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The Relationship between Parental Stress, Parent-child Interaction Quality, and Child Language Outcomes

Meghan Nix

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ABSTRACT

MEGHAN D. NIX
The Relationship Between Parental Stress, Parent-Child Interaction Quality, and Child
Language Outcomes
(Under the direction of SHANNON SELF-BROWN)

Language skills developed in early childhood are important for literacy and communication

in childhood as well as future adult literacy skills and health. Certain demographic

characteristics and parent-child interaction skills have been identified through previous

research as being influential in child language development. Parental stress has also been

associated with child language outcomes. This study aims to explore whether parents'

interactive relational skills, measured by an observational method, are significantly related to

children's verbal outcome, while controlling for demographic variables and parental stress.

Participants included mothers of children aged 4-6 who completed measures of parental

interaction quality, parental stress, and demographic characteristics. Their children competed

a language skill measure. Results indicated that even when controlling for demographic

variables and parental stress, the relationship between parent-child interaction quality and

child language outcomes remained significant. These findings suggest that increasing

positive parent-child interaction skills may be beneficial for increasing children's language

skills.

INDEX WORDS: language development, interaction quality, parental stress, receptive

language, language outcomes

THE RELATIONSHIP BETWEEN PARENTAL STRESS, PARENT-CHILD
INTERACTION QUALITY, AND CHILD LANGUAGE OUTCOMES

by

MEGHAN D. NIX

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by

MEGHAN D. NIX

Approved:

Shannon Self-Brown_____
Committee Chair

Jenelle Shanley_____
Committee Member

May 05, 2013_____
Date

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The author of this thesis is:

Meghan D. Nix
2234 Sparta Rd. SE
Crawfordville, GA 30631

The Chair of the committee for this thesis is:

Shannon Self-Brown, Ph.D.
Center for Health Development
Institute of Public Health

> Georgia State University
> P.O. Box 3995
> Atlanta, GA 30302-3995

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CURRICULUM VITA

Meghan Nix
2234 Sparta Rd. SE
Crawfordville, GA 30631
Email: meghannix@gmail.com

Education

Georgia State University (2011-present)
  Master of Public Health (anticipated May 2013)

University of Georgia (2006-2010)
  Bachelor of Science in Psychology (May 2010)
  Minor in Child and Family Development

Scholarship

Research Experience

Research Assistant, National SafeCare Training and Research Center (Jan. 2011-present)

Research Assistant, University of Georgia Infant Research Lab (Jan. 2009-May 2010)

Presentations

Nix, M., Bright, M.A., Barfield, A., & Frick, J. (2009) *"But the star is green!" Individual differences in preschoolers' use of a scale model*. Poster session presented at the Psi Chi Conference at the University of Georgia, Athens, GA.

Senior Thesis: Year-long thesis in psychology investigating the possibility of a shape bias present in the Dimensional Change Card Sort Task for 3-year-olds.

Honors, Awards, and Memberships

Delta Epsilon Iota Academic Honor Society (January 2009-present)

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CHAPTER I—INTRODUCTION

Children's language development is important for future achievement and overall health (Hart & Risley, 1999; Schoon, Parson, Rush & Law, 2010). Past research has identified parenting behaviors that influence children's language development. In particular, the amount of speech that parents use with their children influences the later vocabulary size and sophistication. The results of past research suggest that the amount of language interaction between parent and child in the first years of life is not only the primary source of early language experience, but also is a significant determinant of later language experience and achievement.

This study aims to contribute to the literature concerning parent-child interaction and child language development. By building on the historical research by Hart and Risley (1995; 1999), the knowledge of this relationship could be expanded. This would provide a point of intervention for improving parent-child interaction and children's language achievement.

CHAPTER II—REVIEW OF THE LITERATURE

Child Language Development

Learning to speak is a critical milestone in a child's early development because of the association between positive spoken language and other outcomes (American Speech-Language-Hearing Association, 2013). Most children learn to talk by the age of three and this sets the stage for their future literacy skills by providing the foundation on which all other skills are built (Topping, Dekhinet & Zeedyk, 2011). Language development refers to learning the rules of language. This includes learning new words, what they mean, and how to put them together to construct sentences (ASHA, 2013). There are two types of language: receptive and expressive (ASHA, 2013; National Institute on Deafness and Other Communication Disorders, 2010). Receptive language, which is the focus of this research project, refers to the comprehension of language. The child is not only listening to but also comprehending the language around him. Expressive language is the production of speech, or the verbalization of language, and communication of messages (ASHA, 2013; NIDCD, 2010). The purpose of receptive and expressive language differs according to the stage of child development. Although communication for a child is, at first, mainly concerned with expressing needs, it also allows access to knowledge about the world around them (Koenig, Clement & Harris, 2004).

Typical language development contains several milestones from birth to five years of age. The first three years are the most intensive as this is when the brain is rapidly developing (NIDCD, 2010). There are critical periods within this age range in which the

brain is best able to learn new information. If a critical period passes without adequate interaction and opportunity for language development, it will become more challenging to accomplish the milestones as the child develops (NIDCD, 2010). Receptive language experience occurs first before children begin to learn to speak, and then in conjunction with expressive language as the child begins to verbalize (ASHA, 2013). In the first year, infants advance from recognizing and reacting to voices to babbling and imitating. By their first birthday, infants should have a vocabulary of one to two words. At this time, receptive (hearing) language is key and expressive language is just beginning to develop. By the age of two, toddlers should be able to combine two words into statements or questions. At the age of three, children should have a broad vocabulary, be able to be understood, use a variety of sounds, and be able to produce two or three word phrases. By the age of five, children should be able to not only understand most of what is being said at home and in school, but they should also be able to communicate easily with detailed sentences and adult grammar (NIDCD, 2010).

Language development affects more than just a child's ability to communicate. It also will affect many different aspects of the child's future life. When children's ability to communicate with and understand others is lacking, they are put at increased risk for deleterious consequences, including social, behavioral, and emotional problems (Topping et al., 2011).

Poor language acquisition in early childhood, specifically poor receptive language development, has been associated with poor adult literacy skills. For instance, a study by Schoon, Parson, Rush and Law (2010) assessed the longitudinal trajectory of receptive

language skills and early influences in childhood on the course of language development with a cohort of 11,349 British five-year-olds. The children were assessed for early receptive language ability, family background, housing conditions, and early literacy environment at age five. These participants were assessed again twenty-nine years later at age thirty-four for their basic literacy skills. The authors compared the experiences of children who showed language problems at age five to those of children with language skills that were in the normal range. Results showed that children with receptive language problems at age five were from a relatively disadvantage home life with fewer economic resources, parents with low educational attainment, and a lack of a stimulating literacy environment. These children were identified as at significant risk for poor adult literacy. Results suggested that certain factors, such as family socio-economic background, housing, and early literacy environment, moderate the risk for continuing language problems in adulthood. Although receptive language problems in childhood were associated with poor adult literacy, the majority of children were able to achieve competent adult literacy skills by age thirty-four, suggesting the moderator effect.

Early language acquisition is not only indicative of future literacy skills and school success, but it is also predictive of future overall health in adulthood (Organization for Economic Co-Operation and Development, 2000). An international adult literacy survey of adults aged sixteen to sixty-five was conducted in twenty-three countries between the years of 1994-1998 to identify how literacy skills were distributed internationally and nationally, as well as what factors influenced attaining higher levels of literacy, and additional outcomes associated with higher levels of literacy. For the purpose of this study, literacy was divided into five levels (1=very poor literacy skills, 2=read simple material, 3=secondary or college-

level reading skills, and 4/5= higher-order information processing skills). Results showed

that between 42% and 48% of individuals aged 16-65 in Canada and the United States

performed poorly on the literacy assessment. High literacy was found to be associated with

better health outcomes, which included increased longevity and healthier habits and

lifestyles.

Influence of Parental Behavior on Child Language Development

A child's first experiences with language are primarily with their parents (Hart &

Risley, 1999). Thus, parental behaviors are greatly influential on a child's language

development. In fact, a key determinant of a child's language development is the parents'

language interaction skills (Hart & Risley, 1995; 1999). Simply put, when a parent's

language interaction skills are high, the child's language acquisition will be higher than when

parent's language interaction skills are poor.

Several key parenting behaviors that were predictive of future language achievement

were identified in a seminal study by Hart and Risley (1995). The aim of the study was to

examine why, despite best efforts to equalize opportunity, children from low-income families

started out and remained behind their higher-income counterparts in terms of language

development. Data was collected to estimate average amounts of parental verbalizations

within homes. One-hour recordings of spoken words within the home between parent and

child were taken once a month for two and a half years. There were 42 parent-child dyads

and these were categorized by social class: professional, working, or welfare. A total of

1,318 transcripts were analyzed.

The authors found that one and two-year-old children hear an average of 1,440 words per hour. This amount varies largely between families with some children hearing over 3,000 words and some hearing less than 500 per hour. The authors extrapolated these findings to estimate how many words the children would have heard by age four. The estimation suggests that the number of words children hear from their parents ranges from 10-50 million. These estimations suggest that the differences that exist at ages one and two will increase as age increases, leading to a profound gap between children by the age of four.

Differences also emerged in the characteristics of language used by parents. All parents used a similar amount of language characterized as initiations (e.g., "what did you do today"), imperatives (e.g., "brush your teeth"), and prohibitions (e.g., "don't play with that"). However, the additional language, or "extra talk," used by more talkative parents contained a broader vocabulary, complex ideas, guidance, and positive reinforcement that was missing from less talkative parents. These differences were also found between social classes. Parents of low socioeconomic status, or those on welfare, talked less overall while professional parents talked more. Working class parents varied greatly between the most talkative and the least talkative in terms of amount of family talk. Furthermore, Hart and Risley (1995) found that the amount of talk, particularly the "extra talk," that children received is significantly related to their later vocabulary size and other later measures of the sophistication of their vocabulary,

Based on these findings, Hart and Risley (1995) recommended key parenting behaviors needed to optimize language development. They suggest that parents use a diverse vocabulary, respond to the children's behavior with words, use verbal guidance, put an emphasis on using language for communication, and be responsive to the child's attempt at

communicating. For language to develop optimally, interactions must be stimulating and supportive as well as predictable and developmentally appropriate for the child (Hertzman, 2000). Activities such as frequent talking and playing together present opportunities to utilize the suggested behaviors (Hart & Risley, 1995).

In a follow-up study to their landmark findings, Hart and Risley (1999) used the same data to describe how the pattern of interaction changed as children grew older. They found that children's talkativeness stops growing when they reach the level of their parents. Generally, children's talking stabilizes at the typical level of talking for the family. The authors also found that children's experiences with expressive (speaking) language experience is linked to their receptive (hearing) language experience. The children of more talkative parents who have, in turn, heard the most language, expressed themselves over 600 times per hour on average. Children of the least talkative parents expressed themselves less than 200 times per hours. These results, paired with their 1995 study (Hart & Risley, 1995), suggest that the amount of language interaction between parent and child in the first years of life is not only the primary source of early language experience, but also is a significant determinant of later language experience and achievement.

Parents' behaviors and perceptions are also related to optimal language development. Glascoe and Leew (2010) recruited 382 families with children between the ages of two weeks and two years from seventeen U.S. states to participate in a national standardization and validation study of the Brigance Infant and Toddler Screens. This screening tool consists of six subtests that evaluate fine motor, gross motor, self-help, social-emotional, receptive language, and expressive language of children. In addition to using the Brigance Infant and Toddler Screens as a measure, the Brigance Parent-Child Interactions Scale and a

demographic form were used. The Brigance Parent-Child Interactions Scale (BPCIS) measured parenting behaviors and perceptions that parents had towards their children. This scale was multi-informant, and included a parent self-report and an observational tool completed by a medical professional. The parent and medical professional observations were combined for analysis based on the frequency of contact between the medical professionals and parents.

Analyses identified four items from the BPCIS that predicted optimal developmental outcomes, which include both non-verbal outcomes (i.e., motor skills) and communication (receptive and expressive). They include: "I help my child learn by talking and showing him or her new things;" "I talk to my child in a special way;" "I can make my child feel better when he or she is upset;" "I talk with my child when feeding or eating with him or her." Children of parents who reported more positive interactions and positive perceptions of interacting with their children were more likely to have language skills in the normal range. Conversely, parents who endorsed less than two positive behaviors or held more than one negative perception had children with three times the risk of falling below the normal range, that is, with delayed language skills. The gap that emerges from the differences in language achievement between the average and below-average children only grew with increased age. While this study highlights the importance of parental behaviors and perceptions in influencing their children's language development, it also provides key areas where improvements can be made to avoid language delays.

Other Important Determinants of Child Language

In addition to parenting behaviors and perceptions, several demographic features have been seen to influence language development. For instance, lower levels of parental education have been found to be associated with the parent being not only less responsive to the child's attempts at communication, but also providing a poorer environment for the child's language acquisition (Hoff, 2009; Raviv, Kessenich & Morrison, 2004). Parents' economic status also has been found to have a strong relationship to children's language development. Hoff, Laursen, & Tardif (2002) found that mothers of higher socioeconomic status (SES) talk more to their children and do so more often for the encouragement of conversation. This allows the child to practice both receptive and expressive language. Lower SES mothers, on the other hand, speak less often to their children and when they do, the speech is more likely to be concerning the child's behavior by correcting or instructing the child's actions. Economic status also relates to language scores and future risk for differing problems. Qi and Kaiser (2004) showed that children from low-income families are especially at risk for significant behavior and language problems. In another study, children of low SES African American families were found to have lower language scores (Qi, Kaiser, Milan & Hancock, 2006). Specifically, these preschoolers scored 1.5 standard deviations below the mean on language functioning compared to European American preschoolers. Together, these studies suggest that socioeconomic status is very important for children's language outcome.

Another robust finding in the current literature is the impact of poor maternal mental health and stress on the child's language development. For instance, mothers with high anxiety have been found to be less responsive to their child's verbal attempts and had a more negative emotional tone when verbally interacting with their child (Nicol-Harper et al.,

2007).   Similarly, parental stress can negatively affect child language acquisition as well. A study by Ayoub, Vallotton, and Mastergeorge (2011) suggests that parenting stress is distinct from general stress in that parenting stress may be more directly related to the child's development and behavior. Examining the outcomes related to a stress intervention, this study found that parents without the intervention had higher general and parenting-related stress. These parents were then found to be more likely to have a child with reduced language ability. The effects of parenting stress remained significant with demographic risks, suggesting that parenting stress is distinct from general stress. When stress taxes the parent's psychological resources, the parent-child relationship may suffer (Hillson & Kuiper, 1994).

Several psychosocial risk factors for poor language outcomes were identified by Glascoe and Leew (2010). These include having 3 or more children, having moved 2 or more times in the past year, scoring high on a depression screening, and limited English ability. Parents who have fewer resources and multiple burdens are less likely to be able to spend adequate time interacting productively with their children and are less likely to enjoy doing so due to the stress of their situations. This leads to poorer language development and promotes a gap in language achievement for their children. Thus, children of parents with high stress are at an increased risk for problems in language acquisition because as the relationship becomes strained, positive interactions that support language development may decrease.

A recent review of the literature by Topping, Dekhinet & Zeedyk (2011) examined the current knowledge of the role of parent-infant interaction in the development of language in early childhood. Focusing on studies involving children ages 0-5, the authors identified 49

studies on this topic. The authors identified problems with certain measures used in these studies. Observations of parent-child interactions were often very brief and subjective. Other measures were used in a laboratory setting, in which strong experimenter effects may have influenced participant behaviors. Demographic characteristics such as socioeconomic status, ethnicity, parents' first language, and parental age emerged as barriers to quality interaction between parent and child, which can then negatively affect the language environment within the home. The relationship between parents' socio-economic status and children's language environments was supported by several robust studies and is, by far, the characteristic that garnered the most support through research. Further, anxiety, depression, and stress were identified as parental mental health problems that could affect children's language development. However, interestingly, the authors point out that children's language skills can improve if parenting behaviors are enhanced, even with the presence of the demographic-related barriers. Because demographic characteristics are rather stable and present a challenge for change, parent behaviors appear to be a critical point of intervention for child language acquisition.

Aims of this Study

Previous research has focused on identifying parental characteristics and barriers that affect children's language development. In a review of the literature, more than 10 studies were identified that used an observational measure of the parent-child interaction to understand how this is associated with children receptive language development. However, these observational measures were often brief and of uncertain reliability due to judgment by experimenters and untested measures (Topping et al., 2011). Thus, the primary purpose of

this study is to contribute to the literature on early child language development, by exploring whether parents' interactive relational skills as measured by the Keys to Interactive Parenting Scale, an validated observational measure with good psychometric properties (e.g., internal consistency), is significantly related to children's verbal outcome, while controlling for several demographic variables and parental stress, factors that have been demonstrated to be important in prior research (Topping et al., 2011; Ayoub et al., 2011). The hypotheses were as follows:

1. It is hypothesized that the parent-child interaction, as rated by the KIPS, will be significantly and positively associated with child receptive language.

2. It is hypothesized that after controlling for the demographic variables, including mother's age, marital status, education level, yearly household income, number of children in the household and number of adults in the household, and parental stress, parent-child interaction will remain a significantly stable associate of child receptive language.

3. It is hypothesized that parent stress will serve as a moderator in the relation between parent-child interaction and child receptive language.

CHAPTER III—METHODS AND PROCEDURES

Participants

Participants for this study participated in a larger study conducted by Carta, Lefever, Bigelow, Borkowski & Warren (2006-2010) that examined the use of cellular phones in increasing parent engagement, decreasing attrition, and increasing improvements in parenting skills within a home visiting program, SafeCare. For the larger study, participants were recruited in two cohorts. The first cohort consisted of families who had previously participated in the Parenting for the First Time Project, a project that examined risk factors for child neglect in families at risk, for families residing in the Kansas City and South Bend communities. The second cohort was recruited from health and social service agencies, such as Head Start programs and WIC offices, in the Kansas City and South Bend communities. Families were considered eligible for the study based on selected risk factors for poverty, young age at first birth, limited education, and limited preparedness for parenting. These families were recruited when their children were between 4 and 6 years. Although there were multiple data points collected in this randomized control study, the data used to examine the research questions for the current study focused on the baseline data collection time point and included 371 mother-child dyads. Mothers included in the study, had a mean age of 28.91 (SD= 5.80) and were primarily Hispanic and African American. The children in this sample had a mean age of 4.56 (SD= .57).

Measures

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Family and Maternal Life History. The Family and Maternal Life History (Carter, Lefever, Bigelow, Borkowski & Warren, 2006-2010) was used to garner information about the mothers' marital, educational, medical, and vocational history. In addition, the mothers' past use of social services, parenting programs, and personal activities as well as use of prescription, licit (alcohol and tobacco), and illicit drugs were assessed through this measure This measure was used to collect information on the following demographic variables that were included in the study analyses: mother's age, marital status, education level, yearly income, number of children in the household, and number of adults in the household.

Parenting Stress Index- Short Form. The Parenting Stress Index- Short Form (PSI-SF; Abidin, 1995) was used as a measure of parenting stress. The PSI-SF is a 36-item questionnaire comprised of 3 subscales: Parental Distress, Difficult Child Characteristics, and Dysfunctional Parent-Child Interaction (Abidin, 1995). Items are rated on a 5-point Likert scale ranging from "strongly agree" to "strongly disagree," and these scores were summed to create the 3 subscale scores as well as the total score. These scores are then converted to percentiles in order to compare to the general population. Scores above the 85th percentile are considered as being indicative of high levels of parenting-related stress as compared to the average population. Normal stress levels are categorized as those between the 16th and 84th percentiles. Internal consistencies have been reported as very good to excellent and the measure has been shown to be useful with low income, African-American mothers (Reitman, Currier & Stickle, 2002).

Keys to Interactive Parenting Scales. The Keys to Interactive Parenting Scales (KIPS; Comfort & Gordon, 2006) was used to evaluate the quality of parents' interaction with their target child. The KIPS is an observational tool that effectively measures parenting behaviors along 12 dimensions. These include: (1) sensitivity to responses, (2) supports emotions, (3) physical interactions, (4) involvement in child's activities, (5) open to child's agenda, (6) engagement in language experiences, (7) reasonable expectations, (8) adapts strategies to child, (9) limits and consequences, (10) supportive direction, (11) encouragement, and (12) promotes exploration and curiosity (Comfort & Gordon, 2006).   The KIPS items are presented on a five-point rating scale with behavior descriptions at points 1, 3, and 5. Each column of rating points are then summed. The total sum is divided by the total number of items scored resulting in the mean KIPS score. This score will be out of a possible mean score of 5. In the validation of the KIPS inter-rater reliability, coefficients were very high ranging from .90 to .96 (Comfort & Gordon, 2006).   The 12 KIPS subscales are averaged to form a single rating of positive parent child interaction (α=.89; Comfort & Gordon, 2006). In this study, the KIPS measure was coded live within the participants' homes by a coder who had successfully completed the KIPS online training. An assessment supervisor attended a site every 6 months to confirm coder reliability.

Peabody Picture Vocabulary Test, Fourth Edition. The Peabody Picture Vocabulary Test, Fourth Edition (PPVT-IV; Dunn & Dunn, 2007) was used to evaluate children's receptive (hearing) language skills. This tool is useful for evaluating a person's knowledge of standard American English words by including commonly used words that are likely to have been heard in high frequencies (Dunn & Dunn, 2007). This test allows for quick evaluation of

receptive vocabulary skills without requiring reading or writing skills.   This measure is also

available in Spanish and this version was administered to those children whose primary

language was Spanish. The PPVT is relevant for children aged 2.5 to adults and can

typically be administered in 10 to 15 minutes.

Procedures

Parents who demonstrated risk for child neglect by having 1 of several risk factors

used as inclusion criteria, including: poverty, young age at first birth, limited education, and

limited preparedness for parenting. Parents were recruited either by phone or in person and

were informed of the study purpose. Parents interested in participating in the study were then

asked to sign informed consent forms. The current analyses focuses on only the pre-

intervention (Baseline) assessments from a larger randomized intervention trial. Specifically,

scores for the Parenting Stress Index, Keys to Interactive Parenting Scale, and Peabody

Picture Vocabulary Test were used in addition to demographic information garnered from the

Family and Maternal Life History measure.

CHAPTER IV—RESULTS

Descriptive Analyses

The sample of mothers ranged in age from 17 to 48 with a mean age of 28.81 (SD=5.71). The sample of children ranged in age from 3 to 6 with a mean age of 4.59 (SD= .57). For marital status, 63.9% of mothers reported being either married or with a partner, while 28% reported being single. For education level, 39.9% of mothers had not completed high school. A further 27.6% of mothers reported the twelfth grade as their highest level of educational attainment, and 24.5% reported completing a higher form of education such as a technical school or college. For family income, 85% of the sample reported having a yearly income of less that $30,000. There was an average of 1.04 (SD=.91) adults other than the mother living in the household and an average of 2.66 (SD=.65) children in the household.

For the measures, the average score on the KIPS scale was 3.62 (SD=.65) out of a total possible score of 5. The average PPVT score was 92.3 (SD=15.76) compared to the normed mean of 100.1 (Dunn & Dunn, 2007). The average PSI total stress score was 75.05 (SD=19.75), which places the average score in the 54th percentile. The 54th percentile is well within the average stress percentile.

Bivariate Correlations

Bivariate correlations between the demographic variables, predictor variables, and outcome variables were conducted and are presented in Table 1. Receptive language scores were found to be significantly and positively correlated with parent-child interaction scores

as well as many of the demographic characteristics, as seen in Table 1. Language scores

were found to be negatively and significantly correlated with the total number of children in

the household as well as a measure of the parent child dysfunction.

Table 1. Bivariate Correlations between Demographic Variables, Parental Stress, Parental Interaction, and Child Language Outcomes

Variable	1	2	3	4	5	6	7	8	9	10	11	12
Demographic Characteristics												
1. Mother's Age	-	.116**	.086	.035	.049	.143**	.029	.040	.025	.030	.178**	.178**
2. Marital Status	-	-	.075	.345**	-.208**	.261**	-.057	.085	-.044	-.019	.119*	.042
3. Total Number of Children in Household	-	-	-	.157**	-.215**	.033	.049	.080	-.033	.060	-.193**	-.165**
4. Total Number Adults in Household	-	-	-	-	-.186**	.235**	-.004	.168**	-.035	.059	-.032	-.032
5. Highest Grade Completed	-	-	-	-	-	.150**	-.158**	-.295**	-.128*	-.194**	.134*	.209*
6. Yearly Household Income	-	-	-	-	-	-	-.071	-.066	-.078	-.051	.137**	.155**
Parental Stress												
7. Parental Distress	-	-	-	-	-	-	-	.566**	.529**	.819**	-.075	0.033
8. Parent-Child Dysfunctional Interaction	-	-	-	-	-	-	-	-	.558**	.817**	-.097	-.117**
9. Difficult Child	-	-	-	-	-	-	-	-	-	.849**	-.075	.044
10. Total Stress	-	-	-	-	-	-	-	-	-	-	-.094	-.050
Parent Interaction												
11. KIPS	-	-	-	-	-	-	-	-	-	-	-	.348**
Child Language Outcome												
12. PPVT	-	-	-	-	-	-	-	-	-	-	-	-

Notes: * Correlation is significant at the 0.01 level (2-tailed)
      ** Correlation is significant at the 0.05 level (2-tailed)

Linear Regression

A linear regression analysis was conducted to determine the unique and combined

effects of demographic variables, parental stress, and parent-child interaction on child

receptive language, as measured by the PPVT. A moderator analysis was also performed to

determine whether parental stress had a moderating effect on the relationship between parent-

child interaction and child receptive language. Variables found to be significantly associated

with child receptive language at the bivariate level were included in the linear regression and are presented in Table 2. Specifically, in Block 1, demographic variables were entered. In Block 2, the Parent Stress Index- Short Form subscale of Parent-Child Dysfunctional Interaction was entered, as this was the only parent stress variable found to be significant at the bivariate level. In Block 3, the Keys to Interactive Parenting Scale total score was entered. In Block 4, the moderator variable (the interaction between the Parenting Stress Index and the Keys to Interactive Parenting Scale variables) was entered.

In the final model, child receptive language was significantly associated with several variables. Main effects were found for mother's age, family income level, and the parent-child observational measure.   Together, these variables explained 18.6% of the variance in child receptive language. Parenting stress was not found to be significantly associated with child language outcomes nor was there a moderator effect for parenting stress on the relationship between parent-child interaction and child language outcome.

Table 2. Linear Regression Analysis Evaluating Effects of Demographic Characteristics, Parent Stress, and Parent Interaction on Child Receptive Language

| | Child Receptive Language | |
	ΔR^2	β
Step 1	.106	
Mother's Age		.184*
TNCH		-.156*
Highest Grade Completed		.127*
Yearly Income		.140*
Step 2	.004	
Mother's Age		.190*
TNCH		-.154*
Highest Grade Completed		.106
Yearly Income		.139*
PSI: PCDI		-.068
Step 3	.066	
Mother's Age		.146*
TNCH		-.101

Highest Grade Completed		.086
Yearly Income		.118*
PSI: PCDI		-.050
KIPS		.270*
Step 4	.004	
Mother's Age		.149*
TNCH		-.100
Highest Grade Completed		.088
Yearly Income		.116*
PSI: PCDI		-.046
KIPS		.271*
I-PSI/KIPS		.060

Note. TNCH= total number of children in household; PSI: PCDI= Parenting Stress Index subscale: Parent-Child Dysfunctional Interaction; KIPS= Keys to Interactive Parenting Scale total score; I-PSI/KIPS= interaction of parenting stress and parental interaction.
*p<.05

Additional Analyses

A follow-up bivariate correlation analysis was conducted to assess whether any specific observed parent-child interaction behaviors as measured by the KIPS were more significantly associated with child receptive language outcomes, as measured by the PPVT. Results indicated that all parent behaviors rated by observers were significantly and positively correlated with child receptive language outcomes and appear to be important and relevant to child receptive language development.

CHAPTER V—DISCUSSION AND CONCLUSION

The purpose of this study was to examine parental interaction skills, using a structured and reliable observational tool, to further understand the relationship between parent-child interaction child language acquisition, as measured by the PPVT. Parental stress was also explored for its role in the relationship. Hypotheses were partially supported.

Results indicated that when controlling for demographic variables that were statistically significant at the bivariate level, the relationship between parent-child interaction quality and child language outcomes remained significant. Consistent with past research, this suggests that parent and child interactions are positively related to the child's language achievement (Hart & Risley, 1995; 1999). However, this study shows that this association holds true when parent-child interaction is measured with a reliable observational tool, and substantiates what past research has indicated when parent-child interaction has been measured in other ways, such as through parent self-report and surveys, or unstandardized observational measures (Topping et al., 2011). Particularly, we understand that the dimensions of parenting behavior measured by the KIPS tool are related to a language outcome.

Main effects were also found for mother's age and yearly household income. Past research has shown mother's age to be a barrier to parent child interaction (Topping et al., 2011). Mother's age has been negatively associated with children's language environment, and this study shows that mother's age is positively associated with child language outcomes. This study provides support for previous findings regarding mother's age and children's language outcomes due to mother's age remaining a significant predictor of child language

outcomes in the correlation and regression analyses. Yearly household income has been found to be a significant predictor of child language development in past research (Hoff et al., 2002). The correlation and regression analyses showed that yearly household income was significantly related to child language outcome.

Correlational and regression analyses showed that parental stress was not statistically related to the receptive language, with the exception of one parental stress dimension. Specifically, Parent-Child Dysfunctional Interaction was negatively associated with receptive language development at the bivariate level, but not in the final regression model. Past research by Ayoub et al. (2011) found a relationship between parenting stress and child development that was mediated by parent-child interactions. The authors suggested that children with lower language skills may be more stressful for parents to interact with and that this relationship may be bidirectional. It has been previously suggested that parental stress affects parents' ability to effectively interact with their child resulting in poorer language acquisition. However, in this particular sample of parents, clearly the parent-child interaction is a more important associate of child language development than parental stress. Due to a significant percentage of the mothers reporting being married or with a partner, they may have more social support that reduces their burden of stress, resulting in the average reported parenting stress scores falling in the average stress level percentile range.

Previous research has shown that parent education and total number of children in the household are related to children's language outcomes (Hoff, 2009; Glascoe & Leew, 2010). Parent education has been shown to be a significant predictor of child language outcomes in that younger mothers have been found to be less responsive to their children and also provide a poorer language environment (Hoff, 2009). Total number of children in the home has been

shown to be psychosocial risk factor for poor language outcomes due to the amount of stress on the parent to which this contributes (Glascoe & Leew, 2010). Neither of these variables were found to be significantly associated with child language outcomes in the regression analyses.

Limitations

This study was conducted using secondary data provided by Carta et al. (2006-2010). By using secondary data, we had no control over which measures were used and the questions that were included in the measures. This was also a cross-sectional study examining one time point. Within cross-sectional studies, the evidence of change is inferred from differences between groups. This design did not allow for the ability to observe changes in language acquisition over time. An additional limitation was the lack of inter-rater reliability data for the KIPS measure used in this study. This data was not available for this study.

Future Directions

Children's language acquisition remains a crucial component of their development and overall future health and success. The relationship between parental interaction skills and language outcomes should be studied further, particularly using valid observational measures to evaluate interaction quality.

This study examined the baseline measurements of a study conducted by Carta et al. (2006-2010). An important next step in this work is to examine how child language scores may change over the additional time points measured, and whether the intervention studies

had any impact on this outcome. Such analyses will help us better understand whether an intervention that has been shown to improve parent-child interaction can directly or indirectly positively impact child receptive language.

More research is needed to examine the combined effects of demographic factors on language development. Many individual factors have been found to be associated with language development, but their interaction with each other and their relation together to language development is less clear. More research is also needed to examine long-term health outcomes related to language development. Related long-term health outcomes are important to understand; however, there is almost no research available on this subject. A large, longitudinal study would be beneficial for identifying outcomes. Potential comorbidities with other variable would also be of interest.

Potential intervention strategies should focus on increasing positive parent interaction skills. Strategies also should focus on increasing communication and verbalization between parents and children in order for children to develop a larger vocabulary (Hart & Risley, 1995). Previous research has shown that the sophistication of children's language will not likely surpass their parents', so interventions should recognize this and focus not only on increasing the amount of talk between parents and children but also on increasing the quality of that talk. This would involve providing parents with education aimed at increasing the sophistication of their language skills.

Education regarding the importance of a healthy language environment for child outcomes should be provided to parents by a trusted professional, such as a pediatrician. This will be particularly important for parents whose children are already at risk for poor

language development. Parents' response to and actions because of these recommendations would need to be examined and support should be provided to them.

While the spotlight is on increasing the quality of children's education, there should also be a focus on increasing the quality of children's home language environment. Parents should be encouraged to speak more frequently with their children and to develop their vocabulary to provide a rich environment for language acquisition.

Conclusions

These findings provide further confirmation of past research on parental interaction and verbal outcomes for children. This is also one of the first studies to pair a valid observational measure of parental interaction quality with a verbal outcome measure, and examine the association between these outcomes while controlling for important demographic factors and parental stress. Clearly, parent-child interaction is an important variable in the development of child language and future research and intervention services should focus on increasing the quality and quantity of these interactions. By focusing on teaching parents to talk to and positively interact with their children, the gap between children's language outcomes could be bridged, leading to positive future outcomes for school performance and later health.

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