

Attachment Theory focuses on the parent-child relationship and the child's behavior during times of separation and reunion with the primary caregiver (Bowlby, 2004). This theory has been used to explain a variety of behavioral outcomes across development, most relevantly aggression (Bates, Maslin, & Frankel, 1985; Lewis, Feiring, McGuffog, & Jaskir, 1984; McCartney, Owen, Booth, Clarke-Stewart, & Vandell, 2004). Evidence is also emerging that attachment is an important indicator of language development. van IJzendoorn, Dijkstra, and Bus

(1995) analyzed seven studies and found a small to moderate effect ( $r = .28$ ) of attachment security on language development. The researchers suggest that as the child grows, language becomes necessary to maintain the parent-child relationship that was established during infancy. Attachment promotes language development, which enhances the parent-child relationship.

Patterson's Theory of parenting builds upon Attachment Theory and offers evidence that disruptions in the bonding associated with attachment leads to aggressive behavior (Patterson, Reid, & Dishon, 1992; Patterson, 1986). Whereas Bowlby's model of attachment focuses on parenting characteristics such as sensitivity and responsiveness that aide in positive adjustment, Patterson's model focuses on maladaptive parental characteristics. Patterson has identified parenting characteristics such as lack of warmth, inconsistency, and harsh discipline which are a quintessential component of a "Coercive Family Process." Within this process, the parent reacts to behavior problems with these coercive practices. This reaction leads to increased behavior problems and the cycle reverberates. When examining both Patterson and Bowlby's Theories, certain parental characteristics (i.e., warmth, consistency, parental involvement) emerge that seem to play an important role in both developing secure attachment and adaptive social adjustment.

Dodge and colleagues build upon the Bowlby's and Patterson's models of parenting practices and suggest that one potential mediator of the relationship between early parenting practices and behavior problems is deficits in social-cognition. This theory is termed Social Information Processing Theory. Social-Information Processing Theory centers around a person's interpretations of environmental cues and in turn the effect of those interpretations on future environmental transactions. Lochman and Dodge (1994) examined these social information processing variables in a sample of nonaggressive, moderately aggressive, and severely

aggressive boys. The investigators examined processing of social cues, attributions, problem solving, affect labeling, outcome expectations, perceived competence, and self-worth. Severely aggressive males showed significant deficits in cue recall, attributions, social problem solving, and general self-worth. These boys tended to endorse feelings of positive affect across several domains that may represent problem avoidance. Moderately aggressive boys shared many of the same deficits. However, the results also indicated that the behavior of the moderately aggressive boys was more proactive or aimed at attaining desirable outcomes.

These findings have been replicated and further evolved into analyses of the interactions between the cognitive processes that predict aggressive behavior (Dodge, Coie, & Lynam 2006; Fontaine, Yang, Dodge, Pettit, & Bates, 2009). Moreover, developmental theorists recognize that these cognitive abilities potentially mediate the relation between parenting and aggressive behavior. For example, Dodge, Bates, and Pettit (1990) found evidence that increases in aggression over time, seen in abused children, were due to increases in deficits in social-cognitive capacities, mainly social cuing and attribution bias. More recently, Cummings and Davis (2002) argued that emotion modulation mediates the effect of marital conflict on child aggression. These studies provide strong evidence of both a direct association between home environment or parenting and aggression, as well as an indirect effect through social cognitive ability. It is posited here that other potential within child mediators exist to explain the relationship between parenting and aggressive behavior.

The aim of the current study is to explore one additional mechanism, language development, which may further account for the relationship between the early home environment and aggressive behavior. This mediator is proposed because of its association with social-cognitive ability. Social-Information Processing Theory proposes that children's

interpretations of social-information lead to aggressive behavior (Dodge, Greenberg, & Malone, 2008; Fontaine, Yang, Dodge, Pettit, & Bates, 2009; Lochman & Dodge, 1994). For this study, it is proposed that it is not only an interpretation or misinterpretation of social cues but also a deficit in self-reflection and conflict resolution. Language plays a key role in self-reflection and is an essential tool when managing conflict. As social information is processed, individuals must have the verbal tools necessary to understand and negotiate with perceived threats or stressors. Testing how language functions in these capacities will enhance our understanding of Social-Information Processing Theory.

### *1.2 Parenting and Aggression*

The proposition that parenting influences aggressive behavior is a crucial piece of both Attachment Theory and Patterson's Theory of Coercive Parenting. There is a wealth of evidence that parenting, in particular responsiveness and sensitivity, influences the development of aggressive behavior. In Attachment Theory, the parent is viewed as a vehicle of open verbal and non-verbal emotional exchanges. As the security of the parent-child relationship increases more open-exchanges occur, and this results in improved social and conceptual development of the child. Much of Patterson's research has focused on a similar process; however, rather than focusing on positive, warm characteristics of the parent-child relationship, this research has focused on the lack of these characteristics. For example, most attachment theorist focus on the ability of the parent to respond to the needs of the child in a warm, sensitive, consistent, and responsive manner. Patterson, on the other hand, has focused on the harsh side of parenting and its association with the development of aggression and behavior problems (i.e., explosive outbursts of anger, lack of warmth, inconsistency, and spanking). And there is strong supporting evidence for Patterson and colleagues' view that harsh parenting leads to the development of

behavior problems and aggression (Snyder, Cramer, Afrank, & Patterson, 2005; Patterson, 1986; Snyder, Reid, & Patterson, 2003). In building this Coercive Parenting Model, by focusing on the opposing side of attachment features, evidence has also been built to support an attachment security perspective in the development of behavior problems.

Researchers have also shown that warmth is important using identical twin paradigms to control for genetic variation. Caspi and colleagues (2004) conducted qualitative interviews with parents of identical-twins to determine which twin received more maternal statements of warmth and which received more maternal negativity. These results indicated that the twin that received more statements of maternal negativity also showed more antisocial and aggressive behavior problems. As reviewed, there is a wealth of research supporting the relationship between parenting and aggressive behavior. However, most researchers have conceptualized parenting using different theories, scales, or measures. In this study, it is proposed that the underlying facets of parenting that connect these studies are responsiveness and sensitivity.

Parental responsiveness refers to the actions of the parent which “intentionally foster individuality, self-regulation, and self-assertion by being attuned, supportive, and acquiescent to children’s special needs and demands” (Baumrind, 1991, p. 62). Parental responsiveness is a distinguishing characteristics of parenting styles (i.e., authoritarian/authoritative). Maccoby and Martin (1983) differentiate authoritative parenting from autocratic parenting styles based on responsiveness. Authoritative parents are high on demandingness and responsiveness, whereas autocratic parents are high on demandingness but low in responsiveness. Autocratic parents impose strict limits on child behavior and refuse to negotiate. Authoritative parents take into account their child’s needs, explain expectations, and are willing negotiate. It appears that responsiveness is an important parenting characteristic, especially given the association between

parenting styles and child aggression (Calkins, 1994; Campbell, 1994; Dodge, Pettit, & Bates, 1994; Kochanska, 1997).

Parental responsiveness is also emerging as a construct of interest from research conducted on the effects of corporal punishment. As stated previously, parent discipline strategies have important consequences for the development of aggressive behavior (Lansford et al., 2002; Patterson, 1986; Snyder, Reid, & Patterson, 2003). However, emerging research suggests that parental responsiveness buffers the effects of harsh discipline (Deater-Deckard, Ivy, & Petrill, 2006; McLoyd & Smith, 2002). McLoyd and Smith (2002) examined physical punishment in a sample of 1,000 Caucasian, African-American, and Latino children. They found, that across all ethnic groups, physical punishment predicted behavior problems only when parental responsiveness was low. More recently, similar effects have been found for verbal punishment (Berlin et al., 2009). From these studies, parental responsiveness is emerging as an important construct in the association between harsh discipline and aggression.

Other studies have chosen to focus on a related but different aspect of parenting, sensitivity. Sensitivity refers to the parents' ability or willingness to respond to the developing child in a warm and timely manner. Sensitive caregivers establish a clear connection between their response and the child's signal of need. Furthermore, the response provided is developmentally appropriate, matches the needs of the infant, and are contextually relevant. The relationship between sensitivity and aggression is very similar to the relationship between parental responsiveness. In fact, attachment security researchers have noted that children are more compliant with parental demands when the parents are sensitive and responsive (Ainsworth, Bell, & Stayton, 1974).

This relationship between responsiveness and sensitivity is important to note. As reviewed, past research has touted the direct effect of parental responsiveness on the development of aggression in early childhood. There is also evidence of a direct effect of sensitivity on aggression (Alink et al., 2008). Additionally, it was previously mentioned that research had found that responsiveness buffers the effects of harsh discipline on the development of behavior problems. A similar pattern of results has been found for sensitivity. Alink and colleagues (2008) examined the buffering effects of sensitivity on the relationship between harsh discipline and aggression in a sample of two to three-year-old children rated as high on externalizing behavior problem. The results from this study supported the role of sensitivity as a buffer. There are two proposed reasons for the importance sensitivity and responsiveness. First, as Alink and Colleagues note, these parenting characteristics are an important mechanism through which children learn behavioral compliance. Children of sensitive and responsive caregivers learn to respond to their caregivers in a way that elicits greater responsiveness and sensitivity. Additionally, as McElwain and colleagues surmise sensitive and responsive caregivers modulate their parenting behavior based on the child's individual needs. These contextually dependent parenting strategies maintain the relationships that is developed during early infancy.

Again, the conceptualization of parenting from past research has varied between studies. In this study, the decision was made to conceptualize parenting in terms of parental responsiveness and sensitivity for three reasons. First, parental responsiveness and sensitivity have been linked to numerous behavioral outcomes (Belsky, 1999; Belsky, Fish, & Isabella, 1991; Shaw & Winslow, 1997). Secondly, and most importantly, parental responsiveness and sensitivity have been show to be related to both parenting strategies (Maccoby & Martin, 1983)

and discipline (McLoyd & Smith, 2002), which are both related to aggressive behavior problems (Dodge, Petit, & Bates, 1994; Patterson, 1986). Sensitivity and responsiveness are also associated with cognitive development, which is reviewed in a later section.

### *1.3 Cognition and Early Behavior Problems*

Deficits in cognition is a defining characteristic of Social Information Processing Theory. As previously mentioned, Social Information Processing Theory proposes that aggressive behavior is the result of cognitive deficits, and these deficits are well documented within the literature. Lochman and Dodge (1994) found that children with aggressive behavior problems show deficits across a variety of social-information processing abilities. Other studies have shown that children with early behavior demonstrate problems in emotion recognition (Eisenberg et al., 2004), are more likely to attribute hostile intentions to the actions of others (Dodge et al., 2003), and lack developmentally appropriate problem solving skills (Dodge et al., 2003). The role that language plays has been less thoroughly explored.

A relationship between language skills and aggression is well documented. Several researchers suggest a causal relationship between the deficits in language and aggressive or externalizing behavior problems. For example, Kopp (1989) suggest that interruptions or delays in language lead to deficits in emotional development and limits the ability of the child to engage in self-directed talk. These limitations inhibit the ability of the child to problem-solve in conflict situations. This inability undermines the child's schema of the social world. Similarly, Barkley (1997) proposes that during the preschool-years emotions come under verbal control. When problems arise in this process, it limits the ability of the child to engage in self-directed talk. Self-directed talk is important for both self-reflection and self-questioning, foundations of problem-solving and development. These two theories have ample supporting evidence from the



literature. For example, McConnell and Odom (1999) found that language ability is important when attempting to enter a new play group or resolve conflict. Researchers have also noted that limited comprehension is related to poorer identification of social cues, whereas deficits in expression are related to decreases in communication (Dodge, Petit, McClaskey, & Brown, 1986). Additionally, evidence from clinical populations shows that externalizing problems are commonly comorbid with language deficits. Blankenstijn and Scheper (2003) noted that the prevalence of language impairment is between 2% and 9% in the general population, but as high as 86% in psychiatric clinic populations. Cohen (2002) notes that the most common comorbid conditions with language impairments among children are externalizing pathologies, such as Attention Deficit Hyperactivity Disorder, Conduct Disorder, and Oppositional Defiant Disorder. Suffering from language impairment puts children at risk of a number of negative outcomes, particularly with respect to externalizing disorders; however, research has yet to assess the mediating role of language on early home environment and aggressive behavior.

#### *1.4 Parenting and Cognition*

There is growing evidence that suggests that early parent-child relationship quality has modest effects on the development of cognitive skills. Studies are beginning to implicate important characteristics of the parent-child relationships and the home environment that facilitate cognitive development, particularly in the domains of language (Bloom, 1991; Bornstein & Bruner, 1989; Tomasello, 1992). One of the most developed areas is the association between attachment and language. Theorists have argued that secure attachment scaffolds language development (Bowlby, 2004). This is supported by Tomasello's (1992) and Locke (2001) view that language developed to assist in the attainment of social and relational goals. van IJzendoorn, Dijkstra, and Bus (1995) conducted a meta-analysis of seven studies examining the

association between attachment and language ability. They concluded that there is a modest positive association ( $r = .28$ ).

More recently, studies have been conducted using the National Institutes of Health and Child Development, Study of Early Child Care and Youth Development database (SECCYD). The SECCYD is a longitudinal survey, intended to measure the effects of early child care on child and adolescent adjustment. Belsky and Fearon (2002) found that secure attachment was associated with language at 36 months after controlling for risk factors. McElwain, Booth-LaForce, Lansford, Wu, & Dyer (2008) analyzed possible mediators of the association between attachment and peer relationships. Among other factors, researchers found that language ability mediated this association at 54 months of age. These studies demonstrate the connection between the attachment security and cognitive development. Several researchers from both the attachment and language field agree that contact with a sensitive and responsive caregiver at least partially accounts for the effects of secure attachment on language (Cohen, 2001; Fish & Pinkerman, 2003; van IJzendoorn, Dijkstra, & Bus, 1995).

### *1.5 Gender Differences*

Gender differences in language (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Hyde & Linn, 1988; Leaper & Smith, 2004) and aggression (Card, Stucky, Sawalani, & Little, 2008) are well documented in early childhood. In terms of language, on average girls have higher language ability than boys (Hyde & Linn, 1988), and may even use language as more of a relationship building tool (Leaper & Smith, 2004). However, as children age these discrepancies dissipate. The most recent meta-analysis of gender differences in aggression analyzed 148 studies and found a small to moderate effect of  $r = .29$  for direct aggression (Card, Stucky,

Sawalani, & Little, 2008). However, the effects for indirect aggression were negligible. These findings illustrate the clear gender differences that exist in language and aggression.

Evidence of gender differences in attachment is much subtle, and no comprehensive reviews have been found by this writer. van Ijzendoorn and colleagues (2000) examined attachment behavior in 138 sibling pairs. The researchers found same-gender siblings were more likely to have concordant attachment styles than different-gender siblings. This study illustrates that gender plays some role in the development of attachment styles. Turner (1991) suggests that child gender may moderate the effect of insecure attachment on behavior. In this study, insecure boys demonstrated more aggressive, disruptive, assertive, controlling, and attention-seeking behavior than secure children in a free-play task. Insecure girls exhibited more dependent, expressive, and compliant behavior, but less assertive and controlling behavior. These studies are suggestive that the hypothesized mediation model may differ by gender.

### *1.6 The Current Study*

Past research has supported the role of individual factors, such as language, as well as contextual factors in forecasting aggressive behavior problems. Moreover, newer research is beginning to provide support for the role of parenting constructs, such as sensitivity and responsiveness, in promoting the development of these individual factors. What remains unclear is the extent of a direct association of parenting with aggression and an indirect association through language. The research indicates that parenting characteristics, such as sensitivity and responsiveness, play an important role in the development of language. These same parenting characteristics play an important role in the development of aggressive behavior problems. It is hypothesized that language will mediate the association of parenting and later aggressive behavior. The decision was made to focus on language at 54 months and parenting quality at 36

months for two reasons: 1) the proximity of these time-points to school entry and 2) these are the time-points used in McElwain and colleagues (2008).

*Hypothesis 1:* That association of parental responsiveness and sensitivity at 36 months and aggression at school entry will be partially mediated by language ability at 54 months. It is hypothesized that there will be a positive effect of these parenting characteristics on language ability. Further, there will be a negative effect of language ability on aggression. A path diagram is pictured in Figure 1.

*Hypothesis 2:* Gender will moderate the effect of parenting on aggressive behavior via language. This is an exploratory research question. Therefore, no hypothesis is made about the direction of this effect.

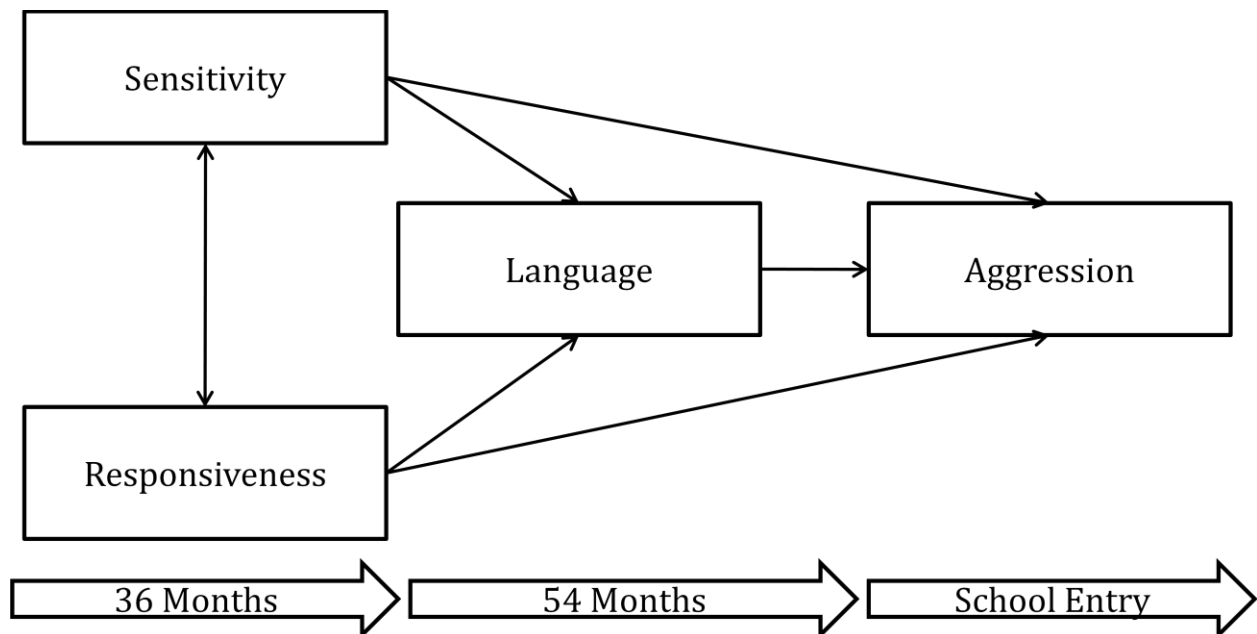


Figure 1. Hypothesized Model

## 2 METHOD

### 2.1 *Sampling Design*

Data for this study were collected as a part of the National Institutes of Child Health and Development, Study of Early Child Care and Youth Development (ECCYD; NICHD ECCRN, 1994). Participant recruitment began in 1991 in ten cities across the United States (Little Rock, AR; Irvine, CA; Lawrence, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton, NC; Seattle, WA; and Madison, WI). Recruitment was conducted at hospitals in each of the sites, and occurred during 24 hour recruitment windows. Sixty percent of the 8,986 mothers, that met eligibility criteria ( at least 18, English speaking, healthy baby, residence with 1 hour of study site, not planning on moving out of study area with a year, and residing in relatively safe neighborhood), agreed to be contacted regarding participation. Next, conditional random sampling was used to select a subsample of the eligible mothers that ensured educational, ethnic, and economic diversity. This resulted in a sample of 3,015 mothers, who received a recruitment phone call. An additional 1,490 participants were excluded based on inability to contact, plans to move out of area, and poor infant health. The final sample consisted of 1,364 mothers and children who completed the 1 month home interview. Data for the survey were collected in four phases. This study used only data from the first two phases, which represent birth through first grade. The SECCYD website (<https://secc.rti.org>) reports that 1,226 children ( $\approx 90\%$ ) in the original sample were followed into the second phase of data collection.

### 2.2 *Measures – 36 Months*

*Responsiveness.* Responsiveness was measured using the Home Observation for Measurement of the Environment (*HOME*; Caldwell & Bradley, 1984). The HOME inventory was intended to be a more detailed predictor of early stimulation in the early home environment

than socioeconomic status. The scale contains an observational component and a semi-structured interview with the primary caregiver. The purpose of the observation and interview is to gauge the role of the child as a recipient, component, and purveyor of information within the home environment. The early childhood scale, used in this study, contains 55 observer-rated items within eight scales. Items on the Responsiveness scale gauge the parents' emotional interactions with the child (i.e., "Caregiver praises child's qualities twice during visit"). Before conducting ratings, all observers attended training sessions with the requirement that they reach 90% reliability with a master coder. Cronbach's alpha is estimated at .87 (ECCRN, 2003).

*Sensitivity.* Sensitivity was measured, at 36 months, using qualitative ratings of the parent-child interaction (ECCRN, 1999). These ratings were based on 15-minute video-taped semi-structured lab observations. Employing Vandell's (1979) procedures, parents were shown three toy containers. Parents were asked to play with their child using the toys in these containers, in the order they were shown the containers. In the first container, there was a stencil, washable markers, and paper. The second contained dress-up clothes and a cash register. The third contained Duplo blocks and a picture of a model. The following mother-child interaction behaviors were rated at 36 months: mothers' supportive presence, respect for the child's autonomy, stimulation of cognitive development, hostility, and confidence. These child behaviors were rated: enthusiasm, negativity, persistence, and affection for mother. Based on previous research (ECCRN, 1999), these scales were combined to form composites. Behaviors were rated on a seven-point Likert-type scale with 1 being *minimally characteristic*. The sensitivity composite at 36 months is an aggregate of the supportive presence, hostility (reverse scored), and respect for autonomy ratings. Scores on this composite ranged from 4 to 21 and showed acceptable internal consistency, Cronbach's  $\alpha = .78$ . For this study, the child affection

to mother rating was included as a part of the aggregate. Based on this studies focus on attachment and the parent-child relationship, it seemed examining both sensitivity and affection as aspects of the parent-child relationship would give a more in-depth view.

*Parent-rated aggression.* Parent-rated aggression was included as a control variable at 36 months. Parent report of aggressive behavior was measured using scores from the Child Behavior Checklist (CBCL; Achenbach, 1991b). The CBCL contains 99 items intended to measure problem behavior (i.e., cries a lot, is cruel to animals, disobedient). This measure has been validated internationally, as well as in clinical and nonclinical samples. Items on the aggressive behavior subscale are rated on a 3 point likert-type scale with 0 indicating “not true of the child” and 2 “very true of the child.” The CBCL syndrome scales have been show to have adequate test-retest and internal consistency ranging from .81 to .96. In this study, the total score was used.

*Language.* Language at 36 months was included as a covariate in the model to control for prior levels of language. It was measured using the Reynell Developmental Language Scale (RDLS; Reynell, 1990). The RDLS, similar to the *PLS-3*, has two scales, one measuring expressive language and one comprehension. Specifically, the RDLS is intended to measure language in very young children or children with severe deficits in spoken language. Each scale consists of 67 items. The comprehension scale has two versions, one for spoken response and the other, for children with severe deficits, allows for the child to point to pictures. The RDLS was administered during a lab visit by a trained researcher. The RDLS has been shown to have adequate internal consistency: .91 to .93 for the comprehension scale and .86 for the expressive language scale. Further, evidence suggests that the RDLS is a valid measure of language ability. The RDLS does not have a total language score composite. However, it is the only language

measure available at this time-point and these two scales are highly correlated. Including both scales in my analyses raised concerns regarding multicollinearity. Thus, the decision was made to only include the expressive language scale.

*Parent language stimulation.* Parent language stimulation was included in the model as a covariate to measure and control for other aspects of the early environment, beyond parenting responsiveness or sensitivity, which are related to language. Language stimulation at 36 months of age was measured using the HOME inventory. Items in this category focus on language scaffolding within the home, such as “Child is encouraged to learn the alphabet,” or “teaches the child simple verbal manners.” This is the same measure that was used to measure the Responsiveness piece of the Responsiveness/Sensitivity composite.

*Additional covariates.* In addition to the covariates already listed, parent level measures of income, maternal age, maternal education, and marital status were included (Kupersmidt, Griesler, DeRosier, Patterson, & Davis, 1995). Furthermore, child gender and ethnicity were included (Card, Stucky, Sawalani, & Little, 2008). Parent income was measured at 36 months and computed dividing the total household income by the federal poverty threshold. Gender was dummy coded with 1 being male. Ethnicity was transformed into three dummy coded variables with White as the reference group. The comparison categories were African-American/Black, Hispanic, and Other. Marital status was dummy coded with 1 being married or partnering/living together. Maternal education was dummy coded with high school education or less as the reference category and two comparison groups. One comparison group compared those with an undergraduate education, and the other consisted of mothers with greater than undergraduate education.



### 2.3 Measures –54 Months

*Language.* Language at 54 months was the mediator. It was measured using the Preschool Language Scale, 3<sup>rd</sup> Edition (*PLS-3*; Zimmerman, Steiner, & Pond, 1992). This measure is intended for children aged 2 months to 6 years 11 months. It measures vocabulary, grammar, morphology, and language reasoning. Additionally, it is thought to measure language precursors. It contains two subscales, one for expressive and receptive language ability. The receptive language scale details auditory comprehension in the domains of attention, semantic meaning, morphology, and syntax. The expressive scale focuses on language as a communication a tool, measuring vocal development, social communication, semantic meaning, morphology, and syntax. The ECCRN found these scales to be highly correlated ( $r = .70, p < .001$ ; 2003). Further, the overall scale was found to have good internal consistency ( $\alpha = .95$ ). This project used the overall percentage correct score. Approximately, 10% of the sample had standardized language scores below 70, two standard deviations below the mean. Less than 1% of the sample had scores above 130.

*Aggression.* Aggression at 54 months of age was included as a control measure in the model. It was measured using the Child Behavior Checklist Parent Version (CBCL; Achenbach, 1991a). This is the same version of the CBCL that was used as a control variable at 36 months and outcome measure of parent rated aggression.

### 2.4 Measures –Kindergarten Entry

*Teacher-rated aggression.* There were two aggression outcomes in this model. Teacher report of aggressive behavior was measured using scores from the Teacher Report Form of the Child Behavior Checklist (TRF; Achenbach, 1991b). The TRF contains 99 items intended to measure problem behavior (i.e., difficulty following directions, disturbs other pupils, and

disrupts class discipline). This measure is one of the most widely used measures of problem behavior in childhood. It has been validated internationally, as well as in clinical and nonclinical samples. Items on the aggressive behavior subscale are rated on a 3 point likert-type scale with 0 indicating “not true of the child” and 2 “very true of the child.” The TRF syndrome scales have been shown to have adequate test-retest and internal consistency ranging from .72 to .95. In this study, the total score was used.

*Parent-rated aggression.* The second aggression outcome was parent-rated. Parent report of aggressive behavior was measured using scores from the Child Behavior Checklist (CBCL; Achenbach, 1991b). This is the same measure of aggression that was used at 36 and 54 months.

### 3 RESULTS

Means, standard deviations, and ranges are presented in Table 1. As a preliminary step, correlation coefficients were calculated for all variables. As can be seen in Table 2, there was a relatively high zero-order correlation between Responsiveness at 36 months and language at 54 months. Also, there was a high correlation between Sensitivity at 36 months and language at 54 months. The association between language at 54 months and aggression at school entry was much smaller, though still significant. There was also a small correlation between Responsiveness at 36 months and teacher-rated aggression, as well as parent-rated aggression, both at school entry. The correlation between Sensitivity at 36 months and teacher and parent-rated aggression was also small but still significant.

Path analysis in M-Plus version 5.21 was used to test the hypothesized mediation model (Muthén & Muthén, 2007). Maximum-likelihood estimation was used, and the model was completely saturated. All of the paths were tested in the same model. The study used a product of coefficients method for testing the hypothesized indirect effects (Mackinnon, Lockwood,

Hoffman, West, and Sheets, 2002). This method tests the significance of the multiplicative constant of the two direct effects. The mediational hypotheses were tested using Bootstrapped Estimates (Preacher & Hayes, 2004). Normal theory estimates of indirect effect estimates require much larger sample sizes to achieve adequate power and rely on the often fallacious assumption that the product of two path coefficients is normally distributed. Bootstrapped estimates make no assumption and use random sampling (from the data) with replacement to calculate the indirect effect estimates (Preacher & Hayes, 2004)

Responsiveness at 36 months and Sensitivity at 36 months, along with control variables, were modeled as correlated predictors of language at 54 months. Referring to Table 3, Sensitivity at 36 months has a unique significant effect on Language at 54 months. Of the control variables, language stimulation, language at 36 months, income, and

<i>Table 1. Means, Standard Deviations, and Ranges</i>				
	<i>N</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
P- Aggression K	1058	7.56	5.61	0.0-32.0
T-Aggression K	1004	4.41	7.22	0.0-49.0
Language 54 mo.	1053	51.62	35.74	1.0-99.0
Responsiveness/Sensitivity	1138	5.25	1.06	1.04-7.00
Responsiveness	1179	5.61	1.36	0.0-7.0
Security and Affection	1161	10.06	2.40	2.0-14.0
Parent Aggression 54 mo.	1061	8.51	5.69	0.0-33.0
Parent Aggression 36 mo.	1175	9.20	5.03	0.0-26.0
Language Stimulation	1179	6.02	1.14	0.0-7.0
Language 36 mo.	1130	96.88	14.53	62.0-138.0
Income	1208	3.61	3.05	0.08-28.50

T-Aggression K is teacher-rated aggression at school entry, measured using the CBCL-TRF; P-Aggression K is parent-rated aggression at school entry, measured using the CBCL.

Table 2. Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.P- Aggression K		.26*	-0.16*	-0.08*	-0.16*	0.71*	0.58*	-0.11*	-0.11*	-0.14*	-0.09*	0.04	0.02	0.00	0.06	-0.16*	-0.06*	-0.11*
2.T-Aggression K			-0.17*	-0.12*	-0.17*	0.23*	0.18*	-0.04	-0.11*	-0.07*	-0.21*	0.11*	-0.00	0.01	0.17*	-0.14*	-0.09*	-0.03
3.Language 54				0.29*	0.39*	-0.16*	-0.17*	0.29*	0.48*	0.35*	0.17*	-0.32*	-0.12*	-0.07*	-0.14*	0.13*	0.05	0.06
4.Responsiveness					0.28*	-0.11*	-0.12*	0.37*	0.21*	0.23*	0.19*	-0.18*	-0.03	-0.10*	-0.04	0.25*	0.12*	0.15*
5.Sensitivity and Affection						-0.16*	-0.18*	0.23*	0.32*	0.27*	0.17*	-0.21*	-0.06*	-0.07*	-0.11*	0.25*	0.10*	0.18*
6.Parent Aggression 54							0.66*	-0.11*	-0.09	-0.10*	-0.09*	0.05	0.02	0.01	0.03	-0.16*	-0.03	-0.09*
7.Parent Aggression 36								-0.06	-0.13*	-0.14*	-0.13*	0.06*	-0.03	0.00	0.02	-0.16*	-0.06	-0.11*
8.Language Stimulation									0.24*	0.19*	0.14*	-0.11*	-0.12*	-0.13*	-0.05	0.13*	0.13*	0.13*
9. Language 36										0.22*	0.15*	-0.19*	-0.09*	-0.10*	-0.16*	0.12*	0.07*	0.08*
10.Income											0.28*	-0.21*	-0.08*	0.01	-0.06*	0.42*	0.06*	0.36*
11.Marital Status (1= Married/Partnered)												-0.31*	-0.02	-0.04	-0.02	0.30*	0.13*	0.11*
12.Race-Black													-0.07*	-0.10*	-0.00	-0.25*	-0.06*	-0.13*
13. Race-Hispanic														0.24*	0.00	-0.11*	-0.04	-0.06*
14. Race-Other															-0.02	-0.08*	-0.04	-0.02
15.Gender (1 = male)																-0.03	-0.04	-0.01
16.Maternal Age																	0.19*	0.34*
17.Maternal Ed (College)																		-0.45*
18.Maternal Ed (>College )																		

\*p < .05, T-Aggression K is teacher-rated aggression at school entry, measured using the CBCL-TRF; P-Aggression K is parent-rated aggression at school entry, measured using the CBCL.

maternal age were significant, positive predictors of language at 54 months. Boys had significantly lower language scores than girls. Black and Hispanic children had significantly lower language scores than White children. Additionally, children of mothers with greater than high school education at time of birth had higher language scores than children of mothers without.

The parent and teacher-aggression outcomes were modeled as independent outcomes of language at 54 months, responsiveness at 36 months, and sensitivity at 36 month. As can be seen in Table 4, Language at 54 months did not have a significant effect on teacher-rated aggression. Sensitivity at 36 months was a significant, positive predictor of teacher-rated aggression. Similar to language at 54 months, Responsiveness at 36 months was not a significant predictor of teacher-rated aggression at school entry. Additionally, aggression at 54 months was a positive, significant predictor of teacher-rated aggression. The dummy coded effect of Marital Status indicated that children who were in homes with parents either married or partnered living together, had significantly lower teacher-rated aggression. Also, Boys had significantly higher levels of teacher-rated aggression than girls.

As can be seen in Table 5, Responsiveness at 36 months, Sensitivity at 36 months, and Language at 54 months were not significant predictors of parent-rated aggression. The only control variables that significantly predicted parent-rated aggression were aggression at 54 months and aggression at 36 months. Both had positive effects.

To maintain the temporal sequence to the model, aggression at 54 months was treated as a second mediator. It was regressed on all of the same covariates as Language at 54 months and allowed to correlate ( $B = -4.21$ ,  $SE = 3.50$ ,  $p = 0.229$ ). The only control variables that

*Table 3. Language 54 Months Outcome: Unstandardized Path Coefficients, Standard Errors, and Significance Level*

Predictor	Total(N = 1,364)			Girls(N = 705)			Boys(N = 659)		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Responsiveness	0.46	1.04	0.659	-1.19	1.61	0.457	1.62	1.32	0.218
Sensitivity and Affection	2.19	0.41	0.000	3.16	0.61	0.000	1.24	0.58	0.032
Language Stimulation	2.71	0.86	0.002	4.37	1.22	0.000	1.51	1.26	0.231
Language 36	0.73	0.07	0.000	0.65	0.10	0.000	0.82	0.10	0.000
Aggression 36	-0.24	0.18	0.173	-0.14	0.27	0.595	-0.36	0.25	0.147
Marital Status (1 = married/partnered)	-4.84	2.65	0.068	-5.85	3.66	0.110	-4.27	4.11	0.298
Income	1.19	0.30	0.000	1.59	0.40	0.000	0.80	0.53	0.132
Sex (1= male)	-4.55	1.72	0.008						
Black	-17.59	2.66	0.000	-16.31	3.93	0.000	-17.74	3.66	0.000
Hispanic	-7.72	3.34	0.021	-5.49	4.82	0.255	-9.16	4.86	0.059
Other Race	-1.83	3.71	0.622	-1.72	5.24	0.743	-0.81	5.66	0.886
Maternal Age	0.80	0.20	0.000	0.73	0.28	0.008	0.86	0.29	0.003
Maternal Education (College)	6.20	2.30	0.007	8.44	3.22	0.009	4.56	3.35	0.174
Maternal Education (>College)	10.95	3.37	0.001	11.18	4.72	0.018	11.39	4.79	0.017
with Aggression 54	-4.21	3.50	0.229	-9.22	4.99	0.065	1.61	5.08	0.752
R <sup>2</sup>		0.42			0.44			0.40	

*Table 4. Teacher-Rated Aggression Using CBCL-TRF: Unstandardized Path Coefficients, Standard Errors, and Significance Level*

Predictor	Total(N = 1,364)			Girls(N = 705)			Boys(N = 659)		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Responsiveness	0.02	0.28	0.939	0.17	0.29	0.553	0.100	0.429	0.815
Sensitivity and Affection	-0.24	0.11	0.031	-0.20	0.15	0.170	-0.319	0.169	0.059
Language 54	-0.01	0.01	0.097	-0.01	0.01	0.589	-0.020	0.012	0.101
Language Stimulation	0.29	0.23	0.206	0.11	0.25	0.655	0.374	0.375	0.318
Language 36	-0.00	0.02	0.909	0.01	0.02	0.732	-0.016	0.029	0.580
Aggression 54	0.24	0.06	0.000	0.28	0.08	0.000	0.219	0.095	0.021
Aggression 36	0.01	0.07	0.870	-0.04	0.07	0.550	0.040	0.101	0.689
Marital Status (1 = married/partnered)	-3.47	0.87	0.000	-1.49	0.98	0.127	-5.314	1.379	0.000
Income	0.12	0.08	0.108	-0.00	0.07	0.990	0.267	0.147	0.069
Sex (1= male)	2.07	0.42	0.000						
Black	0.39	0.95	0.684	0.08	0.96	0.931	0.677	1.557	0.664
Hispanic	-0.46	0.86	0.594	1.21	1.21	0.319	-1.569	1.236	0.204
Other Race	-0.06	0.97	0.948	-1.03	0.98	0.292	0.470	1.647	0.775
Maternal Age	-0.04	0.04	0.343	0.01	0.05	0.894	-0.100	0.073	0.174
Maternal Education (College)	-0.51	0.60	0.401	-1.13	0.81	0.162	0.111	0.885	0.900
Maternal Education (>College)	0.17	0.81	0.829	-0.60	1.03	0.561	0.973	1.239	0.432
with P-Aggression K	3.53	0.99	0.000	1.19	1.24	0.337	5.838	1.509	0.000
R <sup>2</sup>		0.14			0.11			0.14	

Note: P-Aggression K is parent-rated aggression at school entry, measured using the CBCL

significantly predicted aggression at 54 months were language stimulation ( $B = -0.32$ ,  $SE = 0.15$ ,  $p = 0.03$ ) and aggression at 36 months ( $B = 0.73$ ,  $SE = 0.03$ ,  $p < .001$ ).

Using 5000 bootstrapped estimates of indirect effects (Preacher & Hayes, 2004), the effect of Responsiveness via language was nonsignificant for both parent and teacher-rated aggression. The unstandardized estimates of the indirect effect were  $-0.01$  ( $SE = 0.02$ ,  $p = 0.71$ ) for teacher-rated and  $-0.00$  ( $SE = 0.01$ ,  $p = 0.86$ ) for parent. The effect of sensitivity via language was also nonsignificant for both parent and teacher rated aggression. The unstandardized estimates of the indirect effect were  $-0.03$  ( $SE = 0.02$ ,  $p = 0.115$ ) for teacher-rated and  $-0.01$  ( $SE = 0.01$ ,  $p = 0.64$ ) for parent. Thus, these results do not support the hypothesized mediating effect of language on the association between Responsiveness/Sensitivity and Aggression.

Next, the exploratory hypothesis was tested that gender would moderate the indirect effect of Responsiveness/Sensitivity on aggression via language. To test this hypothesis, separate models for both males and females were calculated in a two group model. These models followed a similar pattern of results to the above model. Path coefficients and standard errors are presented in Table 3, 4, and 5. Bootstrapped estimates of the indirect effects for the separate male and female models indicated no significant indirect effects. The indirect effect estimates for each of the models are presented in Table 6. This model was compared to a model in which the paths from Responsiveness/Sensitivity to Language, Language to Aggression, and Responsiveness/Sensitivity to Aggression were constrained to be equivalent across groups. A



*Table 5. Parent-Rated Aggression Using CBCL: Unstandardized Path Coefficients, Standard Errors, and Significance Level*

Predictor	Total(N = 1,364)			Girls(N = 705)			Boys(N = 659)		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
Responsiveness	0.15	0.15	0.324	0.23	0.21	0.272	0.15	0.23	0.501
Sensitivity and Affection	-0.03	0.06	0.590	-0.09	0.10	0.333	-0.02	0.08	0.765
Language 54	-0.00	0.01	0.635	0.00	0.01	0.873	-0.01	0.01	0.462
Language Stimulation	-0.15	0.13	0.252	-0.29	0.18	0.109	0.00	0.19	0.996
Language 36	0.01	0.01	0.631	-0.02	0.01	0.173	0.02	0.02	0.179
Aggression 54	0.56	0.03	0.000	0.59	0.05	0.000	0.52	0.05	0.000
Aggression 36	0.21	0.04	0.000	0.23	0.05	0.000	0.20	0.05	0.000
Marital Status (1 = married/partnered)	0.20	0.47	0.663	0.65	0.64	0.310	0.05	0.67	0.936
Income	-0.05	0.04	0.195	-0.05	0.05	0.351	-0.05	0.06	0.460
Sex (1= male)	0.26	0.25	0.287						
Black	-0.55	0.48	0.253	-0.13	0.63	0.837	-0.81	0.71	0.252
Hispanic	0.01	0.53	0.992	1.57	0.91	0.084	-1.24	0.57	0.030
Other Race	-0.50	0.50	0.325	-0.75	0.74	0.314	-0.55	0.71	0.437
Maternal Age	-0.03	0.03	0.364	0.02	0.04	0.660	-0.06	0.04	0.145
Maternal Education (College)	-0.61	0.33	0.061	-0.52	0.46	0.255	-0.68	0.48	0.156
Maternal Education (>College)	-0.67	0.43	0.120	-0.98	0.58	0.090	-0.41	0.63	0.517
with T-Aggression K	3.53	0.99	0.000	1.19	1.24	0.337	5.84	1.51	0.000
R <sup>2</sup>		0.53			0.57			0.50	

Note: T-Aggression K is teacher-rated aggression at school entry, measured using the CBCL-TRF

*Table 6. Unstandardized Indirect Effect Estimates for Separate Male and Female Models*

		Estimate	SE	<i>p</i>
	Male(N=659)			
R→L→T		-0.03	0.04	0.369
R→L→P		-0.01	0.02	0.612
S→L→T		-0.02	0.02	0.233
S→L→P		-0.01	0.01	0.527
	Female(N=705)			
R→L→T		0.01	0.03	0.766
R→L→P		-0.00	-0.10	0.924
S→L→T		-0.02	0.04	0.594
S→L→P		0.00	0.02	0.875

Note: R is Responsiveness, L is Language, T is Teacher-Rated Aggression, P is Parent-Rated Aggression, S is Sensitivity

eight-degree- of-freedom chi-square ( $\chi^2$ ) test of significance was used to compare these models. The results indicated that the model in which these paths were constrained did not fit significantly differently from a model in which these paths were freely estimated across groups ( $\chi^2(8) = 8.67, p = 0.37$ ). There is no evidence that the indirect effects were moderated by child gender.

After completing the above analyses, two additional questions emerged. Language stimulation, responsiveness, and sensitivity were all significant predictors of language. There was also a positive association between language stimulation and parent-rated aggression. These findings raised a question about the relative magnitude of the effects of language stimulation versus responsiveness and sensitivity. First, the indirect effect of language stimulation on aggression via language was tested. Referring to Table 2, it can be seen that there was a significant association between language stimulation and language, language stimulation and teacher-rated aggression, as well as language and teacher-rated aggression. However, using 5000 bootstraps, estimates of the indirect effect indicated that there was no significant effect of language on the association between language stimulation and teacher-rated aggression (indirect = -0.04,  $SE = 0.03, p = 0.161$ ) nor parent-rated (indirect = -0.01,  $SE = 0.01, p = 0.653$ ). An additional model was run to compare the effects of Responsiveness/Sensitivity and Language Stimulation on language. This was accomplished by comparing a model in which these paths are constrained to be equal with a model in which they are freely estimated. A one-degree-of-freedom chi-square test indicated that the effect of Sensitivity on Language was not significantly stronger than that of Language Stimulation ( $\chi^2(1) = 0.27, p = 0.61$ ).

#### 4 DISCUSSION

The findings from this study do not support the hypothesized indirect effect of responsiveness and sensitivity on aggression via language, nor do they support gender as a moderator of this effect. Initial correlations indicated a strong association between parent-child relationship quality and language, as well as a smaller association between language and aggression. However, the magnitude of these effects decreased once included in the complete model that controlled for demographics and other home environment characteristics. There did appear to be a small unique effect of parent-child relationship quality on language. These findings did not provide evidence of a unique association between language and aggression.

There are two possible explanations for these findings. Past studies have generally only shown small associations between language and aggression, and few studies have controlled for characteristics of the home environment or parent characteristics when advocating for an association between language and aggression. It is possible that previous findings are spurious; that is, the only reason studies have shown a relationship is because the association between home environment or parenting and language is similar to the association between home environment or parenting and aggression.

A more likely possibility is that the relationship among these constructs is more complex than modeled in this study. Multiple theories posit that development is the result of transactions between the individual in the environment. Bandura's (1989, 2001) triadic theory of development theorizes that individuals are both products and producers of their own environment. Similarly, Sameroff (2009) suggests that to understand development we have to understand the transactions that co-occur between the child and the environment. This type of transactional perspective is supported by studies suggesting there are biological predispositions

to development. There is mounting evidence of genetic underpinnings of both language (DeThorne, Petrill, Hart, Channell, Campbell, Deater-Deckard, Thompson, & Vandenberg, 2008) and aggression (Brendegen, Vitaro, Boivin, Dionne, & Perusse, 2006). Given a transactional perspective, it is likely that these genetic predispositions are influencing parent-child relationship quality much earlier than is accounted for in this model. To understand the relationship between parent-child relationship quality, language, and aggression, researchers must first understand how these genetic predispositions interact with other aspects of the early social environment to influence development.

Another possible explanation is that the unexpected findings are due to restrictions in the SECCYD database. One potential problem with the SECCYD study is that it employed relatively restrictive recruitment criteria. As mentioned in the Methods, six participant exclusion criteria were employed: mother was a minor, mother was non-English speaking, eminent plans to move, target child was hospitalized for greater than seven days after birth, target child had an obvious disability, or birth mother had a substance use problem. Most of these criteria are either risk factors for behavior problems or language deficits (Bandstra, Morrow, Mansor, & Accornero, 2010; Whitman, Borkowski, Keogh, & Weed, 2001). It is likely that the variability in these two outcomes was restricted through the exclusion criteria. Past studies of an association between language and aggression have generally only demonstrated small effects. Any restriction to the variability of these measures would result in decreasing the size of this effect. Conducting these analyses in a randomly selected community sample might yield different results because of the restrictions of the SECCYD database.

The finding from this study that parental sensitivity has a significant unique effect on language, while the effect of responsiveness was nonsignificant, is likely due to methodological

differences not conceptual. The SECCYD measurement of sensitivity used a stringent lab based paradigm that focused on qualitative, interval ratings of the parent-child interaction. In comparison, the measurement of responsiveness relied on the HOME inventory. One noted problem with the HOME is the presence of ceiling effects (Linver, Brooks-Gunn, & Cabrera, 2004). Because all of the items on the HOME are rated as present or absent, it has been suggested that the HOME may not adequately appraise the home environment. This limitation in the HOME inventory may explain the unique, significant effect of sensitivity beyond responsiveness.

#### *4.1 Future Directions*

The weak link in this study was the hypothesized association between language and aggression. One possible explanation for this finding is that the relationship between language and aggression is more complex and nuanced than allowed for in this study. Estrem (2005) found an overall association between language and aggression. When subclasses of aggression and language were examined the findings varied depending on child's gender, language domain (expressive or receptive vocabulary), and aggression subtype (relational or physical). Estrem found that after controlling for physical aggression, girls' expressive vocabulary predicted relational aggression more than boys. Boys' expressive vocabulary predicted physical aggression more than girls. These findings suggest the presence of a gender by language domain by aggressive behavior subtype interaction that was not accounted for in this study. The SECCYD database was limited in that it only contained global measures of aggressive behavior. Future studies should account for this type of interaction.

Future analyses could also look at the home environment in more detail to determine if there is a pattern of individual for whom these processes are more important. More advanced

analyses, such as latent class or cluster analysis, may reveal a more nuanced understanding of these processes. These types of analysis are known as a “person-centered” approach and are used to identify meaningful co-occurring characteristics (Laursen & Hoff, 2006). The psychometric properties and validity of the HOME inventory have been widely explored as a part of the SECCYD study, as well other work. Furthermore, the SECCYD database has a large enough to sample to support mixture models (Fanti & Henrich, 2010). These analyses could be used to reveal statistical profiles of the early home environment. These profiles could be compared across social and cognitive outcomes to determine which characteristics of the early home environment are most crucial for adjustment and success. Understanding these co-occurring characteristics and how individuals from different clusters compare across social and academic outcomes has important implications for intervention.

#### *4.2 Implications*

Language interventions often include some parent component or training. However, most language interventions focus on developing certain skills or teaching new techniques that will enhance language development (e.g., dialogic reading, elaborative reminiscing, enhance milieu teaching; Huebner & Payne, 2010; Kaiser, Hancock, & Nietfeld, 2000; Reese, Leyva, Sparks, & Grolnick, 2010). The results of this study suggest that parent based language interventions should go further and be more holistic. These programs should focus on the overall quality of the parent-child relationship as a means of enhancing language development. There should be a focus on helping the parent become more responsive and better able to meet all of the needs of the child, rather than just focusing on certain language skills. Given the focus in this paper on Attachment Theory, the pattern of results, and previous interventions, there seems to be some evidence that early intervention is paramount. An additional consideration is the gender of the

child. The results from this study do not suggest that gender will moderate intervention effectiveness. However, these findings largely diverge with previous research. More importantly than considering gender, intervening when attachment bonds are forming could enhance language intervention effectiveness. Furthermore, focusing on the parent-child relationship, and in particular attachment, could be another means of identifying those children who are most at risk of language delays or deficits. Plus, these types of programs could have independent effects on preventing future behavior problems.



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