

MCH/CCS-04-

PREDICTING AFRICAN AMERICAN CHILDREN'S SCHOOL COMPETENCE

Joanne E. Roberts, Ph.D.
Frank Porter Graham Child Development Institute
105 Smith Level Road, CB# 8180
Chapel Hill, NC 27599-8180

Published: August, 2004

Final Report
Grant R40 MC 00145
Project Period: 08/01/99 – 02/29/04

Prepared for:

THE MATERNAL AND CHILD HEALTH RESEARCH PROGRAM
MATERNAL AND CHILD HEALTH BUREAU, HRSA, PHS, DHHS
PARKLAWN BUILDING
5600 FISHERS LANE
ROCKVILLE, MARYLAND 20857

Abbreviations and Symbols

CELF = Clinical Evaluation of Language Fundamentals -3

HLM = Hierarchical Linear Model

HOME = Home Observation for Measurement of the Environment

MCHB = Maternal and Child Health Bureau

OME = Otitis Media with Effusion

PK = Prekindergarten

PPVT-R = Peabody Picture Vocabulary Test – Revised

SD = Standard Deviation

SS = Standard Score

SSRS = Social Skills Rating System

STRS = Student Teacher Relationship Scale

T-C = Teacher - Child

WJ = Woodcock Johnson Tests of Achievement – Revised

Executive Summary

Title and Number of Grant

PREDICTING AFRICAN AMERICAN CHILDREN'S SCHOOL COMPETENCE (R40 MC 00145)

MCH/CCS-04-

Statement of the Problem

Identifying the child, family, and school factors that influence African American children's school competence is important, given the demographic and ecological gaps between African American and White children in American society. Determining whether risk and buffering/protective factors during early childhood affect children's school functioning, and which different factors become important as children enter middle childhood, is critical for understanding children's functioning in the later elementary school grades and is only possible with longitudinal study designs. Further, the lack of literature on African American children's development leads to the dire need for research that will increase our understanding of the factors that promote and inhibit the development of African American children.

Research Objectives

This project examined the role of child, family, and school factors in predicting African American children's school competence during the later elementary school years. The aims of this study were to: 1) describe the developmental trajectories of African American children's language skills, social skills, and school competence from infancy through middle childhood; 2) determine the multiple predictors of school competence including academic achievement of African American children in middle childhood within an ecological model of child development; and 3) identify the extent to which children's social knowledge and behavior, language, peer adjustment, and the match between Afro-cultural beliefs and practices at home and school mediate the relationships between child, family, and school background factors and school competence.

Study Design and Methods

We followed 75 African American children whose development, family, and schooling environments have been prospectively documented since infancy. The children were recruited in infancy from community child care centers to participate in an MCHB funded study. Upon study entry in infancy, 73.3% of the families were from low-income households according to the federally defined poverty level, while at entry to kindergarten, 60.3% were classified as meeting the federally defined criteria for poverty (i.e., family of three less than \$22,492). Information about the child's language, social skills, and academic skills and their family and school environments were examined from infancy through 5th grade. Standardized and non-standardized tests and questionnaires as well as observations were done on the child, parent, and teacher when children were in grades 3, 4, and 5. These included measures of the home environment and maternal responsiveness, child's social behavior, language, race specific coping behaviors, peer relations, and academic achievement, and school characteristics. This study is a prospective descriptive correlational study, which examined African American children's school success and factors that may enhance their academic success.

Findings

Our studies point to a number of contextual factors that are important for the language and literacy development of African American children during the preschool and early elementary school years. The responsiveness and supportiveness of the home environment and responsiveness of the child care environment during early childhood predicted children's language and early literacy development during the preschool years. Further, the number of risk factors a child experienced was related to their language development during the preschool years.

In follow-up analyses, children who experienced fewer risk factors during early childhood had higher scores on measures of reading, math, and social skills and fewer behavior problems through grade 5. Further, one child measure assessed at kindergarten entry (language skills), one maternal measure assessed in 1st grade (parenting), and two school measures assessed from kindergarten through 5th grade (level of poverty and the teacher-student relationship) interacted with risk. Children with better language, who had mothers who provided more supportive parenting, who attended schools with fewer low-income children, and/or who had teachers who described a closer relationship with the study children were protected from the negative association between risk and the academic outcomes. We did not find that our peer measures or racial socialization measures served as protective factors, however these analyses were complete only through 4th grade and we feel that peer relations and racial beliefs will play a major role in the middle school years. Data collection on our 5th grade cohort was completed this summer and analyses are in process. We also found that one child factor, a history of otitis media with effusion (OME), is minimally or not associated with language or academic achievement between kindergarten entry through 3rd grade.

Recommendations

These studies have described developmental trajectories of language, social, and academic development for African American children, risk factors for children's academic achievement during the elementary school years, and identified how selected child, family, and school factors serve as risk and protective factors for the school competence of African American children through the elementary school years. Results from this study indicate that children who experience both protective and risk factors can show similar patterns of academic trajectories as children who experience fewer risk factors. This suggests that early childhood programs that enhance children's language or parenting skills offer an opportunity to reduce the apparent negative impact of risk. Further, the identification of specific characteristics of the child (i.e., language skills at kindergarten entry), family (i.e., more supportive parenting), and school (i.e., schools with fewer low-income children, and more supportive teacher student relationships) suggest areas to focus interventions to improve the academic competence of African American children. We plan to continue to follow the study children through 8th grade to understand how selected child, family, and school factors serve as risk and protective factors during the middle school years. The results of the studies on OME developmental linkages suggest that aggressive strategies in the medical and educational management of OME may not be warranted.

List of Products

A. Data Based Papers

Zeisel, S. A., Roberts, J. E., Neebe, E. C., Riggins, R., & Henderson, F. W. (1999). A longitudinal study of otitis media with effusion among 2- to 5-year-old African American children in child care. *Pediatrics*, *103*(1), 15-19.

Roberts, J. E., & Wallace, I. (1999). Otitis media and later language and learning. *Seminars in Otitis Media Management*, *2*(1), 10-15.

Burchinal, M. R., Roberts, J. E., Riggins, R., Zeisel, S. A., Neebe, E., & Bryant, D. (2000). Relating quality of center child care to early cognitive and language development longitudinally. *Child Development*, *71*(2), 339-357.

Roberts, J. E., Burchinal, M. R., Jackson, S. C., Hooper, S. R., Roush, J., Mundy, M., Neebe, E., & Zeisel, S. A. (2000). Otitis media in early childhood in relation to preschool language and school readiness skills among African American children. *Pediatrics*, *106*(4), 1-11.

Burchinal, M. R., Roberts, J. E., Hooper, S., & Zeisel, S. A. (2000). Cumulative risk and early cognitive development: A comparison of statistical risk models. *Developmental Psychology, 36*(6), 793-807.

Minter, K. R., Roberts, J. E., Hooper, S. R., Burchinal, M. R., & Zeisel, S. A. (2001). Early childhood otitis media in relation to children's attention-related behavior in the first six years of life. *Pediatrics, 107*(5), 1037-1042.

Jackson, S. C., & Roberts, J. E. (2001). Complex syntax production of African American preschoolers. *Journal of Speech, Language, and Hearing Research, 44*(5), 1083-1096.

Zeisel, S. A., Roberts, J. E., Burchinal, M. A., Neebe, E., & Henderson, F. W. (2002). A longitudinal study of risk factors for otitis media in African American children. *Maternal and Child Health Journal, 6*(3), 189-193.

Roberts, J. E., Burchinal, M. R., & Zeisel, S. A. (2002). Otitis media in early childhood in relation to children's school-age language and academic skills. *Pediatrics, 110*(4), 1-11.

Zeisel, S. A., & Roberts, J. E. (2003). Otitis media in young children with disabilities. *Infants and Young Children, 16*(2), 106-119.

Hooper, S. R., Roberts, J. E., Zeisel, S. A., & Poe, M. (2003). Core language predictors of behavioral functioning in early elementary school children: Concurrent and longitudinal findings. *Behavior Disorders, 29*(1), 10-24.

Poe, M. D., Burchinal, M., & Roberts, J. (in press). Early language and the development of children's reading skills. *Journal of School Psychology*.

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (in review). Risk and resiliency: Protective factors in early elementary school years.

Roberts, J. E., Jurgens, J., & Burchinal, M. (in press). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, Hearing Research*.

Hooper, S. R., Ashley, T. A., Roberts, J. E., Zeisel, S. A., & Poe, M. (in review). The relationship of otitis media in early childhood to attention dimensions.

B. Reviews/Conceptual Papers

Roberts, J. E., Burchinal, M., & Durham, M. (1999). Parents' report of vocabulary and grammatical development of African American preschoolers: Child and environmental associations. *Child Development, 70*(1), 92-106.

Roberts, J. E. (1999). Otitis media and hearing loss: Is child development affected? *Seminars in Otitis Media Management, 2*(1), 1-2.

Roberts, J., & Hunter, L. (2002). Otitis media and children's language and learning. *The ASHA Leader, 7*(18), 6-7.

Roberts, J. E., Zeisel, S. A., Rosenfeld, R., & Reitz, P. (2003). Otitis media and speech – language sequelae: A meta-analysis of prospective studies. *Evidence-Based Otitis Media*. R. R.

Roberts, J. E., Hunter, L., Gravel, J., Rosenfeld, R., Berman, S., Haggard, M., Hall, S., Lannon, C., Moore, D., Vernon-Feagans, L., & Wallace, I. (2004). Otitis media, hearing loss, and language learning: Controversies and current research. *Developmental and Behavioral Pediatrics, 25*(2), 1-13.

Roberts, J. E., Rosenfeld, R. M., & Zeisel, S. A. (2004). Otitis media and speech and language: A meta-analysis of prospective studies. *Pediatrics, 113*(3), 238-248.

Roberts, J. E. (2004). Effects of otitis media on children's speech and language. In C.M. Alper, C.D. Bluestone, M. L. Casselbrant, J. E. Dohar, & E. M. Mandel (Eds.), *Advanced Therapy of Otitis Media*. BC Decker Inc., Ontario, Canada, pp. 425-430.

Final Report: Predicting African American Children's School Competence

I. Introduction

A. Nature of the Research Problem

Consistent with an ecological model of development (Bronfenbrenner & Crouter, 1983; Sameroff, 1983), we studied the child, family, and school factors that influence African American children's competence in school from 3rd through 5th grade. Measuring these constructs is essential for understanding African American children's school performance, given the demographic and ecological gaps between African American and White children in American society (Children's Defense Fund, 2001; The College Board, 1999; Phillips, Brooks-Gunn, Duncan, Klebanov, & Crane, 1998). Determining whether risk and buffering/protective factors during early childhood affect children's school functioning, and which different factors become important as children enter middle childhood, is critical for understanding children's functioning in the later elementary school grades and is only possible with longitudinal study designs. Further, the lack of literature on African American children's development leads to the dire need for research that will increase our understanding of the factors that promote and inhibit the development of African American children.

B. Purpose, Scope, and Methods of Investigation

This project examined the role of child, family, and school factors in predicting African American children's school competence during the later elementary school years. The aims of this study were to: 1) describe the developmental trajectories of African American children's language skills, social skills, and school competence from infancy through middle childhood; 2) determine the multiple predictors of school competence including academic achievement of African American children in middle childhood within an ecological model of child development; and 3) identify the extent to which children's social knowledge and behavior, language, peer adjustment, and the match between Afro-cultural beliefs and practices at home and school mediate the relationships between child, family, and school background factors and school competence. We followed 75 African American children whose development, family, schooling, and neighborhood environments have been prospectively documented since infancy.

C. Nature of the Findings

Our studies point to a number of contextual factors that are important for the language and literacy development of African American children during the preschool and early elementary school years. The responsiveness and supportiveness of the home environment and responsiveness of the child care environment predicted children's language and early literacy development during the preschool years. Further, the number of risk factors a child experienced was related to their language development during the preschool years. In follow-up analyses, children exposed to fewer multiple risks in early childhood had higher scores in reading, math, and social skills and fewer behavior problems from kindergarten through 5th grade. However, children's language skills at entry to school and their mother's teaching style served as protective factors in the acquisition of their reading and in their social adjustment through 5th grade. Further, two dimensions of school assessed from kindergarten through 5th grade (level of poverty in the school and the teacher-student relationship) served as protective factors for risk and the academic outcomes. Children who attended a school with a lower proportion of children from low-income families and had teachers who reported a closer relationship with the child were protected from the negative association between risk and academic outcomes.

II. Review of the Literature

School competence or academic achievement for ethnic minority children is dependent on multiple variables and contextual factors play an important role. Although many African American children are raised in the presence of one, two, or several risk factors, many succeed in school and social relationships. Several factors are believed to buffer the influences of risk and

help at-risk children develop along a more optimal developmental pathway. Parents can play a buffering role for African American children who might otherwise be considered at-risk. For example, parents who spend more time in activities with their child may be providing the child with a sense of security and harmony. Luster and McAdoo (1994) found that children's academic achievement could be predicted from a cumulative advantage index which included a variety of maternal characteristics (e.g., intellectual status) and family context factors (e.g., number of children in the home, the quality of the home environment).

Peer relations may also play a buffering role for African American children who might otherwise be at-risk for school difficulties. As children grow older, their peers become increasingly important and so the peer domain becomes a critical one for children's overall social adjustment. Several lines of research indicate a link between children's relationships with their peers and how well children are adjusting to school (Gutman, Sameroff, & Eccles, 2002; McDougall, Hymel, Vailencourt, & Mercer, 2001). An obstacle to academic success in the lives of many African American children concerns peer pressure that is exerted against doing well in school.

Experiences with racism, discrimination, and ethnic socialization may also have particular importance in affecting African American children's school competence as they enter middle childhood. Racial socialization of children by parents is seen as a process by which children "procure a sense of their unique ethnic and racial identity" (Stevenson, 1994). This process is viewed as a critical step in the healthy psychological adjustment of African American children (Spencer, Swanson, & Cunningham, 1991). Some coping mechanisms allow African American students to respond positively despite racism and discrimination and positively affect their school performance.

Children's early language and literacy skills may play an important role in their later school competence. Although there are a variety of factors that contribute to children's success in school, there is agreement in the literature that language facility is one of the more important skills underlying academic achievement (Blank, Rose, & Berlin, 1978; Wells, 1985). The classroom setting is a pervasive language environment, and almost all interactions among teachers and students during the school day depend on language. The home language and literacy practices children experience may prepare them to enter school with a greater likelihood for school success.

III. Study Design and Methods

A. Study Design

This study is a prospective descriptive correlational study. Children and their families were followed longitudinally. This project examined African American children's school success and factors that may enhance their academic success.

B. Population Studied

Seventy-five African American children (41 girls, 34 boys) were enrolled in the project. All children had participated in earlier research projects examining otitis media, hearing, and language development and African American children's transition to school. Over the course of the current project (1999-2003), four children left the study. One child left after 3rd grade when the family moved to a distant state and did not wish to continue. Three children left after 4th grade; two of these families moved to other parts of North Carolina but did not want to continue even after we offered to test in their homes, and one child left because he had severe emotional problems and had difficulty participating in the assessments. Ten children were retained in school during the study. Six children repeated 3rd grade and 4 children repeated 4th grade.

C. Sample Selection

All children were initially recruited from community based child care centers between 6 and 12 months of age (mean = 8.2 months) and had no known medical or genetic abnormalities

when entering the study. Upon study entry in infancy, 73.3% of the families were from low-income households according to the federally defined poverty level, while at entry to kindergarten, 60.3% were classified as meeting the federally defined criteria for poverty (i.e., family of three less than \$22,492). The primary caregiver had completed 12.5 (SD = 2.1) years of education with the terminal degree for 28.8% of the primary caregivers less than a high school education, 28.8% high school, and 42.5% beyond high school. At kindergarten entry, the mean number of years of education completed by the primary caregiver was 13.1 years (SD = 2.0) with 17.8% of the primary caregivers having less than a high school education, 19.2% high school, and 63.0% greater than a high school education. All children who participated in the previous study (examining factors promoting African American children's transition to school) were invited to participate and all agreed to participate in the current study.

D. Instruments Used

A variety of standardized and non-standardized tests and questionnaires as well as observations were used to collect data from the child, parent (usually the mother), and teacher. These included measures of the family background, child's social behavior, language, race specific coping strategies, peer relations, and achievement, and school characteristics.

E. Statistical Techniques Employed

Two types of longitudinal analysis methods were used to address all major research questions. First, we examined the longitudinal patterns of change in the child's academic competence and social adjustment and related those patterns to the types and changes in social risk factors, parenting beliefs and practices, and school characteristics to address specific research questions using hierarchical linear models. These analyses involved testing whether characteristics, such as the child's language skills, social skills, school adjustment, coping strategies, racial identity, and peer adjustment, served to mediate associations between child outcomes and social risk and protective factors. Second, we identified various developmental pathways or prototypic patterns of development and determined which child, family, and school characteristics distinguished children displaying different patterns of growth. During both types of analyses, emphasis was placed on identifying factors that mediated or moderated observed relations between child, family, and school factors and child competence in school.

IV. Presentation of Findings

Table 1 presents a listing of the means of the measures assessed. Described below are our findings that describe risk and protective factors for children's language and academic achievement during the elementary school years and how contextual factors predicted children's language and early literacy development during the preschool and elementary years.

Table 1. Means for Measures Assessed in Grades 3, 4, and 5

I. Family Background Measures						
	Gr 3		Gr 4		Gr 5	
	N	M (SD) or %	N	M (SD)	N	M (SD)
Demographic						
SES						
Very Low Poverty	11	14.67%				
Low Poverty (185%)	27	36%				
No Poverty	37	49.33%				
Maternal Education	75	13.25 (1.96)				
# in Household	75	4.47 (1.46)				
NLSY HOME	75	0.70 (0.14)			65	0.72 (0.13)
Afrocentric Home Inventory					72	0.79 (0.21)

PSI Stress Score	74	68.01 (21.69)				
CESD	75	0.41 (0.38)			66	0.47 (0.44)
Parent Child Relationship	75	4.35 (0.58)	74	4.25 (0.64)	66	4.31 (0.64)
Social Support MSSI Social Support Index	73	13.40 (2.83)			72	49.70 (7.40)
Home Stimulation	67	3.09 (0.59)	6	2.96 (0.40)	66	3.17 (0.54)
Ethnic Socialization					72	2.90 (0.95)
Events						
General Discrimination			64	0.57 (0.68)	33	0.52 (0.69)
School Discrimination			64	0.23 (0.30)	33	0.28 (0.49)
Social Contact						
White	66	2.18 (0.57)	6	2.60 (0.99)	72	2.25 (0.74)
Black	66	3.08 (0.61)	6	2.93 (0.73)	72	3.06 (0.62)
MIBI						
Private Regard	63	4.61 (0.37)	5	4.76 (0.36)	71	4.57 (0.48)
Public Regard	63	3.14 (0.52)	5	3.80 (0.53)	71	3.34 (0.64)
Centrality	63	3.68 (0.63)	5	3.40 (0.45)	71	3.63 (0.63)
II. Child Measures						
A. Social Behavior						
Conners' (Parent)	75	0.49 (0.29)	74	0.50 (0.36)	66	0.53 (0.42)
Conners' (Teacher)	68	0.95 (0.71)	59	0.91 (0.68)	61	0.92 (0.75)
SSRS (Parent)						
Soc. Skills SS	75	103.79 (17.25)	74	105.61 (17.61)	66	103.91 (18.43)
Prob Beh. SS	75	98.7 (12.21)		100.38 (13.60)	66	98.76 (14.65)
SSRS (Teacher)						
Soc. Skills SS	67	93.33 (14.82)	59	91.97 (12.18)	58	93.14 (13.46)
Prob Beh. SS	67	108.51(15.36)	59	108.58 (14.33)	60	110.18 (17.13)
Academic Comp	68	90.40 (12.24)	59	87.59 (11.36)	60	89.25 (12.65)
SSRS (Child)	67	111.10 (17.69)	74	107.12 (15.34)	65	108.57 (15.54)
Child Checklist Total (Parent)	48	11.94 (8.32)	74	12.93 (8.40)	66	12.89 (9.51)
Child Checklist Total (Teacher)	60	18.10 (14.44)	59	17.54(12.74)	60	16.88 (12.63)
Child Observation % Engaged	72	83.94 (12.23)	71	85.73 (9.93)	70	85.36 (11.22)
B. Language						
ALI (Teacher)	68	3.10 (0.85)	59	3.03 (0.77)	60	3.10 (0.85)
CELF						
Expressive			74	92.98(14.76)		
Receptive			74	92.26 (17.21)		
C. Race Specific Coping						
Stimuli Preference	67	2.23 (0.29)			65	2.38 (0.24)
Home Stimulation	67	2.98 (0.67)	6	2.73 (0.66)	65	3.23 (0.70)
Social Stress racial reason scenarios	64	0.69 (0.27)	6	0.79 (0.27)		Being coded
Social Expectation discrimination /prejudice	66	0.59 (0.42)	6	0.57 (0.46)		Being coded

MIBI						
Private Regard	60	4.28 (0.48)	6	4.31 (0.07)	65	4.21 (0.39)
Public Regard	60	3.15 (0.82)	6	3.33 (0.37)	65	3.22 (0.60)
Centrality	60	3.89 (0.75)	6	3.57 (0.85)	65	3.76 (0.69)
Social Contact						
White	66	2.02 (0.69)	6	2.33 (0.65)	65	2.10 (0.70)
Black	66	3.12 (0.54)	6	3.2 (0.83)	65	3.14 (0.62)
D. Peer Relations						
Strateg. In Peer Situ.	67	3.03 (1.01)	6	3.09 (0.99)	71	3.03 (1.10)
Goals in Peer Situ.	67	4.43 (0.97)	6	4.15 (0.70)	71	3.97 (0.87)
Interp. In Peer Situ.					71	2.87 (0.90)
Friendship Quality	65	3.85 (0.79)	71	3.91 (0.76)	70	3.96 (0.87)
Peer Relation Provision Sum			66	77.94 (17.45)	70	82.49 (14.71)
Peer Relation Victimization Sum			66	12.13 (5.8)	70	11.26 (5.98)
Ideas about Friendship			41	3.24 (0.65)	58	3.05 (0.58)
Peer Character. SSRS - SS						
Social. Beh	57	4.13 (0.52)	56	4.07 (0.50)	61	4.04 (0.52)
Peer Acad	57	41.87 (16.13)	56	94.64 (6.87)	57	95.56 (7.41)
E. Achievement						
WJ						
Broad Reading	75	103.44(12.42)	74	102.84 (12.65)	71	103.17 (12.27)
Broad Math	75	109.47(15.13)	74	104.61 (16.63)	71	105.39 (14.89)
Broad Writing	67	99.21 (12.00)	74	97.36 (12.38)	71	95.45 (13.46)
Hare Self Esteem	66	94.77 (10.39)	6	28.83 (6.34)	64	97.57 (10.87)
What I think of School	75	2.73 (0.25)	74	2.68 (0.25)	65	2.69 (0.23)
Loneliness Scale	71	14.76 (4.51)	70	14.16(4.94)	70	14.16 (4.94)
III. School Characteristics						
St- teach Relationship	68	3.85 (.073)	59	3.81 (0.74)	60	3.77 (0.84)
Classroom Demographics						
# Children in Class	66	22.82 (3.98)	58	22.53 (4.39)	33	22.70 (5.00)
T/C ratio	66	12.84 (3.29)	58	17.70 (6.59)	33	17.74 (6.64)
Proportion white	65	0.36 (0.27)	58	0.38 (0.28)	33	0.41 (0.31)
ADAPT	72	3.09 (0.55)	71	3.14 (0.54)	70	2.91 (0.49)

Risk and Protective Factors in Relation to Language and Academic Achievement

First, we examined the role of risk and protective factors for children's academic achievement and school adjustment through 3rd grade (Burchinal, Roberts, Zeisel, Hennon, & Hooper, in review). A single risk factor score was computed to represent exposure to adversity during early childhood through a factor analysis of risk factors (i.e., maternal IQ, maternal education, poverty, single parent, household size, maternal depression, and life stress). Each variable represented a mean score, averaged over the child's first four years because risks tended to be quite stable. Children experienced an average of three risk factors during early childhood ($SD=3$). The sample varied in terms of exposure to risk during early childhood: 1/3 of the children were exposed to a high number of risk factors (5 or more), 1/3 experienced a moderate number of risk factors (2-4 risk variables); and 1/3 experienced few risk factors (0-1 risk variables). Hierarchical linear models related risk to child outcomes from 1st to 3rd grade for 75

children, assessed directly on Broad Reading and Broad Math on the *Woodcock-Johnson Test of Achievement* (WJ) (Woodcock & Johnson, 1990) and from kindergarten through 3rd grade for teacher ratings on the *Social Skills Rating System* (SSRS) (Gresham & Elliott, 1990).

Analyses that examined these outcomes from kindergarten through 3rd grade indicated that children with higher risk scores had lower math, reading, and social skill scores and higher problem behavior scores over time. Moreover, children's language skills [as measured by the *Clinical Evaluation of Language Fundamentals-3* (CELF) (Semel, Wiig, & Secord, 1995) and *Peabody Picture Vocabulary Test-R* (PPVT) (Dunn & Dunn, 1997)] at entry to kindergarten and the mother's teaching style (as measured by the mother's language and teaching strategies and rated during a series of teaching tasks in 1st grade) were significant protective factors in the analyses of children's reading, math, and social skills. Children's language at kindergarten entry moderated the association between children's risk and math scores ($B=1.4$, $p<.01$), and this interaction is illustrated in Figure 1. The effect size for the early childhood multiple risk score was computed for children whose language was at the 25th, 50th, and 75th percentile for the sample of outcomes at the average age when children were in grades 1, 2, and 3. The effect size describing the risk-math association for children at the 25th percentile for language was substantially larger ($d=.18$ to $.26$) than for children at the 75th percentile for language ($d=.02$ to $.04$). Mother's teaching style and language moderated the association between risk and children's reading ($B=3.33$, $p<.05$) and math ($B=1.4$, $p<.01$). As shown in Figure 2, exposure to multiple risks in early childhood was a stronger negative predictor of reading when mothers scored at the 25th percentile regarding their teaching style (e.g., $d=.21$ in grade 1) than when mothers scored at the 75th percentile (e.g., $d=.04$ in grade 1). Figure 3 shows the effect sizes for risk in predicting children's math scores, illustrating larger effect sizes when mothers are less involved and effective in teaching ($d=.21$ to $.32$) and smaller effect sizes for risk when mothers are more involved and effective in teaching ($d=.04$ to $.06$). Finally, results also indicated that children who attended schools in which more than 50% of the students received free or reduced price lunch scored considerably lower in math and showed more behavior problems. Interestingly, exposure to multiple risk factors was a negative predictor of outcomes for children at schools with less poverty, but not for children at schools with high levels of poverty.

Figure 2: Effect sizes for early childhood risk as predictor of math: Pre-K Language as Protective Factor

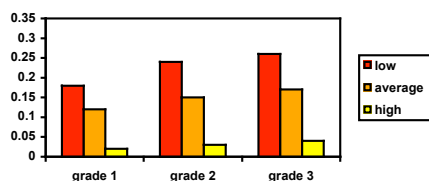


Figure 3 Effect sizes for early childhood risk as predictor of reading: Parenting as a protective factor

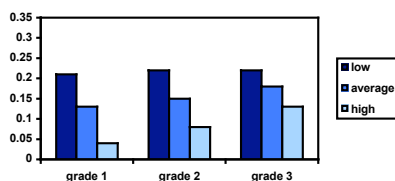
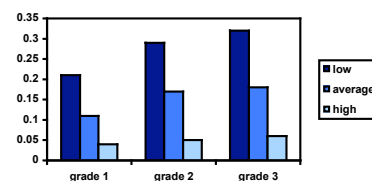


Figure 4 Effect sizes for early childhood risk as predictor of math: Parenting as a protective factor



In follow-up analyses, we extended these analyses of risk and protective factors to literacy and social outcomes through grade 6. WJ achievement data were collected for 75 children through grade 4, 71 children in grade 5, and 42 children in grade 6. Teacher ratings on the SSRS *Social Skills and Problem Behaviors Scales* were available for 69 children through grade 4, 60 children in grade 5, and 31 children in grade 6. Hierarchical Linear Model (HLM) analyses described academic trajectories from 1st through 6th to identify risk scores and selected protective factors. The first model (see Table 2) included age, risk, and gender as predictors. As expected, children with higher risk scores scored lower on every measure of reading and math and on social skills and had higher problem behavior scores as shown in the results from the first HLM model in Table 2. The second model (see Table 2) added parenting and school characteristics to the base model. Parenting was represented by a composite that included: a) the *Home Observation for Measurement of the Environment* (HOME) (Caldwell & Bradley,

1984) (administered every 1–2 years) from infancy through 5th grade; and b) ratings of maternal sensitivity in a book reading session and the mother’s teaching style (as measured by the mother’s teaching strategies during a series of teaching tasks in 1st grade). Parenting both mediated (accounting for 50-75% of risk effect sizes in Model 1) and moderated the association between risk and children’s reading ($B=1.6, p<.05$) and math ($B=1.6, p<.01$) scores on the WJ. However, parenting was a stronger protective factor when children were younger than when they were older. As shown in Figure 4, exposure to multiple risks in early childhood was a stronger negative predictor of reading at the younger ages when mothers scored at the 25th percentile regarding their parenting ($d=.26$ to $.39$) than when mothers scored at the 75th percentile (e.g., $d=.12$ to $.39$). Similarly for math, exposure to multiple risks in early childhood was a stronger negative predictor when mothers scored at the 25th percentile regarding their parenting ($d=.28$ to $.34$) than when mothers scored at the 75th percentile ($d=.03$ to $.04$), and parenting appeared to provide similar protection from risk from grades 1 to 6. In addition, attending a school in which more than half the children were from low-income families appeared to increase the negative effects of risk on social skills across the ages ($B=-2.6, p<.05$) and at older ages for reading ($B=-1.9, p<.05$) and math ($B=-1.2, p<.05$) (lower math and reading scores). Teacher-child (T-C) closeness as measured by the *Student Teacher Relationship Scale* (STRS) (Pianta, 1991) from grades 1 through 6, when examined instead of school poverty in the model, served as a protective factor for math scores at the older ages ($B=-.8, p<.05$) and for behavior problems at the younger ages ($B=-.6, p<.05$). Ethnic socialization as measured by *Ethnic Socialization Measure* (Browne, Malone, Wilson-Brewer, Humphrey, & Clubb, unpublished manuscript) did not moderate risk in the analysis.

The third model (see Table 2) added children’s early language and social skills and, in subsequent models, their ethnic practices and peer relations, to examine if they serve as protective factors for school achievement through grade 6. Children’s language skills were represented by a composite that included the CELF and PPVT at entry to kindergarten. Social skills were measured with the SSRS at kindergarten entry. Both language and social skills measures mediated (reducing effect sizes for risk by approximately 25 to 50%) children’s reading and math skills. Significant interactions with risk indicated language was a protective factor in the analyses of children’s reading and math skills. Children’s language at kindergarten entry moderated the association between children’s risk and reading ($B=1.2, p<.05$) and math scores ($B=1.3, p<.01$), and this interaction is illustrated in Figure 5 for math. The effect size for the early childhood multiple risk score was computed for children whose language was at the 25th, 50th, and 75th percentile for the sample of outcomes at each grade (note, this was done for illustration, but the age x risk x language interaction was nonsignificant suggesting the level of moderation was not different across the ages). The effect size describing the risk-reading association for children at the 25th percentile for language was substantially larger ($d=.26$ to $.47$) than for children at the 75th percentile for language ($d=.05$ to $.17$). A follow-up model added the children’s report of loneliness (as measured by the *Loneliness Questionnaire*) (Asher, Hopmeyer, & Gabriel, 1997), and friendship quality (as measured by the *Friendship Quality Questionnaire*) (Asher, Parker, & Walker, 1998) from 3rd to 6th grade. None of these measures moderated risk in these analyses.

Table 2. HLM growth curve analysis: Coefficients from group growth curve

		WJ Reading	WJ Math	SSRS Social Skills	SSRS Beh Problems
<u>Model 1</u>					
Risk	B (se)	-3.94 (.97) ***	-3.46 (.76) ***	-2.15 (.68) **	2.73 (.83) **
Risk x Age	B (se)	.02 (.25)	.11 (.16)	-.18 (.18)	.10 (.22)
<u>Model 2: Home & School</u>					
Risk	B (se)	-1.56 (1.38)	-1.33 (1.0)	-.71 (.98)	.46 (1.22)
Parenting	B (se)	4.33 (1.76) *	3.60 (1.28) **	3.36 (1.23) **	-4.69(1.56) **
Risk x Parenting	B (se)	1.59 (.81) *	1.57 (.59) **	-.36 (.59)	.56 (.73)
Age x Risk x Parenting	B (se)	-.58 (.24) *	-.08 (.16)	.12 (.19)	-.15 (.22)
Poor School	B (se)	-.92 (1.77)	-2.64 (1.43) *	2.27 (1.76)	-3.41 (1.99) ⁺
Risk x Poor School	B (se)	2.17 (1.30) *	1.52 (1.00)	-2.64(1.31) *	.03 (1.49)
Age x Risk x Poor School	B (se)	-1.90 (.75) *	-1.24 (.54) *	.92 (.59)	-.12 (.68)
Ethnic Socialization	B (se)	-1.34 (2.57)	.43 (.43)	.68 (1.82)	1.17 (2.28)
T-C Closeness	B (se)	-.08 (.72)	-.95 (.64)	6.98 (.81) ***	-4.21 (.90) ***
Risk x T-C Closeness	B (se)	-.55 (.46)	.26 (.40)	.34 (.54)	-.17 (.60)
Age x Risk x T-C Close	B(se)	-.21 (.31)	-.84 (.26) *	.18 (.29)	-.60 (.32) *
<u>Model 3:Child Characteristics</u>					
Risk	B (se)	-2.47 (1.12) *	-1.83 (.83) *	-1.47 (.79) ⁺	2.03 (.98) *
PK Language	B (se)	4.34 (1.24) ***	4.05 (.92) ***	1.58 (.88) ⁺	-.77 (1.08)
Risk x PK Language	B (se)	1.20 (.58) *	1.33 (.43) **	.62 (.40)	-.36 (.50)
PK Social Skills	B (se)	.01 (.14)	-.09 (.11)	.20 (.10) ⁺	-.31 (.13) *
Loneliness	B (se)	-.39 (.11) **	-.09 (.11)	.33 (.37)	-.39 (.35)
Friendship Quality	B(se)	1.59 (.99)	.64 (.96)	-2.09 (3.14)	1.73 (3.04)

Note: all models included gender, age, and interactions between all main effects and interactions with both risk and age although they are not all reported to conserve space. ⁺.1<p<.05; *p<.05; **p<.01; ***p<.001

Figure 1 Parenting as protective factor for reading

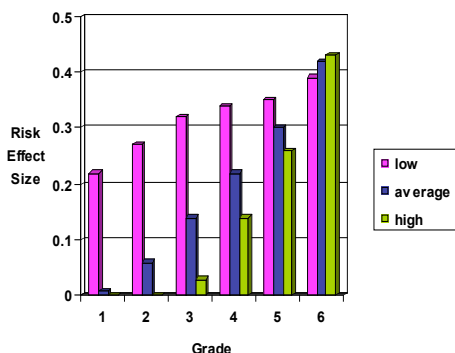
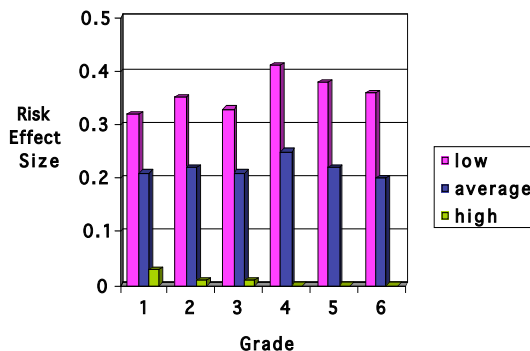


Figure 2: Preschool language as protective factor for math



In summary, results of these analyses indicate that children who experienced fewer multiple risk factors during early childhood had higher scores on measures of reading, math, and social skills and fewer behavior problems through grade 6. Further, one child measure assessed at kindergarten (language skills), one maternal measure assessed in 1st grade (parenting), and two school measures assessed from kindergarten through 5th grade (level of poverty and the teacher-student relationship) interacted with risk. Children with better language, who had mothers who provided more supportive parenting, who attended schools with fewer low-income children, and who had teachers who described a closer relationship with the study children were protected from the negative association between risk and outcomes. We did not find that our peer measures or racial socialization measures served as protective factors, however these analyses were complete through 5th grade and we feel that peer relations and racial beliefs will play a major role in the middle school and high school years.

Contextual Factors as Predictors of Children's Language and Early Literacy Development

In addition to the studies described above, a number of other recent studies have examined how contextual factors related to children's language development during the preschool years. We have reported how child (e.g., ear infections) and contextual factors (e.g., quality of child care and maternal interaction style) relate to the children's language and early literacy development. First, Roberts and colleagues (Roberts et al., 2000; 2002; Minter, Roberts, Hooper, Burchinal, & Zeisel, 2001) reported that a history of otitis media with effusion (OME) (or middle ear disease) and associated hearing loss was minimally or not associated with language development between kindergarten entry through 2nd grade. We also reported on the prevalence of OME through 5 years of age (Zeisel, Roberts, Neebe, Riggins, & Henderson, 1999) and that the age of the child, attendance at group child care, and the number of children in the household were contributing risk factors for OME (Zeisel, Roberts, Burchinal, Neebe & Henderson, 2002). Second, the quality of the home environment was consistently a stronger predictor of language development at all ages through 2nd grade (Jackson, & Roberts, 2001; Roberts, Burchinal, & Durham, 1999; 2000; 2002; Roberts, Jurgens, & Burchinal, in press). Further, specific home literacy practices (frequency of reading, maternal sensitivity, and types of maternal book reading strategies) showed moderate to large correlations with each other, and only a few significant associations with the language and literacy outcomes (Roberts et al., in press). Third, the quality of center-based child care was positively related to early language development from 6 to 36 months (Burchinal et al., 2000b). Fourth, a number of social and family risk factors (e.g., living in poverty, maternal education less than high school, large household) were related to children's language development from infancy through 4 years of life (Burchinal et al., 2000a).

We also have examined the role of language and early phonological skills in children's acquisition of reading from kindergarten through 2nd grade (Poe, Burchinal, & Roberts, in press). Children with more exposure to reading and with stimulating and sensitive child care tended to start school with better vocabularies, which then predicted better reading skills. Language was indirectly related to reading through phonological knowledge prior to 2nd grade, but was directly related to reading in 2nd grade. Further, in kindergarten and 1st grade phonological knowledge was directly related to reading, but was no longer directly related to reading in 2nd grade (Poe, Burchinal, & Roberts, in press). Hooper and colleagues (Hooper, Roberts, Zeisel, & Poe; 2003) also reported that once children began school, children's receptive and expressive language in kindergarten predicted teacher ratings of conduct problems with increasing accuracy as children moved from kindergarten to 3rd grade.

Other analyses are in process examining peer relations, racial and ethnic measures, and their interrelationships with family measures and children's language and academic skills. See Table 1 for the listing of the means on these and other measures assessed.

V. Discussion of Findings

A. Conclusions to be Drawn from Findings

Our studies point to a number of contextual factors that are important for the language and literacy development of African American children during the preschool and early elementary school years. The responsiveness and supportiveness of the home environment and responsiveness of the child care environment predicted children's language and early literacy development during the preschool years. Further, the number of risk factors a child experienced was related to their language development during the preschool years. In follow-up analyses, children exposed to fewer multiple risks in early childhood had higher scores in reading, math, and social skills and fewer behavior problems from kindergarten through 5th grade. However, children's language skills at entry to school and their mother's teaching style served as protective factors in the acquisition of their reading and in their social adjustment through 5th grade. Further, two dimensions of school assessed from kindergarten through 5th grade (level of poverty in the school and the teacher-student relationship) served as protective factors for risk and the academic outcomes. Children who attended a school with a lower proportion of children from low-income families and had teachers who reported a closer relationship with the child were protected from the negative association between risk and academic outcomes.

B. Explanations of Limitations or Possible Distortions

There are a few limitations to our study. First, this study is a correlational study and causation that one particular variable, such as the family responsiveness, causes certain academic results should be interpreted with caution. Second, although we chose instruments that have previously been selected as the most culturally appropriate, it is possible that some of our outcome measures were biased. Third, generalization to other samples should be done cautiously. Our sample size is small and our families are representative of low- to middle-income African American families who place their children in child care during the child's first year.

C. Comparison of Findings with Other Studies

These results are consistent with the findings of previous studies. First, a few studies have reported that once in school, children with multiple risk factors also tend to fall further behind academically from children without risk factors (Alexander & Entwisle, 1998; Entwisle & Alexander, 1992; Guttman, Sameroff, & Cole, 2003; Guttman et al., 2002). Second, consistent with a body of research demonstrating linkages between children's home environment and their development (Bradley, Corwyn, McAdoo, & Garcia Coll, 2001a; Bradley, Corwyn, Burchinal, McAdoo, & Garcia Coll, 2001b; NICHD, 2000; 2002), we also found that children living in a more responsive and supportive environment had better language and early literacy skills. Third, in regard to family protective factors, as in previous studies (Brody, Dorsey,

Forehand, & Armistead, 2002; Krishnakumar & Black, 2002; Linver, Brooks-Gunn, & Kohen, 2002; Masten et al., 1999), this study indicated that the extent of exposure to early social risk was a weaker predictor of reading when home environments were more stimulating and responsive and indicated that parenting also protected children from the adverse effects of risk on academic achievement. Fourth, for school protective factors, results from this study provided very modest evidence that the individual relationship between the teacher and child served as protective factors among children exposed to multiple risks as reported in previous studies (Brody et al., 2002; Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Hamre & Pianta, 2001; Tucker, Zayco, Herman, & Reinke, 2002). Teacher involvement and supportiveness have been linked to academic performance and behavior for children in general (Birch & Ladd, 1996; Pianta, Egeland, & Stroufe, 1990) and African American children in specific (Tucker et al., 2002), especially for children with multiple risk factors (Burchinal et al., 2002; Hamre & Pianta, 2001; Tucker et al., 2002). Results from this study also indicate that attending schools in which more than half of the students are from low-income families may serve as a risk factor. Schools in which proportionately fewer children were from low-income families appeared to buffer children from the negative impact of exposure to multiple risk factors (Caldas & Bankston, 2001; Klinger, 2000). Results supported our hypothesis that language skills specifically could serve as a protective factor, finding that the extent of exposure to early social risk was a weaker predictor of math and, nonsignificantly, of reading and social skills for children who started school with better language skills and a stronger predictor for children who started school with lower language skills. Previous studies provided contradictory evidence regarding whether child characteristics served to protect children from the adverse effects of risk. One study reported that parental ratings of intelligence served as a protective factor (Masten et al., 1999), but another study found that a direct assessment of IQ at entry to school was not protective (Gutman et al., 2002). Rather than study intelligence globally, we examined language skills specifically because language facility is one of the more important skills underlying academic achievement and accounts for much of the association between intelligence and academic achievement (Neisser et al., 1996; Scarborough, 2001).

D. Applications of Findings to MCH Healthcare Delivery Situations

In summary, the results from this study and from previous research support the importance of characteristics of the child and of parenting as protective factors among children exposed to multiple social risk factors. High correlations between our measures of risk and these protective factors suggest that children who experience high levels of social risk in early childhood are substantially less likely to also experience these protective factors. Nevertheless, results from this study and other studies indicate that children who experience both protective and risk factors can show similar patterns of academic trajectories as children who experience fewer risk factors. Since the child care research has fairly consistently suggested that high quality child care experiences enhance intellectual and especially language development of children, particularly children from low-income families (c.f., Hertzman & Wiens, 1996; Lamb, 1998; Magnuson et al., 2004; Vandell, 2004), it is likely that programs such as Head Start or pre-kindergarten programs may be able to achieve their goals of reducing the long-term association between exposure to risk and academic trajectories. Indeed, previous work with this sample indicated that high quality child care was one of the strongest predictors of children's language skills during early childhood in the current sample (Burchinal et al., 2000b). In contrast, the parenting intervention literature has provided less consistent evidence of changing child outcomes through changing parenting styles (St. Pierre et al., 1995). This suggests that early childhood programs that enhance children's language or parenting skills offer an opportunity to reduce the apparent negative impact of risk. Given that children's skills at entry to kindergarten were predictive of later reading and math skills and that trajectories for school success are typically established by the time children are in third grade (Alexander & Entwistle, 1998; Pianta & Walsh, 1996), children need to be as prepared as possible for the challenges of school beginning in kindergarten.

Our work on otitis media with effusion (OME) continues to support that a history of OME and associated hearing loss is minimally or not associated with language and academic achievement between kindergarten entry through 3rd grade. These findings suggest that healthcare providers should continue to monitor children's OME history and associated hearing loss, providing hearing tests when OME persists. However, aggressive medical and educational strategies in the management of OME may not be warranted.

E. Policy Implications

Identification of factors associated with success among youth exposed to multiple social risk factors has important implications for policy. Results from this study indicate that children who experience both protective and risk factors can show similar patterns of academic trajectories as children who experience fewer risk factors. This suggests that early childhood programs that enhance children's language or parenting skills offer an opportunity to reduce the apparent negative impact of risk. Further, the identification of specific characteristics of the child (i.e., language skills at kindergarten entry), family (i.e., more supportive parenting), and school (i.e., schools with fewer low-income children and more supportive teacher student relationships) suggest areas to focus interventions to improve the academic competence of African American children. Early childhood programs that enhance children's language or parenting skills offer an opportunity to reduce the apparent negative impact of risk. It is likely that programs such as Head Start or pre-kindergarten programs may be able to achieve their goals of reducing the long-term association between exposure to risk and academic trajectories. The results of the studies on OME developmental linkages suggest that aggressive strategies in the medical and educational management of OME may not be warranted.

F. Suggestions for Further Research

There are several directions for future research. First, as in any study, it is especially important to replicate the study findings. Second, we are following the study children into middle school to understand how certain child, family, and school factors serve as risk and protective factors. Third, we are exploring the measures of race and ethnicity and peer relations. This summer just finished our last cohort of 5th graders, so some analyses are in process.

VI. List of Products

C. Data Based Papers

Zeisel, S. A., Roberts, J. E., Neebe, E. C., Riggins, R., & Henderson, F. W. (1999). A longitudinal study of otitis media with effusion among 2- to 5-year-old African American children in child care. *Pediatrics*, *103*(1), 15-19.

Roberts, J. E., & Wallace, I. (1999). Otitis media and later language and learning. *Seminars in Otitis Media Management*, *2*(1), 10-15.

Burchinal, M. R., Roberts, J. E., Riggins, R., Zeisel, S. A., Neebe, E., & Bryant, D. (2000). Relating quality of center child care to early cognitive and language development longitudinally. *Child Development*, *71*(2), 339-357.

Roberts, J. E., Burchinal, M. R., Jackson, S. C., Hooper, S. R., Roush, J., Mundy, M., Neebe, E., & Zeisel, S. A. (2000). Otitis media in early childhood in relation to preschool language and school readiness skills among African American children. *Pediatrics*, *106*(4), 1-11.

Burchinal, M. R., Roberts, J. E., Hooper, S., & Zeisel, S. A. (2000). Cumulative risk and early cognitive development: A comparison of statistical risk models. *Developmental Psychology*, *36*(6), 793-807.

Minter, K. R., Roberts, J. E., Hooper, S. R., Burchinal, M. R., & Zeisel, S. A. (2001). Early childhood otitis media in relation to children's attention-related behavior in the first six years of life. *Pediatrics*, *107*(5), 1037-1042.

Jackson, S. C., & Roberts, J. E. (2001). Complex syntax production of African American preschoolers. *Journal of Speech, Language, and Hearing Research, 44*(5), 1083-1096.

Zeisel, S. A., Roberts, J. E., Burchinal, M. A., Neebe, E., & Henderson, F. W. (2002). A longitudinal study of risk factors for otitis media in African American children. *Maternal and Child Health Journal, 6*(3), 189-193.

Roberts, J. E., Burchinal, M. R., & Zeisel, S. A. (2002). Otitis media in early childhood in relation to children's school-age language and academic skills. *Pediatrics, 110*(4), 1-11.

Zeisel, S. A., & Roberts, J. E. (2003). Otitis media in young children with disabilities. *Infants and Young Children, 16*(2), 106-119.

Hooper, S. R., Roberts, J. E., Zeisel, S. A., & Poe, M. (2003). Core language predictors of behavioral functioning in early elementary school children: Concurrent and longitudinal findings. *Behavior Disorders, 29*(1), 10-24.

Poe, M. D., Burchinal, M., & Roberts, J. (in press). Early language and the development of children's reading skills. *Journal of School Psychology*.

Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (in review). Risk and resiliency: Protective factors in early elementary school years.

Roberts, J. E., Jurgens, J., & Burchinal, M. (in press). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, Hearing Research*.

Hooper, S. R., Ashley, T. A., Roberts, J. E., Zeisel, S. A., & Poe, M. (in review). The relationship of otitis media in early childhood to attention dimensions.

D. Reviews/Conceptual Papers

Roberts, J. E., Burchinal, M., & Durham, M. (1999). Parents' report of vocabulary and grammatical development of African American preschoolers: Child and environmental associations. *Child Development, 70*(1), 92-106.

Roberts, J. E. (1999). Otitis media and hearing loss: Is child development affected? *Seminars in Otitis Media Management, 2*(1), 1-2.

Roberts, J., & Hunter, L. (2002). Otitis media and children's language and learning. *The ASHA Leader, 7*(18), 6-7.

Roberts, J. E., Hunter, L., Gravel, J., Rosenfeld, R., Berman, S., Haggard, M., Hall, S., Lannon, C., Moore, D., Vernon-Feagans, L., & Wallace, I. (2004). Otitis media, hearing loss, and language learning: Controversies and current research. *Developmental and Behavioral Pediatrics, 25*(2), 1-13.

Roberts, J. E., Rosenfeld, R. M., & Zeisel, S. A. (2004). Otitis media and speech and language: A meta-analysis of prospective studies. *Pediatrics, 113*(3), 238-248.

C. Books and Chapters

Prizant, B. M., Wetherby, A. M., & Roberts, J. E. (1999). Communication problems. In C. H. Zeanah, Jr. (Ed.). *Handbook of Infant Mental Health, Second Edition*. Guilford Press, New York, NY, p. 282-297.

Roberts, J. E., & Burchinal, M. R. (2001). The complex interplay between biology and environment: Otitis media and mediating effects on early literacy development. In S. B. Newman & D. K. Dickinson (Eds.), *Handbook of Early Literacy Research*, Guilford Press, NY, 232-241.

Roberts, J. E. (2001). Ear infections/otitis media. In N. Salkind (Ed.), *The Macmillan Psychology Reference Series: Vol. 1, Child Development*. Gale Group, Farmington Hills, MI.

Roberts, J. E., Rosenfeld, R., Zeisel, S. A., & Derbenwick, E. (2002). Does otitis media contribute to language sequelae? A meta-analysis of prospective studies. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format), 643-645.

Roberts, J. E., Zeisel, S. A., Jackson, S. C., & Burchinal, M. (2002). Otitis media and later preschool language and academic outcomes. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format) 570-573.

Roberts, J. E., Jackson, S. C., & Burchinal, M. (2002). Otitis media and children's later narrative skills. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format), 640-642.

Roberts, J. E., Zeisel, S., Burchinal, M., & Neebe, E. (2002). Otitis media and parent and teacher ratings of children distractibility and hyperactivity. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format) 646-648.

Zeisel, S. A., Roberts, J. E., Burchinal, M., & Neebe, E. (2002). Risk factors for otitis media during the first 5 years of life. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format), 157-159.

Gravel, J. S., Roberts, J. E., Roush, J., Wallace, I. F., Ellis, M. A., Lee, W. W., & Mundy, M. (2002). Hearing in 10-36 month olds with OME from two geographically-diverse prospective cohorts. In D. J. Lim, C. D. Bluestone, M. Casselbrant, J. O. Klein, & P. L. Ogra (Eds.), *Recent Advances in Otitis Media*, Proceedings of the Seventh International Symposium, BC Decker, Hamilton, Ontario, Canada, (CD format), 591-593.

Roberts, J. E., Zeisel, S. A., Rosenfeld, R., & Reitz, P. (2003). Otitis media and speech – language sequelae: A meta-analysis of prospective studies. *Evidence-Based Otitis Media*. R. R.

Roberts, J. E. (2004). Effects of otitis media on children's speech and language. In C.M. Alper, C.D. Bluestone, M. L. Casselbrant, J. E. Dohar, & E. M. Mandel (Eds.), *Advanced Therapy of Otitis Media*. BC Decker Inc., Ontario, Canada, pp. 425-430.

E. Conference Presentations

Roberts, J. E., Wallace, I., Zeisel, S., & Jackson, S. Otitis media and language and learning sequelae during the preschool years. Poster presentation at the 1999 SRCDD Biennial Meeting, Albuquerque, New Mexico, April, 1999.

Roberts, J. E., Rosenfeld, R., Zeisel, S. A., & Derbenwick, E. Does otitis media contribute to language sequelae? A meta-analysis of prospective studies. Miniseminar presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999.

Roberts, J. E., Zeisel, S. A., Jackson, S. C., & Burchinal, M. Otitis media and later preschool language and academic outcomes. Poster presentation presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999.

Roberts, J. E., Jackson, S. C., & Burchinal, M. Otitis media and children's later narrative skills. Poster presentation presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999.

Roberts, J. E., Zeisel, S., Burchinal, M., & Neebe, E. Otitis media and parent and teacher ratings of children distractibility and hyperactivity. Poster presentation presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999.

Zeisel, S. A., Roberts, J. E., Burchinal, M., & Neebe, E. Risk factors for otitis media during the first 5 years of life. Technical paper presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June 1999.

Gravel, J. S., Roberts, J. E., Roush, J., Wallace, I. F., Ellis, M. A., Lee, W. W., & Mundy, M. Hearing in 10-36 month olds with OME from two geographically-diverse prospective cohorts. Technical paper presented at the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999.

Roberts, J. E., Gravel, J., & Jackson, S. Otitis media and auditory processing and language sequelae. Miniseminar presented at the ASHA Annual Convention, San Francisco, California, November, 1999.

Jackson, S. C., & Roberts, J. E. Complex syntax production and language skills of African American preschoolers. Technical paper presented at the ASHA Annual Convention, San Francisco, California, November, 1999.

Roberts, J. E., Gravel, J. S., Jackson, S. C., & Wallace, I. F. Otitis media and later auditory processing and language sequelae. Seminar presented at the ASHA Annual Convention, Washington, DC, November, 2000.

Jackson, S. C., & Roberts, J. E. Development of personal narratives in African American preschoolers and kindergarteners. Technical paper presented at the ASHA Annual Convention, Washington, DC, November, 2000.

Roberts, J., Jackson, S., & Zeisel, S. African American children's school transition: Role of language, emergent literacy, family, & child care factors. Presented at the 2001 SRCD Biennial Meeting, Washington, DC, April 2001.

Roberts, J. E., Gravel, J. S., Roush, J., & Besing, J. Otitis media and later auditory processing, language, and reading. Presented at the 2001 ASHA Annual Convention, New Orleans, Louisiana, November, 2001.

Jackson, S. C., & Roberts, J. E. Dialectal forms of African American preschoolers. Presented at the 2001 ASHA Annual Convention, New Orleans, Louisiana, November, 2001.

Jackson, S. A., Roberts, J. E., & Lamoreaux, M. C. Dialectal forms and language skills of African American children. Presented at the National Black Association for Speech-Language and Hearing, Raleigh, North Carolina, April 11-14, 2002.

Roberts, J. E. Language, working memory, and cognition: OME and language production. Presented at the Otitis Media and Language Learning Sequelae: Current Research and Controversies, Arlington, Virginia, May, 2002.

Roberts, J. E., Dollaghan, C., Campbell, T., Schwartz, R., Gravel, J., & Hunter, L. L. Otitis media: Implications for language development and disorders and auditory processing. Presented at the 23rd Annual Symposium on Research in Child Language Disorders and 9th Congress International Association for the Study of Child Language, Madison, Wisconsin, July, 2002.

Roberts, J. E., & Jackson, S. A. Role of language, narratives, emergent literacy, family, and childcare factors in African American children's school transition. Presented at the 23rd

Annual Symposium on Research in Child Language Disorders and 9th Congress International Association for the Study of Child Language, Madison, Wisconsin, July, 2002.

Roberts, J. E., Hunter, L. L., Dollaghan, C. A., & Campbell, T. Otitis media, auditory processing, and language: Research controversies. Presented at the 2002 ASHA Annual Convention, Atlanta, Georgia, November, 2002.

Roberts, J. E., Jackson, S. C., Lamoreaux, A., & Gibbs, A. African American children's language, literacy, and later school success. Presented at the 2002 ASHA Annual Convention, Atlanta, Georgia, November, 2002.

Roberts, J. E., Wallace, I., & Gravel, J. Otitis media and later language and academic sequelae. Presented at the 2003 SRCDD Biennial Meeting, Tampa, Florida, April, 2003.

Roberts, J. E., & Roush, J. Auditory Processing: Predictors and Language and Literacy Outcomes. Presented at the FPG Bag Lunch, Chapel Hill, NC, April, 2003.

Roberts, J. E., Burchinal, M., & Rowley, S. Predicting African American children's school success: Role of child, family, child care, and school factors. Presented at the 34th Maternal and Child Health Bureau Research Roundtable, Washington, DC, May 2003.

Roberts, J. E., Jackson, S., Hennon, E., Whitehead, J., & Lamoreaux, A. African American children's language and school success. Presented at the 2003 ASHA Annual Convention, Chicago, Illinois, November, 2003.

Abstracts

Roberts, J. E., Rosenfeld, R., Zeisel, S. A., & Derbenwick, E. Does otitis media contribute to language sequelae? A meta-analysis of prospective studies. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 319.

Roberts, J. E., Zeisel, S. A., Jackson, S. C., & Burchinal, M. Otitis media and later preschool language and academic outcomes. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 190.

Roberts, J. E., Jackson, S. C., & Burchinal, M. Otitis media and children's later narrative skills. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 318.

Roberts, J. E., Zeisel, S., Burchinal, M., & Neebe, E. Otitis media and parent and teacher ratings of children distractibility and hyperactivity. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 320.

Zeisel, S. A., Roberts, J. E., Burchinal, M., & Neebe, E. Risk factors for otitis media during the first 5 years of life. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June 1999, 61.

Gravel, J. S., Roberts, J. E., Roush, J., Wallace, I. F., Ellis, M. A., Lee, W. W., & Mundy, M. Hearing in 10-36 month olds with OME from two geographically-diverse prospective cohorts. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 196.

Hunter, L., Roberts, J., Pasmanter, S., & Rusten, M. Verbal language ability in adolescents with histories of chronic OME. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 187.

Bearman, D., Hunter, L., & Roberts, J. Family environment, academic achievement and intellectual ability in adolescents with histories of chronic OME. Abstracts of the 7th International Symposium on Recent Advances in Otitis Media, Fort Lauderdale, Florida, June, 1999, 188.

Roberts, J. E., Jackson, S., Burchinal, M., & Zeisel, S. Child, family, and childcare factors: Predictors of African-American children's school transition. Technical paper presented at the Head Start's Fifth National Research Conference, Washington, DC, June, 2000, 257.

Gravel, J. S., Roberts, J., Roush, J., Grose, J., Besing, J., Wallace, I., Neebe, E., Burchinal, M., & Zeisel, S. Early hearing loss, OME and later indices of auditory processing. Paper presented at the 8th International Symposium on Recent Advances in Otitis Media. Fort Lauderdale, Florida, June, 2003, 216.

Roberts, J. E., Gravel, J., Zeisel, S., Wallace, I., Burchinal, M., Neebe, E., & Misenheimer, J. Otitis media and children's language and academic achievement during early elementary school years in two prospective samples. Paper presented at the 8th International Symposium on Recent Advances in Otitis Media. Fort Lauderdale, Florida, June, 2003, 219.

F. Master and Doctoral Dissertations

Peebles, C. Y. (1999). Factors influencing African American children's vernacular usage. University of North Carolina at Chapel Hill.

Minter, K. R. (2000). Early childhood, otitis media in relation to attention and behavior in infancy, pre-kindergarten, and first grade. University of North Carolina at Chapel Hill.

Dunston, Y. L. (2001). African-American mothers' feedback to their children's oral reading miscues. University of North Carolina at Chapel Hill.

Jurgens-Whitehead, J. (2002). The role of the home literacy environment in children's language and emergent literacy skills at entry to kindergarten. University of North Carolina at Chapel Hill.

References

- Alexander, K.L., & Entwisle, D.R. (1998). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Child Development*, 53, no 2.
- Asher, S.R., Hopmeyer, A., & Gabriel, S.W. (1997). *Children's loneliness in different school contexts*. Manuscript submitted for publication.
- Asher, S., Parker, J., & Walker, D. (1998). Distinguishing friendship from acceptance: Implications for intervention and assessment. In W. M. Bukowski & A. F. Newcomb, (Eds.), *The company they keep: Friendship in childhood and adolescence. Cambridge studies in social and emotional development* (pp. 366-405).
- Blank, M., Rose, S. A., & Berlin, L. J. (1978). *The Language of Learning: The Preschool Years*. New York: Grune & Stratton.
- Birch, S. H., & Ladd, G. W. (1996). Interpersonal relationships in the school environment and children's early school adjustment: The role of teachers and peers. In J. Juvonen & K. Wentzel (Eds.), *Social Motivation: Understanding Children's School Adjustment*. (pp. 199-225). New York: Cambridge University Press.
- Bradley, R. H., Corwyn, R. F., Burchinal, M., McAdoo, H. P., Garcia Coll, C. (2001b). The home environments of children in the United States: Part 2, Relations with behavioral development from birth through age 13. *Child Development*, 72, 1868-1886.
- Bradley, R. H., Corwyn, R. F., McAdoo, H. P., & Garcia Coll, C. (2001a). The home environments of children in the United States part I: Variations by age, ethnicity, and poverty status. *Child Development*, 72(6), 1844-1867.
- Brody, G. H., Dorsey, S., Forehand, R., & Armistead, L. (2002). Unique and protective contributions of parenting and classroom processes to the adjustment of African American children living in single-parent families. *Child Development*, 73(1), 274-286.
- Bronfenbrenner, U., & Crouter, A. M. (1983). The evolution of environmental models in developmental research. In P. H. Mussen (Ed.), *Handbook of Child Psychology: Vol. 1, History, Theory and Methods*, (W. Kennen, Ed.), 357-414. New York: Wiley.
- Browne, D. C., Malone, P. S., Wilson-Brewer, R., Humphrey, A. D., & Clubb, P. (unpublished manuscript). Perceived discrimination, ethnic factors, and violent behaviors among African American adolescents.
- Burchinal, M., Roberts, J. E., Zeisel, S. A., Hennon, E. A., & Hooper, S. (in review). Risk and resiliency: Protective factors in early elementary school years.
- Burchinal, M. R., Roberts, J. E., Hooper, S., & Zeisel, S. A. (2000a). Cumulative risk and early cognitive development: A comparison of statistical risk models. *Developmental Psychology*, 71, 339-357.
- Burchinal, M. R., Roberts, J. E., Riggins, R., Zeisel, S. A., Neebe, E., & Bryant, D. (2000b). Relating quality of center childcare to early cognitive and language development longitudinally. *Child Development*, 71(2), 339-357.
- Burchinal, M. R., Peisner-Feinberg, E., Pianta, R., & Howes, C. (2002). Development of academic skills from preschool through second grade: Family and classroom predictors of developmental trajectories. *Journal of School Psychology*, 40, 415-436.
- Caldas, S. J., & Bankston, C. (2001). Effect of school population socioeconomic status on individual academic achievement. *The Journal of Educational Research*, 90(5), 269-277.
- Caldwell, B. M. & Bradley, R. H. (1984). *Home Observation for Measurement of the Environment Manual*. Little Rock, Arkansas: University of Arkansas.

Children's Defense Fund. (2001). *The State of America's Children: Yearbook 2001*. Washington, DC: Author.

Dunn, L. M., & Dunn, L. M. (1997). *Peabody Picture Vocabulary Test (Third ed.)*. Circle Pines, ME: American Guidance Service.

Entwisle, D. R., & Alexander, K. L. (1992). Summer setback: Race, poverty, school composition, and mathematics achievement in the first two years of school. *American Sociological Review*, *57*, 72-84.

Gresham, F. M., & Elliott, S. N. (1990). *Social Skill Rating System*. American Guidance Services, Circle Pines, MN.

Gutman, L. M., Sameroff, A. J., & Cole, R. (2003). Academic growth curve trajectories from 1st grade to 12th grade: Effects of multiple social risk factors and preschool child factors. *Developmental Psychology*, *39*(4), 777-790.

Gutman, L. M., Sameroff, A. J., & Eccles, J. S. (2002). The academic achievement of African American students during early adolescence: An examination of multiple risk, promotive, and protective factors. *American Journal of Community Psychology*, *30*(3), 367-400.

Hamre, B., & Pianta, R. C. (2001). Early teacher-child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, *72*(2), 625-638.

Hertzman, C., & Wiens, M. (1996). Child development and long-term outcomes: A population health perspective and summary of successful interventions. *Sociological Science in Medicine*, *43*, 1083-1095.

Hooper, S. R., Roberts, J. E., Zeisel, S. A., & Poe, M. (2003). Core language predictors of behavioral functioning in early elementary school children: Concurrent and longitudinal findings. *Behavior Disorders*, *29*(1), 10-24.

Jackson, S. C., & Roberts, J. E. (2001). Complex syntax production of African American preschoolers. *Journal of Speech, Language, and Hearing Research*, *44*, 1083-1096.

Klinger, D. A. (2000). Hierarchical linear modelling of student and school effects on academic achievement. *Canadian Journal of Education*, *25*(1), 41-55.

Krishnakumar, A., & Black, M. M. (2002). Longitudinal predictors of competence among African American children: The role of distal and proximal risk factors. *Applied Developmental Psychology*, *23*, 237-266.

Lamb, M. (1998). Nonparental child care: Context, quality, correlates, and consequences. In I. Sigel & A. Renninger (Eds.), W. Damon (Series Ed.), *Handbook of child psychology: Vol 4. Child psychology in practice*, 5th ed. New York: Wiley.

Linver, M. R., Brooks-Gunn, J., & Kohen, D.E. (2002). Family processes in pathways from income to young children's development. *Developmental Psychology*, *38*, 719-734.

Luster, T., & McAadoo, H. P. (1994). Factors related to the achievement and adjustment of young African American children. *Child Development*, *65*, 1080-1094.

Magnuson, K. A., Meyers, M. K., Ruhm, C. J., & Waldfogel, J. (2004). Inequality in preschool education and school readiness. *American Educational Research Journal*, *41*, 115-157.

Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology*, *11*, 143-169.

McDougall, P., Hymel, S., Vailencourt, T., & Mercer, L. (2001). The consequence of childhood peer rejection. In M. Leary (Ed.), *Interpersonal Rejection*. New York, Oxford: University Press.

Minter, K. R., Roberts, J. E., Hooper, S. R., Burchinal, M. R., & Zeisel, S. A. (2001). Early childhood otitis media in relation to children's attention-related behavior in the first six years of life. *Pediatrics*, *107*(5), 1037-1042.

Neisser, U., Boodoo, G., Bouchard, T. J., Boykin, A. W., Brody, N., Ceci, S. J., Halpern, D. F., Loehlink, J. C., Perloff, R., Steinberg, R., & Urbina, S. (1996). Intelligence: Knowns and unknowns. *American Psychologist*, *51*, 77-101.

NICHD Early Child Care Research Network. (2002). Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Educational Research Journal*, *39*, 133-164.

NICHD, 2000 NICHD Early Child Care Research Network. (2000). The relation of child care to cognitive and language development. *Child Development*, *71*, 960-980.

Phillips, M., Brooks-Gunn, J., Duncan, G., Klebanov, P., & Crane, J. (1998). Family background, parenting practices, and the Black-White test score gap. In C. Jencks, & Phillips, M. (Eds), *The Black-White test score gap* (pp. 103-145).

Pianta, R. C. (1991). *Student Teacher Relationship Scale*. University of Virginia, Charlottesville, VA.

Pianta, R. C., Egeland, B., & Stroufe, L. A. (1990). Maternal stress and children's development: Prediction of school outcomes and identification of protective factors. In J.E. Rolf, A. S. Masten, D. Cicchetti, K.H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 215-235). New York: Cambridge University Press.

Pianta, R. C., & Walsh, D. J. (1996). *High-risk children in schools: Creating sustaining relationships*. Routledge, Kegan-Paul.

Poe, M. D., Burchinal, M., & Roberts, J. (in press). Early language and the development of children's reading skills. *Journal of School Psychology*.

Roberts, J. E., Burchinal, M., & Durham, M. (1999). Parents' report of vocabulary and grammatical development of African American preschoolers: Child and environmental associations. *Child Development*, *70*(1), 92-106.

Roberts, J. E., Jurgens, J., & Burchinal, M. (in press). The role of home literacy practices in preschool children's language and emergent literacy skills. *Journal of Speech, Language, Hearing Research*.

Roberts, J. E., Burchinal, M. R., & Zeisel, S. A. (2002). Otitis media in early childhood in relation to children's school-age language and academic skills. *Pediatrics*, *110*(4), 1-11.

Roberts, J. E., Burchinal, M. R., Jackson, S. C., Hooper, S. R., Roush, J., Mundy, M., Neebe, E., & Zeisel, S. A. (2000). Otitis media in early childhood in relation to preschool language and school readiness skills among African American children. *Pediatrics*, *106*(4), 1-11.

Sameroff, A. J. (1983). Developmental systems: On texts and evolution. In W. Kennen (Ed.), *Handbook of Child Psychology: Vol. 2, History, Theory, and Methods* (p. 237-294). New York: John Wiley & Sons.

Scarborough, H. S. (2001). Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. B. Neuman, & D. K. Dickinson (Eds.), *Handbook for Research on Early Literacy*. New York: Guilford Press.

Semel, E., Wiig, E., & Secord, W. A. (1995). *Clinical Evaluation of Language Fundamentals - Third Edition*. The Psychological Corporation, Harcourt Brace Company.

Spencer, M. B., Swanson, D. P., & Cunningham, M. (1991). Ethnicity, ethnic identity, and competence formation: Adolescent transition and cultural transformation. *Journal of Negro Education, 60*, 366-387.

St. Pierre, R. G., Layzer, J. I., & Barnes, H. V. (1995). Two-generation programs: Design, cost, and short-term effectiveness. *The Future of Children, 5*, 76-93.

Stevenson, H. C. (1994). Validation of the Scale of Racial Socialization for African American Adolescents: Steps toward multidimensionality. *Journal of Black Psychology, 20*(4), 445-468.

The College Board. (1999). *Reaching to top: A report of the National Task Force on Minority High Achievement*. College Board Publications, New York, NY.

Tucker, C. M., Zayco, R. A., Herman, K. C., & Reinke, W. M. (2002). Teacher and child variables as predictor of academic engagement among low-income African-American children. *Psychology in the Schools, 39*, 477-488.

Vandell, D. (2004). Early child care: The known and unknown. *Merrill Palmer Quarterly*.

Wells, G. (1985). The meaning makers: Children learning language and using language to learn. Portsmouth, NH. *Lack of Culturally Valid Assessment Tools for African American Children*.

Woodcock, R. W., & Johnson, M. B. (1990). *Woodcock-Johnson Psycho-Educational Battery-Revised*. Allen, TX: DLM.

Zeisel, S. A., Roberts, J. E., Burchinal, M., Neebe, E., & Henderson, F. W. (2002). A longitudinal study of risk factors for otitis media in African American children. *Maternal and Child Health Journal, 6*(3), 189-193.

Zeisel, S. A., Roberts, J. E., Neebe, E. C., Riggins, R., & Henderson, F. W. (1999). A longitudinal study of otitis media with effusion among 2- to 5-year-old African American children in child care. *Pediatrics, 103*(1), 15-19.