

## **Final Comprehensive Report**

Maternal and Child Health Bureau Grant # R 40MC00254  
Intergenerational Pathways to Competence in Minority Families

### **I. Introduction:**

A. Nature of the research problem: This research was a long-term follow-up of individuals who were enrolled as infants in two randomized studies of the efficacy of very early childhood education. Both compared outcomes in infants born into poverty who were or were not enrolled in one of two consecutive educational programs provided within a full-time child care setting. The first was the Abecedarian Project (admitted infants born between 1972 and 1977) and the second was the Carolina Approach to Responsive Education (CARE; admitted infants born between 1978 and 1980).

B. Purpose, scope, and methods: Of particular interest for the outcome questions supported by MCH has been an examination of the status of the study population's status as parents, and the investigation of possible second generation benefits in the form of better outcomes in any children born to those who experienced the early childhood program. At this point, the study participants have reached 30 years of age and their status with respect to educational attainment, vocational success, establishment of families, and social adjustment has been investigated. We have contacted all the living and eligible adults, and for those who participated in the age-30 follow-up who also have children, we have assessed their attitudes about parenthood and the relative status of their children. Specifically, the investigators looked at child academic skills as reflected in test scores, child ratings of opinions about school, and child social adjustment as described by the parents.

Methods included the administration of standardized instruments to assess the children's academic skills, and questionnaires completed by parents describing children's social-emotional adjustment, child ratings of liking for school. Parents also completed questionnaires describing the educational stimulus value of the home environments they are providing for their children and their attitudes toward parenting.

C. Nature of the findings: The findings consisted of mean scores on outcomes of interest compared as a function of the parent's own early childhood treatment status. The resulting data provided an estimate of the degree to which long-term benefits that accrued to the parents as a result of their own early childhood experience have implications for the status of their own children's development and the attitudes they now have toward parenthood.

**II. Review of the literature:** Many early childhood educational programs have been provided for children from poor families in an effort to support their early development and improve their chances for success in school. In general, scientific evaluations of such programs have shown that they enhance young children's intellectual test scores and elementary school academic performance (Bryant & Maxwell, 1997; Johnson & Walker, 1991; Lazar, Darlington, Murray, Royce, & Snipper; 1982), and adult follow-up studies have shown that, for some

programs, significant benefits are demonstrable into adulthood (Gray, Ramsey, & Klaus, 1982; Schweinhart, Barnes, & Weikart, 1993; Schweinhart, Montie, Xiang, Barnett, Belfield, & Nores, 2005; Reynolds, 2000; Reynolds, Temple, Ou, Robertson, Mersky, Topitzes, et al. 2007).

The most important domains reported in the literature concerning adult outcomes from early childhood programs included educational attainment, employment, marriage, parenthood, health related behaviors, and social difficulties such as criminal behavior. In terms of later educational accomplishments of the treated and comparison participants, treated individuals in the High/Scope Perry Preschool Project (Berrueta-Clement, Schweinhart, Barnett, Epstein & Weikart, 1984) and the Chicago Child-Parent Centers program (Reynolds, Temple, Robertson, & Mann, 2001) were more likely to graduate from high school, an outcome found only for females treated in the Early Training Project (Gray et al., 1982). Chicago investigators also found higher rates of four-year college attendance by age 24 (Reynolds et al., 2007). At age 18, the heavier weight intervention infants showed higher math achievement and higher Peabody Picture Vocabulary Test scores but no differences in school dropout rates (McCormick et al., 2006).

The Perry Preschool treated group showed better rates of employment and lower rates of lawbreaking (Schweinhart et al. 1993), benefits that persisted through early middle age (Schweinhart et al. 2005). The Chicago Child-Parent Centers also found lower rates of crime up to age 20 (Reynolds et al. 2001). A nonsignificant trend was seen for females treated in the Perry Preschool to delay childbearing (Schweinhart et al. 1993). Neither the Early Training Project (Gray et al. 1982) nor the Chicago program (Reynolds et al. 2007) found significant reductions in teen pregnancies. A follow-up at age 21 showed that Abecedarian treatment group participants still had significantly higher scores on intellectual and academic measures compared with control group participants (Campbell, Pungello, Miller-Johnson, Burchinal & Ramey, 2001). Moreover, on average, they had attained more years of education, were more likely to have skilled jobs, more likely to attend a four-year college, and less likely to be teen parents than control group participants (Campbell, Ramey, Pungello, Miller-Johnson, & Sparling, 2002). Reports of these long-term outcomes were widely cited as important evidence of the significant benefits of early childhood programs (Broder, 2002). In sum, although long-term outcomes from all these programs differed in domains and degrees, they all affirmed some enduring benefits of early childhood intervention.

With the exception of the age-40 follow-up of the Perry Preschool participants, none of the early childhood programs reviewed above has reported on the status of children born to the treated and untreated individuals, therefore the Abecedarian follow-up research supported here by MCH is making a significant contribution to our understanding of possible multigenerational effects accruing to early childhood intervention. Because we know that the Abecedarian participants with early treatment had better educational attainment as adults, and also that they displayed higher levels of academic skills, on average, than did members of their control groups, it is logical to suppose that their children might also benefit in terms of enhanced academic skills. However, many factors will have impacted these third generation study participants in addition to the educational attainments of their parents, so although we hypothesized that the children of those who were themselves treated as children will display better skills in turn, this is by no means certain.

### **III. Study Design and Methods**

A. Study Design. The early childhood study was a two-group randomized trials comparing outcomes in those with and without early childhood intervention. The original treatment and control groups were re-randomized on the basis of their 48-month intellectual test score into four groups, representing treatment in infancy/preschool and the first three year in public school (K, 1, 2 if not retained). Thus, some participants had 8 years of treatment in preschool and primary grades, some had 5 years in preschool only, some had 3 years in primary school only, and some had no years of intervention as part of this study. Because research through early and middle adolescence indicated that the second, primary grade intervention had no apparent effect on cognitive development, the sample reverted to an intent-to-treat model for comparison of outcomes at age 21 and age 30. Thus, at this stage, findings will be compared among those who had the five years of child-care center based early intervention and their controls.

B. Population Studied: The original research targeted children born into families who displayed demographic characteristics known to be associated with delays in cognitive development and early academic failure. Much research linked poverty with suboptimal performance in school. Therefore, the investigators sought persons who were enrolling in low-cost pre-natal clinics and or who had applied to local social services agencies for welfare support. Infants were eligible for the study if they appeared to be healthy newborns free of biologically based conditions known to be associated with compromised cognitive functioning (e.g., Down's Syndrome) or sensory or motor handicaps. In addition, the family needed to appear settled in the region such that the child was likely to be available for study participation for at least three years, and the family also needed to be located at a feasible commuting distance from the child care facility.

C. Sample selection: For the Abecedarian study, the investigators enlisted the help of personnel at local agencies where low-income women might go for prenatal care or welfare benefits in the early 1970s. Information about the study was made available to such persons at the agency, inviting them to contact study personnel if they were interested in pursuing possible enrollment. If so, appointments for home visits were made for study personnel – either the study's Family Nurse Practitioner or the Head of the Infant Nursery – to explain the purpose of the study. At that time, the principal of random assignment was explained, that is, that there was a 50:50 chance that the family might be offered free full time child care, or else assignment to the control group. If the family expressed interest in possible enrollment, the mother was invited to come to the study site –a University-based research center where she was interviewed by the study Evaluator and given a full scale intelligence test (age-appropriate Wechsler). After a sufficient number of potential participants had been thus processed, similar pairs were identified within the sample pool and a treatment/control decision was made on the basis of a table of random numbers. Enrolled children were born between 1972 and 1977. For the Abecedarian study, records indicate that 120 potential enrollees, to whom 122 children were born, were invited to take part. Eight refused their random assignment once it was known, and two were switched from the control to the child care condition as the insistence of

local authorities, meaning that their assignment was not random. Just after recruitment, one child appeared to be ineligible due to a biological condition not apparent at birth and was dropped from the study but allowed to continue in child care. Thus, the base sample consisted of 111 children, born to 109 families, comprised the base sample for the study. Fifty seven of these were assigned to the treatment group and 54 were untreated controls.

Project CARE's two cohorts of participants were born between the spring of 1978 and early 1980. Recruitment procedures were essentially the same for both studies, except that, over time, the Abecedarian study was well known within the community, and interested parties began to contact program staff directly to inquire about enrollment.

As soon as the last Abecedarian infants graduated from the nursery, enrollment of CARE infants began. CARE differed from Abecedarian in two ways. First, to achieve greater diversity within the child care center during the CARE program, half of the child care spaces were set aside for infants from low-risk families, thereby reducing the number of infants from high-risk families who could be enrolled. Second, an alternate model of intervention was offered in CARE. Children who had the center-based intervention had, in addition, a Family Education component. That meant that their child care teachers also made visits to their homes to demonstrate for parents the kind of infant curriculum that was provided during their out-of-home hours. Because the infant program was no longer limited to children from high risk backgrounds, fewer slots were available for high risk families. Thus, for the CARE child-care-plus-family-education treatment group,  $n = 16$ , in contrast to the 57 assigned to early educational intervention in the Abecedarian study. CARE had a unique treatment model also consisting of 25 high risk families (two sets of twins) randomly assigned to a Family-education-only group ( $n = 27$ ). Twenty-three families were assigned to the CARE untreated control group.

Attrition was low for both studies. For the Abecedarian Project, 104 young adults out of the original 111 infants (93.7%) and for CARE, 60 of 66 original enrollees (90.9%) were assessed as young adults.<sup>1</sup> Of these, 53 with early childhood treatment and 51 controls took part in the Abecedarian young adulthood follow-up; 14 of 16 CARE center-based treatment cases took part, 25 of 27 children from the Family Education group were assessed and 21 of the original CARE control group of 23 were followed up at age 21. Moving forward in time to age 30, within the Abecedarian study, by age 30, two more individuals had died, leaving 103 who might have taken part. Two individuals declined to take part, thus age-30 data exist for 101, or 91%, of the original sample of 111. For CARE, of the 64 individuals who might have taken part at age 30, 63 were located and 58 took part (5 declined).

D.Instruments used: Table 1 summarizes the methods and instruments used to assess adult status, child bearing, and parenting attitudes and practices among the adults and children who provided data for this research.

---

<sup>1</sup> Attrition in this group included 4 children who were deceased, one who was withdrawn from the study and one who proved unqualified for inclusion because of congenital mental retardation not immediately diagnosed. Of the remaining 105 individuals who might have participated in a young adult follow-up, all were located and 104 participated. For CARE, of the original 66 enrollees, one child died and one was withdrawn during the early years. Of the remaining 64 individuals, one moved away very early. This individual and two others could not be located for the young adult study, and one person declined to participate in it, leaving 60 cases with young adult data.

*Table 1  
 Methods and Instruments for Parent/Child Data Collection, Abecedarian and CARE Age-30  
 Follow-up*

Domain	Instrument	Scores	Reliability
Parent Measures			
Marital Status	Adult Interview		
Children (n)	Adult Interview		
Home environment	HOME	Factor scores Total score	Test-re-test ranged 89-90
Parental Beliefs	Parent as Educator	Modernity  Values and Beliefs	$\alpha = .90$ test-re-test= .84  NA
Parenting Efficacy	Parent Efficacy Quest.	Love Control Total	$\alpha = .90$ $\alpha .90$
Child Measures			
Academic skill	Woodcock-Johnson, Third Edition	Reading Cluster Math Cluster Letter-Word ID Applied Problems	
Academic Efficacy	What I Think of School	Liking school Doing Well in school Trying hard Importance to parents	
Socio-emotional adjustment	Child Behavior Checklist	Externalizing Internalizing Total Problems Competence	

E. Statistical Techniques Employed. For purposes of this report, data are summarized according to methods used to describe trends and compare group differences. An intent-to-treat model was employed, with each case entered according to his or her original preschool group assignment. The report summarizes the findings as a function of early childhood treatment in Abecedarian and CARE combined (five years in preschool vs. preschool control) or, in the case of CARE, Home Educator model vs. CARE Control. Findings were also compared as a function of treatment x gender of the treated parent to see if mothers and fathers differed in the extent to which having had early treatment influenced how they handled or felt about parenthood.

#### **IV. Detailed Findings**

The age-30 sample is summarized by group and gender in Table 2 below.

*Table 2.*  
*Abecedarian and CARE Study Participants at Age 30*

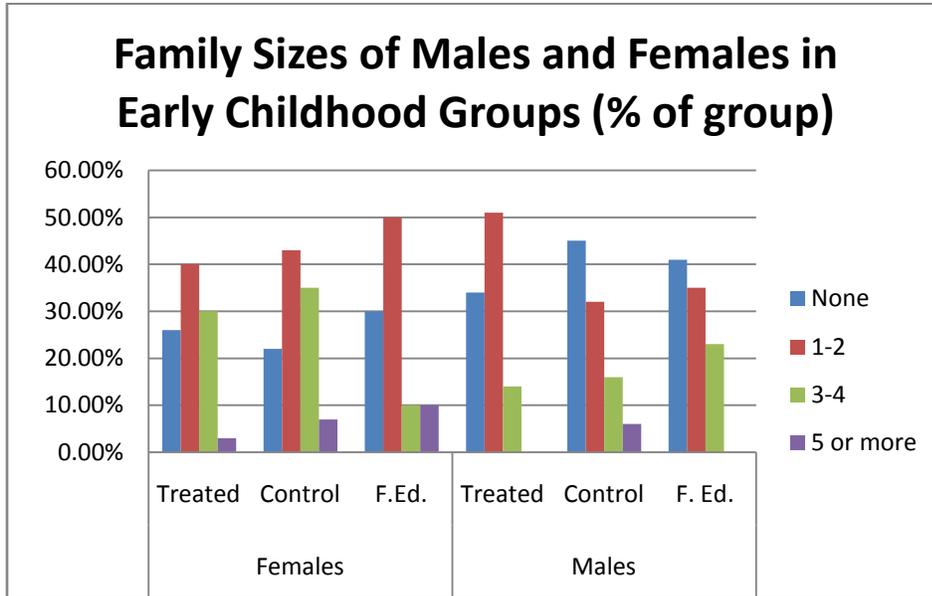
Variable	Study	Experimental Group		Control Group		Home Teacher Group		Total
		Female	Male	Female	Male	Female	Male	
Number of Participants	ABC	25	27	28	21	NA	NA	101
	CARE	5	8	9	10	10	16	58
	Total	30	35	37	31	10	16	159

Table 3 summarizes the percent of each group who reported parenthood, by gender. A cautionary note here: especially in the CARE child care treated group, numbers were very small, thus having any child inflates the relative percentage in that group. Fifty-one of the combined total of the 159 Abecedarian and CARE participants who took part in the age-30 study indicated they had no children at all, approximately a third of the sample. The remaining 108 reported having 285 biological or adopted children, thus 69.8, or, rounding, 70% of the sample had become parents by age 30. By inspection, CARE participants tended to have fewer children than did Abecedarian participants: only 3 of the 10 males in the CARE control group reported having children, the lowest percentage in any group. However, small cell sizes in CARE indicate that one should interpret these trends with caution: they may not be reliable.

*Table 3*  
 Information on Study Participants' Biological or Adopted Children

Variable	Study	Experimental Group		Control Group		Home Teacher Group	
		Female	Male	Female	Male	Female	Male
% of Participants who had any child	ABC	80%	66.67%	78.57%	66.67%	NA	NA
	CARE	40%	62.5%	77.78%	30%	70%	62.5%
No. of Participants who had any child	ABC	20	18	22	14	NA	NA
	CARE	2	5	7	3	7	10
Total no. of Children	ABC	50	47	55	46	NA	NA
	CARE	2	18	14	5	16	32
Average no. of children per participant	ABC	2.00	1.74	1.96	2.19	NA	NA
	CARE	0.40	2.25	1.56	0.50	1.60	2.00

Figure 1 shows, by group and study, the numbers of children born or adopted by study participants, including those who reported no children at age 30.



The figure suggests that numbers of children are essentially the same within the groups who did and did not have early childhood educational intervention, but that men are slightly more likely than females to report not having children at all. In contrast to the finding that males self-reported fewer children at age 21, they appear to have gained ground by age 30. In terms of having 3 or more children, women are more likely than men to have this many children.

A trend apparent in the parent and child data collected here is that marriage and parenthood are not necessarily linked among these study participants. Whereas around 70% overall report having children, about half of parents had never been married. Thus, the setting up of two-parent families was not a given within this sample. Further, having had early childhood treatment was not related to living in families with two parents. Table 4 below shows the percentage of children who lived in two-parent homes as a function of whether the parent did or did not have early childhood treatment and also by the study the parent was in the Abecedarian or CARE program. The percentage who live in two parent homes is smaller than that of children who do not live with two parents, and the percents are virtually identical across the preschool treated and control groups.. Across groups, The percentage of children who lived with a single parent was almost double that of children who lived in two parent homes.

*Table 4*  
*Percentage of Children Living in Two-Parent Homes within the Abecedarian and CARE Studies at Age 30-Follow-up*

<b>Study</b>	<b>ABC</b>		<b>CARE</b>	
<b>Group</b>	<b>Live in Two-Parent Home</b>		<b>Live in Two-Parent Home</b>	
	<b>No</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>
<b>Control</b>	46	22	12	3
<b>Child-Care Treatment</b>	43	26	7	4
<b>Family Education</b>	NA	NA	19	17

### **Characteristics of home environments**

Home Observation for Measurement of the Environment (HOME)(Caldwell & Bradley, 1984). Parents completed the interview form of this widely used instrument, using the version that applied to the age of the oldest child at home. This instrument has different versions to describe home environments for children of different ages: infants up to age 3, children 3-6 years old, children from 6-10 years old, and those older than 10 years. Table 5 shows the number of home environments described by parents, grouped by treatment/control status of the parent's early childhood experience, by study (ABC vs. CARE) and by the version of the HOME that was completed. The number of items on each version is slightly different, but to equate scores across versions, all items were designed such that a binary Yes or No score could be assigned to each item, with "1" always being in the positive, or more supportive, home environment characteristic. The total for each questionnaire, equivalent across all age levels, was the percent of items scored "Yes". Means for the percent of positive scores given by parents with and without the early childhood educational experience were compared using T-tests. To learn if mothers and fathers differed systematically in the way they scored home environments, scores were also compared as a function of parental gender. Some eldest children lacked these data if the target parent had so little contact with the child that he or she could not give an accurate description of the child's living circumstances.

*Table 5*

*Number of HOME Questionnaires Collected from Parents in the Abecedarian and CARE Age-30 Study of Parenting by Study, Treatment Status, and Age Level of Child*

Parental Early Childhood Treatment Status						
	Treated			Control		
	Child Care		Family Ed.			
Age level	ABC	CARE	CARE	ABC	CARE	Total
< 3	4	-	2	5		11
3-6	3	3	2	5	4	17
6-10	14	3	2	8	4	31
>10	12	2	8	13	1	36
						95

Inspection of Table 5 indicates that only a few parents had “eldest” children who were younger than 3 years of age, and only slightly more had eldest preschoolers. Most were aged six or older, with the modal age being older than 10. Recall from earlier research (e.g., Campbell, et al., 2002) that some of the study sample became parents by age 15, thus, when they were 30, their eldest children would have become teenagers themselves. Table 6 below gives mean HOME scores as a function of the parent’s early childhood treatment status and the age of the eldest child whose home was being described.

*Table 6*

*Mean Percent Positive HOME Scores as a Function of Parental Treatment/Control Status*

	Center	Treated			Family	Education		
	Treated	Control	T-test	E.S.	Treated	Control	T-test	E.S.
	%							
<3	.72	.85	-1.62	-0.99	-	-		
3-6	.73	.74	-0.23	-0.13	.85	.78	1.26	1.03
6-10	.68	.70	-0.28	-0.11	.56	.73	-1.16	-0.97
>10	.73	.61	1.49	.55	.67	.45	2.11+	1.87

Analysis of the self-rated HOME scores provided by the Abecedarian and CARE participants describing the learning/cognitive developmental support they supplied for their own children basically did not vary as a function of the parents having had or not had early childhood educational intervention. Given that the parents own adult educational levels varied positively according their early childhood treatment, it was expected that there would be a reflection of that better educational status in the homes they provided their own children. However, if the youngest child was very young, there is no systematic difference in the kinds of home environments these individuals describe for their children, and, in fact, the means were generally slightly higher if rated by those who had been preschool controls.

The one hint in the data is that, for children older than 10, the means, for both those with center-based intervention and family-based intervention, mean HOME scores were higher for parents who had experienced early intervention. In the case of the family-based intervention, the trend approaches statistical significance.

To claim a treatment effect indicating that treated parents did provide better home environments for their own children is not justified, but it is intriguing that a trend is seen in that direction as the home environment provided for the “eldest” pertains to older children, that is, the parent is describing the home circumstances relative to middle childhood or the teen years.

In general, no trends were found for male and female parents to describe the quality of their child’s home environment in a more or less positive way. The one difference seen concerned females in the Family Education group describing the home environment of their children aged 10 or higher: they were much more positive than males in that regard. However, given the number of comparisons made here, one such difference may have occurred by chance.

**Parenting Attitudes**

Parent as Educator Interview The Parent as Educator Interview was devised in the 1970s and 1980s by Schaefer and Edgerton (1985) to measure parental attitudes found to be supportive of children’s learning. The Interview contains questions covering parental views on the responsibility of parents and teachers for children’s school progress, attitudes toward child autonomy, interest in expanding one’s horizons. Schaefer and Edgerton argued that Progressive parents should have children who were better prepared for school success whereas those they labeled “Traditional” were those who distrusted outside influences, expected unquestioning obedience from children, and discouraged child autonomy. Items in the Parent as Educator Interview assessed these beliefs and values. Because the more “modern” attitudes were those found among better educated, higher income individuals, one expectation was that an improvement in parental educational levels associated with having had early childhood intervention might also be associated with a detectable difference in the adult attitudes of the treated study participants.

Table 7

Intervention Effects for Child Care Treated and Control Parents on the Parental Modernity Outcomes

Outcome	Group	N	Mean	S.D.	T-test	E.S.
Modernity Progressive Total	0	41	26.22	3.32	-1.74+	-0.38
	1	43	24.95	3.34		
Modernity Authoritarian Total	0	41	73.38	14.86	-2.182	-0.46
	1	43	66.969	11.98		

Intervention Effects for Family Education and Controls for Parental Modernity Outcomes

Outcome	Group	N	Mean	S.D.	T-test	E.S.
Modernity Progressive Total	0	9	25.56	2.96	0.99	0.38
	2	15	26.87	3.72		
Modernity Authoritarian Total	0	9	66.11	17.2	1.54	0.63
	2	15	76.53	15.53		

Group=2: Home Teacher Group; Group=1: Experimental Group; Group=0: Home Control Group; S.D.=Standard Deviation; E.S.: Effect Size;  
 +: p value<.1; \*: p value<.05; \*\*: p value<.01; \*\*\*: p value<.001.

Note that in Table 7 above Comparison 1 contrasts parents who had center based treatment and controls whereas Comparison 2 refers to parents in the CARE study who had the Family Education program and CARE controls. The results show a reduction in Authoritarian attitudes among those who had the benefit of the five years of educational intervention in preschool. Thus, a positive effect on parenting attitudes was found for persons with center based intervention. However, no such difference was found for those who had the Family Education model intervention.

#### Parenting Efficacy Questionnaire (Ramassini, 2001)

This instrument was designed for use with parents of children from low-income families; it assesses the extent to which the individual feels confident in the parental role. Respondents rate 34 Likert-type items on scales ranging from 1 (Never) to 7 (Always) as to how each pertains to his or her own self-perception. Eight items describe Love (e.g., "I am good at showing my children that I love them."); eight describe Control ("I feel I have the right amount of control over my child's behavior."), and 10 are more general ("I am good at looking at things from my child's point of view."). For purposes of this report, scores for the Love and Control Scales are reported. All items included here are scored in the positive direction such that higher score reflects more confidence in that domain. If all eight were scored maximally, the scores would equal 56. Table 8 below summarizes the outcomes for parents with and without early childhood educational intervention.

*Table 8*  
*Means and Standard Deviations for Love and Control Scales from the Parent Efficacy Questionnaire as a Function of Parental Treatment/Control Status*

	Center Treated				Family Education			
Group	Treated	Control			Treated	Control		
n	43	41			15	9		
Scale			T-test	E. S.			T-test	E.S.
Love	49.80 (5.66)	50.92 (4.82)	-0.97	-0.21	51.40 (3.85)	51.41 (4.83)	-0.00	-.00
Control	43.97 (6.25)	45.78 (6.08)	-1.34	-0.29	45.13 (4.01)	47.11 (5.56)	-1.01	-0.43

## Child Outcomes

Table 9 below details the age distribution of children reported by Abecedarian and CARE parents at the age-30 interview. This table includes all children reported, not only those old enough to be assessed by the investigators. The distribution of ages of children was fairly comparable across studies.

Table 9

*Distribution of Ages of All Children Reported by Study Participants*

Age	ABC				CARE				
	Treatment		Total	Percent	Treatment			Total	Percent
	0	1			0	1	2		
0	0	0	0	0%	2	0	2	4	5.19%
1	6	4	10	5.52%	0	1	1	2	2.60%
2	1	1	2	1.10%	0	0	3	3	3.90%
3	5	8	13	7.18%	1	1	3	5	6.49%
4	5	7	12	6.63%	1	2	5	8	10.39%
5	6	13	19	10.50%	3	1	1	5	6.49%
6	3	5	8	4.42%	2	1	5	8	10.39%
7	8	6	14	7.73%	2	1	3	6	7.79%
8	10	10	20	11.05%	2	1	2	5	6.49%
9	7	4	11	6.08%	1	3	2	6	7.79%
10	4	9	13	7.18%	3	1	5	9	11.69%
11	5	7	12	6.63%	1	1	1	3	3.90%
12	7	6	13	7.18%	0	1	4	5	6.49%
13	11	5	16	8.84%	1	1	0	2	2.60%
14	4	1	5	2.76%	0	0	4	4	5.19%
15	5	1	6	3.31%	0	0	2	2	2.60%
16	2	1	3	1.66%	0	0	0	0	0%
17	2	1	3	1.66%	0	0	0	0	0%
18	0	0	0	0%	0	0	0	0	0%
19	1		1	0.55%	0	0	0	0	0%
Total	92	89	181		19	15	4 3	77	
Missing	9	8	17		0	5	5	10	

0: Control Group; 1: Experimental Group; 2: Home Teacher Group.

To learn if any next-generational benefits of early childhood education for parents could be detected in the children of treated parents, children's status was determined in three domains: children's academic performance in reading and math as measured with a standardized

academic test, the Woodcock-Johnson Psycho-educational Battery-III, Tests of Academic Achievement (ref); children's self-rated attitudes toward school, children's attitudes toward school and child socio-emotional adjustment. Only children aged 3 and up were administered the Woodcock-Johnson, and only those 5 and up, who were actually enrolled in school, completed the attitude measure. Parents rated children's socio-emotional adjustment on the Child Behavior Checklist (Achenbach & Rescorla, 2001) for each of their children aged 2 years and up. Children were given \$50 for completion of the instruments that were administered to them; parents were given \$25 for completion of the parenting attitude questionnaires plus \$10 for each Child Behavior Checklist they completed.

What I Think of School (Landesman & Reid, 1988). This instrument was designed to assess young children's attitudes toward school. Eight 8 items describing aspects of schooling (Liking school, doing well in school, importance of doing well, trying hard, parent's caring about success, getting along with teachers, getting along with peers, and teacher's helping you) were rated on a 3-point scale ( e.g., How much do you like school? "A lot, sort of, or don't like it").

It is difficult to interpret the findings from this instrument in that child ages could range from 5 to 15 when they made the ratings. Time has not allowed us to examine the data as a function of the age of the child raters, nor are our numbers sufficient to assess reliably the outcomes in this manner. Therefore, what is reported here is collapsed across all ages, and must be interpreted with caution. That said, the outcomes for children whose parents had or did not have the five years of center-based early intervention were as follows:

- All items were heavily weighted toward the most positive position. The importance of doing well, trying hard, parent's stressing the importance of success, and teachers helping one to learn had virtually no ratings below the maximum possible.
- Comparing oneself to the others in the class elicited a more nuanced response from the children; self-ratings as "great" in comparison to others were balanced by ratings of "sort of good" in comparison with others.
- Getting along with teachers also elicited some ratings of "sort of" get along well.
- Ratings of getting along with peers also tended to elicit some dubious "sort of" get along ratings.
- No significant differences in attitudes toward school were found between children of parents who did and did not have early childhood educational intervention. Purely descriptively, children whose parents had center-based early childhood education were more nuanced in their self-ratings of liking school, but the difference was not significant by Chi Square test.
- The 4 children of parents who had participated in the CARE Family Education program or the CARE control group, 7 in each group, also completed these ratings. Like the children of parents from the larger child-care centered treated and control groups, children in these groups overwhelmingly chose the highest, most positive alternate for the items. However, with so few cases, even trends are difficult to detect in the data.
- The data were examined to learn if there were systematic differences in the ways that girls and boys responded to the items. None were detected.

### Children’s Academic Performance

Because a well-respected test of academic performance that covers preschool readiness skills as well as the academic skills of those in kindergarten and older was available (Woodcock, McGrew, & Mather, 2001), all second generation children aged 3 and up were invited to take part in the academic outcomes part of the study. However, analysis of the findings indicated that the readiness skill data from children younger than 5 were difficult to interpret therefore the analysis of this outcome is limited to data obtained from those who were aged 5 or older. This report describes the scores for Broad Reading and Broad Math as a function of the testee’s parental intervention history. Table 10 summarizes the numbers of children who contributed academic test data for this analysis, by study and treatment group of the parents. Table 11 gives the means and standard deviations for child scores on the Broad Reading and Broad Mathematics Scores from the Woodcock-Johnson III.

Table 10  
Participants for Broad Reading and Broad Math Scores (Aged Five or Older)

		Study	
	ABC	CARE	Total
Control	43	9	52
Treated	43	2	45
Family Ed.		15	15
	86	26	112

The data presented in Table 11 are age-references standardized scores, such that the “average” child of a given age would score 100, with a standard deviation of 15. Thus, mean scores below 100 would indicate that children scored below the national average for others their own age. Even limiting the data to those from children aged 5 or older, some Broad Domain scores could not be calculated due to missing scores on some of the constituent skills.

**Table 11**  
**Means and Standard Deviations for Woodcock-Johnson Broad Reading and Broad Mathematics Scores as a Function of Parental Treatment/Control Status**

Group	Center Treated		T-test	E. S.	Family Education		T-test	E. S.
	Treated	Control			Treated	Control		
n	44	52			15	9*		
Broad Reading	95.68 (14.68)	94.35 (13.66)	0.30	0.08	97.60 (11.38)	92.38 (22.48)	0.27	.08
Broad Math	99.14 (10.41)	99.35 (12.76)	0.05	0.01	98.00 (8.68)	98.67 (15.64)	0.12	0.03

\*For the reading score, 8 individuals contributed data.

The first thing to note about these standardized academic test outcomes is how close to the national average the child scores obtained here fell. Recall that the parents were themselves from families at high risk for children's having developmental delays and academic problems. Over the years, consistently, children who had the early childhood educational intervention outperformed the control children in terms of academic performance, but the average academic performance of individuals in the control group tended to be around 85.00. In the second generation, children of parents in all treatment groups were scoring in the high 90s. This speaks well for the school systems in which the next generation of students matriculated.

Descriptively, children of treated parents scored a few points higher on the Broad Reading score than did children of parents in the control group, but the difference was not statistically significant. Interestingly, scores on mathematics were virtually identical across all groups and also they were slightly higher than reading scores.

Contrary to expectations, given that parents who had experienced the center-based early childhood educational intervention had significantly better educational attainment as 30-year-old adults, there are no apparent differences in the academic performance of their offspring as measured here by the Woodcock-Johnson III. It will be important to expand this study by dividing the child sample into younger and older children and re-examining the mean reading and math performance to see if any trends toward better academic outcomes are seen as the children got older, but given the nature of the present information, the conclusion would have to be that the offspring do not show benefits as a function of their parents' early educational experience.

Socio-emotional Development as Rated by Parents. According to the age of the child, parents completed either the Child Behavior Checklist for children ages 1.5 to 5 years (100 items), or the Checklist for children aged 6-18 (113 items). For the older aged child, ratings of involvement in activities, school performance, and social relationships with peers and family are included. For purposes of this report, three major indices of socio-emotional adjustment will be described: scores that describe groupings of syndromes as either Internalizing (problems

mainly within the self) and Externalizing (problems involving conflicts or acting out), and a summary score or Total Problems that gives an estimate of overall mental well-being (Achenbach & Rescorla, 2001). These checklists ask parents to rate 100 CBCL Parent Rating

Tables 12 and 13 below contain means and standard deviations for scores on these syndromes as rated by the parents for their children. Each parent was asked to complete a checklist for each of his or her children, even those younger than 3 years, who were not otherwise included in the child measures collected as part of this study. Note that CBCL1 refers to the one for younger children

Table 12

Comparison for CBCL1 Outcomes for Children Aged 1.5-5 Years Whose Parents Did or Did Not Experience Center-Based Early Childhood Educational Intervention (ABC and CARE combined)

Sample Size for CBCL1 Ages 1.5 to 5

Group	ABC	CARE
Home Control	15	6
Experimental	20	4
Home Teacher	NA	10

Outcome	Group	N	Mean	S.D.	T-test	E.S.
Problem Scale- Internalizing T Score	Control	21	41.10	8.71	1.06	0.32
	Treated	23	44.54	12.38		
Problem Scale- Externalizing T Score	Control	21	43.42	7.26	0.65	0.20
	Treated	23	45.23	10.62		
Problem Scale- Total Problems T Score	Control	21	41.95	7.19	0.83	0.25
	Treated	23	44.46	11.93		

Comparison 2 for CBCL1 Outcomes for Children Whose Parents had CARE Family Education with the CARE Control Group

Outcome	Group	N	Mean	S.D.	T-test	E.S.
Problem Scale- Internalizing T Score	Control	6	38.33	9.35	0.37	0.20
	Treated	9	40.33	10.60		
Problem Scale- Externalizing T Score	Control	6	39.67	4.23	-0.72	-0.38
	Treated	9	37.94	4.77		
Problem Scale- Total Problems T Score	Control	6	38.00	5.22	-0.08	-0.04
	Treated	9	37.72	7.54		

*Table 13*  
*CBCL Outcomes for Children Aged 6-18*  
 Sample Size for CBCL2 for Children Aged 6-18

Group	ABC	CARE
Home Control	22	5
Experimental	27	4
Home Teacher	NA	10

*Group Comparison Between Children of Child Care Treated Parents and Controls for CBCL*  
*Outcomes Ages 6-18*

Outcome	Group	N	Mean	S.D.	T-test	E.S.
Problem Scale- Externalizing T Score	Control	26	50.00	9.68	-0.90	-0.24
	Treated	31	47.90	7.96		
Problem Scale- Internalizing T Score	Control	26	46.13	11.83	0.09	0.02
	Treated	31	46.38	8.81		
Problem Scale- Total Problem T Score	Control	26	47.43	11.26	-0.43	-0.11
	Treated	31	46.25	9.54		

Problem Scale- Externalizing T Score	0	4	43.75	7.964	0.47	0.29
	2	10	46.41	10.06		
Problem Scale- Internalizing T Score	0	4	36.50	4.73	1.93+	1.04
	2	10	46.13	9.38		
Problem Scale- Total Problem T Score	0	4	37.62	7.63	0.88	0.53
	2	10	43.28	11.75		

No significant differences in parental ratings of their children's social-emotional adjustment were found for offspring of adult participants in the Abecedarian and CARE early childhood programs. The mean scores indicated that children were functioning in the normal range on average and there were not systematic effects on the way that parents rated their children as a function of the parents' early childhood experience. Nor were there differences in the way that males and females rated their children.

## **V. Discussion and Interpretation of the Findings**

A. Conclusions to be drawn: The most striking finding from this examination of child outcomes and parenting attitudes as a function of the parent's own early childhood experience is that effects on parental attitudes were detected, in the predicted direction, but essentially no differences were seen in the children's outcomes as measured here. Parents who were randomly assigned to have early intervention achieved, on average, higher levels of education compared to parent in the control groups, but effects of this enhanced educational attainment

on the school performance or attitudes toward school in the next generation were not apparent. Their children did not, on average, display better scores on standardized tests of reading and math nor were the children's attitudes toward school detectably different from those of children whose parents did not have the early treatment.

Parents who had early childhood treatment, however, did display attitudes considered more supportive of children's positive development, as detected through responses to the Modernity/Traditional construct derived from the Parent as Educator Interview. Such parents were less Authoritarian in their approach to child rearing. Lower scores on this construct have been associated with better child cognitive development and progress in school (Campbell, Goldstein, Schaefer, & Ramey, 1988).

B. Limitations: The small sample size limits power to detect differences that may in fact have existed in child or parent outcomes for the participants in this study. Arguing against this supposition, however, is the fact that some of the differences that were found in individual items assessing parent attitudes favored controls over those treated. One possibility is that the treated group, having slightly better educational attainment, were somewhat more candid in responding to the Parent as Educator items, or possibly more nuanced, in their thinking about supporting the development of their children.

One factor that makes interpretation of child outcomes difficult in this study is the wide range in the ages of the children studied – some data were collected concerning child outcomes from those aged two years, with a maximum child age up to 16 years. Another is that, for this report, other analyses would be helpful in which child outcomes are examined as a function of single-parent or two-parent families. A third is that few of the child outcomes have been considered as a function of child gender itself.

C. Comparison to other studies. This research is unique in that it is one of the first examination of the actual school performance of a second generation based on the parents' own early childhood experience. Most follow-up studies have examined effects on the treated individuals themselves. An exception is the follow-up report from the Perry Preschool at age 40 (Schweinhart et al., 2005). In that study, no significant differences were found in the school performance (graduation rates, dropping out). The investigators of that study were able to compare outcomes for older children, some of whom had, by that time, married or become parent themselves. The same problems of interpretation of findings were discussed by the Perry investigators as those pertaining to this study: a range of ages in children of study participants, and demographic changes in circumstances that made adult comparisons, such as welfare dependence, difficult. The latter was not a problem for this round of Abecedarian and CARE outcomes.

D. Implications for Maternal and Child Health Delivery Situations: The implications of this work are, first, that there were not clear indications of better school performance in children born to adults who had themselves had better school performance associated with having had early childhood educational intervention. Because this findings emerges from a long-term follow-up of randomized trials of early childhood intervention, it is a more stringent test of whether

treatment benefits might have extended to a second generation. Although raw means show a very slight trend toward better reading scores in the second generation, this finding cannot be considered statistically significant and therefore, it cannot be attributed to the early childhood treatment itself.

For health care per se, the findings are not directly relevant, but that parental attitudes were shifted slightly in a more nuanced direction could imply that parents would be better able to provide supportive care for their children, which should extend to better vigilance for health and well-being. That some of the specific attitude shifts were toward taking a less harsh view of children's intentionality, this could have implications for mental health as well.

This study shows, within its participants, a disconnect between establishing a two-parent home and becoming a parent. At least half of the individuals in the Abecedarian and CARE studies who became parents did so in the absence of marriage. In the parent generation, three-quarters of the infants enrolled in the study lived in female headed households. The trend is still apparent in this generation.

E. Policy Implications: To the extent that these randomized trials of early childhood educational intervention for children at risk for developmental delays and academic failure have shown that better parental education was found at age 30, support for early childhood programs is clearly warranted. We can be less sure of policy implications pertinent to the next generation of children born to the study participants. The present data only hint at better performance in reading for children of parents who had early childhood intervention, and this finding, while in the predicted direction, does not attain statistical significance and thus cannot be considered as demonstrated with confidence. It is noteworthy that children born to parents who did not have the early childhood educational intervention earned slightly higher mean scores on standardized tests of academic achievement than their own parents earned. In contrast, children of parents who did have the early childhood treatment earned scores more similar to those earned by their parents. Speculatively, a greater emphasis on preschool programs for poor children may have better prepared these children for school success, and it is also possible that schools may be doing a slightly better job of encouraging academics among students whose parent families faced economic hardship during their own childhoods.

F. Suggestions for future research. These data need to be further examined to learn the extent to which having two parents, as opposed to one parent in a child's home is related to better child outcomes. The data may also shed light on parental perceptions of children's socio-emotional development in one-parent versus two-parent homes. The hint that outliers in parent attitudes were more prevalent in individuals in the early childhood control groups needs further exploration. In addition, more analyses are needed to learn if the academic outcomes vary according to the age of the child being tested.

The Abecedarian and CARE studies contain the possibility for multigenerational analyses extended across three generations because much is known about the circumstances of the parents of the children enrolled in the early childhood randomized trials. Data exist in the study archives that will allow further investigation of multigenerational effects. Based on the present findings, parent's early childhood educational experience is not predictive of the

academic skills of their children. Reading and Math scores earned by children of parents in the treated and control groups were virtually identical. This phenomenon should be explored further.

## VI. List of products

### **Publications during funded period (with extensions) 2001-2011:**

- Campbell, F.A., Pungello, E. P., Kainz, K., Sparling, J. J., Burchinal, M., Wasik, B. H., Barbarin, O., Ramey, C. T., Pan, Y. Adult outcomes as a function of early childhood educational intervention: An Abecedarian Project follow-up. (In press) *Developmental Psychology*  
A
- Muennig, P., Robertson, D., Johnson, G., Campbell, F., Pungello, E., & Neidell, M. (2011) The effect of an early education program on adult health: The Carolina Abecedarian Project randomized controlled trial. *American Journal of Public Health*. 101(3), 512-516.
- McMillian-Robinson, M. M., Frierson, H. T. & Campbell, F. A. (2011). Do gender differences exist in the academic identification in African American elementary school-age children? *Journal of Black Psychology*,37(1), 78-98.
- Campbell, F. A., & Ramey, C. T. (2010). The Abecedarian Project. In A. J. Reynolds, A. Rolnick, M. M. Englund & J. Temple (Eds.). *Cost effective programs in children's first decade: A human capital integration*. (pp. 76-95), New York: Cambridge University Press.
- Reynolds, A. J., Englund, M. M., Ou, S-R, Schweinhart, L.J., & Campbell, F. A. (2010). Paths of effects of preschool participation to educational attainment at age 21: A study of the Child-Parent Centers, High/Scope Perry Preschool, and the Abecedarian Project. In A. J. Reynolds, A. Rolnick, M. M. Englund & J. Temple (Eds.). *Cost effective programs in children's first decade: A human capital integration*. (pp. 415-452), New York: Cambridge University Press.
- Pungello, E. P., Kainz, K., Burchinal, M. Wasik, B. H., Sparling, J. J., Ramey, C. T., & Campbell, F. A. (2010). Early educational intervention, early cumulative risk, and the early home environment as predictors of young adult outcomes within a high-risk sample. *Child Development*, 81(1), 410-426.
- Campbell, F. A., & Taylor, K. (2009). Early Childhood Programs That Work for Economically Disadvantaged Children in E. Essa & M. M. Burnham (Eds.) *Informing Our Practice: Useful Research on Young Children's Development* (pp. 203-215). Washington, DC: National Association for the Education of Young Children.
- Campbell, F. A., Wasik, B. H., Pungello, E. P., Burchinal, M. R., Kainz, K., Barbarin, O., Sparling, J. J., & Ramey, C. T. (2008). Young Adult Outcomes from the Abecedarian and CARE Early Childhood Educational Interventions. *Early Childhood Research Quarterly*, 23, 452-466.

- Steen, R. G., & Campbell, F. A. (2008). The cognitive impact of systemic illness in childhood and adolescence. Invited chapter in *WISC-IV, Clinical Use and Interpretation* (pp. 365-407). Burlington, MA: Elsevier Academic Press.
- Campbell, F. A. & Burchinal, M. (2008). Early childhood interventions: The Abecedarian Project. In P. C. Kyllonen, R. D. Roberts, & L. Stankov (Eds.). *Extending intelligence: Enhancement and new constructs* (pp. 61-84). New York: Lawrence Erlbaum Associates/Taylor & Francis Group.
- Campbell, F. A., & Ramey, C. T. (2007). Carolina Abecedarian Project. National Invitational Conference of the Early Childhood Research Collaborative. [www.earlychildhoorc.org](http://www.earlychildhoorc.org)
- McLaughlin, A. E., Campbell, F. C., Pungello, E. P., & Skinner, M. (2007) Depressive symptoms in young adults: The influences of the early home environment and early educational childcare. *Child Development, 78*, 746-756.
- Pungello, E.P, Campbell, F.A., & Barnett, S. W. (2006). Poverty and Early Childhood Education. /Center for Poverty, Work and Opportunity: Policy Brief Series/. [www.law.unc.edu/povertycenter](http://www.law.unc.edu/povertycenter) <<http://www.law.unc.edu/povertycenter>>
- Campbell, F. A. & Pungello, E. P. (2006). The Abecedarian Project. In C. R. Reynolds and E. Fletcher-Jantzen (Eds). *Encyclopedia of Special Education* (3<sup>rd</sup>.ed., Vol. 1, pp-8-15). Hoboken, NJ: Wiley
- Peart, N. A., Pungello, E. P., Campbell, F. A., & Richey, T. G. (2006). Faces of fatherhood: African American young adults view the parental role. *Families in Society, 87*(1), 71-83.
- Campbell, F. A., Goldman, B. D., Boccia, M. L., & Skinner, M. (2004). The effect of format modifications and reading comprehension on recall of informed consent information by low-income parents: A comparison of print, video, and computer-based presentations. *Patient Education and Counseling. 53*, 205-216.
- Campbell, Frances. [2004; Invited] "Commentary on the Relationship Between Preschool Programs and School Completion" (Invited). In Encyclopaedia on Early Childhood Development. *Centre of Excellence for Early Childhood Development Website*, [http://www.excellenceearlychildhood.ca/liste\\_theme.asp?lang=EN&act=32](http://www.excellenceearlychildhood.ca/liste_theme.asp?lang=EN&act=32)
- Agre, P., Boccia, M., Campbell, F., Goldman, B., Kass, N., McCullough, L., Merz, J., Miller, S., Mintz, J., Sugarman, J., Sorenson, J., Wirshing, D. (2003). Improving informed consent: The medium is not the message. In *Toward Improving the Informed Consent Process in Research with Humans: Supplement to IRB Ethics and Human Research*, Laura Siminoff, Issue Editor, 25(5), 11-19.

Campbell, F. A. (2002). High quality childcare and school readiness. In *A Generational Journey: Women Carrying on the Vision, Common Issues, United Voices. Conference Proceedings of the Third National Conference on Women, Special Preview Edition* (pp.46-48). Rockville, MD: U. S. Department of Health and Human Services, Substance Abuse and Mental Health Services Administration.

Campbell, F. A., Pungello, E. P., & Miller-Johnson, S. (2002). The development of perceived scholastic competence and global self-worth in African American adolescents from low-income families: The roles of family factors, early educational intervention, and academic experience. *Journal of Adolescent Research, 17*, 277-302.

Campbell, F. A., Ramey, C. T., Pungello, E. P., Sparling, J.J., & Miller-Johnson, S. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science, 6*, 42-57.

Campbell, F. A., Pungello, E. P.; Miller-Johnson, S., Burchinal, M., & Ramey, C. T. (2001). The development of cognitive and academic abilities: growth curves from an early childhood educational experiment. *Developmental Psychology, 37*, 231-242.

#### **Presentations during funded period:**

Campbell, F. A., & Pungello, E. P. (2011, April 1). The Duration of Benefits from Early Childhood Educational Intervention: Adult Outcomes from the Abecedarian and CARE Studies. In Samuel L. Odom, Chair. Views by Two. Invited presentation at the Biennial Meeting of the Society for Research in Child Development, Montreal, Canada

Campbell, F. A. (2010, September 29) The Carolina Abecedarian Project: Invited presentation to the School Readiness Conference, Improving Low-Income children's School Readiness: New Perspectives on an Enduring Challenge. New York, NY.

Campbell, F. A. (2009, December 2) The Abecedarian Study: Long-term outcomes of early childhood educational intervention. Presentation to Chinese Delegation (Shanghai) visitors to Frank Porter Graham Child Development Institute.

Campbell, F. A., Pungello, E. P., Kainz, K., & Ramey, C. T. (2009, April 2). Economic indicators for Abecedarian study participants at age thirty. In E. P. Pungello, Chair, Breaking the Poverty Cycle: Economic Indicators for Adults Who Participated in Three Early Childhood Intervention Programs. Paper Symposium presented at the Biennial Meeting of the Society for Research in Child Development, Denver, CO.

Campbell, F. A., Kainz, K., Pungello, E., & Sparling, J. (2008, June 24). Early cognitive skills as mediators of long-term benefits of early childhood educational intervention. Poster presented at Head Start's Ninth National Research Conference: Creating Connections:

Linking Policy, Practice and Research across Early Childhood Development, Care and Education. Washington, DC:

Sparling, J. J., Campbell, F. A., & Capizzano, J. (2008, June 23). Comparing program implementation and fidelity of an adult-child interaction curriculum resource across a variety of service modalities. Poster presented at Head Start's Ninth National Research Conference: Creating Connections: Linking Policy, Practice and Research across Early Childhood Development, Care and Education. Washington, DC:

Campbell, F. A. (2008, June 12). The Carolina Abecedarian Project. Invited testimony at the Robert Wood Johnson Commission to Build a Healthier America Field Hearing, Raleigh, NC.

Sparling, J. J., & Campbell, F. A. (2008, June 8). How to Use the Abecedarian Longitudinal Research Results as a Tool for Advocating for Early Childhood Programs. Training Institute for the National Association for the Education of Young Children. New Orleans, LA.

Briggs, H. & Campbell, F. A. (2008, March 22). A longitudinal examination of involvement in crime. Poster presented at the Society for Research in Adult Development Conference. New York, NY.

Reynolds, A., Englund, M., Ou, S-R., Schweinhart, L., & Campbell, F. (2007, December 8). Mechanisms of influence from preschool to educational attainment: A three-study analysis. Presentation at the National Invitational Conference of the Early Childhood Research Collaborative. Minneapolis, MN.

Campbell, F. A., & Ramey, C. T. (2007, December 7). Carolina Abecedarian Project. Invited presentation at the National Invitational Conference of the Early Childhood Research Collaborative. Minneapolis, MN.

Pungello, E. P., & Campbell, F. A. (2007, March 31) Does gender moderate the long-term effects of early childhood educational intervention? Poster presented at the Biennial Meeting of the Society for Research in Child Development. Boston, MA.

Campbell, F. A., & Pungello, E. P. (2006, August 24). A brief introduction to the Abecedarian and CARE studies. Presentation at the Meeting of the Pritzker Consortium on Early Childhood Development meeting with members of the Atlantic Philanthropies Disadvantaged Children and Youth Programme, University College of Dublin, Dublin, Ireland.

Campbell, F. A., Wasik, B. H., & Pungello, E. P. (2006, June 27). Long-term outcomes from two models of early childhood education. Poster presented at Head Start's Eighth National Research Conference. Washington, DC.

Campbell, F. A. (2006, April 29). Early childhood education matters: The Abecedarian and CARE studies. Invited presentation to the Fourth Annual District of Columbia Universal School Readiness Conference, Early Childhood Leadership Institute. Washington, DC.

Campbell, F. A. (2005, April 30). Abecedarian Project: Linking early learning to school success. Invited presentation to the Third Annual District of Columbia Universal School Readiness Conference, Early Childhood Leadership Institute. Washington, DC.

Pungello, E., Campbell, F. A., Wasik, B. H., Burchinal, M. Cai, L. Nelson, L., and Ramey, C. T. (2005, April 10). Early risk and educational intervention predicting to young adult outcomes within a high-risk population. In F. A. Campbell, Chair, *Becoming Competent: Longitudinal Studies of Risk and Protective Factors that Impact the Development of Adolescents and Adults*. Paper Symposium presented at the Biennial Meeting of the Society for Research in Child Development, Atlanta, Georgia

McLaughlin. A., Campbell, F., Skinner, M., Pungello, E. (2005, April 9). Does early childhood treatment affect young adult depression? Poster presented at the Biennial Meeting of the Society for Research in Child Development, Atlanta, Georgia,

Campbell, F. A., & Pungello, Elizabeth P. (2004, June 29). The effects of early childhood education on special education assignments in public school: The Abecedarian study. Poster presented at Head Start's Seventh National Research Conference: Promoting Positive Development in Young Children. Washington, DC.

Campbell, F. A. (2004, May 1). Linking early learning to school success. Invited presentation to the Second Annual District of Columbia Universal School Readiness Conference, Early Childhood Leadership Institute. Washington, DC.

Campbell, F. A. (2003, October 20). Early childhood educational intervention. Invited presentation to the Maternal and Child Health Federal/State Partnership Meeting: Building Bridges, Research to Practice. Alexandria, VA.

Campbell, F. A. (2003, May 3). Does a good early childhood program make a difference? Invited presentation to the First Universal School Readiness Conference, Early Childhood Leadership Institute. Washington, DC.

Campbell, F. A. (2003, April 26). Introduction: What's a good early childhood education worth and why? Presentation in F. A. Campbell, Chair, *What's a good early childhood*

education worth and why? Symposium presented at the Biennial Meeting of the Society for Research in Child Development, Tampa, FL.

Pungello, E. P. & Campbell, F. A. (2002, September 20) The Abecedarian Project. Invited presentation at the Virginia Family Literacy Insititue, Roanoke VA

Campbell, F. A., & Pungello, E. P. (2002, June 27) Differential effects of early risk and early intervention on reading and math achievement. Poster presented at Head Start's Sixth National Research Conference: Pathways to the Future: The First 8 Years. Implications for Research, Policy, and Practice. Washington, DC.

Campbell, F. A. (2002, April 14). No systematic negative effects of intensive early child care found on the socioemotional adjustment of adolescents. Poster presented at the Ninth Benennial Meetingof the Society for Research on Adolescence. New Orleans, LA.

Campbell, F. A. (2001, November 28). The malleability of cognitive development of children of low-income African American families: Intellectual test performance over twenty-one years. Invited keynote address at the Third International Spearman Seminar, Extending Intelligence: Ehancement and New Constructs. Sydney, Australia.

Campbell, F. A. (2001, June 21). High quality child care and school readiness: What does research tell us? In Mini-Plenary Session entitled High quality child care and school readiness, Margaret Miller, Moderator. Invited presentation to the Third National Conference on Women. Orlando, FL.

Campbell, F. A., Pungello, E. P., & Miller-Johnson, S. (2001, April 21). Effects of early environmental risk within a high-risk sample: The Abecedarian study. Paper presented in G. Lamberty, Chair, Context in longitudinal studies of competence among African American children. Symposium presented at the Biennial Meeting of the Society for Research in Child Development, Minneapolis, MN.

**.References cited in text.**

- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for the ASEBA School-Age Forms and Profiles*. Burlington, VT: University of Vermont Research Center for Children, Youth & Families.
- Broder, D. (2002, Nov 27). Strong families, strong young minds. *The Washington Post*, p. A17.
- Bryant, D. M., & Maxwell, K. (1997). The effectiveness of early intervention for disadvantaged children. In M. Guralnick (Ed.). *The Effectiveness of Early Intervention* (pp. 23-46). Baltimore, MD: Paul H. Brookes.
- Caldwell, b. M., & Bradley, R. H. (1984). *Home Observation for Measurement of the Environment : Revised Edition (HOME)*. Little rock, AR. University of Arkansas at Little Rock
- Campbell, F. A., Goldstein, S., Schaefer, E. S., & Ramey, C. T. (1991) Parental beliefs and values related to family risk indicators, educational intervention, and child academic competence. *Early Childhood Research Quarterly*, 6. 167-182.
- Campbell, F. A., Pungello, E. P., Miller-Johnson, S., Burchinal, M. R., & Ramey, C. T. (2001). The development of cognitive and academic abilities: Growth curves from an early childhood educational experiment. *Developmental Psychology*, *37*, 231-242.
- Campbell, F. A., Ramey, C. T., Pungello, E. P., Miller-Johnson, S., & Sparling, J. J. (2002). Early childhood education: Young adult outcomes from the Abecedarian Project. *Applied Developmental Science*, *6*, 42-57.
- Gray, S. W., Ramsey, B. K., & Klaus, R. A. (1982). *From 3 to 20: The Early Training Project*. Baltimore, MD; University Park Press.
- Johnson, D. L., & Walker, T. (1991). A follow-up evaluation of the Houston Parent-Child Development Center: School performance. *Journal of Early Intervention*, *15*(3), 226-236.
- Landesman, S., & Reid, M. (1988). *What I think of School (WITS)*. Seattle, WA: University of Washington.
- Lazar, I., Darlington, R., Murry, H., Royce, J., & Snipper, A. (1982). Lasting effects of early education: A report from the Consortium for Longitudinal Studies. *Monographs of the Society for Research in Child Development*, *47*(2-3, Serial No. 195).

- McCormick, M. C., Brooks-Gunn, J., Buka, S. L., Goldman, J., Yu, J., Salganik, M. et al. (2006). Early intervention in low birth weight premature infants: Results at 18 years of age for the Infant Health and Development Program. *Pediatrics*, *117*, 1-10.
- Ramassini, K. (2001). *Parent Efficacy Questionnaire*. Mississippi University for Women. Used by permission.
- Reynolds, A. J. (2000). *Success in early intervention: The Chicago Child-Parent Centers*. Lincoln, NB: University of Nebraska Press.
- Reynolds, A. J., Temple, J. A., Ou, S-R., Robertson, D. L., Mersky, J. P., Topitzes, J. W. et al. (2007). Effects of a school-based, early childhood intervention on adult health and well-being. *Archives of Pediatric and Adolescent Medicine*, *161*(87), 730-739.
- Reynolds, A. J., Temple, J. A., Robertson, D. I., & Mann, E. A. (2001). Long term effects of an early childhood intervention on educational achievement and juvenile arrest: A 15-year follow-up of low-income children in public schools. *Journal of the American Medical Association*, *285*, 2339-2346.
- Schaefer, E. S., & Edgerton, M. (1985). Parent and child correlates of modernity. In I. E. Sigel (Ed.). *Parental belief systems* (pp. 287-318). New York: Erlbaum.
- Schweinhart, L. J., Barnes, H. V., & Weikart, D. P. (1993). *Significant benefits: The High/Scope Perry Center-based study through age 27*. Ypsilanti: High/Scope Press.
- Schweinhart, L. J., Montie, J., Xiang, Z., Barnett, W. S., Belfield, C. R., & Nores, M. (2005). *Lifetime Effects: the High/Scope Perry Preschool Study Through Age 40*. Ypsilanti: High/Scope Press.
- Woodcock, R. W., McGrew, K. S., & Mather, N. (2001). *Woodcock-Johnson III: Tests of Achievement*. Itasca, IL: Riverside Publishing.