

# The Effects of Early Intervention on Human Development and Social Outcomes: Provisional Evidence from ABC and CARE

Frances A. Campbell

Gabriella Conti

James J. Heckman

Seong Hyeok Moon

Rodrigo Pinto<sup>1</sup>

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<sup>1</sup>Frances A. Campbell is a Senior Scientist at the Frank Porter Graham Child Development Institute at the University of North Carolina at Chapel Hill. Gabriella Conti is an Assistant Professor at the Harris School of Public Policy at the University of Chicago. James J. Heckman is the Henry Schultz Distinguished Service Professor of Economics at the University of Chicago; the Professor of Science and Society, University College Dublin; and a Senior Fellow at the American Bar Foundation. Seong Hyeok Moon and Rodrigo Pinto are Research Fellows at the Economic Research Center at the University of Chicago. This research was supported by the Buffett Early Childhood Fund. The views expressed in this paper are those of the authors and not necessarily those of the funder or persons named here. Our special thanks go to Elizabeth Pungello and Dylan Robertson for their continued support for this research. We also thank to Jongwook Lee, Willem van Vliet, Edward Sung, Hanna Lee, Ji Min Park and Maryclare Griffin for their excellent research assistance.

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# 1 Introduction

The Carolina Abecedarian Project (ABC) and the Carolina Approach to Responsive Education (CARE) are randomized control trials (RCTs) designed to assess whether early intervention can prevent the development of low cognitive performance and school failure among children growing up in poverty. The two studies are closely related: both studies were conducted in Chapel Hill, North Carolina, recruited participants from the same population at birth, the same High Risk Index (HRI)<sup>1</sup> was used in both to screen prospective participants; the participants shared similar background characteristics such as maternal IQ and early family environment, and were conducted consecutively during the 1970s and early 1980s. The programs differ in the treatments provided: the ABC intervention consists of a two-stage treatment, with an early childhood education stage (from 2 months until 5 years) and an initial schooling stage targeting (from 5 to 8 years). Both the early childhood and initial schooling stages were center-based. The CARE intervention expanded on the ABC design for the early childhood education stage by adding a home visiting treatment which provided family education as a substitute for center-based early childhood education treatment (Campbell et al., 2008).

At the time the interventions started, the local population consisted primarily of faculty, students, local business proprietors, and a stable community of African American families with a range of socioeconomic backgrounds, mostly employed in relatively low-paid service jobs. In addition, the 1970s was a decade of significant social changes in the area where the studies took place: local schools had been desegregated only a few years earlier, and the region was undergoing moderate economic growth after the opening of a large research and development complex that brought new employment opportunities to the area. During the eight-year period separating the beginning of recruitment for the ABC study from the end of recruitment for CARE, there was a sizeable decline in the poverty rate for African American families, from 26% in 1970 to 20% in 1980 (Campbell et al., 2008). This different context in which the two interventions operated is very important to keep in mind in order to understand their estimated effects.

The ABC and CARE interventions, however, are not only interesting in their own right, but also in so far as they extend the existing literature on early interventions and enable the prediction

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<sup>1</sup>An index measuring socio-demographic factors associated with developmental delays or academic failure. See Section 2 for details of this index.

of long term effects of similar programs being implemented at present. Together with the Perry Preschool Program (PPP), the ABC and CARE interventions are the only rigorously designed randomized control trials of early childhood interventions with long-term follow-up data. ABC and CARE interventions share many features with the recently implemented Educare program which was patterned after the ABC/CARE program as described later in this report. Educare, however, offers higher quality services on several dimensions, such as the continuity of care provided, and emphasis on prenatal services.<sup>2</sup> Hence, the main aim of our research is to evaluate these two programs since their inception through the latest wave of data collection to assess a lower bound for the likely benefits of other similar but on-going programs such as Educare. This report applies state-of-art methodology to evaluate the ABC/CARE programs exploiting the wealth of information which was collected at multiple stages since birth until the end of the school age, and in the five follow-up surveys and data collection at ages 12, 15, 21, 30 and 34. Additionally, this already rich resource has been supplemented with administrative data from governmental records, on crime and welfare benefits. We present results on a variety of outcomes produced through rigorous statistical procedures addressing many issues crucial for correct interpretations of the effects of ABC/CARE programs, which have often been ignored in most of the previous literatures.

This report is organized as follows. Section 2 provides an overview of the ABC and CARE programs. Section 5 discusses the analytical issues and the evaluation methodology. Section 6 describes the data and Section 6 presents and discusses the main results. Section 7 concludes and we discuss our plans for future research on ABC to further understand the long term benefits of Educare.

## 2 Overview of Program Design and Main Features

The Carolina Abecedarian Project (ABC) and the Carolina Approach to Responsive Education (CARE) are prospective longitudinal randomized controlled trials of early educational interventions implemented to prevent the development of mild mental retardation for children at high risk for poor cognitive and academic outcomes. The ABC and CARE studies are based on six consecutive cohorts of children from low-income, predominantly black families (96% African American, 4% White)

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<sup>2</sup>The children stay with the same teaching team from infancy through age 3, and then from preschool through kindergarten, while in ABC/CARE the children had a new teaching team each year.

from the same community in a semi-rural county in North Carolina. Participants were enrolled in sequential randomized trials of early childhood education in the 1970s and 1980s. Cohorts 1-4 participated in the ABC intervention. Soon after their exit from the nursery, cohorts 5 and 6 were recruited to take part in the CARE intervention. Eligibility criteria were similar for both programs, and were based on a High Risk Index (HRI) that included maternal and paternal educational levels, family income, father’s presence, and 9 other indicators of family status and functioning.<sup>3</sup> A schematic representation of the treatment and control groups in ABC and CARE is presented in Figure 1. An important point to emphasize is that, in both studies, children in the control groups might have attended other childcare centers during their preschool years, depending on parental choice. Accounting for this affects our estimates.

In this section, we briefly discuss the history and the key features of these two programs.

## 2.1 The Carolina Abecedarian Project (ABC)

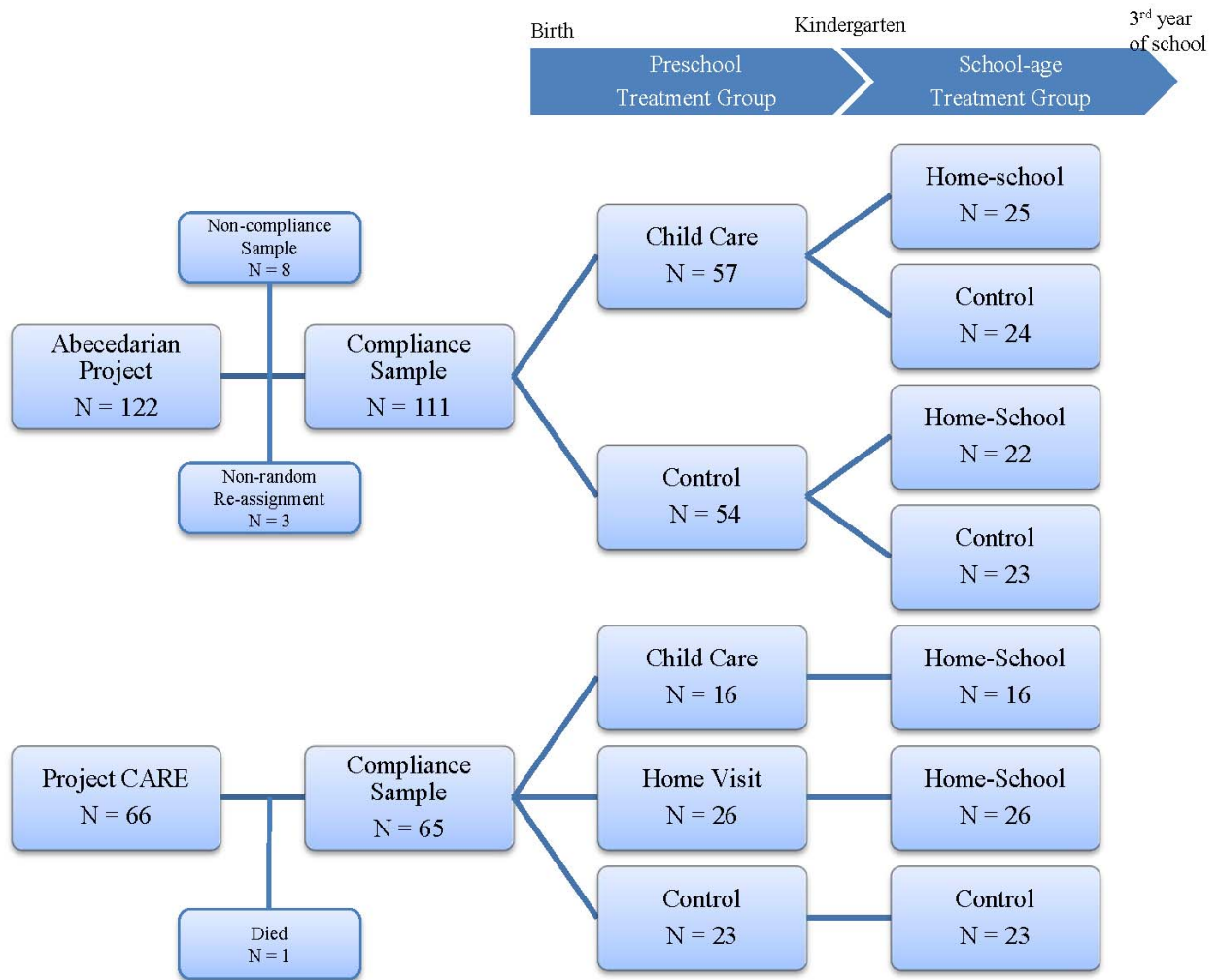
### 2.1.1 Recruitment and Randomization

**Eligibility** The ABC project recruited children in four separate waves by eliciting referrals from local community organizations such as prenatal clinics, hospitals, and social services (Breitmayer and Ramey, 1986). Families whose children appeared healthy and free from biological conditions that could be associated with mental, sensory, or motor disabilities were contacted (Ramey and Campbell, 1984). Once a potential candidate was identified, a High Risk Index (HRI) was computed on the basis of 13 socio-economic factors as described in Ramey and Smith (1977) to determine preliminary eligibility; a family was included if the index was greater than 11. Final eligibility was then determined after an interview with the mothers of the potential participants. On this occasion, demographic background data was collected and maternal intelligence was assessed using the Wechsler Adult Intelligence Scale (WAIS). The selection process took place either before or shortly after the birth of the subject child. A total of 122 eligible families (combining all waves) were

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<sup>3</sup>The 9 other components of the HRI for ABC include “Absence of maternal relatives in the area”; “Siblings of school age one or more grades behind age-appropriate level or with equivalently low scores on school-administered achievement tests”; “Payments received from welfare agencies within past 3 years”; “Record of father’s work indicates unstable or unskilled and semiskilled labor”; “Record of mother’s or father’s IQ indicate scores of 90 or below”; “Record of sibling’s IQ indicates scores of 90 or below”; “Relevant social agencies in the community indicate the family is in need of assistance”; “One or more members of the family has sought counseling or professional help in the past 3 years”; “Special circumstances not included in any of the above are likely contributors to cultural or social disadvantage”. See Ramey et al. (2000). For CARE, the components are slightly different but very similar.

Figure 1: Schematic representation of treatment groups in ABC and CARE with sample sizes in each branch of the tree



invited to enroll in the program. One family declined to participate and one mother miscarried, so the final randomized set consists of 120 families associated with 122 children (Campbell and Ramey, 1995; Ramey, Yeates, and Short, 1984). As shown in Figures 2–4, the ABC intervention participants were born to younger, less educated, and poorer mothers compared to the whole black population born in the 1970s as represented by the Panel Study of Income Dynamics (PSID), a nationally representative sample.

**First Randomization** The first randomization was performed immediately after each cohort was formed. The initial 120 families were matched in pairs on the basis of the sex of the child, the IQ of the mother, the number of siblings and the High-Risk Index score (Ramey and Campbell, 1984; Breitmayer and Ramey, 1986; and Campbell and Ramey, 1995). The precise matched pairs are unknown. The matched children were randomly assigned either to treatment or to control status within each pair. 118 children out of 122 stayed in the study through the initial stage; among these, 61 were assigned to the treatment group, and 57 to the control group. Average age at entry for the treated ranged from 3 to 21 weeks, with an average of 8.8 weeks.

**Compliance and non-random re-assignment** As displayed in Figure 1, among the 120 families (122 children) who were randomized 112 families accepted their original assignment and 8 families (7 treatment and 1 control) refused to participate after learning their assignment.<sup>4</sup> Among the 112 families (114 children) who complied, one infant assigned to the treatment group proved to be biologically retarded and was excluded from the study.<sup>5</sup> In addition, two infants in the control group were non-randomly re-assigned to the treatment group at the urging of protective service officials. The final base sample included 109 families (111 children). We call this “the compliance sample” in contrast to “the randomized sample,” although 3 of the 11 “non-compliers” were actually either excluded by researchers, or non-randomly reassigned. Of these 111 children in the compliance sample, 57 were assigned to the treatment status, and 54 to the control. Among them there was one pair of twins and one pair of siblings, both of whom were assigned to the treatment group (Campbell and Ramey (1995)).

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<sup>4</sup>Campbell and Ramey (1995) attribute the higher rate of study rejection in the treatment group to “mothers wanting to care for their infants at home.”

<sup>5</sup>Although excluded from the study, he attended the day care center as a regular member and underwent the regular series of assessments.

**Attrition during the pre-school-age treatment** Among these 111 children, 16 children attrited from the study sample for various reasons.<sup>6</sup> The remaining set of 95 participants is composed of 49 treated children and 46 control children, resulting in overall retention rates of 86% for the compliance sample or 78% for the randomized sample.<sup>7</sup>

**Second randomization** The pre-school-age treatment lasted until the children entered kindergarten at age 5. At this point another randomization took place for the school-age treatment. Only 96 of the original 122 children were included in this sample: the remaining 95 children from the preschool phase, and one child who originally dropped out and returned. A simple protocol was used to randomly assign treatment status within each of the 8 sets of partitions based on day-care treatment status, cohort and IQ at 48 months. The children were ranked on the basis of the 48-month Stanford-Binet IQ score, and pairs were formed according to the proximity of their scores. This resulted in 49 children in the school-age treatment and 47 in the control group. Among the 49(47) children from the preschool-age treatment(control) group, 25(24) were assigned to the school-age treatment and 24(23) to the control group. See the Figure 1 for the full detail.

**Attrition during the school age treatment and at the follow-ups** After the second randomization, three children who were assigned to the control group in the first phase and treated in the second did not receive the assigned intervention, so that the sample size was further reduced to 93. By the endpoint at age 8, only 90 children remained in the sample because 3 children were missing at the 96th month evaluation. By the time of the first follow-up (when the participants were 12 years old), the 3 children who had been missing evaluations at 96 months despite receiving the assigned school age intervention reappeared, but the 3 participants who had not received the assigned school age intervention were still missing. At the second follow-up (when the participants were 15 years old), there is information on 92 out of the 93 subjects who went through the entire study. The adolescents were contacted during the summer of their 10th year in school, and were tested at the child development center by individuals. Their parents were also interviewed ([Campbell and Ramey, 1995](#)). Attrition patterns across treatment assignment and gender in the later

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<sup>6</sup>One child was diagnosed to be biologically retarded, two died at very early ages (3 and 4 months), and two children died at later ages (12 and 50 months). One child was withdrawn from the sample before 6 months of age. In addition, other 10 children dropped out of the sample before 54 months.

<sup>7</sup>[Breitmayer and Ramey \(1986\)](#) use data on these 95 children.



follow-ups conducted at subjects' age 21 and 30 are displayed in Figure 5. Section 5 discusses this issue in a greater detail.

### 2.1.2 Treatment

**Preschool-age Educational Component** The preschool-age day-care component consisted of full-day child care for five days per week, 50 weeks per year, for the first 5 years of life. Child care was characterized by a low teacher-child ratio (1:3 for infants). The curriculum used was developed by Joseph Sparling and Isabelle Lewis, and consisted of a series of “educational games”, which emphasized language, emotional development, and cognitive skills (Sparling and Lewis, 1979; Sparling and Lewis, 1984).

Compared to another well-known early childhood intervention in the U.S. – the Perry Preschool Program – the ABC curriculum has some unique features. For example, it simulates in the center several aspects of parenting, socio-emotional and motor activities in its lessons.<sup>8</sup> The Perry Preschool curriculum is unique in its planning component, since the child chooses his activity and sticks with it during the whole work time. The ABC intervention differs significantly from Perry in that it provided free primary pediatric care and nutrition to the treated children. In the ABC preschool, there was no form of parenting, apart from the health counseling parents received during the well-child care assessments.<sup>9</sup>

Families in both groups (treatment and control) received social service support as needed (Breitmayer and Ramey, 1986 and Campbell et al., 2002). Families in the control group also received diapers until the child was toilet trained as an incentive for their participation (Campbell et al., 2001). The average cost of the intervention was estimated as about \$ 67,225 per child for the first 5 years of intervention in year 2002 dollars by Barnett and Masse (2002).<sup>10</sup>

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<sup>8</sup>For example, the 0-3 curriculum is heavily loaded with the kinds of activities a momther and a child would engage in, such as tasting different foods or saying la-la-la sounds.

<sup>9</sup>However, it also should be noted that two curricula have some common teaching components as well because they target a similar audience and draw from a similar school of thought. First, both emphasize verbal interaction between the teacher and student in a similar manner. ABC calls it the 3 N's, Notice, Nudge, Narrate. The Perry curriculum asks the teacher to verbalize the concept they are teaching, and then ask the children open-ended questions, and then ask the child to describe/use the words and concepts they are learning. Second, both emphasize tailored or individualized teaching, and teachers keep logs of the child's progress. Third, both try to teach the child at the developmental level s/he is at, and work with the child at that level until it is internalized and the child can do the same activity at different levels of complexity. Fourth, both teach concepts of classification, seriation, spatial relations, and temporal relations. Both use role playing as a way to encourage socio-emotional development. And, finally, classroom equipment, layout, areas, teacher to pupil ratios are similar for the two preschools.

<sup>10</sup>In year 2010 dollars, this becomes \$ 76,939 after inflation adjustment.

**Health Care Component** The Abecedarian intervention also included a health care component, which provided complete medical care for the children who attended the FPG center (Ramey et al., 1982).<sup>11</sup> The medical staff had three pediatricians, a family nurse practitioner and a licensed practical nurse. Active research on respiratory tract infections in children was also ongoing (Roberts et al., 1986; Sanyal et al., 1980). The *well child care* component included assessment at ages 2, 4, 6, 9, 12, 18 and 24 months, and yearly thereafter, in which a complete physical exam was performed and parents were counseled about child health care, nutrition, growth and development. The *ill child care* component included daily surveillance of all the children in the FPG center for illness.<sup>12</sup> When ill, children were examined by a member of the health care staff, laboratory tests were performed, the appropriate treatment was given, and the child was followed until recovery (Ramey et al., 1982).

**Nutritional Component** In addition to receiving their primary pediatric care, the treated children also received breakfast, lunch and an afternoon snack at the center. The food was catered in by kitchens approved by the local health department. A nutritionist who planned the local public school menus consulted with the kitchen service to plan menus for breakfast, lunch, and daily snacks. Infants were given iron-fortified formula until the doctors advised adding solids, which was commercial baby food chosen by the staff. Control families were offered free iron-fortified formula for the first 15 months of life in order to exercise control over the quality of nutrition during a period of rapid brain growth.

**School-age treatment** After age 5, a new randomization reassigned treatment and control status among participants for the second phase of the ABC project. This second stage treatment introduced the participants to math, science, and music. In the school-age phase, children in the treatment group received high-quality, full-day, year-round care during grades 1 to 3, characterized by a teacher-child ratio of 1:6 for 5-year-olds. In this second phase, the teachers also identified the needs of the children and then created individualized curriculum packets, which targeted primar-

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<sup>11</sup>The medical care was no-cost to the families, but they were responsible for buying medicines. The original plan was to provide medical care at the FPG center also to the control families, but after the first year that proved to be impractical (Frances Campbell, personal communication, 2012.)

<sup>12</sup>The licensed practical nurse visited the classroom daily to review the health status of the children and receive reports from the parents (Sanyal et al., 1980).

ily math and reading skills and were delivered to the home every other week by the Home School Resource Teacher. Parents were taught how to use the learning activities with their children (Campbell and Ramey, 1994), and were asked to use them at least 15 min each day (Campbell et al., 2002). Parental feedback was required to assess the success of these activities and children ‘earned’ books for completing them (Campbell and Ramey, 1995). The Home School Resource Teacher also assisted parents in other aspects of their lives such as medical care, housing, employment, and childcare information for younger children. This additional support varied from providing transportation to medical clinics to completing forms and dealing with bureaucracy involved with securing services (Campbell and Ramey, 1995).

## **2.2 The Carolina Approach to Responsive Education (CARE)**

### **2.2.1 Recruitment and Randomization**

Over an 18-month period beginning in June 1978, 65 families were identified for participation in Project CARE and contacted for an initial screening. All 65 families met the risk criterion for eligibility and were randomly assigned to one of three experimental groups: (1) Child Development Center Plus Family Education (TT-T group), (2) Family Education only (CT-T group), or (3) a Control group (CC-C group). Figure 1 summarizes the structure of this program.

After learning of the assignment, one family randomized to the first group dropped out. Of the remaining 64 families, 16 were randomized in the first group, 25 in the second, and 23 in the third. Two of the families in the Family Education group had twins, so 27 children participated in this group; both children in each twin set received the intervention program (Wasik et al. (1990)). Only one child dropped at the initial stage due to premature death. See Figure 6 for details.

### **2.2.2 Treatment**

In the CARE study, children were randomly assigned to one of two treatment models or to a control group. The main difference between the two models occurred in the preschool period. The first CARE treatment model consisted of full-time childcare using the same curriculum as the ABC study, with the addition of weekly home visits by the teacher to demonstrate the curriculum to the parents. This first model was called “Child Development Center plus Family Education”. The

second treatment group only received the weekly home visits (i.e., did not receive the childcare treatment). This second model was called “Family Education” only. In school-age, instead, the same treatment as in ABC was provided to all children in these two groups. The control group children only received free iron-fortified formula for the first 15 months of age and a monthly supply of diapers, as did the children in the two treatment groups. A social worker was available to all families in all three groups for crisis intervention. The novel component which distinguishes CARE from ABC is the Family Education program. It was designed to help the parents foster the cognitive and social development of the child (Wasik et al., 1990), on the basis of the belief many families not only lack the knowledge and the skills required to positively influence their child’s development, but they also experience stresses that interfere with effective parenting. To respond to family needs, home visitors attempted to establish a caring relationship with the parent; to provide support, encouragement, and information; promote effective coping; and foster and model positive parent-child interactions. Home visitors also facilitated contact with agencies in the community, for example by helping parents sign up for the WIC program or by referring them to local support services for clothing. They would also accompany them on a medical visit or to court.

To facilitate the home visitors’ ability to influence parent-child interactions, two specific components were incorporated into the intervention. The first was a problem-solving approach that called for the home visitor to encourage and promote parent problem-solving by teaching specific strategies. This component was included based on the rationale that problem-solving ability is necessary for effective parenting as well as for managing everyday problems, and that this ability could be enhanced by specific training. Home visitors discussed with parents ongoing concerns or goals and ways they could use problem-solving strategies to deal with them; concerns could be brought up for discussion either by the home visitor or by the parent and could be child- or adult-related. The home visitor used these concerns to show how to engage in effective problem solving through different stages (also with the aid of printed material): problem identification, goal selection, generating alternatives, selecting consequences, making decisions, evaluating problems, implementation, and evaluation. These steps were presented to the parents in everyday language (e.g., “It is important to stop and think before you act”), using both real and hypothetical problems. The home visitor also encouraged the parents to think through their concerns, to generate alternatives, and to make decisions, on topics ranging from baby-sitting and feeding to returning to school or finding a job.

The second component of the home visit was LearningGames, the same curriculum used in the day-care. Home visitors showed to the parents the developmentally appropriate activities and helped the family identify materials in the home needed for them. This component was not only important by itself, but it also helped exchange information between the visitor and the parents on child development and other parental concerns.

Home visitors had backgrounds as daycare teachers, social workers, or nurses. Their educational credentials ranged from high school diplomas to master’s degrees. To assure comparability in the delivery of the Family Education program across the two intervention groups, home visitors were trained in the same sessions, identical curriculum materials were used, and the same developmental goals and expectations for the children and parenting skills for the adults were emphasized, regardless of the family’s intervention group assignment.<sup>13</sup>

### 2.3 Follow-ups Data Collection

In both ABC and CARE, after the school-age treatment ended, there were multiple follow-ups, at age 12, 15 (ABC only), 21, 30, and mid-30s. Extensive measurements have been collected over the years both on the participants as well as their parents. The age-30 follow-up added the assessment of the participants’ children (academic achievement, behavior, perceptions of school, and health). Lastly, a biomedical sweep was conducted when the participants were in their mid-30s, for the purpose of collecting indicators to measure cardiovascular, diabetes and stroke risk. Information on biomeasures was collected from two sources: (a) a physical exam carried out by a local physician in the Chapel Hill Internal Medicine practice, and (b) Lab tests results, based on the blood collected from the subjects during the medical visit. More details on the data collected are presented in Section 5.

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<sup>13</sup>Wasik et al. (1990) present an analysis of the number of completed home visits showing the actual frequency of home visits averaged 2.5 visits per month for the Family Education group and 2.7 for the CDC Plus Family Education groups. During years 4 and 5, the frequency of home visits was designed to vary as a function of parental preference from weekly or biweekly to monthly or every 6 weeks. During this time home visits average 1.4 per month for the Family Education group and 1.1 per month for the CDC Plus Family Education group. Approximately 92% of the home visits were with the mother, although on a few occasions the fathers and grandparents participated. Sixty percent of the visits were between 30 and 60 min; 20% were longer than an hour. Parents’ meetings that served as an information source and as a support group were held approximately once a month; parents from both groups were invited, and attendance rates for the groups were similar. Topics presented in these parent group meetings ranged from nutrition, health, and safety to language enhancement and preparation for kindergarten.

## 2.4 Literature

There is an extensive literature on early childhood through young adulthood outcomes from the ABC and CARE studies. [Campbell and Ramey \(2010\)](#) provide a comprehensive overview of the existing literature on ABC and [Campbell et al. \(2008\)](#) discuss the two studies together.

The literature on early childhood outcomes, such as [Ramey and Campbell \(1984\)](#), [Martin, Ramey, and Ramey \(1990\)](#), and [Wasik et al. \(1990\)](#) shows that childcare treatment significantly enhanced performance in cognitive tests in both the ABC and CARE studies. For example, ABC school-age results indicated that, after 3 years in school, children's academic test scores increased as a linear function of the duration of early treatment - effect sizes equaled .28, .75, and 1.04 for reading, and .11, .27, and .64 for math for students having 3, 5, and 8 years of treatment respectively ([Ramey and Campbell, 1991](#)). Combining ABC and CARE data, [Burchinal et al. \(1997\)](#) found that children who experienced the childcare treatment outscored control children in overall intellectual test scores from infancy through age 8. Further analyses of the combined data show that the effects of the childcare treatment on rates of change in intellectual test scores were mediated by treatment effects on young children's responsiveness to people and objects, which led to greater engagement and task persistence, which in turn predicted a faster rate of change in IQ scores through age 8.

Analyses combining age 12 data from both studies show that children who received the childcare treatment significantly outscored both the control group and the home visit group on cognitive test scores at ages 8 and age 12, with later cohorts earning significantly higher scores on intellectual tests than earlier ones. Additionally, the children who received the childcare treatment outscored the controls in both reading and math achievement through age 12, but no significant cohort effects were found, and academic scores significantly decreased from age 8 to age 12. Furthermore, analyses based on ABC data alone showed that significant cognitive and academic benefits for treated children persisted through age 15. At age 12, effect sizes across the 3 treated groups<sup>14</sup> ranged from .23 to .68 to .86 for reading and from .24 to .63 to .54 for math; these figures were very similar at age 15: .14, .53, and .87 for reading and .09, .65, and .63 for math ([Campbell and Ramey, 1995](#)).

It has been found that, at age 21, the treated group had maintained statistically significant

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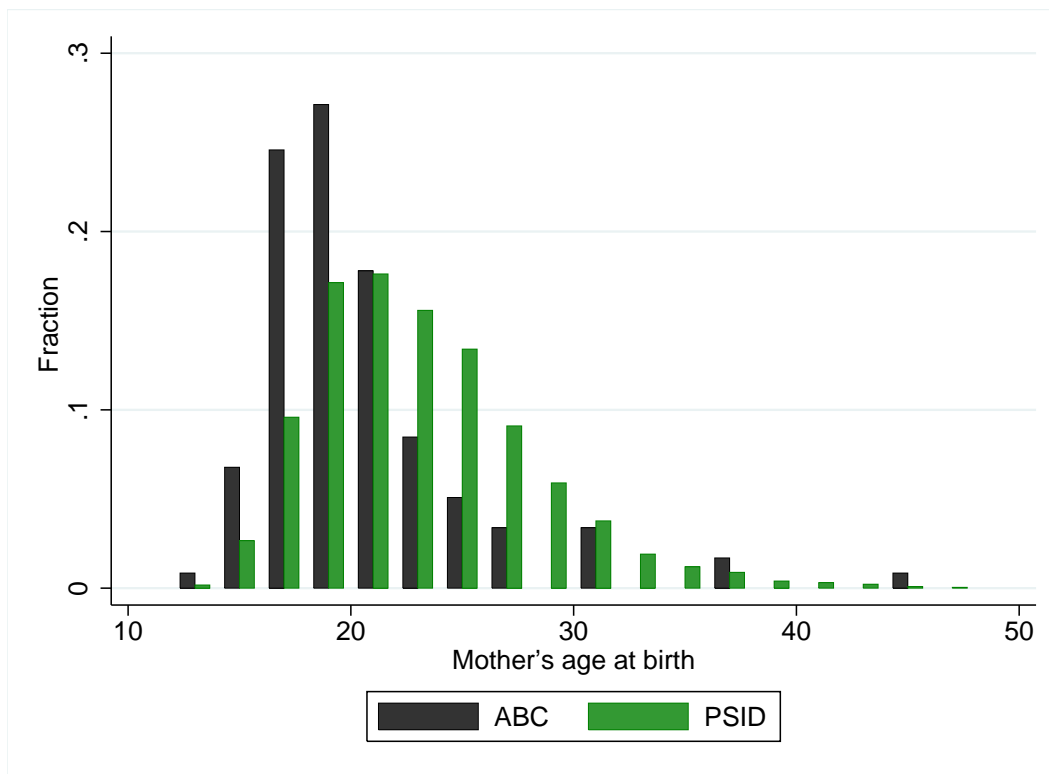
<sup>14</sup>Those who received only the preschool-age treatment, those who received only the school-age treatment, and those who received both

advantages both in intellectual test performance and in reading and mathematics achievement scores and had attained more years of education, although no significant group differences were found for the percent completing high school (Campbell et al., 2001). Additionally, those who received the early treatment were more likely to attend a 4-year college or university (35% of the treated group vs. 14% of the control group), and either to be in school or to have a skilled job, or both. Finally, treated individuals were less likely to be teen parents, to smoke marijuana (Campbell et al., 2002), to report depressive symptoms (McLaughlin et al., 2007) and to have a more active lifestyle (Campbell et al., 2008) when compared to individuals in the control group.

Concerning CARE, Campbell et al. (2008) show that it replicated the Abecedarian young adult educational and vocational attainment gains, the increase in active lifestyle, and also the reduction in marijuana use; however, the effect on reduced likelihood of being a teen parent was not replicated. Analyses combining both samples found that the childcare treatment buffered against the effects of a poor quality early home environment on educational attainment in young adulthood (Pungello et al., 2010).

Barnett and Masse (2002, 2007) conducted a cost-benefit analysis of the ABC program and computed an estimated benefits per child at \$158,278 in the year 2002 dollars, giving an estimated benefit-cost ratio of 2.5:1 for the 3 % of discount rate.

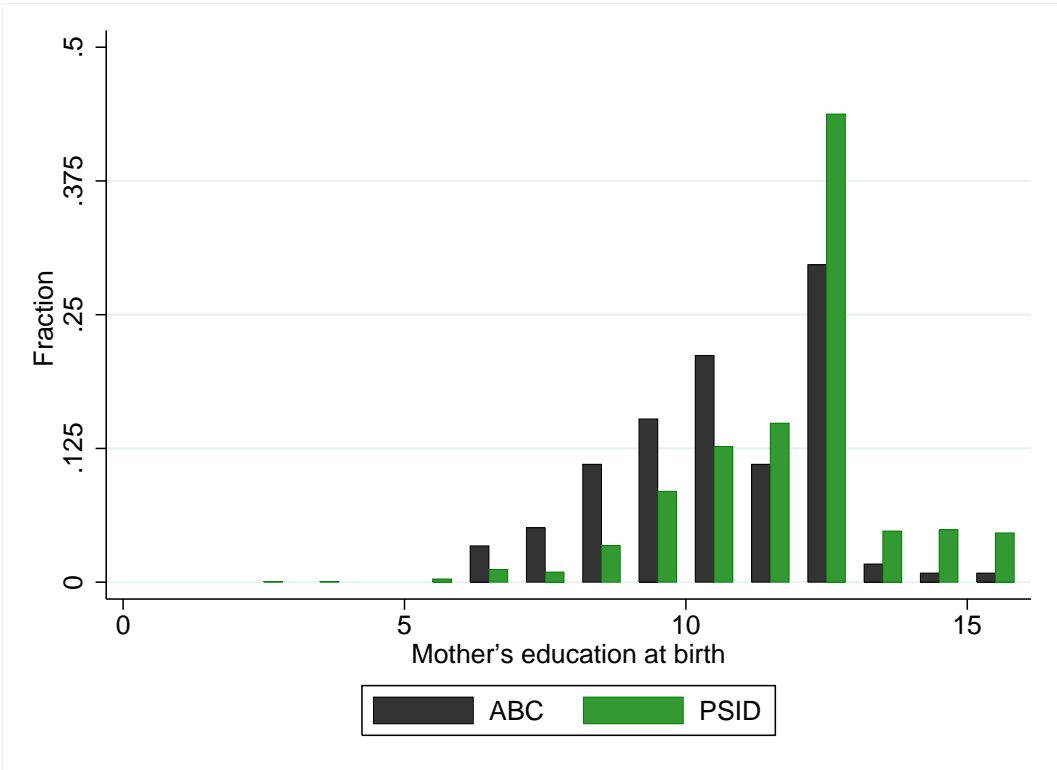
Figure 2: ABC vs. PSID : Mother's age at birth



Note: PSID sample consists of all Black children born to PSID sample families between 1971-1980.

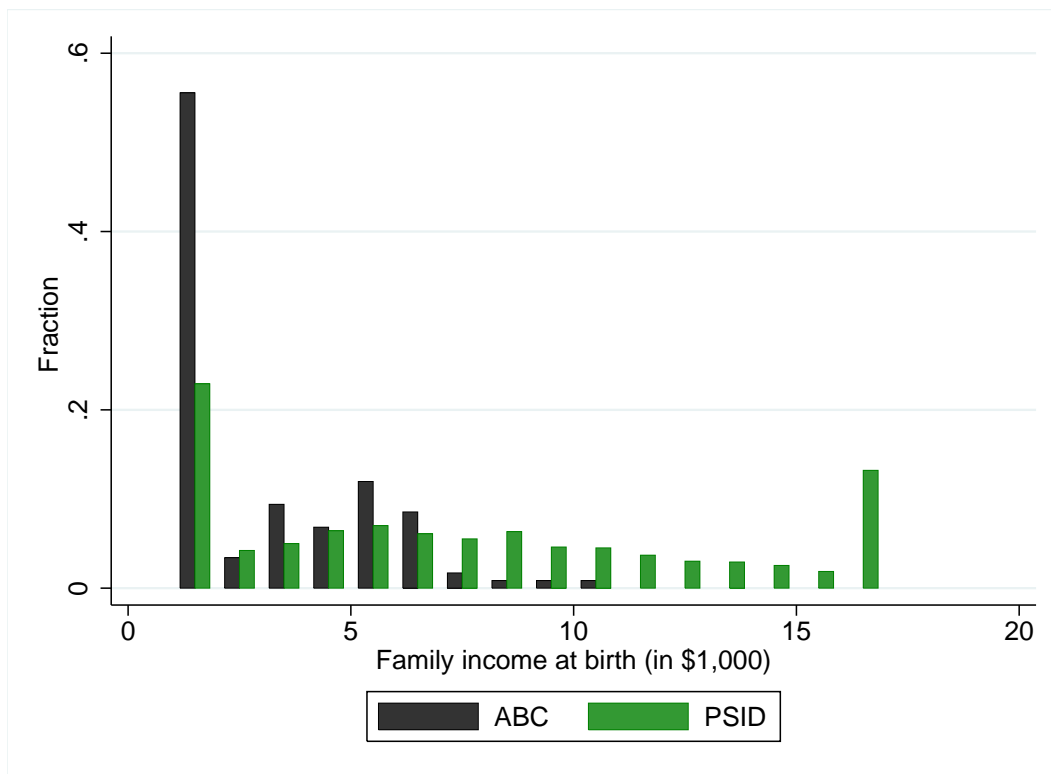


Figure 3: ABC vs. PSID : Mother's education at birth



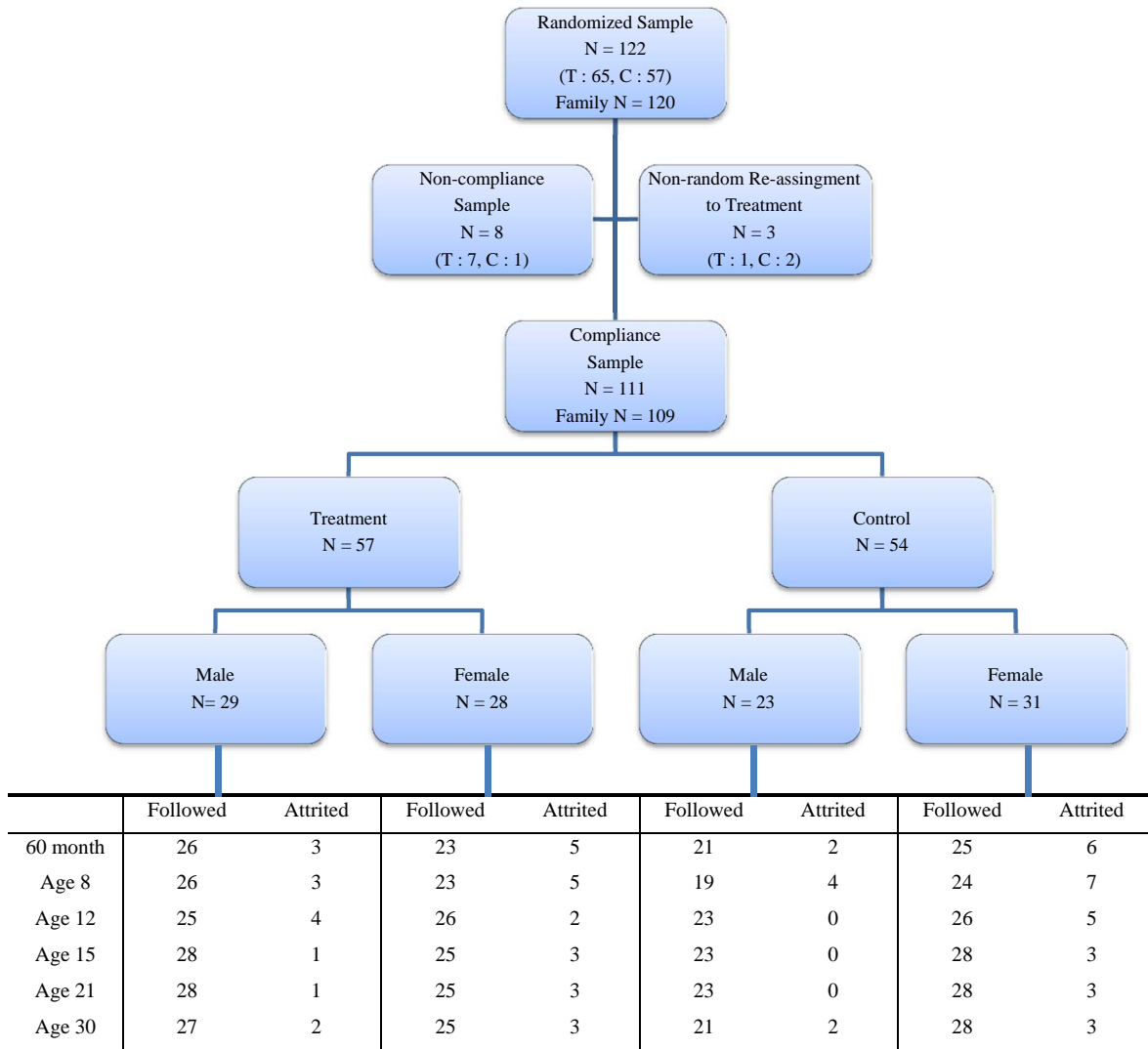
Note: PSID sample consists of all Black children born to PSID sample families between 1971-1980.

Figure 4: ABC vs. PSID : Family income at birth



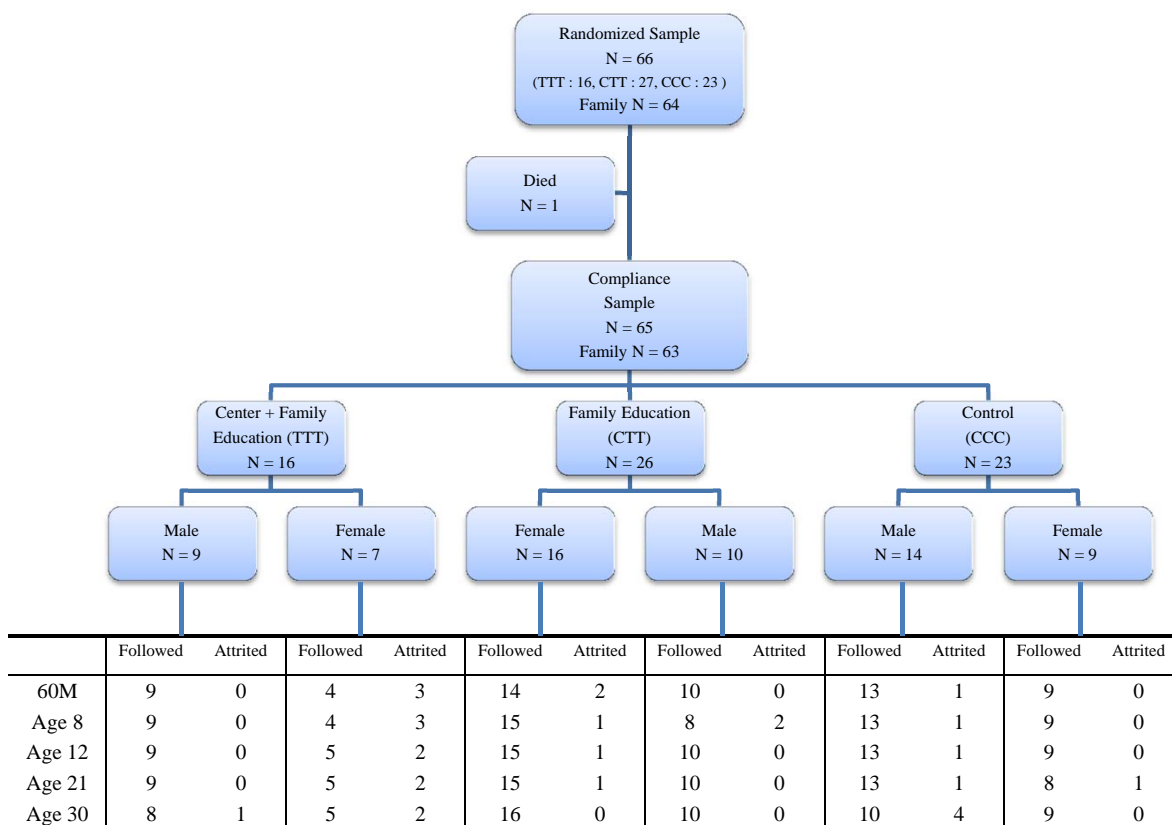
Note: PSID sample consists of all Black children born to PSID sample families between 1971-1980.

Figure 5: Flow Chart of ABC Program



Source: ABC Raw Data

Figure 6: Flow Chart of CARE Program



Source: CARE Raw Data

### 3 Comparing Educare to ABC/CARE

In many respects, the ABC program (and the companion CARE study) and the Educare program are very similar. See Table 1. Both interventions start in infancy and continue through school entry. Both are very intensive in each year of the program (full-time, year-round), and they have similar class sizes. They both focus on increasing school readiness by via enhanced language and literacy outcomes, positive social and emotional development, and improved program solving and numeracy skills. In each, these activities are supported by arts programs. Further, both have on-site family support services, and both use the “reflective practice model” for training and supervision of teachers (Ghaye and Ghaye, 1998; Schunk and Zimmerman, 1998).

Although quite similar, there are some differences between the programs as well. The ABC program does not have the same continuity of the teaching staff, staff qualifications are lower, and the ABC program did not offer the prenatal services provided by Educare. In addition, parental interventions were not conducted in the ABC program, although, similar to Educare, they were by CARE. Further, while both had intensive on-site training for teachers, they differed a great deal in the educational qualification required for teachers. While each Educare room consists of a lead teacher with a BA, an assistant with an AA, and an aide with a HS diploma or GED, the ABC program did not have any educational requirements for teachers. Both retained their well-trained teachers, though, through good wages and benefits.

In sum, while differences exist, the two programs closely resemble each other. When they deviate, Educare is offering a higher quality bundle. Thus, our evaluation of the ABC/CARE program will provide a lower bound to the total gross benefit of Educare.

Table 1: Comparison of Educare and ABC/CARE

<b>Educare Model Core Feature</b>	<b>Abecedarian Program Practice</b>
Research-Based Practices and Strategies * · Design informed by research * · Evaluation through FPG *	Research-Based Practices and Strategies * · Design informed by research * · Evaluation through FPG *
Small Class and High Staff/Child Ratios ◊ · Infants: 8 children, 3 adults ◊ · Preschool: 17 children, 3 adults *	Small Class and High Staff/Child Ratios ◊ · Infants: 14 children, 4-5 adults · Preschool: 17 children, 3 adults *
High Staff Qualifications */Intensive Professional Development * · Adults: Teach with BA, Assistant with AA, Aide with HS/GED * · Training and development a priority* · Good wages and benefits *	Low Staff Qualifications */Intensive Professional Development * · Good with children (not even HS required)* · VERY intensive on-site, continuous training* · Good wages and benefits *
Focus on Language and Literacy - YES *	Focus on Language and Literacy - YES *
Emphasis on Social-Emotional Development to Promote School Readiness - YES*	Emphasis on Social-Emotional Development to Promote School Readiness - YES*
Continuity of CARE YES * · Stay with same teaching team infancy - age three; preschool-K *	Continuity of CARE NO * · New teaching team each year as moved up to next age*
On-Sit Family Support Services - YES*	On-Sit Family Support Services - YES*
Reflective Supervision and Practice* · Reflective Practice model implemented throughout organization*	Reflective Supervision and Practice* · although not called such, the spirit of Reflective Practice used in teacher training*
Interdisciplinary Team Approach - YES*	Interdisciplinary Team Approach - YES*
Art Programs Used to Support Social-Emotional, Language and Literacy Development - YES*	Art Programs Used to Support Social-Emotional, Language and Literacy Development - YES*
Emphasis on Prenatal Services - YES *	Emphasis on Prenatal Services - NO *
Enhanced Focus on Problem-Solving & Numeracy - YES *	Enhanced Focus on Problem-Solving & Numeracy - YES *
<b>Home Visits - YES *</b>	<b>Home Visit - Yes*(after school begins)</b> <b>- No*(preschool)</b> <b>For CARE - YES * in both preschool and in school years</b>

Note: (1) items that match \*; (2) items that are close ◊; (3) items that don't match \*. FPG stands for Franklin Porter Graham Center at UNC.

## 4 Issues in Evaluation

In this section we discuss the main issues which arise in the analysis of the treatment effects of the ABC/CARE programs, and the way we deal with them. First, the *sample size* of the ABC/CARE studies is *small*. Although this is one of the basic features of these studies, it has never been rigorously addressed in the literature. Second, the *multiplicity of outcomes* and measures available in the data causes the risk of selectively reporting the few significant ones (the so-called “cherry-picking problem”), and calls for a rigorous methodology to jointly test multiple hypotheses. Third, the ABC/CARE study has suffered from *non-negligible non-compliance and attrition*, which can cause bias in estimating treatment effects if, as a consequence, the randomization assumption no longer holds. Fourth, many children in the control group also experienced various types of out-of-home care, depending on their family circumstances, before the age of 5 so that the group comparison in the existing literature has been between those who received a systematic early treatment and those who grew up in the natural ecology. This *contamination of the control group* needs to be accounted for, in order for our findings to be generalizable and relevant. Fifth, given the study design, there are two types of *interactions among different interventions*: one between early (pre-school-age) versus late (school-age) treatment, and another between center-based versus home-visit-based treatment.

**Framework** Before discussing our solutions to the above-mentioned issues involved in the evaluation of the ABC and CARE interventions, we delineate a framework within which to interpret the evidence.

Heckman (2007) and Cunha and Heckman (2007) develop a framework for analyzing the expression and evolution of capabilities, from conception through adulthood, which links early-life conditions to late-life outcomes by accounting for intervening mechanisms and a variety of exposures at different levels. This framework recognizes the multiple nature of capabilities, the synergies across them, and the need to consider the child in her entirety, by developing her cognitive potential, together with her physical and mental health. Hence, the different aspects of the well-being of the child can be written in terms of the vector  $\theta_t$ , which can have different components, such as cognition ( $\theta_{C,t}$ ), mental ( $\theta_{MH,t}$ ) and physical health ( $\theta_{PH,t}$ ). There could be many different compo-

nents. These capabilities can have different weights in affecting adult outcomes, so that a shortfall in one dimension can be compensated by a greater strength in another. Others, instead, can have a great degree of specificity. Some of these traits might operate as determinants of choices, while others operate through purely biological mechanisms.<sup>15</sup> Additionally, these capabilities are not fully genetically determined. They are produced early in the life of the child, and their evolution over time can be represented by the following dynamics of capability formation Heckman (2007):

$$\theta_{t+1} = f_t( \underbrace{\theta_t}_{\text{Self-Productivity}}, \underbrace{I_t}_{\text{Investments}}, \underbrace{h_t}_{\text{Environments}}, \underbrace{\theta_t^P}_{\text{Parental Traits}} ).$$

This equation captures the notion that the development of child capabilities in period  $t_{t1}$  depends on the stock already present, and on parental traits, environments, and investments,<sup>16</sup> starting with the initial endowments determined at conception ( $\theta_0$ ), which are function of maternal investments in pregnancy ( $I_{-1}$ ). It also embeds the idea that capabilities at one age enhance capabilities at later ages: for example, a healthy child who is able to pay attention in class learns more and increases her cognitive ability; this can have in turn positive effects on her mental and physical health. This framework also recognizes that the productivity of investments depends on the age at which they are made, so that it is easier to develop certain capabilities at certain ages. If investment effects are especially strong in one period, this is called a sensitive period. If investments are productive in only one period, that is called a critical period. A critical feature of this framework is the complementarity of capabilities with investments, i.e. the fact that investments are more productive in children with higher stocks of capabilities. This not only implies that providing early nurturing environments to children will crucially affect their health and development, but also that early life interventions have to be followed-up with quality schooling and health care, in order for them to be effective in the long-term.

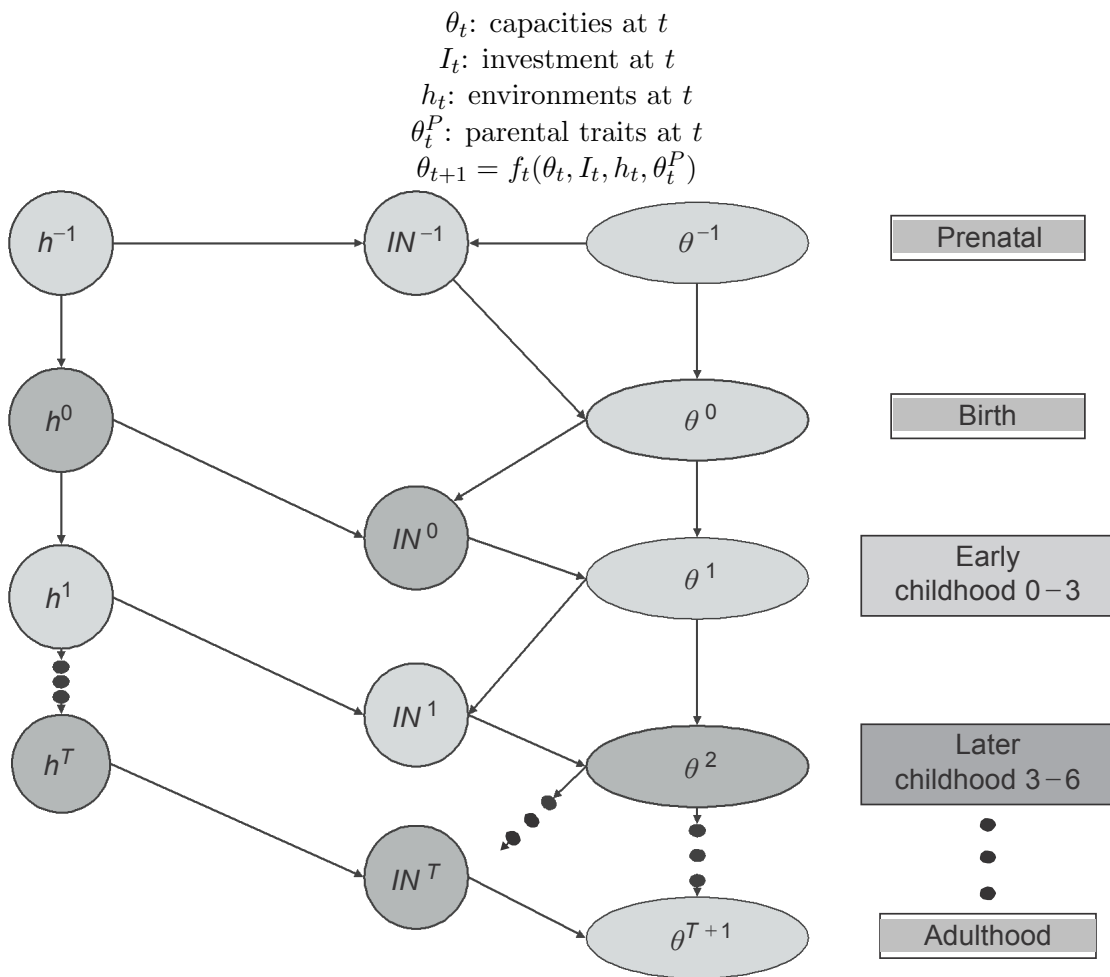
Figure 7 summarizes the framework graphically. Some progress has been made in estimating the linkages displayed in this figure, but most remains unknown. This lifecycle developmental framework suggests that intervening early in life can generate effects across the lifecourse. We will keep this framework in mind when examining and interpreting the evidence from the ABC and

<sup>15</sup>For example, an obese child is likely to become an obese adult, since the metabolic rate is set early in life.

<sup>16</sup>The latter include investments made by parents, teachers and doctors in the health and development of the child.



Figure 7: A Life Cycle Framework for The Development of Capabilities



CARE interventions.

## 4.1 Small sample size

The sample size of the ABC/CARE study is small: 122 children from 120 families and 66 children from 64 families were originally randomized in ABC and in CARE, respectively. As noted by Heckman et al. (2010a), the small sample size calls into question the validity of classical statistical hypothesis tests since they rely on central limit theorems and produce inference based on  $p$ -values that are only asymptotically valid. Heckman et al. (2010a) address this issue in their analysis of Perry Preschool Program by using permutation-based inference procedures that are valid even in small samples. These methods involve testing a null hypothesis using permutations of the data. If the null hypothesis is true, the distribution of the data is invariant to permutations. In other words, this procedure relies on the assumption of exchangeability of observations under the null hypothesis. Permutation-based inference is often termed data-dependent because the computed  $p$ -values are conditional on the observed data. Permutation tests are also distribution-free because they do not rely on assumptions about the parametric distribution from which the data have been sampled. They give accurate  $p$ -values even when the sampling distribution is skewed. For this reason, they are often used when sample sizes are small and sample statistics are unlikely to be normal.

In order to better explain the use of permutation tests, it is useful to introduce a standard model of program evaluation. Let the observed outcome for participant  $i$  be  $Y_i = D_i Y_{i,1} + (1 - D_i) Y_{i,0}$  where  $(Y_{i,1}, Y_{i,0})$  are potential outcomes corresponding to treatment and control status for participant respectively, and  $D_i$  is the assignment indicator:  $D_i = 1$  if treatment occurs,  $D_i = 0$  otherwise. The fundamental problem of causal inference arises because either  $Y_{i,1}$  or  $Y_{i,0}$  is observed, but not both. Additionally, in non-experimental data, *selection bias* can arise from participant's self-selection into the treatment group. Randomized experiments are a standard tool to eliminate this type of bias because they induce independence between  $(Y_{i,1}, Y_{i,0})$  and  $D_i$ :  $(Y_1, Y_0) \perp\!\!\!\perp D$ , where  $(Y_1, Y_0)$ , and  $D$  are vectors of the pooled variables across participants and  $\perp\!\!\!\perp$  denotes statistical independence. In the context of this model, the null hypothesis of no-treatment effect is equivalent to the statement that control and treated outcome distributions are the same:  $Y_1 \stackrel{d}{=} Y_0$  where  $\stackrel{d}{=}$  denotes equality in distribution. If this null hypothesis is true, then the distribution of the elements

of  $Y$  is the same irrespective of the treatment status  $D$ , so that a permutation of treatment label  $D_i$ 's does not change the distribution of  $Y$ ; in other words, under the assumption of independence between  $Y$  and  $D$ , the joint distribution of  $(Y, D)$  is invariant to permutation of elements if the null hypothesis is true.

Thus, permutation procedures test the invariance of outcomes  $Y$  to the treatment indicators  $D$  by swapping the positions of the elements of  $D$ . In other words, permutation procedures test whether  $Y \perp\!\!\!\perp D$  using the Randomization Hypothesis:  $(Y, D) \stackrel{d}{=} (Y, gD)$  for  $\forall g \in G$  where  $g$  denotes a permutation protocol and  $G$  is the set of feasible permutations. In practice, the permutation testing procedure compares a test statistic computed on the original (unpermuted) data with a distribution of test statistics computed on re-samplings of that data; the  $p$ -value is computed as the fraction of re-sampled data which yields a test statistic greater (or smaller, depending on the side of test) than that yielded by the original data.

The permutation testing procedure relies on the exchangeability property of the joint distribution  $(Y, D)$ . This property can be easily achieved in a randomized sample. However, it might not hold if randomization is compromised. In this case, a conditional inference can be implemented using a revised version of permutation-based test that relies on restricted classes of permutations. This procedure exploits the conditional exchangeability property and tests  $Y \perp\!\!\!\perp D|X$  where  $X$  denotes a set of conditioning variables on which the joint distribution  $(Y, D)$  is exchangeable. [Heckman et al. \(2010a\)](#) apply this procedure in their re-analysis of the Perry Preschool Program, whose randomization was compromised, so that the exchangeability property was no longer guaranteed.

In the case at hand, this version of permutation test has a crucial importance, since the ABC/CARE has a similar compromise in randomization as the Perry study. As mentioned in the previous section, the first randomization was performed immediately after each cohort was formed. The initial 120 families were matched in pairs based on sex of the child, maternal IQ, number of siblings and High-Risk Index score. The precise matched pairs are unknown. Subsequently, the matched families/children were randomly assigned to either the treated or the control group within each pair. The modified permutation procedure that we use first partitions the sample into subsets of participants with common background measures, termed orbits or blocks. Under the null hypothesis of no treatment effect, treatment and control units have the same outcome distributions within an orbit; equivalently, treatment assignments  $D$  are exchangeable (therefore

permutable) with respect to the outcome  $Y$  for participants who share common pre-program values of  $X$ . Thus, we modify the standard permutations method by swapping labels within conditioning orbits defined by the following pre-program variables used in the randomization protocol: mother’s WAIS full-scale IQ score, number of siblings, high-risk index, cohort, and gender.

## 4.2 Multiple Hypothesis Testing

The multiplicity of outcomes available in the ABC/CARE study raises the risk of selectively reporting only the significant ones (the so-called “cherry-picking”). We deal with this issue by considering the null hypothesis of no treatment effect for a set of  $K$  outcomes jointly. The complement of this is that there exists at least one hypothesis out of  $K$  that we reject. In other words, we are interested in knowing the ABC/CARE program’s overall effect on the whole set, rather than on individual outcomes. To do this, we apply the methodology developed in [Romano and Wolf \(2005\)](#) and extended by [Heckman et al. \(2010a\)](#). This method controls for overall error rates for vectors of hypotheses using the family-wise error rate (FWER) (the probability of yielding one or more false positives out of a set of hypotheses tests) as a criterion.

The procedure begins by considering a set of  $K$  null hypotheses, each postulating no treatment effect on a specific outcome. The first step is a joint test of all the null hypotheses: to this end, the method uses the maximum of the set of statistics associated with the hypotheses being jointly tested. The next step compares the computed test statistic with the  $\alpha$ -quantile ( $\alpha$  is the target level of FWER which we want to control) of its distribution and determines whether the joint hypothesis is rejected or not. If we fail to reject the joint null hypothesis, then the algorithm stops. If instead we reject the null hypothesis, then we iterate and consider the joint null hypothesis that excludes the most individually statistically significant outcome, i.e. the one that is most likely to contribute to the rejection of the joint null. So, the method “steps down” and is applied to a set of  $K - 1$  remaining null hypotheses that excludes the set of hypotheses previously rejected. In each successive step, the most individually statistically significant hypothesis is excluded from the joint null hypothesis, and the joint test is performed on the reduced set of hypotheses. The process iterates until only one hypothesis remains. By doing this, we obtain  $K$  adjusted  $p$ -values that correct each single-hypothesis  $p$ -value for the effect of multiple hypothesis testing, thus also providing a way to determine which hypotheses are rejected.

The Romano and Wolf (2005) stepdown multiple-hypothesis testing procedure is similar to traditional ones, such as the Bonferroni or Holm procedures, since it exhibits strong FWER control, in contrast with the classical tests like the  $F$  or  $\chi^2$ . However, in contrast with traditional multiple-hypothesis testing procedures, the stepdown procedure is less conservative. The gain in power comes from accounting for statistical dependencies among the test statistics associated with each individual hypothesis (see Lehmann and Romano (2005) and Romano and Wolf (2005) for an in depth discussion).

Heckman et al. (2010a) extend this method by combining it with permutation-based testing and apply it to an empirical analysis of Perry Preschool Program. Here we apply their procedure to our analysis of the ABC/CARE interventions.

### 4.3 Non-compliance, Attrition, and Missing Information

As described in the previous section, the ABC/CARE study has suffered from non-negligible non-compliance and attrition (see Figures 5 and 6.).

First, out of the 122 children who were initially randomized in the ABC study, only 111 (from 109 families) remained in the sample when the program began: 11 children dropped out after they learned their treatment assignments. In the case of CARE, of the original 66 enrollees, one child died, so that the number of participants decreased to 65. This translates in retention rates of 91% for ABC and 98% for CARE when the treatment began. We define this type of attrition as “non-compliance”, following the tradition in the experimental study literature.

Second, during the pre-school age intervention, 16 children attrited from the ABC study for various reasons, so that the sample size at the end of this phase was reduced to 95, resulting in a retention rate of 78% compared to the initially randomized sample ( $0.78=95/122$ ). In the CARE study, 60 children were retained in the pre-school age intervention, resulting in a retention rate of 91% ( $0.91=60/66$ ).

Third, 3 children dropped out after the second randomization of ABC, and other 3 were missing at the end of the school-age intervention, resulting in a sample size of 90 (with one child who dropped during the pre-school-age intervention returning into the sample at the school-age intervention) and a retention rate of 74% ( $0.74=90/122$ ). In the case of CARE, the sample size and the retention rate at the end of school age intervention were 60 and 92% ( $0.91=60/66$ ), respectively.

Fourth, after the two stages of the interventions were finished, more subjects dropped out, and only some of them returned to the sample later. This resulted in 101 subjects and 83% retention rate at the age 30 follow-up survey for ABC, and 58 subjects and 89% retention rate for CARE at the age 30 survey.

In our analysis, we correct our estimates for potential biases due to this type of non-random selection via the method of Inverse Probability Weighting (IPW),<sup>17</sup> which adjusts for missing data using observed covariates. Specifically, we retrieve statistics for the full outcome distribution through reweighing non-missing observations according to their likelihood of compliance.

The key assumption of Inverse Probability Weighting methods is that, controlling for a set of observed variables, we are able to retrieve the full distribution of an outcome of interest. In that sense, IPW methods rely on matching on observed variables and can be stated as:

**Assumption A-1.**  $Y \perp\!\!\!\perp A | (D, X, Z)$ ,

where  $Z$  are pre-program variables other than  $X$  and  $A$  is an attrition indicator  $A = (A_i : i \in \mathcal{I})$  which takes value  $A_i = 1$  if participant  $i$  has non-missing data on outcome  $Y$  and  $A_i = 0$  otherwise. If Assumption **A-1** holds then  $E(Y|D, X, A) = E(Y|D, X)$ . Moreover,  $D \perp\!\!\!\perp Y(d)|X, Z$  holds due to randomization, and the Average Treatment Effect (ATE) can be evaluated by

$$\begin{aligned} E(Y_i(1) - Y_i(0)) &= \int E(Y_i|D_i = 1, X_i = x, Z_i = z) - E(Y_i|D_i = 0, X_i = x, Z_i = z) dF_{X,Z}(x, z), \\ &= \int E(Y_i|D = 1, A_i = 1, X_i = x, Z_i = z) - E(Y_i|D_i = 0, A_i = 1, X_i = x, Z_i = z) dF_{X,Z}(x, z), \end{aligned} \tag{1}$$

where the last equation holds by Assumption **(A-1)**. ATE is identified as  $E(Y|D, A = \mathbf{1}, X, Z)$  and the distribution of  $(X, Z)$  is observed from the data. The standard IPW formula for ATE can be obtained by applying the Bayes' theorem to Equation 1:

$$E\left(\frac{Y_i 1[A_i = 1, D_i = 1]}{\Pr(A_i = 1|D_i = 1, X_i, Z_i) \Pr(D_i = 1|X_i, Z_i)} - \frac{Y_i 1[A_i = 1, D_i = 0]}{\Pr(A_i = 1|D_i = 0, X_i, Z_i) \Pr(D_i = 0|X_i, Z_i)}\right), \tag{2}$$

where  $\Pr(\cdot)$  means probability. The implementation of expression (2) as developed by [Johnston](#)

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<sup>17</sup>This method goes back to Horvitz and Thompson (1952). For a recent review, see [Huber \(2012\)](#).

and DiNardo (1997) is given by:

$$\widehat{ATE} = \sum_{i=1}^N \frac{Y_i \cdot 1[D_i = 1] \cdot 1[A_i = 1] \cdot \omega_{i,1}}{N_1} - \sum_{i=1}^N \frac{Y_i \cdot 1[D_i = 0] \cdot 1[A_i = 1] \cdot \omega_{i,0}}{N_0} \quad (3)$$

$$\text{where } \omega_{i,d} = \frac{1}{\hat{p}_{i,d}} \bigg/ \left( \frac{1}{N_d} \sum_{j=1}^N \frac{1[D_j = d] \cdot 1[A_j = 1]}{\hat{p}_{j,d}} \right) \quad d \in \{0, 1\}$$

$$\text{and } p_{i,d} = \Pr(A = 1 | D = d, X_i, Z_i) \Pr(D = d | X_i, Z_i) \quad d \in \{0, 1\}$$

$$\text{where } N_d = \sum_{i=1}^N 1[D_i = d] \cdot 1[A_i = 1]; \quad d \in \{0, 1\}$$

where  $N$  is the total sample size and  $\hat{p}_{i,d}$  is an estimate for  $p_{i,d}$ . The weights  $\omega_{i,d}$  are set such that their sum adds to the available sample size of the respective treatment, that is,  $\sum_{i=1}^N \omega_{i,d} \cdot 1[D_i = d] \cdot 1[A_i = 1] = N_d$ .

For the ABC intervention, the probabilities  $\hat{p}_{i,d}$  are estimated using a logit model with the following six covariates:<sup>18</sup> (1) mother’s Wechsler Adult Intelligence Scale (WAIS) at entry, (2) father present at home, (3) number of siblings, (4) High Risk Index (HRI) at birth, (5) mother working status, and (6) gender. Accounting for these variables is also particularly important, since there is also significant imbalance at baseline in some of them.<sup>19</sup> We use the weighted pre-pivoted  $t$ -statistics between treatment and control groups as test statistics. Small sample IPW inference is done by recalculating these probabilities for each permutation draw.

#### 4.4 Contamination Bias Correction

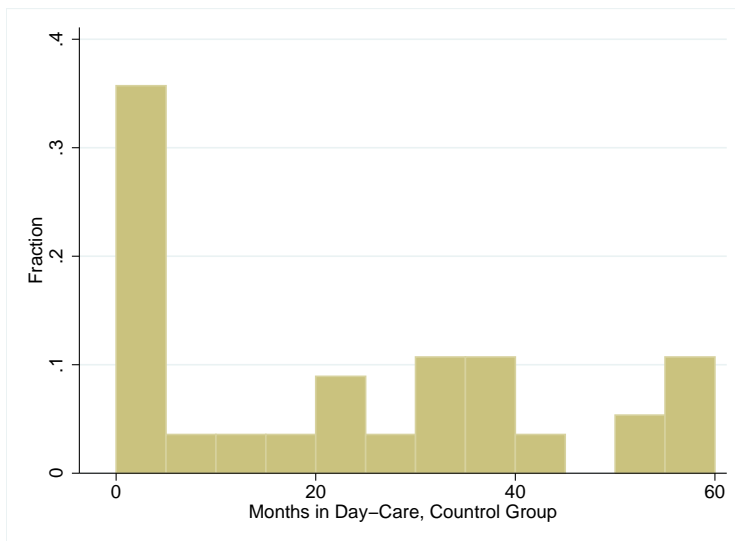
As discussed in the previous sections, many control group children did experience some types of out-of-home care before the age of 5, as displayed in Figure 8. Hence, group comparisons in the existing literature have been between those who received a systematic early treatment and those who grew up in the natural ecology. The degree or the level of dosage which the control group received varies across children and can be considered another source of potential bias due to non-random self-selection. In this section, we account for this “contamination” to address “what the treatment effect would have been if all control children were purely *untreated*? Or if they received

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<sup>18</sup>Even though the matching assumption is not testable, we can do inference on whether the choice of model used in the implementation of the IPW method generates reliable results. These tests are called balancing tests.

<sup>19</sup>See Table 38.

Figure 8: Length of Daycare Treatment among Controls



a certain level of dosage?” These questions are crucial when establishing external validity and robustness of our analysis because the natural ecology of child rearing has changed since the 1970s when the ABC/CARE programs were implemented.

We face two statistical challenges when correcting for control contamination. First, control participants were not randomly assigned to out-of-home care: assignment was the result of parental choice. Second, the small sample size of the ABC control group prohibits the implementation of complex models that require a larger data set. We solve these statistical challenges by adopting two assumptions that allow us to address this problem. We avoid potential selection bias by adopting a matching assumption stating that control contamination can be solved by conditioning on a set of observable characteristics. We overcome the data restriction by adopting a simple control contamination correction model that assumes linearity.

Formally, we use  $T_i \in [0, 60]$  to denote the number of months that the ABC control participant  $i$  enrolled in out-of-home care. We use  $Y_i(0, t); t \in [0, 60]$  for the outcome  $Y$  for ABC control participants  $i$  when treatment status  $D_i$  is fixed at 0 and when the number of months enrolled in out-of-home care is fixed at  $t$ . Following previous notation, we use  $T = (T_i : i \in \mathcal{I})$  and  $Y(0, t) = (Y_i(0, t) : i \in \mathcal{I})$  to denote the vectors of  $T_i$  and  $Y_i(0, t)$  across participants. We use  $X$  to denote a vector of pre-program variables used in the randomization protocol and we use  $W$  for



pre-program variables other than the ones used in the randomization protocol.

Causal effects can be evaluated under a *matching assumption* (see e.g. [Caliendo and Kopeinig \(2008\)](#)). In our case, the matching assumption of interest is given by:

**Assumption A-2.**  $Y(0, t) \perp\!\!\!\perp T \mid (X, W) \forall t \in \text{supp}(T)$ ,

where “supp” means support. Matching Assumption [A-2](#) states that the counterfactual outcome  $Y(0, t)$ , namely the outcome  $Y$  when the out-of-home care choice  $T$  is exogenously set to level  $t$  and treatment status  $D$  is fixed at control, is independent of  $T$  when controlling for some observed covariates  $X$  and  $W$ . Intuitively, the matching assumption states that controlling for  $(X, W)$  the outcome  $Y$  for control group and the out-of-home care choice  $T$  share the desired property of a randomized trial on  $T$ : no confounding effects. Under Matching Assumption [A-2](#), the expectation of the counterfactual outcome  $Y_i(0, t)$  is given by:

$$E(Y_i(0, t)) = \int E(Y_i \mid D_i = 0, T_i = t, X_i = x, W_i = w) dF_{X, W}(x, w) \quad (4)$$

where the left-hand side can be evaluated through observed data.

We attempt to evaluate the expectation in Equation [4](#) using different models that vary in degree of complexity. Our estimates are unreliable when we use parametric models based on a larger numbers of parameters, so we avoid erratic behavior of the estimates by assuming linearity. In particular, we adopt a linear-in-parameters model to described relation between  $Y$ , and  $T, X$  and  $W$  conditional on  $D = 0$  :

$$Y_i = \tau + \beta_W W_i + \beta_X X_i + \beta_T T_i + \epsilon_i \text{ for } D_i = 0; \quad (5)$$

where  $\epsilon_i$  is an exogenous zero-mean error term. Under the linearity assumption, we could perform inference using the estimates of the counterfactual outcome  $Y(0, t)$  when the number of months enrolled in out-of-home care  $t$  is fixed at zero, i.e. under no control contamination. Notationally, we have  $\hat{Y}_i(0, 0) = \hat{\tau} + \hat{\beta}_W W_i + \hat{\beta}_X X_i$ . For observed conditioning covariates which satisfy a balancing property we use: (1) mother’s Wechsler Adult Intelligence Scale (WAIS) at entry; (2) whether father lived at home at birth; (3) number of siblings; (4) High Risk Index (HRI) at birth; (5)

mother’s working status; and (6) gender.<sup>20</sup>

## 4.5 Interactions between various interventions

The ABC/CARE programs consist of various components of treatment, which can be re-stated in two dimensions: (1) the timing of intervention; (2) the interventional pathway. ABC is relevant for the first, and CARE for the second.

ABC has two interventions at two developmental stages: pre-school (0-5) and school age (6-8). At the pre-school stage, it has two randomized groups: “pre-school treatment” and “pre-school control”. After the pre-school age intervention ended, the second round of randomization (orthogonal to the first) was implemented, the children were re-assigned to “treatment” and “control” status for the “school age” experiment. By this design, the study sample can be divided into four distinct groups according to the sequence of assignments: Treatment-Treatment(T-T) group, Treatment-Control(T-C) group, Control-Treatment(C-T) group, and Control-Control(C-C) group. These four groups have comparable numbers of children, so that one can analyze the interaction effects (complementarity or substitutability) between early (i.e. “pre-school-age”) and late (i.e. “school-age”) intervention.

On the other hand, CARE has three distinct treatment components: a center-based day-care service at pre-school age, a home-visit-based family education at pre-school age, and a school-age intervention like ABC. Among the three randomized groups, one received all of these three interventions (TT-T group), another received only the last two (CT-T group), and the remaining one received nothing (CC-C group). This study design enables one to investigate the degree of complementarity or substitutability of a center-based pre-school intervention and a home-visit-based family education at the same ages.

Both these analyses can yield important insights for designing optimal early childhood interventions.

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<sup>20</sup>Even though the matching assumption **A-2** is not testable, we can do inference whether the linear model used in the implementation of the control contamination method generates reliable results. Specifically, we test whether  $T \perp\!\!\!\perp (W, X) | f_{T|(W, X)}$  where  $f_{T|(W, X)}$  is a sufficient statistic for the probability density function of  $T$  according to our linear model. We also test if  $1[T = t] \perp\!\!\!\perp (W, X) | f_{1[T=t]|(W, X)}$  for  $t \in \text{supp}(T)$ . Our inference cannot reject those hypotheses as desired.

## 5 Data

**Background variables** A large amount of data was collected from the families at the beginning of both programs on their background characteristics. The data collected includes parental characteristics, family structure, socioeconomic status, birth circumstances, and health of the mother and baby. These are meant to be pre-program variables, i.e. not affected by the treatment.

**Early Surveys** Data on cognitive skills, noncognitive skills, health, achievement, and behavior was collected at multiple stages from birth until the end of the school-age treatment.

**Follow-ups** After the second stage of treatment ended, there were five follow-ups: at ages 12, 15 (ABC only), 21, 30, and in the mid-30s, when a biomedical sweep was performed. After the treatment stages, attrition at the follow-ups was fairly minimal, with the exception of the biomedical sweep.

**Outcomes** A large amount of information was gathered during the two periods of treatment and in the follow-ups. This information has been used to construct a variety of outcome variables that we can categorize according to the developmental framework as measures of cognitive, socioemotional and physical development, parenting and home environment, education, school performance, crime and other behavioral outcomes, labor market outcomes, and health status. The data comes from both surveys administered to the children, parents, and teachers, from tests, and – in the biomedical sweep – from physical exams and lab tests. <sup>21</sup>

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<sup>21</sup>A biomedical sweep was conducted when the participants were in their mid-30s, for the purpose of collecting indicators to measure primarily cardiovascular, diabetes and stroke risk. Information on biomeasures was collected from two sources:

1. A physical exam carried out by a local physician in the Chapel Hill Internal Medicine practice. The subject was first asked to complete a series of forms while in the waiting room, that she then reviewed with the doctor during the visit. The doctor then entered the information from the forms, and the additional information gathered during the visit, into a software. During the physical exam, the following vitals were also measured on the subject: weight (lbs), height (inches), waist (inches), hips (inches), pulse, systolic and diastolic blood pressure. During the medical visit the physician checked the status of, and the presence of abnormalities in several body systems.
2. Lab tests results, based on the non-fasting blood collected from the subjects during the medical visit.

The physical examination was carried out at the Chapel Hill Internal Medicine practice, NC. The same doctor examined all patients. Those resident out of the state were brought in for the visit.

**Administrative Records** Additionally, some data were also gathered from administrative sources, such as schools, local governments, and criminal justice system agencies. The school records provide information for each subject’s school attendance such as grade retention, special education records, graduation dates, and school absenteeism. The information obtained from local government provides their actual welfare receipt history for several welfare programs such as Foodstamp and AFDC/TANF for years from 1995 and 2009. The range of administrative records for each subject’s criminal activity is wide covering police records, court records, and incarceration records for almost full adult years up to today. Some juvenile administrative data have already been used in previous studies. For example, [Clarke and Campbell \(1998\)](#) analyzed youth crime of the ABC participants using data collected from the North Carolina crime records, including detailed information on criminal charges and arrests. But, additional crime records were also newly collected through the North Carolina Office of the Courts and the Automated Criminal Infraction System (ACIS) for their adult crimes through the year 2011. We exploit all of these data sources together with follow-up surveys and other data obtained through various psychological and developmental assessments.

## 6 Empirical Results

In this section we present the main results of our analysis, organized by age and domain according to the developmental framework described in Section 4. We first discuss the evidence on the effects of the intervention on the capabilities of the child, in the three domains of cognitive, socio-emotional, and health development.

### 6.1 Early Outcomes

**Cognitive Development** Tables 2–3 present treatment effects of ABC daycare service on cognitive development for each gender group at various stages of the life course.

In these tables, we use many intelligence quotient (IQ) scales depending on its availability in our data such as Stanford-Binet IQ for ages 2, 3, and 4; McCarthy General Cognitive Scales for ages 3, 4, and 7; Wechsler Preschool and Primary Scale of Intelligence (WPPSI) for age 5; Wechsler Intelligence Scale for Children-Revised (WISC-R) for ages 7, 8, 12, and 15; Woodcock-Johnson

Table 2: Cognitive Development with Correction for Contamination of Controls: ABC, Females

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender		
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	Naïve <i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>IQ and Achievements Scores</b>																
Stanford-Binet IQ Score	No	2	27	24	83.710	14.040	4.161	5.469	5.608	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.349
Stanford-Binet IQ Score	No	3	27	24	81.240	18.760	2.701	4.304	4.217	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.425
McCarthy Scales - General Cognitive	No	3	26	24	96.567	7.850	1.157	2.504	2.628	<b>0.002</b>	<b>0.003</b>	<b>0.025</b>	<b>0.089</b>	<b>0.003</b>	<b>0.020</b>	0.778
Stanford-Binet IQ Score	No	4	26	24	90.938	8.562	1.082	2.583	2.588	<b>0.002</b>	<b>0.003</b>	<b>0.012</b>	<b>0.064</b>	<b>0.003</b>	<b>0.020</b>	<b>0.021</b>
McCarthy Scales - General Cognitive	No	4	25	23	93.482	7.344	0.824	1.448	1.464	<b>0.008</b>	<b>0.010</b>	<b>0.046</b>	0.135	<b>0.024</b>	<b>0.078</b>	0.478
WPPSI - IQ Score	No	5	24	20	96.384	4.966	0.587	1.210	1.284	<b>0.061</b>	<b>0.070</b>	0.132	0.290	<b>0.056</b>	0.145	0.188
WISC-R - IQ Score	No	7	22	23	95.625	1.940	0.249	0.501	0.507	0.279	0.284	0.549	0.549	0.585	0.585	0.600
McCarthy Scales - General Cognitive	No	7	22	23	90.155	7.150	0.888	1.623	1.747	<b>0.018</b>	<b>0.017</b>	0.133	0.271	<b>0.066</b>	0.154	0.905
WISC-R - IQ Score	No	8	23	22	94.227	2.955	0.457	1.005	1.228	0.165	0.175	0.361	0.471	0.277	0.379	0.946
Woodcock-Johnson - Total - Std. Score (Spring)	No	8	21	22	88.565	8.169	1.263	2.602	3.219	<b>0.003</b>	<b>0.004</b>	<b>0.010</b>	<b>0.059</b>	<b>0.003</b>	<b>0.019</b>	0.505
Woodcock-Johnson - Total - Std. Score (Fall)	No	8	21	22	87.934	6.794	1.118	1.637	1.866	<b>0.007</b>	<b>0.007</b>	<b>0.015</b>	<b>0.075</b>	<b>0.007</b>	<b>0.033</b>	0.530
WISC-R - IQ Score	No	12	25	25	88.436	7.524	1.185	2.759	3.102	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.018</b>	<b>0.000</b>	<b>0.001</b>	<b>0.066</b>
WISC-R - IQ Score	No	15	28	25	90.890	3.470	0.669	1.237	1.656	0.101	0.116	0.178	0.314	<b>0.085</b>	0.169	0.513
WAIS-R - IQ Score	No	21	28	25	85.568	5.872	1.517	3.615	4.052	<b>0.006</b>	<b>0.009</b>	<b>0.024</b>	<b>0.093</b>	<b>0.006</b>	<b>0.030</b>	<b>0.052</b>
<b>Rank Average</b>	No	-	29	27	0.396	0.223	1.016	2.087	2.255	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>	-	<b>0.001</b>	-	-

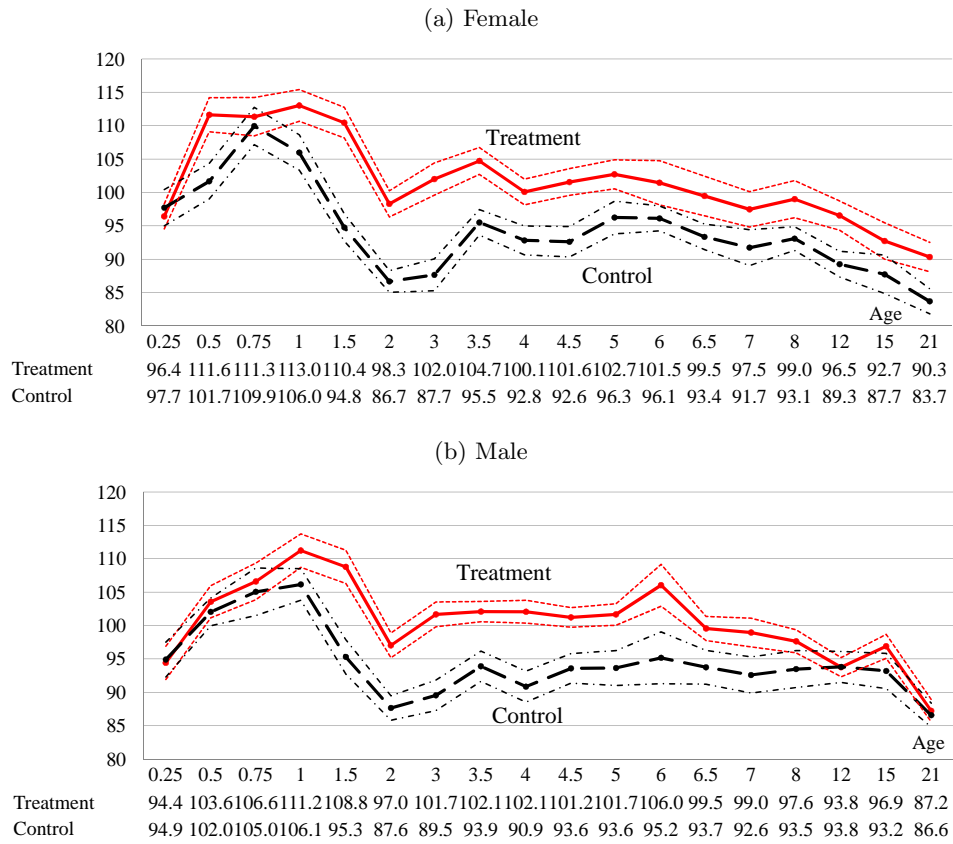
**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation *p*-value. By “naïve”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 3: Cognitive Development with Correction for Contamination of Controls: ABC, Males

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.		
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	Naïve <i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val		S.D.	<i>p</i> -val
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>IQ and Achievements Scores</b>																
Stanford-Binet IQ Score	No	2	21	27	83.316	10.906	3.618	3.255	3.565	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	0.349
Stanford-Binet IQ Score	No	3	21	26	79.026	22.321	3.429	3.941	4.218	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.425
McCarthy Scales - General Cognitive	No	3	21	26	92.708	8.908	1.557	2.167	2.405	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	<b>0.009</b>	<b>0.000</b>	<b>0.001</b>	0.778
Stanford-Binet IQ Score	No	4	21	26	85.893	17.838	2.660	4.126	4.330	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.021</b>
McCarthy Scales - General Cognitive	No	4	21	26	91.393	10.184	1.338	2.599	2.938	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.004</b>	<b>0.000</b>	<b>0.000</b>	0.478
WPPSI - IQ Score	No	5	20	21	91.178	10.536	1.385	2.416	2.646	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.007</b>	<b>0.000</b>	<b>0.000</b>	0.188
WISC-R - IQ Score	No	7	21	24	95.098	4.193	0.630	1.537	1.814	<b>0.071</b>	<b>0.067</b>	<b>0.071</b>	0.174	<b>0.043</b>	0.133	0.600
McCarthy Scales - General Cognitive	No	7	20	25	91.197	7.683	0.994	1.860	2.208	<b>0.006</b>	<b>0.006</b>	<b>0.010</b>	<b>0.052</b>	<b>0.001</b>	<b>0.009</b>	0.905
WISC-R - IQ Score	No	8	19	26	95.704	2.681	0.492	2.599	2.581	0.167	0.152	<b>0.069</b>	0.194	<b>0.057</b>	<b>0.100</b>	0.946
Woodcock-Johnson - Total - Std. Score (Spring)	No	8	19	26	88.482	5.479	0.859	1.772	1.702	<b>0.039</b>	<b>0.030</b>	<b>0.033</b>	0.131	<b>0.030</b>	0.115	0.505
Woodcock-Johnson - Total - Std. Score (Fall)	No	8	19	24	87.109	4.447	0.785	2.083	1.935	<b>0.056</b>	<b>0.049</b>	<b>0.057</b>	0.197	<b>0.049</b>	0.123	0.530
WISC-R - IQ Score	No	12	22	26	92.243	1.449	0.253	1.229	1.750	0.249	0.241	0.133	0.215	<b>0.042</b>	0.144	<b>0.066</b>
WISC-R - IQ Score	No	15	23	28	95.947	1.196	0.250	0.943	1.415	0.282	0.272	0.102	0.196	<b>0.019</b>	<b>0.082</b>	0.513
WAIS-R - IQ Score	No	21	23	28	88.029	0.042	0.011	0.470	0.713	0.492	0.491	0.280	0.280	0.139	0.139	<b>0.052</b>
<b>Rank Average</b>	No	-	23	28	0.402	0.198	0.914	1.923	2.155	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	-	<b>0.000</b>	-	-

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation *p*-value. By “naïve”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Figure 9: Cognitive Tests by Gender and Daycare Treatment Status



Note: (a) All the cognitive tests have been standardized to population mean of 100 and standard deviation of 15.  
 (b) The measures used in this figure are Bayley Mental Development Index at age 0.25, 0.5, 0.75, 1, and 1.5; Stanford Binet Intelligence Scale at age 2, 3, 4, 5, and 6; McCarthy Index at age 3.5, 4.5, and 7; WPPSI IQ Score at age 5; WISC-R Intelligence Scale at age 6.5, 8, 12, and 15; WAIS-R Adult Intelligence Scale at age 21.

Scales for age 8; and Wechsler Adult Intelligence Scale-Revised (WAIS-R) for age 21.

In each table, we present a variety of statistics which are useful to obtain correct statistical inference. First, we define our convention: variables are ordered to that higher values of a variable correspond to more favorable outcomes. We define an indicator for whether a variable was re-ordered or not for computational purpose. Some variables are reversed, others are not. We reversed some variables so that higher values always indicate “socially desirable” results given that we use the one-sided hypothesis testing in this report.<sup>22</sup> After presenting the mean value in the control group and the difference in means between the treatment and control groups, we present a set of effect size estimates in the next columns. For example, in Table 2, the “Unconditional” effect size on female’s WPPSI IQ Score at their age 5 when the ABC daycare service was almost finished is 0.587, meaning that the ABC treatment boosted the average treated girl’s IQ by more than a half of standard deviation of the control group children’s IQ. But this statistics is based on the original scores obtained from the raw data without any adjustment for various potential biases. The next column, labeled as “Cond.”, presents similar statistics but conditioned on a few pre-program variables which are used for pairing participants before randomization.<sup>23</sup> This conditioning is crucial to guarantee the exchangeability condition on which a permutation testing procedure works. The next column presents the conditional effect size estimates which are now adjusted for potential attrition bias by the method of inverse probability weighting (IPW).<sup>24</sup> However, this adjustment has only a modest effect on our effect size estimates. This so for two reasons. First, as previously shown, imbalances in baseline characteristics due to non-compliance and attrition are in opposite directions. That is, non-compliance mostly occurred at the bottom of the treatment group (e.g. younger, less-educated, and lower-IQ mothers) while attrition was more concentrated at the top of the treatment group distribution. When we adjust for these two sources of missing information together, the overall adjustment effects tend to offset. Secondly, given the small sample size and

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<sup>22</sup>Three points should be noted. First, the notion of “socially desirable” can be problematic, of course. We used our best judgement on each variable leaving room for criticism. Second, we use the one-sided testing because our interest is on knowing whether the ABC/CARE program can generate “socially desirable” results or not. Third, the “reversing” results in negative values for “reversed” variables although they were positive in the raw data. In this case, a “smaller” value in the absolute term means “more socially desirable”.

<sup>23</sup>They are mother’s (a) cohort, (b) gender, (c) mother’s full scale WAIS IQ, (d) High Risk Index, and (e) number of siblings.

<sup>24</sup>The IPW method is based on a logit model of attrition status on the following pre-program variables in addition to five variables used for conditioning: (a) mother’s full scale WAIS IQ, (b) High Risk Index, (c) number of siblings, (d) father’s presence at home at child’s birth, (e) mother’s working status, and (g) gender.



complex missing pattern across variables, our freedom to choose covariates for the IPW logit model was very limited so that the difference between the conditioning variables and the logit covariates is not substantial so that the effect of adjustment is minor. The next columns present  $p$ -values obtained from various hypothesis testing procedures. The column (10) presents the usual  $t$ -test  $p$ -value (“Ass.  $p$ -val”) which is valid only asymptotically. The column (11) presents a simple small sample permutation  $p$ -value (“Naive  $p$ -val”) which does not address the compromise made in the actual randomization protocol (e.g. pre-randomization pairing). The column (12) presents  $p$ -values obtained from a single hypothesis permutation testing conditional on a set of variables used in the pre-randomization pairing as listed before. The next column (13) presents  $p$ -values for multiple hypothesis testing using a stepdown procedure as described in Section 4. The next two columns (14) and (15) present those  $p$ -values but now adjusted for non-compliance and attrition biases via the method of inverse probability weighting (IPW). The last column (16) presents  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each panel, labeled as “Rank Average”, provides the inference based on the composite variable generated by the rank average (in  $[0,1]$ ) of each participant across outcomes.

Tables 2–3 provide strong evidence for positive program effects on cognitive development for both males and females. These effects last through early adulthood (age 21). Figures 9 graphically display the persistent pattern in IQ effect over ages.

**Socio-Emotional Development** Tables 4–5 show that the male infants in the treated group were rated by the interviewer to be more confident, attentive and cooperative, and less distractible and disruptive, according to the Kohn and Rosman Test Behavior Inventory (Kohn and Rosman, 1972), which was completed by the examiner immediately after administering the cognitive tests to screen the behavior of the child in a test situation.<sup>25</sup> A more complete picture can be obtained by

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<sup>25</sup>The Kohn and Rosman Test Behavior Inventory is made of 26 items. Each of the items can take values of 1 (=never), 2 (=hardly ever), 3 (=sometimes), 4 (=often), 5 (=very often), 6 (=always). The following four scales were computed as means of the items. (1) Confident/Friendly scale: “Appeared self-confident in ability to perform task”; “Appeared comfortable with test situation”; “Worked readily”; “Carried out instructions in an independent way and understood what was required”; “Was friendly to examiner”; “Was eager to continue”; “Expressed ideas clearly”. (2) Anxious/Withdrawn scale: “Appeared flat, unresponsive”; “Needed praise, encouragement or reassurance”; “Acted helpless and confused”; “Avoided looking at the examiner”; “Appeared tense, anxious”; “Spoke in a low, unsteady tone (or worked nervously)”. (3) Attentive/Cooperative scale: “Cooperated with examiner”; “Followed directions well”; “Attended closely to examiner’s directions and instructions”; “Appeared to have a good grasp of instructions”;

Table 4: Socio-emotional Development with Correction for Contamination of Controls: ABC, Females

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass.		Naïve		Block Per.		Block IPW Per.		Gender
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	
<b>Kohn and Rosman Test Behavior Inventory</b>	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)			
Kohn and Rosman - Confident/Friendly	No	2	18	15	3.680	0.273	0.562	0.572	0.653	0.123	0.138	<b>0.049</b>	<b>0.088</b>	<b>0.080</b>	0.135	<b>0.088</b>			
Kohn and Rosman - Anxious/Withdrawn	Yes	2	18	15	-2.309	0.276	0.586	0.579	0.833	0.114	0.128	<b>0.006</b>	<b>0.019</b>	<b>0.002</b>	<b>0.006</b>	0.858			
Kohn and Rosman - Attentive/Cooperative	No	2	18	15	3.120	0.747	1.957	2.454	2.545	<b>0.002</b>	<b>0.004</b>	<b>0.008</b>	<b>0.017</b>	<b>0.010</b>	<b>0.022</b>	0.512			
Kohn and Rosman - Distractible/Disruptive	Yes	2	18	15	-3.341	0.241	0.794	0.969	0.993	0.140	0.163	0.203	0.203	0.171	0.171	0.188			
<b>Rank Average</b>	No	-	18	15	0.415	0.188	1.010	1.101	1.197	<b>0.012</b>	<b>0.017</b>	<b>0.009</b>	-	<b>0.029</b>	-	-			
<b>Kohn and Rosman at age 3</b>																			
Kohn and Rosman - Confident/Friendly	No	3	26	24	4.177	-0.105	-0.312	-0.715	-0.842	0.716	0.704	0.873	0.941	0.901	0.955	<b>0.008</b>			
Kohn and Rosman - Anxious/Withdrawn	Yes	3	26	24	-2.385	0.149	0.347	0.315	0.232	0.183	0.191	0.187	0.372	0.243	0.445	<b>0.045</b>			
Kohn and Rosman - Attentive/Cooperative	No	3	26	24	4.077	-0.102	-0.276	-0.145	-0.239	0.700	0.692	0.862	0.943	0.845	0.929	0.209			
Kohn and Rosman - Distractible/Disruptive	Yes	3	26	24	-2.634	-0.325	-0.972	-1.085	-1.038	0.959	0.952	0.992	0.992	0.994	0.994	0.387			
<b>Rank Average</b>	No	-	26	24	0.489	0.024	0.125	0.047	0.066	0.363	0.362	0.553	-	0.555	-	-			
<b>Kohn and Rosman Test Behavior Inventory</b>																			
Kohn and Rosman - Confident/Friendly	No	4	26	24	4.681	-0.140	-0.449	-0.926	-0.843	0.794	0.781	0.891	0.955	0.904	0.960	<b>0.006</b>			
Kohn and Rosman - Anxious/Withdrawn	Yes	4	26	24	-2.042	-0.076	-0.347	-0.524	-0.410	0.677	0.666	0.849	0.951	0.858	0.957	<b>0.015</b>			
Kohn and Rosman - Attentive/Cooperative	No	4	26	24	4.627	-0.177	-0.620	-0.586	-0.885	0.817	0.805	0.927	0.956	0.933	0.961	<b>0.009</b>			
Kohn and Rosman - Distractible/Disruptive	Yes	4	26	24	-2.269	-0.413	-2.237	-1.039	-1.286	0.973	0.965	0.985	0.985	0.988	0.988	<b>0.005</b>			
<b>Rank Average</b>	No	-	26	24	0.485	0.031	0.258	0.438	0.461	0.323	0.328	0.656	-	0.555	-	-			

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation  $p$ -value. By “naïve”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 5: Socio-emotional Development with Correction for Contamination of Controls: ABC, Males

Variable	Rev.	Age	Sample Sizes		Ctr.	Diff.	Effect Sizes			Ass.		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T			Uncond.	Cond.	IPW	p-val	Naive p-val	p-val	S.D.	p-val	p-val	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Kohn and Rosman Test Behavior Inventory</b>																
Kohn and Rosman - Confident/Friendly	No	2	15	24	3.145	0.790	2.394	2.782	2.918	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.002</b>	<b>0.001</b>	<b>0.002</b>	<b>0.088</b>
Kohn and Rosman - Anxious/Withdrawn	Yes	2	15	24	-2.593	0.337	0.819	1.827	2.041	0.102	<b>0.068</b>	<b>0.015</b>	<b>0.015</b>	<b>0.038</b>	<b>0.038</b>	0.858
Kohn and Rosman - Attentive/Cooperative	No	2	15	24	2.823	0.960	3.979	3.594	3.665	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	0.512
Kohn and Rosman - Distractible/Disruptive	Yes	2	15	24	-3.559	0.632	2.815	2.165	2.122	<b>0.003</b>	<b>0.001</b>	<b>0.003</b>	<b>0.005</b>	<b>0.002</b>	<b>0.004</b>	0.188
<b>Rank Average</b>	No	-	15	24	0.329	0.277	2.121	2.660	2.749	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-
<b>Kohn and Rosman at age 3</b>																
Kohn and Rosman - Confident/Friendly	No	3	21	26	3.716	0.515	1.619	1.778	1.867	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.004</b>	<b>0.001</b>	<b>0.003</b>	<b>0.008</b>
Kohn and Rosman - Anxious/Withdrawn	Yes	3	21	26	-2.722	0.587	1.762	2.299	2.256	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.005</b>	<b>0.001</b>	<b>0.002</b>	<b>0.045</b>
Kohn and Rosman - Attentive/Cooperative	No	3	21	26	3.731	0.254	0.525	0.785	0.927	0.110	0.101	0.268	0.327	0.118	0.155	0.209
Kohn and Rosman - Distractible/Disruptive	Yes	3	21	26	-3.069	-0.065	-0.148	-0.130	0.055	0.609	0.618	0.850	0.850	0.746	0.746	0.387
<b>Rank Average</b>	No	-	21	26	0.396	0.188	1.041	1.244	1.370	<b>0.004</b>	<b>0.004</b>	<b>0.030</b>	-	<b>0.009</b>	-	-
<b>Kohn and Rosman Test Behavior Inventory</b>																
Kohn and Rosman - Confident/Friendly	No	4	21	26	4.232	0.438	1.449	1.641	1.754	<b>0.000</b>	<b>0.000</b>	<b>0.003</b>	<b>0.008</b>	<b>0.001</b>	<b>0.003</b>	<b>0.006</b>
Kohn and Rosman - Anxious/Withdrawn	Yes	4	21	26	-2.449	0.429	1.658	1.840	2.061	<b>0.001</b>	<b>0.000</b>	<b>0.008</b>	<b>0.015</b>	<b>0.002</b>	<b>0.004</b>	<b>0.015</b>
Kohn and Rosman - Attentive/Cooperative	No	4	21	26	4.178	0.445	1.535	1.871	2.000	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	<b>0.003</b>	<b>0.000</b>	<b>0.001</b>	<b>0.009</b>
Kohn and Rosman - Distractible/Disruptive	Yes	4	21	26	-2.831	0.307	1.617	2.316	2.029	<b>0.021</b>	<b>0.010</b>	<b>0.027</b>	<b>0.027</b>	<b>0.043</b>	<b>0.043</b>	<b>0.005</b>
<b>Rank Average</b>	No	-	21	26	0.350	0.272	2.301	2.696	2.842	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naive permutation  $p$ -value. By “naive”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

looking at the full distribution of the Kohn&Rosman confident/friendly scales (Figure 10): here we see that, while there is no significant difference between treated and control females, the effect of the intervention has been mainly to bring treated boys to the same level of behavioral maturity as the girls.

Tables 6–7 provide our analysis results on socio-emotional development for age 15. Here the measures from Achenbach Child Behavior Checklist - Mother Report (CBCL-Mother) were used for our analysis. The results show that the treated girls have fewer externalizing problems and somatic complaints, and are less delinquent than their control group counterparts. This pattern holds even when we consider the clinical score for somatic complaints and delinquent behavior.<sup>26</sup> A similar pattern also appear once we control the contamination in the control group. At age 15, the treated boys also show improvements in Externalizing Behavior, Schizoid and Somatic Complaints Scores.

**Physical Development** Physical development is measured using physical measurements (height, weight, head circumference) taken at the time the children had their routine assessments. In Tables 8–9 we report the treatment effects of the ABC intervention on physical development. A gender difference clearly emerges: treated males were less likely than control males to be overweight in the preschool years.<sup>27</sup> Additionally, by looking at the full BMI distribution by treatment status and gender shown in Figure 11, it is evident that the distribution is both less spread out and shifted to the left for the treatment males relative to the control males. These results echo the findings obtained in more than one study on the health effects of Head Start. Both Frisvold and Lumeng (2011) and Carneiro and Ginja (2012) show that participation in Head Start reduces the prevalence of obesity in enrolled children.<sup>28</sup>

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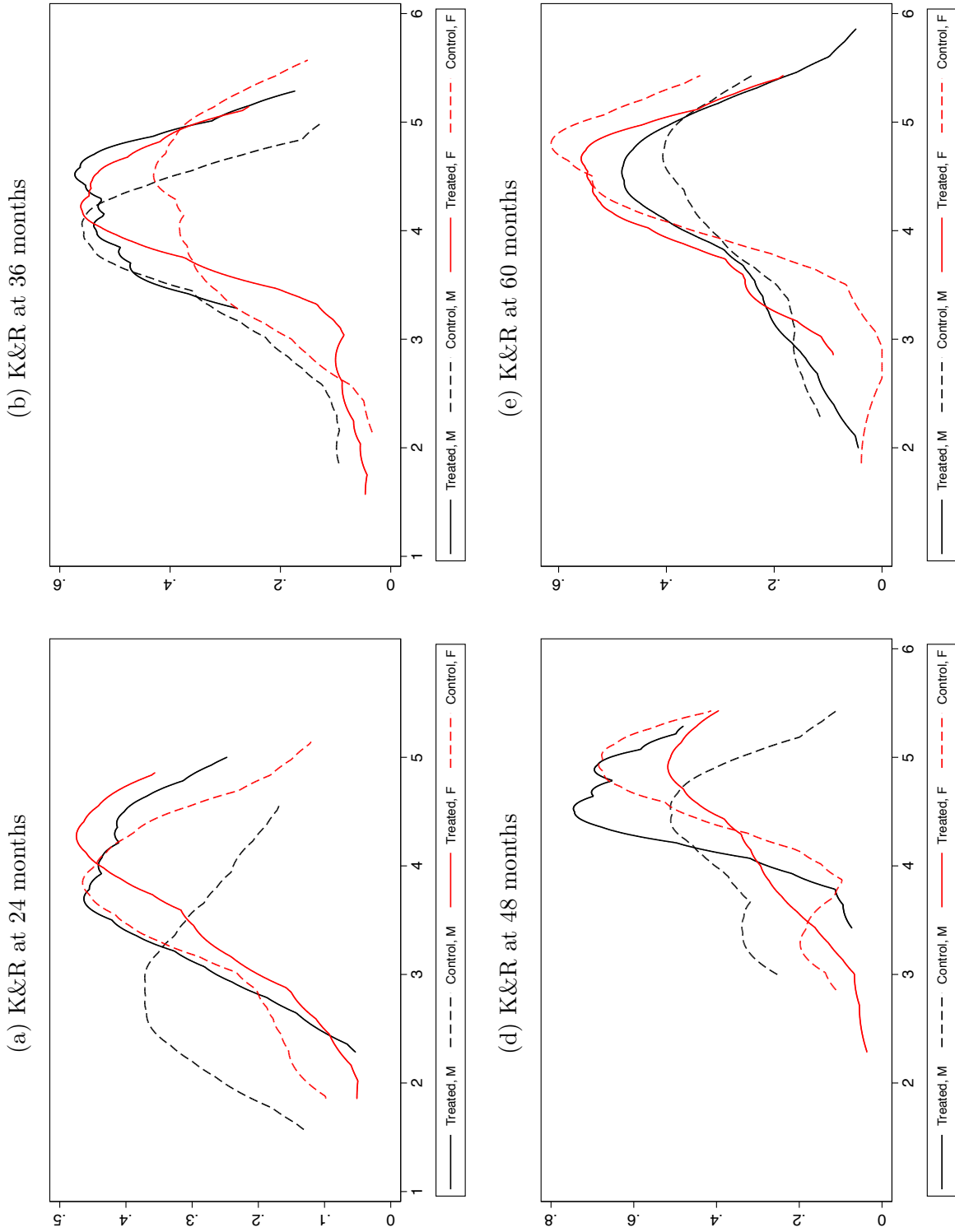
“Was able to sit, took tests efficiently”. (4) Distractible/Disruptive scale: “Impulsive, began without knowing what to do (or without listening to instructions)”; “Openly insisted on doing things his own way, changed or challenged rules”; “Attention was distracted by objects”; “Appeared to have a short attention span”; “Appeared to comply, but actually did not and did things in his own way”; “Interrupted test situation, was disruptive”; “Was easily distracted by extraneous noises or activities”; “Gazed around the room”.

<sup>26</sup>This pattern of positive mental well-being is present also in adulthood, since females report fewer symptoms of depression, both at age 21 (as measured by the Brief Symptom Inventory) and at age 30 (as measured by the Pearlin Mastery Scale), as shown later in this report.

<sup>27</sup>Following CDC recommendations, we use weight-for-length over the 85<sup>th</sup> percentile for being “at-risk overweight” under 24 months, and BMI-for-age over the 85<sup>th</sup> percentile for being overweight for 24 months and older.

<sup>28</sup>While Frisvold and Lumeng (2011) do not perform their analysis separately by gender, actually Carneiro and Ginja (2012) do perform their analysis separately by gender and also find significant results only for the boys.

Figure 10: Abecedarian Intervention: Kohn and Rosman Confident/Friendly Scale in Preschool



**Notes:** The graphs above are non-parametric kernel estimations of the probability density function that use Epanechnikov function, namely, the kernel  $K$  is given by  $K(u) = \frac{3}{4}(1-u^2)\mathbf{1}[|u| \leq 1]$  where  $\mathbf{1}[\cdot]$  is an indicator function. M.=Males; F.=Females.

Table 6: Socio-emotional Development with Correction for Contamination of Controls: ABC, Females

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	<i>p</i> -val	Naïve <i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	<i>p</i> -val	S.D.	
<b>Achenbach Parent</b>																	
Achenbach Parent - Total Competence	No	15	26	23	38.453	3.156	1.392	1.322	1.101	<b>0.048</b>	<b>0.061</b>	0.102	0.286	0.127	0.359	0.953	
Achenbach Parent - Activities	No	15	27	23	42.449	1.204	0.343	0.079	-0.020	0.242	0.260	0.319	0.319	0.422	0.422	0.886	
Achenbach Parent - Social	No	15	27	23	43.830	0.996	0.430	1.600	1.452	0.280	0.298	0.256	0.398	0.162	0.420	0.417	
Achenbach Parent - School	No	15	26	23	38.868	4.654	1.222	2.260	2.187	<b>0.009</b>	<b>0.012</b>	<b>0.019</b>	0.105	<b>0.026</b>	0.141	0.575	
Achenbach Parent - Internalizing Behavior	Yes	15	27	23	-56.337	4.120	2.096	1.889	2.107	<b>0.009</b>	<b>0.016</b>	<b>0.053</b>	0.203	<b>0.062</b>	0.227	0.806	
Achenbach Parent - Externalizing Behavior	Yes	15	27	23	-56.334	4.812	1.483	2.485	2.554	<b>0.003</b>	<b>0.005</b>	<b>0.025</b>	0.113	<b>0.051</b>	0.210	0.263	
Achenbach Parent - Somatic Complaints	Yes	15	27	23	-65.371	5.154	2.268	2.010	2.156	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>	<b>0.007</b>	<b>0.002</b>	<b>0.013</b>	0.372	
Achenbach Parent - Somatic Complaints (Clinical)	Yes	15	27	23	-47.715	4.280	2.177	1.865	1.952	<b>0.000</b>	<b>0.001</b>	<b>0.002</b>	<b>0.017</b>	<b>0.005</b>	<b>0.038</b>	0.322	
Achenbach Parent - Schizoid	Yes	15	27	23	-60.380	1.728	1.125	1.547	1.191	<b>0.045</b>	<b>0.053</b>	0.219	0.520	0.378	0.660	0.689	
Achenbach Parent - Schizoid (Clinical)	Yes	15	27	23	-45.590	2.329	1.166	1.654	1.307	<b>0.009</b>	<b>0.011</b>	<b>0.075</b>	0.235	0.210	0.425	0.915	
Achenbach Parent - Delinquent	Yes	15	27	23	-62.070	3.505	1.694	2.580	2.472	<b>0.000</b>	<b>0.001</b>	<b>0.016</b>	<b>0.096</b>	<b>0.044</b>	0.201	<b>0.037</b>	
Achenbach Parent - Delinquent (Clinical)	Yes	15	27	23	-41.490	3.968	1.827	3.167	3.132	<b>0.000</b>	<b>0.001</b>	<b>0.010</b>	<b>0.065</b>	<b>0.022</b>	0.127	<b>0.027</b>	
Achenbach Parent - Aggressive	Yes	15	27	23	-60.146	3.060	1.338	1.761	1.689	<b>0.000</b>	<b>0.001</b>	<b>0.003</b>	<b>0.025</b>	<b>0.016</b>	0.100	0.142	
Achenbach Parent - Aggressive (Clinical)	Yes	15	27	23	-42.856	3.856	1.401	2.068	2.079	<b>0.000</b>	<b>0.001</b>	<b>0.006</b>	<b>0.040</b>	<b>0.020</b>	0.119	0.233	
<b>Rank Average</b>	No	-	27	23	0.406	0.204	2.006	3.303	3.264	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	-	<b>0.003</b>	-	-	

**Notes:** This table shows small sample inference results by ABC Day-care/treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naive permutation *p*-value. By “naive”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 7: Socio-emotional Development with Correction for Contamination of Controls: ABC, Males

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. $p$ -val	Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val		S.D.	$p$ -val	$p$ -val	S.D.	
<b>Achenbach Parent</b>																
Achenbach Parent - Total Competence	No	15	22	28	39.577	2.994	1.461	1.122	0.954	<b>0.092</b>	<b>0.070</b>	<b>0.024</b>	0.123	<b>0.045</b>	0.191	0.953
Achenbach Parent - Activities	No	15	22	28	43.235	0.836	0.277	0.357	0.308	0.337	0.321	0.179	0.392	0.241	0.474	0.886
Achenbach Parent - Social	No	15	22	28	43.419	2.938	1.772	0.964	0.720	<b>0.048</b>	<b>0.032</b>	<b>0.018</b>	0.110	<b>0.057</b>	0.222	0.417
Achenbach Parent - School	No	15	22	28	38.849	3.044	1.362	2.126	2.335	<b>0.087</b>	<b>0.065</b>	<b>0.035</b>	0.142	<b>0.028</b>	0.145	0.575
Achenbach Parent - Internalizing Behavior	Yes	15	22	28	-59.285	3.427	1.907	2.632	2.773	<b>0.061</b>	<b>0.041</b>	<b>0.088</b>	0.236	<b>0.084</b>	0.231	0.806
Achenbach Parent - Externalizing Behavior	Yes	15	22	28	-57.025	1.739	0.760	0.752	0.787	0.212	0.189	0.187	0.299	0.225	0.479	0.263
Achenbach Parent - Somatic Complaints	Yes	15	22	28	-63.016	3.409	1.685	3.588	3.710	<b>0.009</b>	<b>0.004</b>	<b>0.027</b>	0.127	<b>0.027</b>	0.144	0.372
Achenbach Parent - Somatic Complaints (Clinical)	Yes	15	22	28	-47.192	2.549	1.322	3.779	3.945	<b>0.028</b>	<b>0.016</b>	<b>0.078</b>	0.235	<b>0.073</b>	0.227	0.322
Achenbach Parent - Schizoid	Yes	15	22	28	-62.177	2.391	1.716	1.715	1.730	<b>0.037</b>	<b>0.024</b>	<b>0.027</b>	0.129	<b>0.024</b>	0.141	0.689
Achenbach Parent - Schizoid (Clinical)	Yes	15	22	28	-47.410	2.517	1.318	1.545	1.509	<b>0.040</b>	<b>0.027</b>	<b>0.028</b>	0.129	<b>0.025</b>	0.144	0.915
Achenbach Parent - Delinquent	Yes	15	22	28	-60.971	-0.279	-0.195	-0.211	-0.147	0.572	0.570	0.474	0.487	0.530	0.542	<b>0.037</b>
Achenbach Parent - Delinquent (Clinical)	Yes	15	22	28	-41.856	-0.465	-0.293	-0.303	-0.231	0.610	0.601	0.489	0.489	0.545	0.545	<b>0.027</b>
Achenbach Parent - Aggressive	Yes	15	22	28	-59.445	0.766	0.455	0.487	0.601	0.278	0.260	0.238	0.322	0.273	0.366	0.142
Achenbach Parent - Aggressive (Clinical)	Yes	15	22	28	-42.098	1.562	0.747	0.869	0.988	0.160	0.140	0.144	0.330	0.166	0.377	0.233
<b>Rank Average</b>	No	-	22	28	0.415	0.151	1.862	2.936	2.919	<b>0.002</b>	<b>0.001</b>	<b>0.004</b>	-	<b>0.005</b>	-	-

**Notes:** This table shows small sample inference results by ABC Day-care/treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naive permutation  $p$ -value. By “naive”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 8: ABC Inf. Linear Control Contamination Correction: Table 18 (Females)

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender		
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val	Diff.	
<b>At Risk Overweight/Overweight</b>																		
At Risk Overweight (CDC) at 3 mo.	Yes	0	26	21	-0.308	0.117	0.422	0.312	0.376	<b>0.078</b>	<b>0.095</b>	0.111	0.327	0.113	0.334	0.372		
At Risk Overweight (CDC) at 6 mo.	Yes	0	26	24	-0.309	0.142	0.511	0.259	0.240	<b>0.038</b>	<b>0.042</b>	<b>0.030</b>	0.173	<b>0.036</b>	0.167	0.681		
At Risk Overweight (CDC) at 9 mo.	Yes	0	25	14	-0.408	0.265	0.922	0.705	0.686	<b>0.004</b>	<b>0.010</b>	<b>0.031</b>	0.154	<b>0.034</b>	0.180	0.755		
At Risk Overweight (CDC) at 12 mo.	Yes	1	23	24	-0.480	0.272	0.820	0.557	0.513	<b>0.003</b>	<b>0.004</b>	<b>0.008</b>	<b>0.058</b>	<b>0.009</b>	<b>0.064</b>	0.519		
At Risk Overweight (CDC) at 18 mo.	Yes	1	25	22	-0.434	0.116	0.320	0.254	0.226	0.139	0.150	0.170	0.385	0.206	0.444	<b>0.020</b>		
Overweight (CDC) at 24 mo.	Yes	2	17	23	-0.356	0.182	0.588	0.461	0.492	<b>0.035</b>	<b>0.022</b>	<b>0.053</b>	0.213	<b>0.048</b>	0.180	0.328		
Overweight (CDC) at 36 mo.	Yes	3	23	21	-0.325	0.182	0.593	0.234	0.346	<b>0.027</b>	<b>0.029</b>	<b>0.056</b>	0.209	<b>0.034</b>	0.190	0.236		
Overweight (CDC) at 48 mo.	Yes	4	26	22	-0.182	-0.228	-0.635	-0.676	-0.713	0.984	0.974	0.980	0.980	0.987	0.987	0.296		
Overweight (CDC) at 60 mo.	Yes	5	23	22	-0.305	0.032	0.092	-0.033	0.085	0.379	0.384	0.330	0.510	0.230	0.386	0.765		
Overweight (CDC) at 96 mo.	Yes	8	23	20	-0.357	0.007	0.019	0.004	0.017	0.475	0.477	0.528	0.638	0.559	0.673	<b>0.096</b>		
<b>Rank Average</b>	No	-	30	26	0.394	0.230	1.269	1.176	1.194	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-		

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: At Risk Overweight/Overweight (11 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

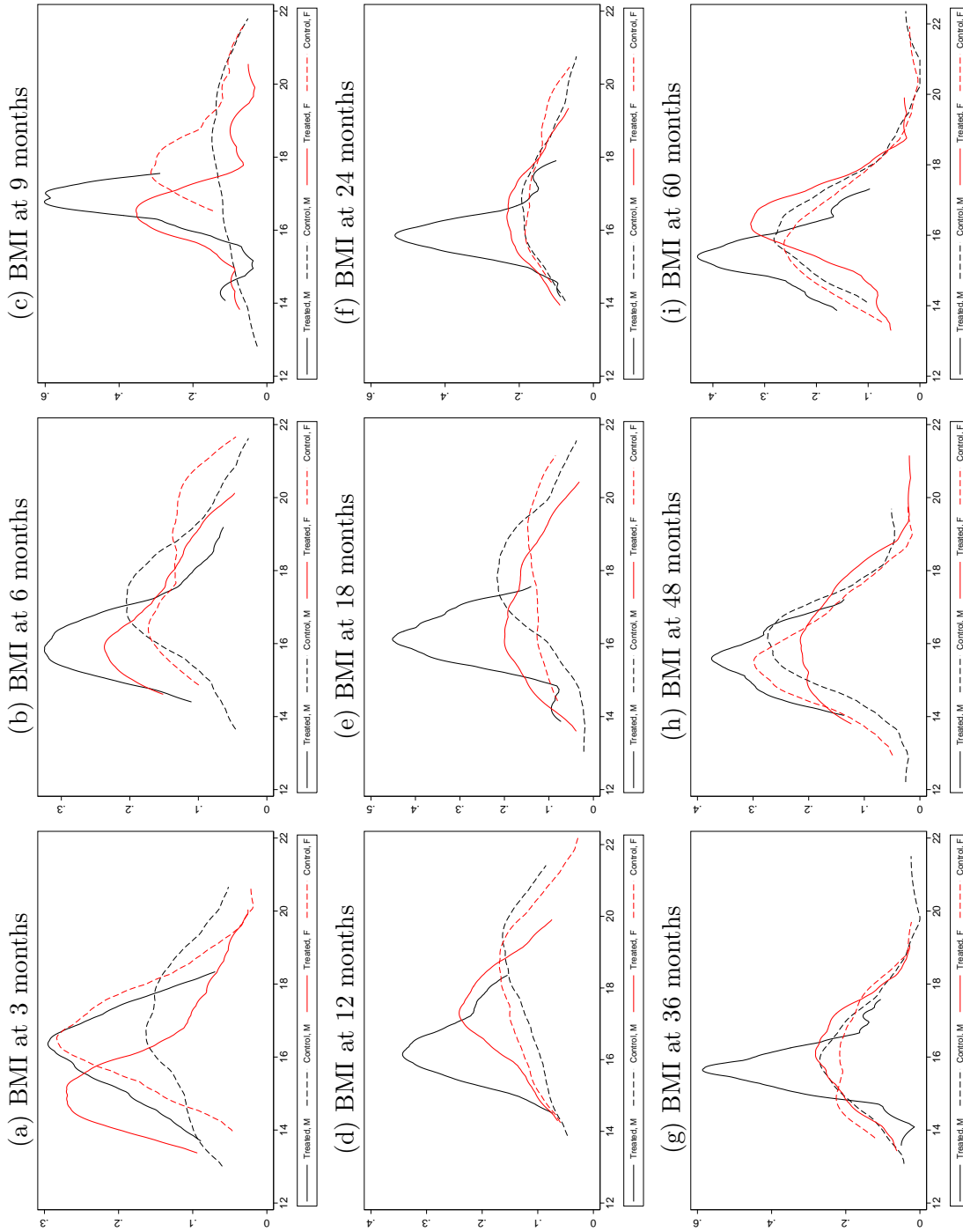


Table 9: ABC Inf. Linear Control Contamination Correction: Table 18 (Males)

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender		
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val	Diff.	
<b>At Risk Overweight/Overweight</b>																		
At Risk Overweight (CDC) at 3 mo.	Yes	0	22	27	-0.241	0.204	1.256	1.233	1.118	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.372
At Risk Overweight (CDC) at 6 mo.	Yes	0	20	25	-0.178	0.098	0.432	0.520	0.463	<b>0.078</b>	<b>0.071</b>	0.123	0.370	0.274	0.598	0.681	0.755	0.519
At Risk Overweight (CDC) at 9 mo.	Yes	0	17	16	-0.225	0.225	1.199	1.339	1.093	<b>0.001</b>	<b>0.000</b>	<b>0.002</b>	<b>0.010</b>	<b>0.027</b>	0.117	<b>0.020</b>	0.328	0.236
At Risk Overweight (CDC) at 12 mo.	Yes	1	21	27	-0.342	0.342	2.514	2.836	2.571	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.296
At Risk Overweight (CDC) at 18 mo.	Yes	1	18	26	-0.403	0.403	2.775	2.696	2.225	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.765
Overweight (CDC) at 24 mo.	Yes	2	15	27	-0.277	0.277	3.101	3.086	2.534	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.096
Overweight (CDC) at 36 mo.	Yes	3	19	25	-0.111	0.031	0.119	0.146	0.123	0.349	0.359	0.279	0.440	0.327	0.514	0.236	0.296	0.765
Overweight (CDC) at 48 mo.	Yes	4	20	24	-0.091	-0.076	-0.250	-0.272	-0.361	0.794	0.798	0.791	0.791	0.875	0.875	0.296	0.765	0.096
Overweight (CDC) at 60 mo.	Yes	5	20	24	-0.198	0.073	0.253	0.242	0.211	0.204	0.196	0.202	0.417	0.230	0.596	0.765	0.096	0.096
Overweight (CDC) at 96 mo.	Yes	8	19	25	-0.343	0.223	0.862	0.772	0.632	<b>0.003</b>	<b>0.001</b>	<b>0.002</b>	<b>0.011</b>	<b>0.013</b>	<b>0.071</b>	<b>0.096</b>	<b>0.096</b>	0.096
<b>Rank Average</b>	No	-	23	28	0.321	0.322	2.041	2.140	1.756	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: At Risk Overweight/Overweight (11 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Figure 11: Abecedarian Intervention: BMI in Preschool



**Notes:** The graphs above are non-parametric kernel estimations of the probability density function that use Epanechnikov function, namely, the kernel  $K$  is given by  $K(u) = \frac{3}{4}(1 - u^2)\mathbf{1}[|u| \leq 1]$  where  $\mathbf{1}[\cdot]$  is an indicator function. M.=Males; F.=Females.

Table 10: Parenting and Home Environment with Correction for Contamination of Controls: ABC, Females

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. Naive		Block Per.		Block IPW Per.		Gender	
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val	Diff.	
<b>Mother-Child Interactions - Duration 1</b>																	
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	0	28	25	352.173	90.811	1.055	1.263	1.032	<b>0.029</b>	<b>0.036</b>	<b>0.073</b>	0.134	0.134	<b>0.051</b>		
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	1	27	21	291.818	189.115	2.225	2.920	2.926	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.003</b>	<b>0.006</b>	<b>0.001</b>		
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	3	26	24	270.147	215.853	1.770	2.529	2.354	<b>0.001</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.006</b>	0.471		
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	5	23	22	196.539	358.007	5.520	3.928	4.344	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	<b>0.014</b>		
<b>Rank Average</b>	No	-	28	26	0.408	0.200	1.097	1.394	1.250	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.002</b>	-	-		
<b>Mother-Child Interaction - Duration 2</b>																	
Mother-Child Interaction - Duration - Child Plays Alone	No	0	28	25	541.637	-108.613	-1.864	-1.589	-1.427	0.979	0.972	0.937	1.000	0.904	0.998	<b>0.055</b>	
Mother-Child Interaction - Duration - Child Plays Alone	No	1	27	21	735.151	-160.979	-2.460	-2.969	-2.776	1.000	0.999	0.978	1.000	0.983	1.000	<b>0.007</b>	
Mother-Child Interaction - Duration - Child Plays Alone	No	3	26	24	934.755	-239.630	-1.990	-2.776	-2.596	1.000	1.000	1.000	1.000	1.000	1.000	0.398	
Mother-Child Interaction - Duration - Child Plays Alone	No	5	23	22	980.496	-344.086	-4.268	-4.095	-4.548	1.000	1.000	0.999	1.000	1.000	1.000	<b>0.010</b>	
<b>Rank Average</b>	No	-	28	26	0.581	-0.188	-1.267	-1.763	-1.554	1.000	1.000	1.000	-	0.999	-	-	
<b>Mother-Child Interactions - Duration 3</b>																	
Mother-Child Interactions - Duration - Mutual Reading	No	0	28	25	19.734	44.626	2.261	1.545	1.423	<b>0.008</b>	<b>0.010</b>	<b>0.004</b>	<b>0.015</b>	<b>0.005</b>	<b>0.018</b>	0.921	
Mother-Child Interactions - Duration - Mutual Reading	No	1	27	21	24.406	30.346	1.375	1.084	0.999	<b>0.013</b>	<b>0.024</b>	<b>0.064</b>	0.122	<b>0.093</b>	0.176	0.754	
Mother-Child Interactions - Duration - Mutual Reading	No	3	26	24	50.615	16.176	0.541	0.356	-0.118	0.213	0.226	0.244	0.244	0.494	0.494	<b>0.009</b>	
Mother-Child Interactions - Duration - Mutual Reading	No	5	23	22	1.127	39.101	1.442	1.902	1.795	<b>0.006</b>	<b>0.009</b>	<b>0.018</b>	<b>0.052</b>	<b>0.013</b>	<b>0.038</b>	0.218	
<b>Rank Average</b>	No	-	28	26	0.503	0.029	0.170	0.061	-0.147	0.291	0.293	0.124	-	0.352	-	-	

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) describes the variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) presents the control sample size; (5) presents the treatment sample size; (6) presents the control mean; (7) presents the unconditional difference in means across treatment and control groups; (8) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother wais full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws (12) presents the single hypothesis one-sided naive permutation  $p$ -value. By naive we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple pothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple pothesis testing (stepdown)  $p$ -values associated with (12). The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Mother-Child Interactions - Duration 1 (5 variables), Mother-Child Interactions - Duration 2 (5 variables), Mother-Child Interactions - Duration 3 (5 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 11: Parenting and Home Environment with Correction for Contamination of Controls: ABC, Males

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. Naive		Block Per.		Block IPW Per.		Gender	
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val	Diff.	
<b>Mother-Child Interactions - Duration 1</b>																	
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	0	23	26	430.074	-45.644	-0.578	-0.706	-0.985	0.812	0.823	0.757	0.939	0.892	0.892	<b>0.051</b>	
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	1	22	26	386.328	-40.043	-0.501	-0.648	-0.587	0.797	0.812	0.875	0.875	0.876	0.984	<b>0.001</b>	
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	3	21	26	350.910	142.974	1.349	1.851	2.011	<b>0.033</b>	<b>0.024</b>	<b>0.062</b>	0.227	<b>0.019</b>	<b>0.074</b>	0.471	
Mother-Child Interactions - Duration - Mutual Playing With Toy	No	5	20	26	471.390	67.341	1.212	1.466	1.593	0.219	0.190	0.127	0.328	0.120	0.309	<b>0.014</b>	
<b>Rank Average</b>	No	-	23	28	0.503	-0.012	-0.079	-0.187	-0.229	0.587	0.590	0.613	-	0.723	-	-	
<b>Mother-Child Interaction - Duration 2</b>																	
Mother-Child Interaction - Duration - Child Plays Alone	No	0	23	26	385.464	46.120	0.702	0.480	0.770	0.213	0.204	0.234	0.568	0.128	0.352	<b>0.055</b>	
Mother-Child Interaction - Duration - Child Plays Alone	No	1	22	26	608.199	32.601	0.636	0.897	0.848	0.262	0.248	<b>0.086</b>	0.297	<b>0.088</b>	0.307	<b>0.007</b>	
Mother-Child Interaction - Duration - Child Plays Alone	No	3	21	26	853.675	-154.367	-1.489	-2.069	-2.210	0.974	0.983	0.957	0.957	0.986	0.986	0.398	
Mother-Child Interaction - Duration - Child Plays Alone	No	5	20	26	681.066	-34.566	-0.487	-1.124	-1.391	0.652	0.670	0.765	0.956	0.812	0.972	<b>0.010</b>	
<b>Rank Average</b>	No	-	23	28	0.502	-0.004	-0.036	-0.024	0.073	0.536	0.538	0.535	-	0.444	-	-	
<b>Mother-Child Interactions - Duration 3</b>																	
Mother-Child Interactions - Duration - Mutual Reading	No	0	23	26	24.099	41.901	2.436	1.508	1.636	<b>0.020</b>	<b>0.015</b>	<b>0.030</b>	<b>0.030</b>	<b>0.018</b>	<b>0.035</b>	0.921	
Mother-Child Interactions - Duration - Mutual Reading	No	1	22	26	55.049	39.435	1.929	1.284	1.192	<b>0.051</b>	<b>0.043</b>	<b>0.028</b>	<b>0.051</b>	<b>0.032</b>	<b>0.032</b>	0.754	
Mother-Child Interactions - Duration - Mutual Reading	No	3	21	26	42.515	143.678	7.827	5.168	5.196	<b>0.002</b>	<b>0.000</b>	<b>0.002</b>	<b>0.007</b>	<b>0.000</b>	<b>0.002</b>	<b>0.009</b>	
Mother-Child Interactions - Duration - Mutual Reading	No	5	20	26	53.696	98.804	4.650	1.836	2.019	<b>0.015</b>	<b>0.009</b>	<b>0.007</b>	<b>0.019</b>	<b>0.003</b>	<b>0.007</b>	0.218	
<b>Rank Average</b>	No	-	23	28	0.496	0.033	0.257	0.284	0.190	0.276	0.261	0.131	-	0.148	-	-	

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) describes the variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) presents the control sample size; (5) presents the treatment sample size; (6) presents the control mean; (7) presents the unconditional difference in means across treatment and control groups; (8) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother wais full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender. (11) presents the asymptotic *p*-value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws (12) presents the single hypothesis one-sided naive permutation *p*-value. By naive we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple pothesis testing (stepdown) *p*-values associated with (10). (15) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple pothesis testing (stepdown) *p*-values associated with (12). The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Mother-Child Interactions - Duration 1 (5 variables), Mother-Child Interactions - Duration 2 (5 variables), Mother-Child Interactions - Duration 3 (5 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

**Parenting and Home Environment** It is important to analyze the effects of the intervention on measures of parenting and childhood home environment in order to understand the role of private investments: are they crowded out by public investments? Do the parents of the treated subjects invest more than the parents of the control subjects? In general, the evidence from the Home Stimulation Scales at early ages (6-60 months) is not strong, but it consistently points to a private investment response only in the case of parents of daughters. A similar gender difference is observed from laboratory observations of mother-child interactions (Tables 10–11) recorded at 6, 20, 36, and 60 months.<sup>29</sup> We find that the treatment increased the attachment of the mother with the child more among the girls than among the boys.<sup>30</sup> Treated girls spent on average more minutes engaging in mutual play with the toy with the mother, and less time playing alone.<sup>31</sup>

## 6.2 Adult Outcomes

We now presents the results of our analysis on adult outcomes. The basic lesson that emerges is that the ABC program turns out to have substantial treatment effects in many domains. The pattern varies across genders and ages.

**Healthy Behaviors** We first show the effects of the intervention on healthy behaviors in Tables 12-15. We find that the females who spent their childhood in the ABC child care center were significantly less likely to start drinking before age 17, and that they were also more likely to engage in physical activity and to eat more nutritious food. For males, we find the main effects of the intervention on smoking and drug use: treated males experienced a delayed onset of smoking and marijuana use, and they were also less likely to make use of illegal drugs, both at the extensive and at the intensive margin. The effect on drug use is also present for females.

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<sup>29</sup>A mother and her child were put in an observation room which resembled a small living room, containing comfortable furniture, magazines for the mother, and developmentally appropriate toys for the child. They were observed and videotaped for 25 minutes. The duration of detailed interactive activity was scored from videotapes and cross-checked by multiple observers. See [Farran and Ramey \(1980\)](#) and [Farran and Haskins \(1980\)](#).

<sup>30</sup>Only in case of “mutual reading” we find a significant effect of the treatment for the boys. This gender difference still persists, although it is attenuated, when we control for contamination of the control group.

<sup>31</sup>A related discussion has been done in psychology literature. For example, see [Brooks-Gunn and Markman \(2005\)](#)’s discussion on “tough love” among African American mothers, which means the parenting style characterized by warmth and firm control along with negative and harsh control.

Table 12: Healthy Behavior with Correction for Contamination of Controls: ABC, Females

Variable	Rev.	Age	Sample Sizes		Ctr.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	Naïve $p$ -val	$p$ -val	S.D.	$p$ -val	
<b>Smoking</b>															
Never a Regular Smoker (age 35)	No	21	28	25	0.350	0.210	0.561	0.408	0.399	<b>0.023</b>	<b>0.032</b>	0.136	<b>0.050</b>	0.142	<b>0.057</b>
Age of Onset of Regular Smoking (age 30)	No	21	18	10	18.019	-0.969	-0.688	-0.875	-0.918	0.957	0.909	0.980	0.986	<b>0.058</b>	
No. Cigarettes per Day (age 30)	Yes	30	11	9	-4.404	-0.762	-0.169	-0.268	-0.231	0.646	0.641	0.549	0.798	0.781	
<b>Rank Average</b>	No	-	28	25	0.501	0.134	0.596	0.465	0.492	<b>0.017</b>	<b>0.023</b>	<b>0.049</b>	<b>0.060</b>	-	
<b>Drug Use</b>															
Never a Marijuana User or Quitter (age 35)	No	21	28	25	0.537	0.183	0.541	0.476	0.638	<b>0.027</b>	<b>0.034</b>	<b>0.030</b>	<b>0.011</b>	<b>0.021</b>	0.499
Age of Onset of Marijuana Use (age 30)	No	21	21	15	16.421	1.445	0.823	1.005	0.931	<b>0.009</b>	<b>0.017</b>	<b>0.042</b>	<b>0.096</b>	<b>0.096</b>	0.441
No. Times Used Marijuana (age 30)	Yes	30	28	25	-6.844	4.364	0.710	0.544	0.536	<b>0.006</b>	<b>0.004</b>	<b>0.006</b>	<b>0.009</b>	<b>0.024</b>	0.435
<b>Rank Average</b>	No	-	28	25	0.366	0.313	2.053	1.972	2.168	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	
<b>Alcohol Use</b>															
Early Onset Drinker (age 21)	Yes	21	28	25	-0.746	0.466	1.453	1.489	1.551	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.087</b>
Drank Driving (age 21)	Yes	21	27	25	-0.200	0.080	0.322	0.285	0.215	0.125	0.136	0.181	0.262	<b>0.006</b>	
Age of Onset of Alcohol Use (age 30)	No	21	27	22	16.119	1.609	0.862	0.824	0.820	<b>0.002</b>	<b>0.004</b>	<b>0.026</b>	<b>0.035</b>	<b>0.067</b>	<b>0.022</b>
<b>Rank Average</b>	No	-	28	25	0.381	0.260	1.344	1.334	1.430	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naive permutation  $p$ -value. By naive we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Smoking (4 variables), Drug Use (4 variables), Alcohol Use (4 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 13: Healthy Behavior with Correction for Contamination of Controls: ABC, Males

Variable	Rev.	Age	Sample Sizes		Ctr.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.	
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	<i>p</i> -val	Naïve <i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val		<i>p</i> -val
<b>Smoking</b>																
Never a Regular Smoker (age 35)	No	21	23	28	0.392	-0.071	-0.194	-0.283	-0.270	0.753	0.772	0.777	0.777	0.599	0.599	<b>0.057</b>
Age of Onset of Regular Smoking (age 30)	No	21	14	18	18.150	1.572	0.562	0.481	0.506	<b>0.060</b>	<b>0.045</b>	<b>0.082</b>	0.216	0.125	0.315	<b>0.058</b>
No. Cigarettes per Day (age 30)	Yes	30	8	15	-6.516	0.016	0.003	0.027	-0.058	0.497	0.490	0.447	0.685	0.546	0.783	0.781
<b>Rank Average</b>	No	-	23	28	0.523	0.062	0.283	0.239	0.224	0.160	0.142	0.172	-	0.171	-	-
<b>Drug Use</b>																
Never a Marijuana User or Quitter (age 35)	No	21	23	28	0.364	0.279	0.740	0.652	0.730	<b>0.006</b>	<b>0.004</b>	<b>0.005</b>	<b>0.009</b>	<b>0.000</b>	<b>0.001</b>	0.499
Age of Onset of Marijuana Use (age 30)	No	21	20	25	16.806	0.694	0.291	0.312	0.375	0.168	0.149	0.145	0.145	<b>0.093</b>	<b>0.093</b>	0.441
No. Times Used Marijuana (age 30)	Yes	30	20	27	-9.387	6.480	0.878	0.861	0.761	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>	<b>0.002</b>	0.435
<b>Rank Average</b>	No	-	23	28	0.385	0.211	1.161	1.086	1.137	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-
<b>Alcohol Use</b>																
Early Onset Drinker (age 21)	Yes	21	23	26	-0.761	0.222	0.588	0.584	0.569	<b>0.022</b>	<b>0.018</b>	<b>0.017</b>	<b>0.045</b>	<b>0.005</b>	<b>0.015</b>	<b>0.087</b>
Drank Driving (age 21)	Yes	21	23	26	-0.233	-0.306	-0.801	-0.811	-0.699	0.996	0.997	0.991	0.991	0.942	0.942	<b>0.006</b>
Age of Onset of Alcohol Use (age 30)	No	21	22	28	16.617	-0.706	-0.242	-0.264	-0.264	0.800	0.823	0.730	0.944	0.445	0.730	<b>0.022</b>
<b>Rank Average</b>	No	-	23	28	0.531	-0.073	-0.330	-0.325	-0.231	0.877	0.887	0.814	-	0.371	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother was full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic *p*-value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation *p*-value. By naïve we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown) *p*-values associated with (10). (15) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the multiple hypothesis testing (stepdown) *p*-values associated with (12). (17) double-sided *p*-value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Smoking (4 variables), Drug Use (4 variables), Alcohol Use (4 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 14: Healthy Behavior with Correction for Contamination of Controls: ABC, Females (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender	
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val	Diff.
<b>Physical Activity</b>																	
Exercise 4 or more Days per Week (age 21)	No	28	25	0.073	0.247	0.701	0.642	0.570	<b>0.007</b>	<b>0.010</b>	<b>0.014</b>	<b>0.014</b>	<b>0.024</b>	<b>0.024</b>	<b>0.024</b>	0.147	
<b>Rank Average</b>	No	28	25	0.459	0.087	0.305	0.217	0.169	0.136	0.134	0.200	—	0.240	—	—		
<b>Nutrition</b>																	
No. of Fruit Servings per Day (age 21)	No	28	25	0.516	0.284	0.476	0.515	0.597	<b>0.044</b>	<b>0.054</b>	<b>0.018</b>	<b>0.055</b>	<b>0.011</b>	<b>0.031</b>	0.691		
Vit. D Deficiency (age 35)	Yes	35	18	-0.641	-0.081	-0.239	-0.385	-0.437	0.773	0.758	0.778	0.778	0.830	0.830	<b>0.013</b>		
Not Proper Nutrition (age 35)	Yes	35	18	-0.426	0.093	0.247	-0.069	-0.131	0.220	0.234	0.379	0.621	0.579	0.817	0.274		
<b>Rank Average</b>	No	28	25	0.492	0.037	0.179	0.090	0.032	0.259	0.268	0.241	—	0.280	—	—		

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Physical Activity (2 variables), Nutrition (4 variables), Health Care (4 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.



Table 15: Healthy Behavior with Correction for Contamination of Controls: ABC, Males (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender			
		# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	<i>p</i> -val	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	Diff.
<b>Physical Activity</b>																	
Exercise 4 or more Days per Week (age 21)	No	23	26	0.272	0.036	0.094	0.142	0.215	0.371	0.361	0.401	0.401	0.465	0.465	0.147		
<b>Rank Average</b>	No	23	26	0.570	-0.132	-0.474	-0.435	-0.330	0.948	0.953	0.943	—	0.930	—	—		
<b>Nutrition</b>																	
No. of Fruit Servings per Day (age 21)	No	23	26	0.669	0.177	0.246	0.296	0.369	0.197	0.183	0.156	0.156	0.130	0.130	0.691		
Vit. D Deficiency (age 35)	Yes	12	19	-0.735	0.367	0.912	0.877	0.971	<b>0.008</b>	<b>0.004</b>	<b>0.010</b>	<b>0.020</b>	<b>0.025</b>	<b>0.073</b>	<b>0.013</b>		
Not Proper Nutrition (age 35)	Yes	9	18	-0.391	0.280	0.895	1.040	0.958	<b>0.016</b>	<b>0.017</b>	<b>0.009</b>	<b>0.028</b>	<b>0.078</b>	0.149	0.274		
<b>Rank Average</b>	No	23	28	0.480	0.078	0.376	0.522	0.582	<b>0.093</b>	<b>0.079</b>	<b>0.055</b>	—	0.133	—	—		

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic *p*-value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation *p*-value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown) *p*-values associated with (10). (15) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (12). (17) double-sided *p*-value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Physical Activity (2 variables), Nutrition (4 variables), Health Care (4 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

**Physical Health** The results for physical health are reported in Tables 16-25. In Tables 16-19 we report anthropometric indicators collected during the medical visit, and several indicators of obesity derived from them. We find that treated males are taller than controls, they weigh less, have smaller waist and hips, a lower BMI, and consequently are less likely to be obese – although, among all these outcomes, only the difference in height achieves statistical significance. Instead, we find that treated females have significantly smaller waist-hip ratio, and lower prevalence of abdominal obesity.

In Tables 20-21 we report the results on the outcomes related to blood pressure: in this case, we find that both treated males and females have on average lower values of both systolic and diastolic blood pressure, and treated females are less likely to fall into the pre-hypertension category, while treated males are less likely to fall into the stage I hypertension category, according to the definition of the American Heart Association.<sup>32</sup>

We then examine the results from the blood lab tests in Tables 22-23.<sup>33</sup> We see that both treated males and females are less likely to be in the pre-diabetes condition,<sup>34</sup> although in neither case the difference achieves statistical significance. Instead, when we analyze the results from the metabolic panel, we find that the both treated males and females have significantly higher levels of the “good” cholesterol.<sup>35</sup> More specifically, they have a level of HDL cholesterol which is just above the lower recommended limit of 40, according to the American Heart Association;<sup>36</sup> indeed, they are less likely to have dyslipidemia.

Finally, in Tables 24-25 we report results on several indicators for the presence of multiple risk factors. We find that the none of the treated males – and a very small proportion of treated females – presents that cluster of conditions which is known as the Metabolic Syndrome, while the prevalence of such risk factors is 26% in the control group.<sup>37</sup> Also, we find that treated males

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<sup>32</sup>The blood pressure categories as defined by the American Heart Association are as follows: normal is <120 for systolic and <80 for diastolic; prehypertension is 120-139 for systolic and 80-89 for diastolic; high blood pressure (hypertension) stage 1 is 140-159 for systolic and 90-99 for diastolic; high blood pressure (hypertension) stage 2 is 160 or higher for systolic and 100 or higher for diastolic. Source: [http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/AboutHighBloodPressure/Understanding-Blood-Pressure-Readings\\_UCM\\_301764\\_Article.jsp](http://www.heart.org/HEARTORG/Conditions/HighBloodPressure/AboutHighBloodPressure/Understanding-Blood-Pressure-Readings_UCM_301764_Article.jsp)

<sup>33</sup>Note we do not report results for glucose or triglycerides, since the blood tests are non-fasting.

<sup>34</sup>This is defined as having a value of the Glycosylated Hemoglobin  $\geq 5.7$ , as reported in Association (Association).

<sup>35</sup>High levels of the High-Density Lipoprotein Cholesterol seem to protect against heart attack, by removing excess cholesterol from the arteries and carrying it back to the liver.

<sup>36</sup>Source: [http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/Triglycerides\\_UCM\\_306029\\_Article.jsp](http://www.heart.org/HEARTORG/GettingHealthy/NutritionCenter/Triglycerides_UCM_306029_Article.jsp)

<sup>37</sup>We use three indicators of the US National Cholesterol Education Program Adult Treatment Panel III (2001)

Table 16: Anthropometrics with Correction for Contamination of Controls: ABC, Females

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass.		Naive		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Means	Uncond.	Cond.	IPW	p-val	p-val	p-val	S.D.	p-val	p-val	S.D.	p-val		
<b>Anthropometrics</b>																			
Weight at age 35	Yes	35	22	18	-219.562	8.218	0.156	-0.004	-0.103	0.312	0.336	0.592	0.858	0.712	0.924	0.640			
Height at age 35	No	35	22	18	66.624	-2.249	-1.247	-1.121	-1.222	1.000	1.000	1.000	1.000	1.000	1.000	<b>0.000</b>			
BMI at age 35	Yes	35	22	18	-34.799	-1.067	-0.120	-0.228	-0.360	0.646	0.619	0.834	0.967	0.903	0.987	0.316			
<b>Rank Average</b>	No	-	22	18	0.505	-0.011	-0.051	-0.198	-0.391	0.564	0.561	0.830	-	0.944	-	-			
<b>Anthropometrics</b>																			
Waist at age 35	Yes	35	21	16	-43.430	1.958	0.337	0.082	-0.024	0.157	0.183	0.413	0.546	0.582	0.717	0.601			
Hips at age 35	Yes	35	21	17	-45.435	-1.412	-0.283	-0.426	-0.586	0.806	0.764	0.922	0.922	0.977	0.977	0.159			
<b>Rank Average</b>	No	-	21	17	0.468	0.086	0.313	0.021	-0.133	0.171	0.180	0.448	-	0.729	-	-			

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Anthropometrics (4 variables), Anthropometrics (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 17: Anthropometrics with Correction for Contamination of Controls: ABC, Males

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass.		Naïve		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val		
<b>Anthropometrics</b>																			
Weight at age 35	Yes	35	9	18	-203.927	-2.860	-0.072	-0.038	-0.231	0.569	0.582	0.570	0.570	0.805	0.805	0.805	0.805	0.805	0.640
Height at age 35	No	35	9	18	66.777	3.682	1.684	1.542	1.624	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
BMI at age 35	Yes	35	8	18	-32.169	2.951	0.518	0.500	0.277	0.114	0.114	0.129	0.164	0.392	0.457	0.392	0.457	0.316	
<b>Rank Average</b>	No	-	9	18	0.372	0.190	1.013	0.975	0.775	<b>0.008</b>	<b>0.009</b>	<b>0.011</b>	-	<b>0.056</b>	-	<b>0.056</b>	-	-	
<b>Anthropometrics</b>																			
Waist at age 35	Yes	35	8	17	-42.266	3.516	0.611	0.661	0.401	<b>0.080</b>	<b>0.081</b>	<b>0.091</b>	0.119	0.308	0.365	0.308	0.365	0.601	
Hips at age 35	Yes	35	8	17	-43.591	2.308	0.473	0.445	0.190	0.137	0.143	0.148	0.148	0.452	0.452	0.452	0.452	0.159	
<b>Rank Average</b>	No	-	8	17	0.390	0.162	0.574	0.627	0.348	<b>0.093</b>	0.106	0.105	-	0.363	-	0.363	-	-	

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic *p*-value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation *p*-value. By naïve we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown) *p*-values associated with (10). (15) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (12). (17) double-sided *p*-value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Anthropometrics (4 variables), Anthropometrics (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 18: Adult Health with Correction for Contamination of Controls: ABC, Females

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender		
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	p-val	p-val	p-val	S.D.	p-val	S.D.	p-val	Diff.
<b>Obesity</b>																
Overweight at age 35	Yes	35	22	18	-0.851	-0.038	-0.164	-0.312	-0.485	0.697	0.687	0.817	0.817	0.959	0.959	0.268
Obese at age 35	Yes	35	22	18	-0.741	0.074	0.192	-0.122	-0.259	0.274	0.286	0.567	0.750	0.811	0.941	0.757
Severely Obese at age 35	Yes	35	22	18	-0.378	0.156	0.456	0.308	0.121	<b>0.078</b>	<b>0.088</b>	0.195	0.410	0.431	0.728	0.757
<b>Rank Average</b>	No	-	22	18	0.521	-0.047	-0.229	-0.550	-0.780	0.763	0.759	0.929	-	0.995	-	-
<b>Obesity</b>																
Waist-Hip Ratio at age 35	Yes	35	21	16	-0.951	0.075	0.976	0.792	0.725	<b>0.002</b>	<b>0.005</b>	<b>0.013</b>	<b>0.023</b>	<b>0.026</b>	<b>0.043</b>	0.212
Abdominal Obesity at age 35	Yes	35	21	16	-0.763	0.200	0.538	0.446	0.468	<b>0.055</b>	<b>0.078</b>	<b>0.095</b>	<b>0.095</b>	<b>0.078</b>	<b>0.078</b>	0.848
<b>Rank Average</b>	No	-	21	16	0.436	0.149	0.583	0.466	0.460	<b>0.042</b>	<b>0.053</b>	<b>0.086</b>	-	0.111	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Obesity (4 variables), Obesity (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 19: Adult Health with Correction for Contamination of Controls: ABC, Males

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Hedges Effect Sizes		Ass. Native		Block Per.		Block IPW Per.		Gender	
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	p-val	p-val	S.D.	p-val	S.D.	p-val	Diff.
<b>Obesity</b>															
Overweight at age 35	Yes	8	18	-0.842	0.1119	0.304	0.407	0.273	0.239	0.169	0.118	0.246	0.164	0.321	0.268
Obese at age 35	Yes	8	18	-0.690	0.135	0.300	0.247	0.114	0.242	0.188	0.204	0.318	0.378	0.536	0.757
Severely Obese at age 35	Yes	8	18	-0.215	0.104	0.317	0.353	0.165	0.229	0.237	0.266	0.266	0.592	0.592	0.757
<b>Rank Average</b>	No	8	18	0.510	-0.014	-0.066	0.014	-0.205	0.562	0.567	0.520	-	0.739	-	-
<b>Obesity</b>															
Waist-Hip Ratio at age 35	Yes	8	17	-0.966	0.028	0.446	0.587	0.513	0.151	0.111	0.106	0.159	0.112	0.170	0.212
Abdominal Obesity at age 35	Yes	8	17	-0.810	0.163	0.391	0.621	0.736	0.183	0.114	0.126	0.126	0.136	0.136	0.848
<b>Rank Average</b>	No	8	17	0.462	0.055	0.205	0.420	0.441	0.317	0.291	0.296	-	0.294	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Obesity (4 variables), Obesity (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 20: Adult Health with Correction for Contamination of Controls: ABC, Females (cont'd)

Variable	Rev.	Age	Sample Sizes			Ctr.	Diff.		Hedges Effect Sizes			Ass.		Native		Block Per.		Block IPW Per.		Gender Diff.	
			# C	# T	#		Mean	Means	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val		
<b>Blood Pressure</b>																					
Systolic Blood Pressure at age 35	Yes	35	22	18	18	-131.317	1.650	0.111	0.108	0.145	0.363	0.375	0.276	0.356	0.238	0.309	<b>0.086</b>				
Diastolic Blood Pressure at age 35	Yes	35	22	18	18	-85.657	0.324	0.026	0.048	0.080	0.468	0.477	0.437	0.437	0.398	0.398	<b>0.029</b>				
<b>Rank Average</b>	No	-	22	18	18	0.476	0.054	0.194	0.193	0.230	0.272	0.281	0.244	-	0.194	-	-				
<b>Pre-Hypertension</b>																					
Pre-Hypertension at age 35 (Sys.>120 & Dias.>80)	Yes	35	22	18	18	-0.713	0.213	0.577	0.380	0.375	<b>0.037</b>	<b>0.052</b>	<b>0.060</b>	<b>0.090</b>	<b>0.091</b>	0.127	0.610				
Pre-Hypertension at age 35 (Sys.>120 or Dias.>80)	Yes	35	22	18	18	-0.723	0.056	0.168	0.198	0.219	0.300	0.323	0.164	0.164	0.180	0.180	0.717				
<b>Rank Average</b>	No	-	22	18	18	0.532	-0.072	-0.270	-0.375	-0.377	0.800	0.787	0.691	-	0.751	-	-				
<b>Hypertension</b>																					
Hypertension at age 35 (Sys.>140 & Dias.>90)	Yes	35	22	18	18	-0.382	0.160	0.504	0.453	0.355	<b>0.059</b>	<b>0.072</b>	<b>0.086</b>	0.143	0.157	0.242	0.208				
Hypertension at age 35 (Sys.>140 or Dias.>90)	Yes	35	22	18	18	-0.408	-0.092	-0.258	-0.247	-0.244	0.790	0.770	0.612	0.612	0.593	0.593	<b>0.051</b>				
<b>Rank Average</b>	No	-	22	18	18	0.445	0.121	0.489	0.421	0.380	<b>0.065</b>	<b>0.078</b>	<b>0.070</b>	-	0.103	-	-				

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother was full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Blood Pressure (3 variables), Pre-Hypertension (3 variables), Hypertension (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 21: Adult Health with Correction for Contamination of Controls: ABC, Males (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr.		Diff.		Hedges Effect Sizes		Ass. Native		Block Per.		Block IPW Per.		Gender	
		# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	Native $p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val	Diff.
<b>Blood Pressure</b>																	
Systolic Blood Pressure at age 35	Yes	9	19	-138.830	13.041	1.015	0.812	0.947	<b>0.008</b>	<b>0.004</b>	<b>0.004</b>	<b>0.004</b>	<b>0.002</b>	<b>0.002</b>	<b>0.002</b>	<b>0.086</b>	
Diastolic Blood Pressure at age 35	Yes	9	19	-90.805	12.279	1.266	1.092	1.278	<b>0.001</b>	<b>0.001</b>	<b>0.003</b>	<b>0.005</b>	<b>0.002</b>	<b>0.003</b>	<b>0.029</b>		
<b>Rank Average</b>	No	9	19	0.280	0.325	1.383	1.174	1.345	<b>0.001</b>	<b>0.001</b>	<b>0.002</b>	—	<b>0.001</b>	—	—		
<b>Pre-Hypertension</b>																	
Pre-Hypertension at age 35 (Sys.>120 & Dias.>80)	Yes	9	19	-0.727	0.306	0.712	0.501	0.523	<b>0.042</b>	<b>0.014</b>	<b>0.035</b>	<b>0.061</b>	0.110	0.184	0.610		
Pre-Hypertension at age 35 (Sys.>120 or Dias.>80)	Yes	9	19	-0.680	-0.004	-0.010	-0.321	-0.450	0.510	0.524	0.551	0.551	0.832	0.832	0.717		
<b>Rank Average</b>	No	9	19	0.536	-0.053	-0.214	-0.470	-0.570	0.701	0.768	0.843	—	0.949	—	—		
<b>Hypertension</b>																	
Hypertension at age 35 (Sys.>140 & Dias.>90)	Yes	9	19	-0.444	0.338	1.225	1.372	1.577	<b>0.002</b>	<b>0.000</b>	<b>0.002</b>	<b>0.003</b>	<b>0.001</b>	<b>0.001</b>	0.208		
Hypertension at age 35 (Sys.>140 or Dias.>90)	Yes	9	19	-0.444	0.233	0.657	0.585	0.609	<b>0.055</b>	<b>0.019</b>	<b>0.021</b>	<b>0.021</b>	<b>0.073</b>	<b>0.073</b>	<b>0.051</b>		
<b>Rank Average</b>	No	9	19	0.268	0.342	1.785	1.731	1.889	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	—	<b>0.000</b>	—	—		

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother was full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Blood Pressure (3 variables), Pre-Hypertension (3 variables), Hypertension (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.



Table 22: ABC Inf. Linear Control Contamination Correction: Table 31 (Females)

Variable	Rev.	Age	Sample Sizes		Ctr.	Diff.	Hedges Effect Sizes		Ass.		Naïve		Block Per.		Block IPW Per.		Gender		
			# C	# T			Uncond.	Cond.	IPW	p-val	p-val	p-val	S.D.	p-val	p-val	S.D.	p-val	p-val	S.D.
<b>Pre-Diabetes</b>																			
Pre-Diabetes at age 35 (HbA1C>5.7)	Yes	35	22	17	-0.470	0.117	0.306	0.431	0.321	0.174	0.186	0.340	0.340	0.398	0.398	0.398	0.398	0.763	
<b>Rank Average</b>	No	-	22	17	0.449	0.118	0.411	0.516	0.405	0.104	0.117	0.246	-	0.306	-	-	-	-	-
<b>Lipid Panel</b>																			
Total Cholesterol at age 35	Yes	35	22	18	-182.110	7.498	0.353	0.570	0.588	0.135	0.165	0.177	0.177	0.147	0.147	0.147	0.308		
HDL Cholesterol at age 35	No	35	22	18	47.881	12.563	1.105	1.050	1.062	<b>0.000</b>	<b>0.002</b>	<b>0.003</b>	<b>0.005</b>	<b>0.004</b>	<b>0.007</b>	<b>0.004</b>	0.690		
Cholesterol/HDL-Cholesterol at age 35	Yes	35	22	18	-4.052	1.013	1.729	1.834	1.907	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.313		
<b>Rank Average</b>	No	-	22	18	0.394	0.235	1.194	1.554	1.655	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	-	<b>0.000</b>	-	<b>0.000</b>	-	-	-
<b>Dyslipidemia</b>																			
HDL Cholesterol at age 35	No	35	22	18	47.881	12.563	1.105	1.050	1.062	<b>0.000</b>	<b>0.002</b>	<b>0.003</b>	<b>0.004</b>	<b>0.004</b>	<b>0.006</b>	<b>0.004</b>	0.690		
Dyslipidemia at age 35 (HDL<50)	Yes	35	22	18	-0.634	0.356	1.137	0.963	0.867	<b>0.000</b>	<b>0.002</b>	<b>0.005</b>	<b>0.005</b>	<b>0.015</b>	<b>0.015</b>	<b>0.015</b>	0.180		
<b>Rank Average</b>	No	-	22	18	0.394	0.236	0.923	0.989	0.909	<b>0.003</b>	<b>0.006</b>	<b>0.014</b>	-	<b>0.019</b>	-	<b>0.019</b>	-	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother was full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean a permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Pre-Diabetes (2 variables), Lipid Panel (4 variables), Dyslipidemia (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 23: ABC Inf. Linear Control Contamination Correction: Table 31 (Males)

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.	
		# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	<i>p</i> -val		S.D.
<b>Pre-Diabetes</b>															
Pre-Diabetes at age 35 (HbA1C>5.7)	Yes	12	19	-0.534	0.060	0.141	0.109	0.097	0.351	0.324	0.304	0.304	0.404	0.404	0.763
<b>Rank Average</b>	No	12	19	0.484	0.026	0.091	0.053	0.042	0.403	0.381	0.366	—	0.538	—	—
<b>Lipid Panel</b>															
Total Cholesterol at age 35	Yes	12	19	-190.055	-5.366	-0.171	-0.161	-0.226	0.678	0.706	0.710	0.710	0.502	0.502	0.308
HDL Cholesterol at age 35	No	12	19	42.923	10.288	0.839	0.835	0.919	<b>0.013</b>	<b>0.004</b>	<b>0.007</b>	<b>0.018</b>	<b>0.005</b>	<b>0.014</b>	0.690
Cholesterol/HDL-Cholesterol at age 35	Yes	12	19	-4.504	0.615	0.652	0.674	0.654	<b>0.041</b>	<b>0.025</b>	<b>0.026</b>	<b>0.046</b>	<b>0.019</b>	<b>0.034</b>	0.313
<b>Rank Average</b>	No	12	19	0.416	0.137	0.641	0.699	0.712	<b>0.044</b>	<b>0.042</b>	<b>0.039</b>	—	<b>0.028</b>	—	—
<b>Dyslipidemia</b>															
HDL Cholesterol at age 35	No	12	19	42.923	10.288	0.839	0.835	0.919	<b>0.013</b>	<b>0.004</b>	<b>0.007</b>	<b>0.007</b>	<b>0.005</b>	<b>0.005</b>	0.690
Dyslipidemia at age 35 (HDL<40)	Yes	12	19	-0.645	0.539	2.128	2.043	2.140	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.180
<b>Rank Average</b>	No	12	19	0.300	0.327	1.606	1.638	1.740	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	—

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother was full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic *p*-value of the one-sided single hypothesis based on the t-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation *p*-value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the t-statistic. (13) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the t-statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown) *p*-values associated with (10). (15) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW t-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (12). (17) double-sided *p*-value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Pre-Diabetes (2 variables), Lipid Panel (4 variables), Dyslipidemia (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 24: Adult Health with Correction for Contamination of Controls: ABC, Females (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr. Mean		Diff. Means		Hedges Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.	
		# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val		
<b>Risk Scores</b>																	
Framingham Risk Score at age 35 (Equation-Based)	Yes	35	22	18	-2.747	2.025	2.275	2.310	2.548	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	0.234
Framingham Risk Score at age 35 (Wilson et al)	Yes	35	22	17	-3.650	2.611	3.318	3.026	3.283	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>
<b>Rank Average</b>	No	-	22	18	0.288	0.470	3.072	2.864	3.159	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-	-
<b>Risk Scores</b>																	
Metabolic Syndrome at age 35 (NCEP)	Yes	35	21	16	-0.265	0.203	0.923	0.797	0.519	<b>0.004</b>	<b>0.004</b>	<b>0.016</b>	<b>0.016</b>	<b>0.091</b>	<b>0.091</b>	<b>0.091</b>	0.566
Multiple Risks (age 35)	Yes	35	22	18	-0.076	0.076	1.032	0.921	1.125	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.062</b>
<b>Rank Average</b>	No	-	22	18	0.326	0.384	2.726	2.451	2.406	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-	-
Hypertension and Obesity (age 35)	Yes	35	22	17	-0.406	0.112	0.323	0.266	0.201	0.161	0.181	0.214	0.305	0.291	0.401	<b>0.076</b>	0.174
Hypertension and Severe Obesity (age 35)	Yes	35	22	17	-0.228	0.052	0.174	0.076	-0.055	0.296	0.307	0.408	0.408	0.601	0.601	0.601	0.174
<b>Rank Average</b>	No	-	22	17	0.400	0.230	0.940	0.796	0.696	<b>0.002</b>	<b>0.006</b>	<b>0.012</b>	-	<b>0.032</b>	-	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Risk Scores (3 variables), Risk Scores (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 25: Adult Health with Correction for Contamination of Controls: ABC, Males (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr. Mean	Diff. Means	Hedges Effect Sizes		Ass. $p$ -val	Naïve $p$ -val	Block Per.		Block IPW Per.		Gender Diff.	
		# C	# T			Uncond.	Cond.			IPW	$p$ -val	S.D. $p$ -val	$p$ -val		S.D. $p$ -val
<b>Risk Scores</b>															
Framingham Risk Score at age 35 (Equation-Based)	Yes 35	9	18	-4.075	0.714	0.233	0.230	0.184	0.285	0.236	0.287	0.354	0.151	0.204	0.234
Framingham Risk Score at age 35 (Wilson et al)	Yes 35	9	18	-4.693	-0.554	-0.229	-0.233	-0.324	0.712	0.747	0.794	0.794	0.746	0.746	<b>0.002</b>
<b>Rank Average</b>	No -	9	18	0.440	0.090	0.315	0.230	0.197	0.222	0.192	0.247	-	0.163	-	-
<b>Risk Scores</b>															
Metabolic Syndrome at age 35 (NCEP)	Yes 35	8	17	-0.263	0.263	1.789	2.025	1.706	<b>0.000</b>	<b>0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.070</b>	<b>0.070</b>	0.566
Multiple Risks (age 35)	Yes 35	8	18	-0.151	0.151	2.278	2.326	2.549	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.062</b>
<b>Rank Average</b>	No -	9	18	0.230	0.389	3.383	3.809	3.359	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-
Hypertension and Obesity (age 35)	Yes 35	8	18	-0.505	0.394	1.360	1.399	1.394	<b>0.001</b>	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.076</b>
Hypertension and Severe Obesity (age 35)	Yes 35	8	18	-0.222	0.222	1.662	2.012	1.594	<b>0.000</b>	<b>0.009</b>	<b>0.005</b>	<b>0.005</b>	0.114	0.114	0.174
<b>Rank Average</b>	No -	8	18	0.279	0.319	2.128	2.428	2.076	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	-	<b>0.004</b>	-	-

**Notes:** The results of this table use outcomes corrected for control contamination using a linear model for Abecedarian Treatment Effects of Day-care treatment. We account for attrition using an Inverse Probability Weighting (IPW) Approach. Conditioning Variables used in the IPW and control contamination are: (1) High Risk Index at birth, (2) Mother wais full scale iq score, (3) Weight at birth (in kilograms), (4) Father last grade completed. This table presents the inference and descriptive statistics of selected Female outcomes of Abecedarian Intervention. We list here the information of each column: (1) variable of interest; (2) shows if the variable were reversed or not. By reversed we mean multiplied by -1. (3) shows the age of the participant when data was collected; (4) control sample size; (5) treatment sample size; (6) control arithmetic mean; (7) unconditional difference in means across treatment and control groups; (8) unconditional Hedges g effect size according to Rosenthal and Rosnow (1991) and Becker (2000). (9) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort and (e) gender. (10) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column six. Probabilities of IPW are estimated using the variables previously cited on the beginning of this note. (11) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 permutation draws (12) presents the single hypothesis one-sided naïve permutation  $p$ -value. By naïve we mean an permutation based on an unconstrained permutation scheme. The chosen test statistic is also the  $t$ -statistic. (13) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation we mean that permutations are done within Strata defined by the variables described in (6). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (6) and permute the treatment status within matched participants (14) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (10). (15) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (7). (16) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (12). (17) double-sided  $p$ -value for the test of gender difference on treatment effect. The multiple hypothesis testing is applied to blocks of outcomes. In this table, we have: Risk Scores (3 variables), Risk Scores (3 variables). The last Line of each block of outcomes provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

are also less likely to show the co-presence of other risk factors associated with obesity, such as hypertension. Lastly, treated females have a significantly lower risk of developing coronary heart disease, according to the Framingham Risk Score (Wilson et al., 1998).

In sum, the available evidence from the biomedical sweep shows that the males who participated in the early childhood intervention have enjoyed a better physical health until their adult age.

**Education** The ABC daycare program has substantial effects on participants' educational achievement (Tables 26–27), which reflect its strong effect on cognitive development discussed before. This pattern is obvious regardless of gender, although it is slightly stronger for females. Both genders are more likely to graduate from high school and to have a colleges degree by age 30, and to have acquired more years of education.<sup>38</sup>

**Labor Market Outcomes** Results for employment and earnings, instead, exhibit gender differences (see Tables 28–29). We observe no statistically significant treatment effect on female's labor market performance, but we do find it among the males. We reject the null hypothesis of no treatment effect on male's employment and earnings at age 30, but not at age 21. This gender-age pattern is comparable to that of the Perry Preschool Program (see Heckman et al., 2010a, for details of Perry Preschool). Figure 12 compares earning profiles over subject's ages 20s and 30s between Perry Preschool and Abecedarian.

**Crime** Treatment effects on crime are reported in Tables 30–31. They show significant program impact on a reduction in the number of probations and in the number of times incarcerated for males, but it is not strong among females. Notice that many of measures reported in these tables were newly collected through administrative sources as described in Section 5 so that the manifested

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definition, given the unavailability of the information required to construct the WHO index. Hence, a subject is defined to have the Metabolic Syndrome if the following three conditions are present: (1) Central obesity, defined as waist circumference = 102 cm or 40 inches (male), = 88 cm or 36 inches (female); (2) Dyslipidemia, defined as HDL-C < 40 mg/dL (male), < 50 mg/dL (female); (3) High blood pressure = 130/85 mmHg.

<sup>38</sup>Heckman et al. (2010a) note that in the Perry Preschool Program, instead, the effects on educational attainment appeared only among females, not among males. They explain this through local economic situation : “..as Perry participants entered the workforce, the male-friendly manufacturing sector was booming. Employees did not need high school diplomas to get good entry-level jobs in manufacturing, and men were much more likely to be employed in the manufacturing sector than women” (Heckman et al., 2010a, p.39). This conjecture does not rule out the possibility that male participants in Perry Preschool Program would have attained more schooling if there was no local economic boom. In the case of ABC/CARE program, there is no indication of such economic shock in the area, so that local economic conditions are unlikely to explain the treatment effects.

Table 26: Adult Outcomes with Correction for Contamination of Controls: ABC, Females

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender		
	(1)	# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	Naïve $p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val	Diff.
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(16)
<b>Adult Outcome - Education</b>																
Graduated High School? (Excluding GED)	No	28	25	0.493	0.267	1.475	2.400	2.238	<b>0.002</b>	<b>0.003</b>	<b>0.016</b>	<b>0.032</b>	<b>0.022</b>	<b>0.043</b>	0.564	
Graduated High School? (Excluding GED)	No	28	25	0.452	0.268	1.257	2.118	1.996	<b>0.004</b>	<b>0.005</b>	<b>0.008</b>	<b>0.018</b>	<b>0.010</b>	<b>0.025</b>	0.154	
Ever Attended a 4 Year University?	No	28	25	0.195	0.205	1.587	1.558	1.545	<b>0.020</b>	<b>0.029</b>	0.158	0.178	0.170	0.189	0.309	
Ever Attended a 4 Year University?	No	28	25	0.254	0.146	1.356	1.429	1.471	<b>0.069</b>	<b>0.082</b>	0.332	0.332	0.306	0.306	0.265	
Last Grade Received Credit	No	28	25	11.367	1.193	1.752	3.072	2.884	<b>0.000</b>	<b>0.001</b>	<b>0.007</b>	<b>0.019</b>	<b>0.014</b>	<b>0.034</b>	<b>0.012</b>	
<b>Rank Average</b>	No	28	25	0.447	0.111	0.718	0.747	0.632	<b>0.044</b>	<b>0.053</b>	0.176	—	0.255	—	—	
<b>Adult Outcome - Education</b>																
Graduated High School? (Excluding GED)	No	30	25	0.493	0.267	1.475	2.400	2.253	<b>0.002</b>	<b>0.003</b>	<b>0.016</b>	<b>0.062</b>	<b>0.020</b>	<b>0.070</b>	0.756	
Graduated High School? (Excluding GED)	No	30	25	0.493	0.267	1.475	2.400	2.253	<b>0.002</b>	<b>0.003</b>	<b>0.016</b>	<b>0.062</b>	<b>0.020</b>	<b>0.070</b>	0.756	
Ever Attended a 4 Year University?	No	30	25	0.159	0.241	1.393	1.377	1.445	<b>0.010</b>	<b>0.015</b>	0.110	0.217	<b>0.098</b>	0.193	<b>0.094</b>	
Ever Attended a 4 Year University?	No	30	25	0.159	0.241	1.393	1.377	1.445	<b>0.010</b>	<b>0.015</b>	0.110	0.217	<b>0.098</b>	0.193	<b>0.094</b>	
Have a 4 Year Degree?	No	30	25	0.016	0.184	2.774	3.134	3.213	<b>0.011</b>	<b>0.025</b>	<b>0.033</b>	<b>0.095</b>	<b>0.008</b>	<b>0.034</b>	0.927	
Have a 4 Year Degree?	No	30	25	0.088	0.112	1.563	1.636	1.621	<b>0.080</b>	<b>0.100</b>	<b>0.074</b>	0.189	<b>0.067</b>	0.171	0.985	
High School Graduation or GED Age	No	30	22	19.496	-0.587	-0.648	-0.641	-0.661	0.913	0.918	0.847	0.847	0.827	0.827	0.650	
Number of Years Associated with Degree	No	30	25	12.136	1.504	1.794	2.426	2.325	<b>0.001</b>	<b>0.001</b>	<b>0.005</b>	<b>0.022</b>	<b>0.009</b>	<b>0.036</b>	0.148	
<b>Rank Average</b>	No	28	25	0.456	0.085	0.497	0.415	0.300	<b>0.050</b>	<b>0.054</b>	0.123	—	0.206	—	—	

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation  $p$ -value. By “naïve”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 27: Adult Outcomes with Correction for Contamination of Controls: ABC, Males

Variable	Rev. Age	Sample Sizes		Ctr. Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.		
		# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	<i>p</i> -val	Naïve <i>p</i> -val	<i>p</i> -val	S.D. <i>p</i> -val	<i>p</i> -val		S.D. <i>p</i> -val	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Adult Outcome - Education</b>																
Graduated High School? (Excluding GED)	No	21	27	0.480	0.187	0.939	0.893	0.890	<b>0.050</b>	<b>0.037</b>	<b>0.023</b>	<b>0.066</b>	<b>0.027</b>	<b>0.076</b>	0.564	
Graduated High School? (Excluding GED)	No	21	27	0.463	0.056	0.259	0.336	0.405	0.321	0.303	0.365	0.524	0.345	0.542	0.154	
Ever Attended a 4 Year University?	No	21	27	0.271	0.062	0.576	0.397	0.410	0.282	0.262	0.167	0.309	0.178	0.326	0.309	
Ever Attended a 4 Year University?	No	21	27	0.344	-0.010	-0.108	-0.077	0.010	0.538	0.545	0.401	0.401	0.387	0.387	0.265	
Last Grade Received Credit	No	21	27	11.947	0.016	0.033	0.085	0.150	0.481	0.479	0.364	0.565	0.386	0.496	<b>0.012</b>	
<b>Rank Average</b>	No	-	27	0.514	-0.026	-0.185	-0.157	-0.155	0.640	0.654	0.566	-	0.546	-	-	
<b>Adult Outcome - Education</b>																
Graduated High School? (Excluding GED)	No	30	27	0.480	0.224	1.125	1.265	1.184	<b>0.022</b>	<b>0.015</b>	<b>0.010</b>	<b>0.039</b>	<b>0.010</b>	<b>0.041</b>	0.756	
Graduated High School? (Excluding GED)	No	30	27	0.480	0.224	1.125	1.265	1.184	<b>0.022</b>	<b>0.015</b>	<b>0.010</b>	<b>0.039</b>	<b>0.010</b>	<b>0.041</b>	0.756	
Ever Attended a 4 Year University?	No	30	27	0.376	-0.006	-0.042	-0.020	0.023	0.522	0.522	0.361	0.669	0.353	0.650	<b>0.094</b>	
Ever Attended a 4 Year University?	No	30	27	0.376	-0.006	-0.042	-0.020	0.023	0.522	0.522	0.361	0.669	0.353	0.650	<b>0.094</b>	
Have a 4 Year Degree?	No	30	27	0.064	0.195	2.139	1.469	1.581	<b>0.027</b>	<b>0.017</b>	<b>0.005</b>	<b>0.020</b>	<b>0.004</b>	<b>0.017</b>	0.927	
Have a 4 Year Degree?	No	30	27	0.150	0.109	1.312	0.810	0.865	0.137	0.112	<b>0.037</b>	<b>0.095</b>	<b>0.028</b>	<b>0.074</b>	0.985	
High School Graduation or GED Age	No	30	17	19.961	-0.252	-0.255	-0.255	-0.343	0.651	0.668	0.702	0.702	0.818	0.818	0.650	
Number of Years Associated with Degree	No	30	27	12.687	0.610	0.769	0.791	0.815	<b>0.085</b>	<b>0.070</b>	<b>0.014</b>	<b>0.042</b>	<b>0.013</b>	<b>0.039</b>	0.148	
<b>Rank Average</b>	No	-	27	0.520	-0.042	-0.335	-0.308	-0.369	0.775	0.789	0.592	-	0.616	-	-	

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation *p*-value. By “naïve”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 28: Adult Outcomes with Correction for Contamination of Controls: ABC, Females (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr. Mean		Diff. Means	Effect Sizes		Ass. Naive		Block Per.		Block IPW Per.		Gender Diff.	
		# C	# T	Mean	#		Uncond.	Cond.	IPW	<i>p</i> -val	<i>S.D.</i>	<i>p</i> -val	<i>p</i> -val	<i>S.D.</i>		<i>p</i> -val
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Adult Outcome - Working</b>																
Working?	No	21	28	25	0.483	0.197	1.008	0.477	0.572	<b>0.025</b>	<b>0.030</b>	0.225	0.423	0.259	0.484	0.740
Working?	No	21	28	25	0.448	0.192	0.988	0.430	0.566	<b>0.030</b>	<b>0.037</b>	0.148	0.307	0.153	0.325	0.775
Working?	No	30	28	25	0.878	0.002	0.009	-0.770	-0.601	0.490	0.488	0.339	0.440	0.449	0.449	0.381
Working?	No	30	28	25	0.788	0.012	0.048	-0.232	-0.092	0.449	0.450	0.453	0.453	0.430	0.548	0.143
<b>Rank Average</b>	No	-	28	25	0.425	0.159	0.775	0.484	0.652	<b>0.005</b>	<b>0.006</b>	<b>0.032</b>	-	<b>0.059</b>	-	-
<b>Adult Outcome - Income</b>																
Total Available Household Income	No	21	26	24	23873.106	2048.728	0.173	-0.305	-0.215	0.362	0.381	0.815	0.871	0.912	0.949	0.613
Total Personal Income	No	21	26	25	6168.253	785.347	0.215	-0.173	-0.106	0.268	0.274	0.501	0.696	0.545	0.761	0.563
Total Available Income	No	21	20	24	25682.490	1745.010	0.109	-0.267	-0.208	0.397	0.403	0.965	0.965	0.993	0.993	0.816
<b>Rank Average</b>	No	-	27	25	0.491	-0.015	-0.058	-0.621	-0.528	0.581	0.582	0.824	-	0.892	-	-
<b>Adult Outcome - Income</b>																
Total Available Household Income	No	30	28	25	33784.286	2152.874	0.143	0.125	0.088	0.371	0.383	0.824	0.848	0.797	0.822	0.942
Earnings	No	30	20	20	27944.864	1235.246	0.098	0.281	0.368	0.415	0.425	0.578	0.700	0.438	0.569	0.400
Total Annual Household Income	No	30	28	25	35354.352	582.808	0.037	0.013	-0.010	0.465	0.474	0.858	0.858	0.831	0.831	0.627
Income from Savings, Stocks, and Bonds	No	30	26	25	-62.129	125.729	1.077	0.923	0.894	<b>0.006</b>	<b>0.001</b>	<b>0.013</b>	<b>0.036</b>	<b>0.010</b>	<b>0.028</b>	0.302
<b>Rank Average</b>	No	-	28	25	0.501	-0.017	-0.070	-0.192	-0.227	0.600	0.600	0.890	-	0.902	-	-

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naive permutation *p*-value. By “naive”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.



Table 29: Adult Outcomes with Correction for Contamination of Controls: ABC, Males (cont'd)

Variable	Rev. Age	Sample Sizes		Ctr. Mean	Diff. Means	Effect Sizes			Ass. Naïve		Block Per.		Block IPW Per.		Gender Diff.	
		# C	# T			Uncond.	Cond.	IPW	$p$ -val	Naïve $p$ -val	$p$ -val	S.D. $p$ -val	$p$ -val	S.D. $p$ -val		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Adult Outcome - Working</b>																
Working?	No	21	21	27	0.384	0.245	1.094	1.589	1.594	<b>0.019</b>	<b>0.015</b>	<b>0.008</b>	<b>0.021</b>	<b>0.006</b>	<b>0.017</b>	0.740
Working?	No	21	21	27	0.433	0.234	1.088	1.400	1.465	<b>0.022</b>	<b>0.016</b>	<b>0.023</b>	<b>0.044</b>	<b>0.019</b>	<b>0.046</b>	0.775
Working?	No	30	21	27	0.789	0.099	0.473	0.509	0.586	0.112	0.102	<b>0.056</b>	<b>0.056</b>	0.126	0.126	0.381
Working?	No	30	21	27	0.648	0.203	0.765	0.893	0.993	<b>0.018</b>	<b>0.014</b>	<b>0.018</b>	<b>0.044</b>	<b>0.029</b>	<b>0.042</b>	0.143
<b>Rank Average</b>	No	-	21	27	0.384	0.207	1.227	1.812	1.887	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-
<b>Adult Outcome - Income</b>																
Total Available Household Income	No	21	18	21	29523.835	-2030.502	-0.184	-0.010	0.073	0.658	0.663	0.667	0.667	0.565	0.565	0.613
Total Personal Income	No	21	18	24	7169.884	2140.949	0.568	0.694	0.712	0.160	0.142	0.202	0.382	0.154	0.301	0.563
Total Available Income	No	21	12	19	27729.806	-408.754	-0.027	-0.005	0.092	0.525	0.526	0.466	0.574	0.356	0.458	0.816
<b>Rank Average</b>	No	-	20	25	0.480	-0.014	-0.061	0.130	0.202	0.569	0.574	0.507	-	0.512	-	-
<b>Adult Outcome - Income</b>																
Total Available Household Income	No	30	14	22	60113.863	3637.455	0.221	0.187	0.108	0.432	0.425	0.317	0.480	0.337	0.501	0.942
Earnings	No	30	12	21	36749.854	18256.260	1.623	1.028	0.915	0.190	0.172	0.121	0.243	0.143	0.273	0.400
Total Annual Household Income	No	30	17	23	50881.300	10098.221	0.614	0.402	0.281	0.298	0.303	0.225	0.367	0.259	0.411	0.627
Income from Savings, Stocks, and Bonds	No	30	19	25	95.833	12.167	0.101	-0.086	-0.006	0.451	0.506	0.449	0.449	0.442	0.442	0.302
<b>Rank Average</b>	No	-	21	27	0.598	-0.175	-0.735	-0.765	-0.774	0.992	0.990	0.939	-	0.954	-	-

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation  $p$ -value. By “naïve”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 30: Adult Outcomes with Correction for Contamination of Controls: ABC, Females (cont'd)

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass.		Naive		Block Per.		Block IPW Per.		Gender
	(1)	(2)	# C	# T	Mean	Means	Uncond.	Cond.	IPW	<i>p</i> -val	<i>p</i> -val	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val	S.D.	<i>p</i> -val	Diff.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)			
<b>Adult Outcome - Crime</b>																			
Number of Probations	Yes	21	27	24	-0.020	-0.021	-0.123	-0.115	-0.222	0.657	0.634	0.558	0.637	0.585	0.663	<b>0.005</b>			
Number of Times Incarcerated	Yes	21	28	24	0.039	-0.081	-0.194	-0.511	-0.611	0.805	0.815	0.559	0.559	0.781	0.781	<b>0.021</b>			
Number of Days Incarcerated	Yes	21	27	24	-9.221	8.637	0.112	0.253	0.180	0.292	0.286	0.156	0.386	0.146	0.369	<b>0.019</b>			
Number of Misdemeanors	Yes	21	28	24	-0.222	0.180	0.435	0.610	0.568	<b>0.029</b>	<b>0.025</b>	<b>0.041</b>	0.131	<b>0.037</b>	0.124	0.813			
Any Police Involvement?	Yes	21	28	24	-0.342	0.009	0.050	0.397	0.466	0.465	0.467	0.485	0.758	0.378	0.635	0.990			
<b>Rank Average</b>	No	-	28	24	0.468	0.064	0.233	0.298	0.199	0.147	0.139	<b>0.062</b>	-	<b>0.073</b>	-	-			
<b>Adult Outcome - Crime</b>																			
Ever Convicted of a Misdemeanor?	Yes	30	28	25	-0.166	0.126	0.891	0.811	0.850	<b>0.005</b>	<b>0.003</b>	<b>0.045</b>	0.110	<b>0.035</b>	<b>0.088</b>	0.770			
Ever Cited as an Adult?	Yes	30	28	25	-0.126	-0.114	-0.881	-0.916	-1.006	0.905	0.889	0.966	0.966	0.972	0.972	0.256			
Ever Convicted of a Felony?	Yes	30	28	25	-0.103	-0.017	-0.174	-0.339	-0.758	0.602	0.580	0.783	0.880	0.858	0.926	0.999			
<b>Rank Average</b>	No	-	28	25	0.389	0.235	1.011	1.034	0.907	<b>0.000</b>	<b>0.000</b>	<b>0.010</b>	-	<b>0.021</b>	-	-			
<b>Any Crimes (age 18 - 34)</b>																			
Any Arrests 18-34	Yes	34	26	20	-0.112	0.062	0.821	0.516	0.662	<b>0.095</b>	0.124	0.173	0.173	<b>0.020</b>	<b>0.020</b>	0.971			
Any Offenses 18-34	Yes	34	26	20	-0.112	0.062	0.821	0.516	0.662	<b>0.095</b>	0.124	0.173	0.173	<b>0.020</b>	<b>0.020</b>	0.971			
<b>Rank Average</b>	No	-	26	20	0.352	0.340	1.282	2.110	2.220	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.000</b>	-	-			

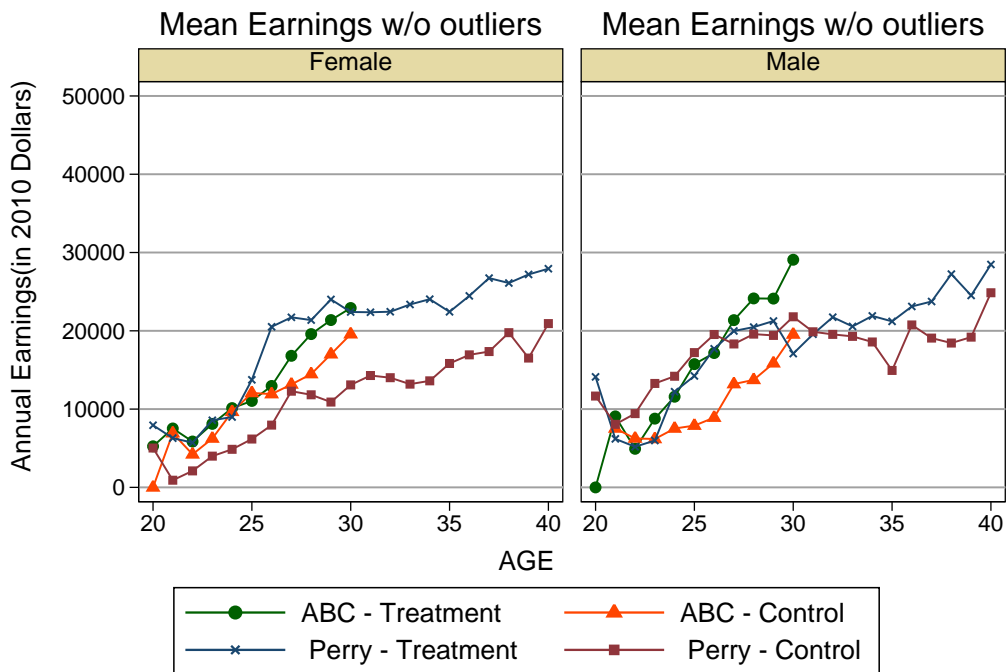
**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic *p*-value of the one-sided single hypothesis based on the *t*-statistic associated with the unconditional difference in means. The remaining columns present permutation *p*-values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation *p*-value. By “naive”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the *t*-statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown) *p*-values associated with (9); (14) presents the one-sided single hypothesis constrained permutation *p*-value of the based on the IPW *t*-statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown) *p*-values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the *p*-values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in [0, 1]) of each participant across outcomes.

Table 31: Adult Outcomes with Correction for Contamination of Controls: ABC, Males (cont'd)

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. Naive		Block Per.		Block IPW Per.		Gender Diff.
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	
<b>Adult Outcome - Crime</b>																	
Number of Probations	Yes	21	21	26	-0.470	0.316	1.475	2.485	2.380	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.005</b>	
Number of Times Incarcerated	Yes	21	21	27	-0.885	0.514	1.106	1.598	1.419	<b>0.010</b>	<b>0.005</b>	<b>0.008</b>	<b>0.023</b>	<b>0.020</b>	<b>0.038</b>	<b>0.021</b>	
Number of Days Incarcerated	Yes	21	20	27	-188.303	126.118	1.637	2.404	2.194	<b>0.003</b>	<b>0.001</b>	<b>0.002</b>	<b>0.007</b>	<b>0.007</b>	<b>0.025</b>	<b>0.019</b>	
Number of Misdemeanors	Yes	21	21	26	-0.410	0.217	0.519	1.093	1.078	<b>0.038</b>	<b>0.038</b>	<b>0.030</b>	<b>0.058</b>	<b>0.017</b>	<b>0.045</b>	0.813	
Any Police Involvement?	Yes	21	21	27	-0.603	0.011	0.048	0.159	0.055	0.464	0.465	0.306	0.306	0.332	0.332	0.990	
<b>Rank Average</b>	No	-	21	27	0.384	0.206	1.134	1.941	1.846	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	-	<b>0.000</b>	-	-	
<b>Adult Outcome - Crime</b>																	
Ever Convicted of a Misdemeanor?	Yes	30	21	25	-0.357	0.157	1.067	0.762	0.830	<b>0.050</b>	<b>0.040</b>	<b>0.029</b>	<b>0.071</b>	<b>0.030</b>	<b>0.075</b>	0.770	
Ever Cited as an Adult?	Yes	30	21	26	-0.564	0.064	0.517	0.331	0.373	0.288	0.267	0.315	0.432	0.358	0.476	0.256	
Ever Convicted of a Felony?	Yes	30	21	26	-0.329	-0.017	-0.159	-0.204	-0.303	0.563	0.570	0.567	0.567	0.665	0.665	0.999	
<b>Rank Average</b>	No	-	21	26	0.417	0.145	1.306	1.083	1.058	<b>0.017</b>	<b>0.013</b>	<b>0.017</b>	-	<b>0.040</b>	-	-	
<b>Any Crimes (age 18 - 34)</b>																	
Any Arrests 18-34	Yes	34	18	22	-0.330	0.058	0.531	0.370	0.343	0.301	0.287	0.487	0.487	0.544	0.544	0.971	
Any Offenses 18-34	Yes	34	18	22	-0.330	0.058	0.531	0.370	0.343	0.301	0.287	0.487	0.487	0.544	0.544	0.971	
<b>Rank Average</b>	No	-	18	22	0.375	0.227	1.703	1.487	1.434	<b>0.004</b>	<b>0.003</b>	<b>0.034</b>	-	<b>0.039</b>	-	-	

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale IQ score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother WAIS full scale IQ score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation  $p$ -value. By “naïve”, we mean a permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Figure 12: Comparison of Earning Profiles over ages 21-40: Perry vs. ABC



Graphs by sex

Source: Perry Preschool and Abecedarian Raw data

patterns are different from those in the previous literature which heavily depend on self-reported criminal activity. Compared to the previous literature (for example, [Clarke and Campbell \(1998\)](#)), the administrative crime records reveal that the treatment effect of ABC daycare service on male's adult crime through their mid-30s is substantial. This implies that the crime reduction effect should receive more attention in evaluating this program.<sup>39</sup>

**Intergenerational Effects** Finally, Tables [32–33](#) present our results on the outcomes of the subject's children. We find that the treated female subjects tend to report fewer children with age-typical activity problems, but no results are found for males.<sup>40</sup>

### 6.3 Early versus Later Treatment

As described in the previous section, the ABC program has two stages of treatment. The first stage lasted from preschool up to age 5. At the end of this stage, a new randomization was conducted and subjects were assigned to the second stage treatment or control group.<sup>41</sup> This school-age treatment was implemented for three years. This particular design allows us to compare early versus late treatment.

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<sup>39</sup>In their cost-benefit analysis on Perry Preschool Program, [Heckman et al. \(2010b\)](#) show that the crime reduction effect is a major driving force to generate a substantial life time net benefit to Perry Preschool.

<sup>40</sup>However, one should be cautious in interpreting the weak effect on family formation among males given that all information used here are collected through survey and that information provided by un-married males on their children are likely imprecise.

<sup>41</sup>This second randomization is orthogonal to the first one in the sense that a subject's second assignment does not depend on the first one.

Table 32: Intergenerational Effects with Correction for Contamination of Controls: ABC, Females

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass. Naïve		Block Per.		Block IPW Per.		Gender	
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val		Diff.
<b>Intergenerational Effects</b>																		
Number of Children With Non-Excellent Health	Yes	30	22	21	-1.165	0.070	0.154	0.089	0.343	0.404	0.407	0.692	0.692	0.577	0.874	0.608		
Have Any Children With Non-Excellent Health?	Yes	30	22	21	-0.756	0.185	0.592	0.727	1.038	<b>0.076</b>	<b>0.083</b>	0.195	0.481	0.105	0.297	0.860		
Number of Children With Learning Problems	Yes	30	22	21	-0.502	0.264	2.085	2.424	2.444	<b>0.015</b>	<b>0.014</b>	<b>0.034</b>	0.132	<b>0.015</b>	<b>0.061</b>	0.428		
Have Any Children With Learning Problems?	Yes	30	22	21	-0.502	0.311	2.461	4.684	4.478	<b>0.000</b>	<b>0.001</b>	<b>0.002</b>	<b>0.011</b>	<b>0.001</b>	<b>0.008</b>	0.298		
Number of Children With Age-Usual Activity Problems	Yes	30	22	21	-0.446	0.303	0.872	0.713	1.105	<b>0.010</b>	<b>0.009</b>	<b>0.029</b>	0.139	<b>0.009</b>	<b>0.049</b>	0.269		
Have Any Children With Age-Usual Activity Problems?	Yes	30	22	21	-0.308	0.213	1.018	0.991	1.314	<b>0.004</b>	<b>0.005</b>	<b>0.018</b>	<b>0.095</b>	<b>0.009</b>	<b>0.047</b>	0.157		
Number of Children With Health Problems	Yes	30	22	21	-1.076	0.076	0.262	0.306	-0.436	0.372	0.375	0.541	0.788	0.778	0.778	0.557		
Have Any Children With Health Problems?	Yes	30	22	21	-0.629	0.058	0.377	0.445	-0.245	0.306	0.309	0.455	0.771	0.762	0.853	0.165		
<b>Rank Average</b>	No	-	22	21	0.406	0.192	1.395	2.093	2.149	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	-	<b>0.002</b>	-	-		

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naïve permutation  $p$ -value. By “naïve”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 33: Intergenerational Effects with Correction for Contamination of Controls: ABC, Males

Variable	Rev.	Age	Sample Sizes		Ctr.		Diff.		Effect Sizes		Ass.		Naive		Block Per.		Block IPW Per.		Gender	
			# C	# T	Mean	Diff.	Uncond.	Cond.	IPW	$p$ -val	$p$ -val	S.D.	$p$ -val	$p$ -val	S.D.	$p$ -val	S.D.	$p$ -val		Diff.
<b>Intergenerational Effects</b>																				
Number of Children With Non-Excellent Health	Yes	30	17	18	-1.186	0.297	0.612	0.568	0.824	0.179	0.171	0.273	0.648	0.251	0.613	0.608				
Have Any Children With Non-Excellent Health?	Yes	30	17	18	-0.663	0.219	0.717	0.823	1.092	<b>0.066</b>	<b>0.066</b>	0.101	0.349	<b>0.084</b>	0.300	0.860				
Number of Children With Learning Problems	Yes	30	16	18	-0.285	0.118	0.933	1.177	1.246	0.188	0.208	0.287	0.602	0.329	0.648	0.428				
Have Any Children With Learning Problems?	Yes	30	16	18	-0.285	0.173	1.372	2.353	2.404	<b>0.025</b>	<b>0.020</b>	<b>0.033</b>	0.142	<b>0.039</b>	0.162	0.298				
Number of Children With Age-Usual Activity Problems	Yes	30	16	18	-0.365	0.031	0.078	0.175	0.375	0.442	0.445	0.550	0.826	0.506	0.793	0.269				
Have Any Children With Age-Usual Activity Problems?	Yes	30	16	18	-0.238	0.016	0.071	0.380	0.598	0.448	0.443	0.602	0.850	0.528	0.791	0.157				
Number of Children With Health Problems	Yes	30	17	18	-0.642	-0.136	-0.518	-0.589	-0.212	0.695	0.673	0.757	0.844	0.763	0.852	0.557				
Have Any Children With Health Problems?	Yes	30	17	18	-0.310	-0.190	-1.350	-1.500	-1.215	0.927	0.928	0.935	0.935	0.948	0.948	0.165				
<b>Rank Average</b>																				
	No	-	17	18	0.418	0.158	1.080	1.485	1.774	<b>0.011</b>	<b>0.013</b>	<b>0.032</b>	-	<b>0.021</b>	-	-				

**Notes:** This table shows small sample inference results by ABC Day-care treatment status obtained from various testing procedures. We list here the information of each column: (1) shows whether the variable was reversed or not for the purpose of one-sided testing. By “reversed”, we mean that the variable is multiplied by -1; (2) shows the age of the participant when data was collected; (3) presents the control sample size; (4) presents the treatment sample size; (5) presents the control group mean; (6) presents the unconditional difference in means across treatment and control groups; (7) presents the unconditional effect size, namely, the difference in means divided by the control standard deviation; (8) presents the conditional effect size. The conditional variables are the following selection of pre-program variables used in the randomization protocol, namely: (a) mother’s WAIS full scale iq score, (b) number of siblings, (c) high risk index, (d) cohort, and (e) gender; (9) presents the inverse probability weighting (IPW) estimation of the conditional effect size described in column (8). Probabilities of IPW are estimated using the following variables: (a) mother wais full scale iq score, (b) father present at home, (c) number of siblings, (d) high risk index, (e) mother working status, and (f) gender; (10) presents the asymptotic  $p$ -value of the one-sided single hypothesis based on the  $t$ -statistic associated with the unconditional difference in means. The remaining columns present permutation  $p$ -values based on 30,000 draws; (11) presents the single hypothesis one-sided naive permutation  $p$ -value. By “naive”, we mean an permutation based on an unconstrained permutation scheme; (12) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the  $t$ -statistic associated with the difference in means between treatment groups. By constrained permutation, we mean that permutations are done within Strata defined by the variables described in (8). More specifically, we simulate the pairwise matching defined in the randomization protocol using variables in (8) and permute the treatment status within matched participants; (13) presents the multiple hypothesis testing (stepdown)  $p$ -values associated with (9); (14) presents the one-sided single hypothesis constrained permutation  $p$ -value of the based on the IPW  $t$ -statistic associated with the difference in means between treatment groups. Probabilities of the IPW are computed according to (9); (15) presents the the multiple hypothesis testing (stepdown)  $p$ -values associated with (14). The multiple hypothesis testing is applied to blocks of outcomes; and, finally, (16) presents the  $p$ -values for hypothesis testing of non-zero difference-in-difference between males and females by treatment status. In addition, the last row of each block provides the inference based on the composite variable generated by the rank average (in  $[0, 1]$ ) of each participant across outcomes.

Table 34: Testing Interaction between Early and Later Treatment : Female

Measure	Age	Single p-values					
		H0 : Interaction<0		H0 : Interaction=0		H0 : Interaction>0	
		Uncond.	Cond.	Uncond.	Cond.	Uncond.	Cond.
<b>IQ</b>							
WISC-R Full-Scale IQ Score	12	0.998	1.000	<b>0.002</b>	<b>0.002</b>	<b>0.000</b>	<b>0.002</b>
WISC-R Full-Scale IQ Score	15	0.998	1.000	<b>0.002</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
WAIS-R Full-Scale IQ Score	21	0.996	1.000	<b>0.004</b>	<b>0.003</b>	<b>0.000</b>	<b>0.003</b>
<b>Achenbach, Parents</b>							
Achenbach Child Behavior, parents : Social Competence	12	0.982	0.989	<b>0.038</b>	<b>0.039</b>	<b>0.020</b>	<b>0.028</b>
Achenbach Child Behavior, parents : Activities	12	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Achenbach Child Behavior, parents : Social	12	0.196	0.165	0.366	0.345	0.830	0.820
Achenbach Child Behavior, parents : School Performance	12	0.747	0.824	0.505	0.498	0.252	0.322
Achenbach Child Behavior, parents : Internalizing	12	<b>0.069</b>	<b>0.049</b>	0.125	0.122	0.944	0.927
Achenbach Child Behavior, parents : Externalizing	12	0.182	0.127	0.392	0.406	0.790	0.721
Achenbach Child Behavior, parents : Somatic Complaints	12	0.922	0.928	0.123	0.147	<b>0.045</b>	<b>0.075</b>
Achenbach Child Behavior, parents : Somatic Complaints (clinical)	12	0.896	0.891	0.170	0.213	<b>0.066</b>	0.104
Achenbach Child Behavior, parents : Schizoid	12	<b>0.008</b>	<b>0.013</b>	<b>0.022</b>	<b>0.022</b>	0.986	0.991
Achenbach Child Behavior, parents : Schizoid (clinical)	12	<b>0.008</b>	<b>0.013</b>	<b>0.034</b>	<b>0.026</b>	0.974	0.987
Achenbach Child Behavior, parents : Delinquent	12	0.288	0.246	0.621	0.635	0.667	0.611
Achenbach Child Behavior, parents : Delinquent (clinical)	12	0.285	0.225	0.622	0.648	0.663	0.577
Achenbach Child Behavior, parents : Aggressive	12	0.570	0.511	0.817	0.824	0.387	0.335
Achenbach Child Behavior, parents : Aggressive (clinical)	12	0.456	0.409	0.964	0.958	0.492	0.451
<b>Achenbach, Parents</b>							
Achenbach Child Behavior, parents : Social Competence	15	0.305	0.285	0.583	0.578	0.722	0.707
Achenbach Child Behavior, parents : Activities	15	<b>0.098</b>	<b>0.081</b>	0.189	0.193	0.909	0.888
Achenbach Child Behavior, parents : Social	15	0.386	0.290	0.710	0.680	0.676	0.610
Achenbach Child Behavior, parents : School Performance	15	0.888	0.943	0.222	0.208	0.110	0.151
Achenbach Child Behavior, parents : Sum of Problems Listed	15	<b>0.080</b>	<b>0.056</b>	0.140	0.124	0.940	0.932
Achenbach Child Behavior, parents : Internalizing	15	<b>0.064</b>	<b>0.054</b>	0.107	<b>0.088</b>	0.957	0.966
Achenbach Child Behavior, parents : Externalizing	15	0.169	0.125	0.343	0.323	0.826	0.802
Achenbach Child Behavior, parents : Somatic Complaints	15	0.941	0.982	0.131	0.139	<b>0.072</b>	0.121
Achenbach Child Behavior, parents : Somatic Complaints (clinical)	15	0.948	0.990	0.106	0.102	<b>0.054</b>	<b>0.092</b>
Achenbach Child Behavior, parents : Schizoid	15	0.616	0.647	0.768	0.751	0.384	0.398
Achenbach Child Behavior, parents : Schizoid (clinical)	15	0.689	0.751	0.592	0.571	0.281	0.322
Achenbach Child Behavior, parents : Delinquent	15	<b>0.016</b>	<b>0.001</b>	<b>0.031</b>	<b>0.042</b>	0.985	0.959
Achenbach Child Behavior, parents : Delinquent (clinical)	15	<b>0.033</b>	<b>0.008</b>	<b>0.077</b>	<b>0.075</b>	0.956	0.933
Achenbach Child Behavior, parents : Aggressive	15	0.890	0.920	0.196	0.167	<b>0.086</b>	<b>0.087</b>
Achenbach Child Behavior, parents : Aggressive (clinical)	15	0.599	0.603	0.822	0.819	0.421	0.422
<b>Harter Self-Perception</b>							
Harter Self-Perception, child : Scholastic Competence	15	<b>0.024</b>	<b>0.037</b>	<b>0.049</b>	<b>0.047</b>	0.975	0.990
Harter Self-Perception, child : Social Acceptance	15	0.112	<b>0.097</b>	0.184	0.190	0.928	0.907
Harter Self-Perception, child : Athletic Competence	15	0.907	0.941	0.198	0.223	0.105	0.164
Harter Self-Perception, child : Physical Appearance	15	<b>0.049</b>	<b>0.057</b>	<b>0.079</b>	<b>0.073</b>	0.970	0.984
Harter Self-Perception, child : Job Competence	15	0.919	0.934	0.169	0.195	<b>0.088</b>	0.129
Harter Self-Perception, child : Romance	15	0.104	<b>0.059</b>	0.180	0.160	0.924	0.899
Harter Self-Perception, child : Conduct/Morality	15	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.002</b>	0.998	0.998
Harter Self-Perception, child : Close Friendship	15	<b>0.026</b>	<b>0.016</b>	<b>0.047</b>	<b>0.035</b>	0.979	0.981
Harter Self-Perception, child : Self-worth	15	<b>0.018</b>	<b>0.035</b>	<b>0.029</b>	<b>0.042</b>	0.989	0.993
<b>Risky Behavior</b>							
Carry weapon? (0=no/1=yes)	21	0.355	0.126	0.581	0.552	0.774	0.574
Attempt suicide? (0=no/1=yes)	21	<b>0.021</b>	<b>0.028</b>	0.194	<b>0.078</b>	0.827	0.950
Ever tried smoking? (0=no/1=yes)	21	1.000	1.000	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.002</b>
Smoked during the past 6 months? (0=no/1=yes)	30	0.902	0.917	0.159	0.154	<b>0.061</b>	<b>0.071</b>
Ever drink alcohol? (0=no/1=yes)	21	0.991	0.996	<b>0.041</b>	<b>0.037</b>	<b>0.032</b>	<b>0.033</b>
Had a drink more than 5 dyas during the past 30 days? (0=no/1=yes)	30	0.421	0.308	0.874	0.764	0.547	0.544
Ever tried marijuana? (0=no/1=yes)	21	0.929	0.956	0.142	0.136	<b>0.071</b>	<b>0.092</b>
Use drug? (0=not true/1=true)	30	0.999	1.000	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Ever used cocaine? (0=no/1=yes)	21	0.992	1.000	<b>0.008</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Ever pregnant? (0=no/1=yes)	30	0.308	0.216	0.568	0.540	0.740	0.676

Note: p-values are for single hypothesis testing of interaction term in a linear regression  $Y = \alpha + \beta D + \gamma S + \delta DS + \epsilon$  where  $D$  and  $S$  are treatment indicators for daycare and school-age treatment, respectively, and  $DS$  refers to their interaction. The coefficient  $\delta$  is tested by the permutation procedure.



Table 35: Testing Interaction between Early and Later Treatment : Female (continued)

Measure	Age	Single p-values					
		H0 : Interaction<0		H0 : Interaction=0		H0 : Interaction>0	
		Uncond.	Cond.	Uncond.	Cond.	Uncond.	Cond.
<b>Brief Symptom Inventory - Subscales</b>							
Somatization	21	0.225	<b>0.067</b>	0.470	0.500	0.755	0.567
Obsessive-compulsive	21	0.972	0.963	<b>0.047</b>	<b>0.048</b>	<b>0.019</b>	<b>0.011</b>
Interpersonal sense	21	<b>0.054</b>	<b>0.030</b>	<b>0.096</b>	0.110	0.958	0.920
Depression	21	0.476	0.430	0.934	0.940	0.542	0.490
Anxiety	21	0.699	0.636	0.627	0.634	0.326	0.270
Hostility	21	0.267	0.142	0.516	0.542	0.751	0.600
Phobic anxiety	21	0.373	0.200	0.710	0.690	0.663	0.510
Paranoid ideation	21	0.172	<b>0.071</b>	0.314	0.308	0.858	0.763
Psychoticism	21	<b>0.046</b>	<b>0.013</b>	<b>0.075</b>	<b>0.072</b>	0.971	0.941
<b>Brief Symptom Inventory - Indices</b>							
Global severity index	21	0.539	0.401	0.929	0.914	0.468	0.315
Positive symptom total	21	0.296	0.129	0.564	0.544	0.732	0.585
Positive symptom distress index	21	0.735	0.607	0.579	0.567	0.314	0.174
<b>Education</b>							
High School Graduate (1 = graduate; no GEDs)	21	0.132	<b>0.048</b>	0.240	0.235	0.892	0.813
Ever Attended a 4-year University (1 = yes)	21	0.634	0.705	0.759	0.691	0.393	0.396
Last Grade in which Subject Received Credit	21	0.318	0.275	0.608	0.595	0.710	0.680
Age of High School Graduation or obtained GED	30	0.866	0.851	0.194	0.216	<b>0.060</b>	<b>0.067</b>
High School Graduate (1 = graduate; no GEDs)	30	0.183	0.127	0.339	0.325	0.844	0.802
Ever Attended a 4-year University (1 = yes)	30	0.804	0.879	0.367	0.356	0.171	0.235
4-year Degree (1 = yes)	30	0.863	0.849	0.173	0.205	<b>0.036</b>	<b>0.054</b>
Number of Years Associated with Degree	30	0.511	0.500	0.968	0.969	0.479	0.469
<b>Employment</b>							
Working Status (1 = working)	21	0.902	0.879	0.216	0.228	0.118	0.107
Working Status (1 = working)	30	<b>0.059</b>	<b>0.048</b>	<b>0.096</b>	<b>0.095</b>	0.963	0.953
<b>Income</b>							
Total Available Household Income	21	0.876	0.944	0.169	0.141	<b>0.045</b>	<b>0.085</b>
Individual Income	21	0.618	0.571	0.774	0.774	0.392	0.345
Total Other Income	21	0.840	0.900	0.217	0.201	<b>0.057</b>	0.101
Total Available Household Income	30	0.795	0.816	0.367	0.381	0.162	0.197
Total Other Income	30	0.998	1.000	<b>0.004</b>	<b>0.004</b>	<b>0.002</b>	<b>0.004</b>
Spouse Income	30	0.928	0.956	<b>0.083</b>	<b>0.064</b>	<b>0.011</b>	<b>0.020</b>
Total Earnings	30	<b>0.025</b>	<b>0.008</b>	<b>0.049</b>	<b>0.033</b>	0.976	0.975
Wage Income (no overpay/tips/bonus/commissions)	30	<b>0.042</b>	<b>0.024</b>	<b>0.074</b>	<b>0.065</b>	0.968	0.959
<b>Intergenerational Effects</b>							
Number of Children with Non-Excellent Health Condition	30	0.481	0.553	0.985	0.996	0.496	0.557
Has any Child with Non-Excellent Health Condition (1 = yes)	30	0.211	0.199	0.435	0.391	0.776	0.808
Number of Children with Learning Problem	30	0.960	0.975	<b>0.046</b>	<b>0.032</b>	<b>0.006</b>	<b>0.007</b>
Has any Child with Learning Problem (1 = yes)	30	0.971	0.984	<b>0.037</b>	<b>0.026</b>	<b>0.008</b>	<b>0.010</b>
Number of Children with Age-usual Activity Problem	30	0.173	0.123	0.390	0.401	0.783	0.722
Has any Child with Age-usual Activity Problem (1 = yes)	30	0.125	0.119	0.287	0.316	0.838	0.803
Number of Children with any Health Problems	30	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Has any Child with Health Problems (1 = yes)	30	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>

Note: p-values are for single hypothesis testing of interaction term in a linear regression  $Y = \alpha + \beta D + \gamma S + \delta DS + \epsilon$  where  $D$  and  $S$  are treatment indicators for daycare and school-age treatment, respectively, and  $DS$  refers to their interaction. The coefficient  $\delta$  is tested by the permutation procedure.

Table 36: Testing Interaction between Early and Later Treatment : Male

Measure	Age	Single p-values					
		H0 : Interaction<0		H0 : Interaction=0		H0 : Interaction>0	
		Uncond.	Cond.	Uncond.	Cond.	Uncond.	Cond.
<b>IQ</b>							
WISC-R Full-Scale IQ Score	12	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	1.000	1.000
WISC-R Full-Scale IQ Score	15	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	<b>0.002</b>	1.000	0.999
WAIS-R Full-Scale IQ Score	21	<b>0.000</b>	<b>0.002</b>	<b>0.001</b>	<b>0.004</b>	0.999	0.998
<b>Achenbach, Parents</b>							
Achenbach Child Behavior, parents : Social Competence	12	0.935	0.940	0.123	0.126	<b>0.058</b>	<b>0.066</b>
Achenbach Child Behavior, parents : Activities	12	0.999	0.994	<b>0.014</b>	<b>0.014</b>	<b>0.013</b>	<b>0.008</b>
Achenbach Child Behavior, parents : Social	12	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Achenbach Child Behavior, parents : School Performance	12	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	1.000	1.000
Achenbach Child Behavior, parents : Internalizing	12	0.920	0.947	0.213	0.188	0.133	0.135
Achenbach Child Behavior, parents : Externalizing	12	0.990	0.995	<b>0.039</b>	<b>0.030</b>	<b>0.029</b>	<b>0.025</b>
Achenbach Child Behavior, parents : Somatic Complaints	12	0.982	0.985	<b>0.025</b>	<b>0.027</b>	<b>0.007</b>	<b>0.012</b>
Achenbach Child Behavior, parents : Somatic Complaints (clinical)	12	0.976	0.979	<b>0.031</b>	<b>0.036</b>	<b>0.007</b>	<b>0.015</b>
Achenbach Child Behavior, parents : Schizoid	12	0.802	0.821	0.373	0.397	0.175	0.218
Achenbach Child Behavior, parents : Schizoid (clinical)	12	0.871	0.894	0.233	0.235	0.104	0.129
Achenbach Child Behavior, parents : Delinquent	12	0.917	0.938	0.115	<b>0.088</b>	<b>0.032</b>	<b>0.026</b>
Achenbach Child Behavior, parents : Delinquent (clinical)	12	0.919	0.940	0.107	<b>0.079</b>	<b>0.026</b>	<b>0.019</b>
Achenbach Child Behavior, parents : Aggressive	12	0.620	0.644	0.744	0.723	0.364	0.367
Achenbach Child Behavior, parents : Aggressive (clinical)	12	0.736	0.780	0.512	0.477	0.248	0.257
<b>Achenbach, Parents</b>							
Achenbach Child Behavior, parents : Social Competence	15	0.411	0.352	0.810	0.821	0.601	0.531
Achenbach Child Behavior, parents : Activities	15	0.136	0.112	0.227	0.230	0.909	0.882
Achenbach Child Behavior, parents : Social	15	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Achenbach Child Behavior, parents : School Performance	15	<b>0.005</b>	<b>0.005</b>	<b>0.005</b>	<b>0.006</b>	1.000	0.999
Achenbach Child Behavior, parents : Sum of Problems Listed	15	0.226	0.278	0.457	0.475	0.769	0.803
Achenbach Child Behavior, parents : Internalizing	15	0.129	0.157	0.267	0.249	0.862	0.908
Achenbach Child Behavior, parents : Externalizing	15	<b>0.050</b>	<b>0.085</b>	0.118	0.140	0.932	0.945
Achenbach Child Behavior, parents : Somatic Complaints	15	0.575	0.644	0.813	0.798	0.388	0.442
Achenbach Child Behavior, parents : Somatic Complaints (clinical)	15	0.760	0.811	0.424	0.400	0.184	0.211
Achenbach Child Behavior, parents : Schizoid	15	0.164	0.169	0.353	0.333	0.811	0.836
Achenbach Child Behavior, parents : Schizoid (clinical)	15	<b>0.095</b>	0.107	0.258	0.240	0.837	0.867
Achenbach Child Behavior, parents : Delinquent	15	0.583	0.612	0.785	0.769	0.368	0.381
Achenbach Child Behavior, parents : Delinquent (clinical)	15	0.503	0.523	0.949	0.939	0.452	0.462
Achenbach Child Behavior, parents : Aggressive	15	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	1.000	0.999
Achenbach Child Behavior, parents : Aggressive (clinical)	15	<b>0.000</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	0.999	1.000
<b>Harter Self-Perception</b>							
Harter Self-Perception, child : Scholastic Competence	15	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	1.000	1.000
Harter Self-Perception, child : Social Acceptance	15	0.317	0.338	0.590	0.629	0.727	0.709
Harter Self-Perception, child : Athletic Competence	15	0.876	0.884	0.234	0.248	0.110	0.132
Harter Self-Perception, child : Physical Appearance	15	0.911	0.905	0.194	0.195	0.105	0.100
Harter Self-Perception, child : Job Competence	15	0.987	0.986	<b>0.020</b>	<b>0.021</b>	<b>0.007</b>	<b>0.007</b>
Harter Self-Perception, child : Romance	15	0.158	0.147	0.285	0.290	0.873	0.857
Harter Self-Perception, child : Conduct/Morality	15	<b>0.047</b>	<b>0.046</b>	0.101	0.129	0.946	0.917
Harter Self-Perception, child : Close Friendship	15	0.217	0.207	0.419	0.396	0.798	0.811
Harter Self-Perception, child : Self-worth	15	0.910	0.893	0.195	0.217	0.105	0.110
<b>Risky Behavior</b>							
Carry weapon? (0=no/1=yes)	21	0.743	0.777	0.429	0.387	0.172	0.164
Attempt suicide? (0=no/1=yes)	21	0.999	1.000	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Ever tried smoking? (0=no/1=yes)	21	0.969	0.958	0.118	0.135	<b>0.087</b>	<b>0.093</b>
Smoked during the past 6 months? (0=no/1=yes)	30	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Ever drink alcohol? (0=no/1=yes)	21	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Had a drink more than 5 days during the past 30 days? (0=no/1=yes)	30	0.435	0.412	0.861	0.862	0.574	0.550
Ever tried marijuana? (0=no/1=yes)	21	0.999	1.000	<b>0.028</b>	<b>0.012</b>	<b>0.027</b>	<b>0.012</b>
Use drug? (0=not true/1=true)	30	0.910	0.920	0.101	0.103	<b>0.011</b>	<b>0.023</b>
Ever used cocaine? (0=no/1=yes)	30	<b>0.038</b>	<b>0.029</b>	0.256	0.222	0.782	0.807

Note: p-values are for single hypothesis testing of interaction term in a linear regression  $Y = \alpha + \beta D + \gamma S + \delta DS + \epsilon$  where  $D$  and  $S$  are treatment indicators for daycare and school-age treatment, respectively, and  $DS$  refers to their interaction. The coefficient  $\delta$  is tested by the permutation procedure.

Table 37: Testing Interaction between Early and Later Treatment : Male (continued)

Measure	Age	Single p-values					
		H0 : Interaction<0		H0 : Interaction=0		H0 : Interaction>0	
		Uncond.	Cond.	Uncond.	Cond.	Uncond.	Cond.
<b>Brief Symptom Inventory - Subscales</b>							
Somatization	21	0.958	0.969	<b>0.050</b>	<b>0.048</b>	<b>0.008</b>	<b>0.017</b>
Obsessive-compulsive	21	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Interpersonal sense	21	0.994	0.995	<b>0.008</b>	<b>0.009</b>	<b>0.002</b>	<b>0.004</b>
Depression	21	0.996	0.998	<b>0.004</b>	<b>0.003</b>	<b>0.000</b>	<b>0.001</b>
Anxiety	21	0.982	0.994	<b>0.028</b>	<b>0.012</b>	<b>0.010</b>	<b>0.006</b>
Hostility	21	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Phobic anxiety	21	1.000	1.000	<b>0.001</b>	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>
Paranoid ideation	21	1.000	0.999	<b>0.000</b>	<b>0.003</b>	<b>0.000</b>	<b>0.002</b>
Psychoticism	21	0.993	0.986	<b>0.010</b>	<b>0.020</b>	<b>0.003</b>	<b>0.006</b>
<b>Brief Symptom Inventory - Indices</b>							
Global severity index	21	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Positive symptom total	21	1.000	1.000	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Positive symptom distress index	21	0.995	0.995	<b>0.011</b>	<b>0.011</b>	<b>0.006</b>	<b>0.006</b>
<b>Education</b>							
High School Graduate (1 = graduate; no GEDs)	21	0.150	0.137	0.273	0.278	0.877	0.859
Ever Attended a 4-year University (1 = yes)	21	<b>0.016</b>	<b>0.018</b>	<b>0.061</b>	<b>0.065</b>	0.955	0.953
Last Grade in which Subject Received Credit	21	<b>0.001</b>	<b>0.003</b>	<b>0.003</b>	<b>0.005</b>	0.998	0.998
Age of High School Graduation or obtained GED	30	0.642	0.689	0.699	0.665	0.341	0.354
High School Graduate (1 = graduate; no GEDs)	30	0.575	0.575	0.868	0.860	0.443	0.435
Ever Attended a 4-year University (1 = yes)	30	<b>0.001</b>	<b>0.003</b>	<b>0.007</b>	<b>0.006</b>	0.994	0.997
4-year Degree (1 = yes)	30	<b>0.000</b>	<b>0.000</b>	<b>0.002</b>	<b>0.002</b>	0.998	0.998
Number of Years Associated with Degree	30	<b>0.001</b>	<b>0.001</b>	<b>0.002</b>	<b>0.001</b>	0.999	1.000
<b>Employment</b>							
Working Status (1 = working)	21	<b>0.000</b>	<b>0.002</b>	<b>0.000</b>	<b>0.002</b>	1.000	1.000
Working Status (1 = working)	30	0.126	0.132	0.262	0.274	0.864	0.858
<b>Income</b>							
Total Available Household Income	21	0.349	0.329	0.701	0.728	0.648	0.601
Individual Income	21	<b>0.008</b>	<b>0.008</b>	<b>0.040</b>	<b>0.024</b>	0.968	0.984
Total Other Income	21	0.637	0.645	0.700	0.705	0.337	0.350
Spouse Income	21	0.563	0.579	0.843	0.839	0.406	0.418
Total Available Household Income	30	0.453	0.515	0.974	0.971	0.427	0.486
Total Other Income	30	0.999	1.000	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>
Spouse Income	30	<b>0.001</b>	<b>0.002</b>	<b>0.010</b>	<b>0.011</b>	0.991	0.991
Total Earnings	30	0.493	0.555	0.810	0.805	0.303	0.360
Wage Income (no overpay/tips/bonus/commissions)	30	0.447	0.473	0.949	0.937	0.498	0.536
<b>Intergenerational Effects</b>							
Number of Children with Non-Excellent Health Condition	30	0.870	0.911	0.219	0.216	<b>0.089</b>	0.127
Has any Child with Non-Excellent Health Condition (1 = yes)	30	0.893	0.939	0.223	0.261	0.116	0.200
Number of Children with Learning Problem	30	0.900	0.898	0.104	0.110	<b>0.004</b>	<b>0.008</b>
Has any Child with Learning Problem (1 = yes)	30	0.952	0.949	<b>0.049</b>	<b>0.056</b>	<b>0.001</b>	<b>0.005</b>
Number of Children with Age-usual Activity Problem	30	0.997	0.994	<b>0.003</b>	<b>0.006</b>	<b>0.000</b>	<b>0.000</b>
Has any Child with Age-usual Activity Problem (1 = yes)	30	1.000	0.999	<b>0.000</b>	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>
Number of Children with any Health Problems	30	0.990	0.993	<b>0.013</b>	<b>0.007</b>	<b>0.003</b>	<b>0.000</b>
Has any Child with Health Problems (1 = yes)	30	0.999	1.000	<b>0.001</b>	<b>0.000</b>	<b>0.000</b>	<b>0.000</b>

Note: p-values are for single hypothesis testing of interaction term in a linear regression  $Y = \alpha + \beta D + \gamma S + \delta DS + \epsilon$  where  $D$  and  $S$  are treatment indicators for daycare and school-age treatment, respectively, and  $DS$  refers to their interaction. The coefficient  $\delta$  is tested by the permutation procedure.

Tables 38–46 compare our results for the two stages of treatment. Each table shows two blocks of results by gender. The first block performs statistical inference on the day-care treatment and the second block tests if the schooling age treatment is statistically significant. Each block has four columns. The first column of the daycare and school-age treatment gives the control group mean and the second column shows the difference of means the between the control and the treated groups. The third column provides a small-sample permutation-based  $p$ -value for one-sided single hypothesis testing for this difference in means, and the last column gives the stepdown  $p$ -value for multiple hypothesis testing. We find that, in most cases, we fail to reject the null hypothesis for the school-age treatment, while we reject it for the daycare treatment. This evidence shows that later intervention may be less effective than early treatment, or not effective at all.

Table 38: Comparison of Early versus Later Treatment : Female and Male

	Female Day Care				Female School Age				Male Day Care				Male School Age				
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	
HOME Stimulation	26.33	1.227	0.31	0.64	27.5	-0.611	0.67	0.67	27.26	0.850	0.16	0.46	28.231	-1.549	0.85	0.95	
HOME Stimulation	27.96	2.384	0.20	0.53	29.1	0.802	0.36	0.60	29.76	-0.243	0.21	0.44	28.160	3.022	<b>0.04</b>	0.14	
HOME Stimulation	30.52	0.023	0.37	0.52	30.2	1.169	0.28	0.54	29.19	-0.031	0.43	0.59	28.360	1.783	0.16	0.42	
HOME Stimulation	55.46	3.039	0.34	0.57	55.4	2.571	0.22	0.49	54.90	-0.825	0.76	0.76	53.560	1.964	0.17	0.36	
HOME Stimulation	57.79	1.890	0.53	0.53	58.2	0.768	0.41	0.58	56.81	1.799	0.20	0.47	59.273	-3.046	0.87	0.87	
Bayley (MDI)	94.35	-0.782	0.85	0.85	98.4	-2.775	0.76	0.88	94.45	0.675	0.49	0.74	94.360	-0.360	0.57	0.81	
Bayley (MDI)	101.73	9.587	<b>0.05</b>	0.15	108.6	-3.304	0.78	0.78	100.74	2.654	0.29	0.57	99.500	4.364	0.19	0.45	
Bayley (MDI)	112.00	1.292	0.74	0.88	111.7	0.202	0.43	0.81	106.91	-0.358	0.80	0.80	104.231	4.360	0.17	0.48	
Bayley (MDI)	104.93	7.442	<b>0.10</b>	0.24	109.7	-0.926	0.57	0.81	106.00	4.519	0.22	0.52	109.462	-4.507	0.88	0.88	
Bayley (MDI)	91.61	17.935	<b>0.00</b>	<b>0.00</b>	100.5	0.820	0.44	0.80	87.24	18.540	<b>0.00</b>	<b>0.00</b>	98.680	-2.680	0.77	0.89	
Stanford-Binet IQ Score	24 Month	84.89	12.861	<b>0.00</b>	<b>0.00</b>	91.381	0.064	0.51	0.69	84.67	9.556	<b>0.00</b>	<b>0.00</b>	89.480	1.429	0.29	0.46
Stanford-Binet IQ Score	36 Month	85.00	15.000	<b>0.00</b>	<b>0.01</b>	94.952	-2.878	0.75	0.75	83.33	18.013	<b>0.00</b>	<b>0.00</b>	93.720	-0.902	0.56	0.56
Stanford-Binet IQ Score	48 Month	91.42	8.077	<b>0.07</b>	<b>0.07</b>	97.000	-2.111	0.69	0.79	86.43	17.302	<b>0.00</b>	<b>0.00</b>	95.840	0.342	0.42	0.53
Kohn & Rosman - anxious/withdrawn	48 Months	12.23	0.478	0.78	0.88	11.762	0.720	0.72	0.72	14.67	-2.551	<b>0.05</b>	<b>0.05</b>	13.200	0.118	0.51	0.72
Kohn & Rosman - confident/friendly	48 Months	32.12	-0.324	0.65	0.83	32.667	-0.630	0.65	0.76	28.90	3.788	<b>0.01</b>	<b>0.03</b>	30.680	0.684	0.27	0.52
Kohn & Rosman - distractible/disruptive	48 Months	19.81	1.651	0.90	0.90	21.524	-2.079	<b>0.08</b>	0.18	24.48	-4.284	<b>0.02</b>	<b>0.03</b>	21.200	1.936	0.80	0.80
Kohn & Rosman - attentive/cooperative	48 Months	22.50	-0.250	0.73	0.87	22.810	-0.291	0.56	0.74	20.19	2.925	<b>0.01</b>	<b>0.03</b>	21.520	0.616	0.27	0.50

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 39: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
Mccarthy general cognitive	92.12	8.706	<b>0.04</b>	<b>0.08</b>	98.667	-3.705	0.84	0.94	89.86	11.720	<b>0.00</b>	<b>0.00</b>	95.960	0.813	0.34	<b>0.49</b>
Mccarthy memory	47.84	3.899	<b>0.02</b>	<b>0.06</b>	51.381	-2.496	0.92	0.92	47.57	4.082	<b>0.03</b>	<b>0.03</b>	49.360	1.004	0.26	<b>0.48</b>
Mccarthy motor	46.04	1.960	0.34	0.34	48.191	-1.998	0.85	0.94	46.05	3.452	<b>0.02</b>	<b>0.05</b>	48.240	-0.604	0.47	0.57
Mccarthy performance	42.60	6.530	<b>0.04</b>	<b>0.09</b>	47.000	-2.077	0.81	0.94	42.24	4.531	<b>0.02</b>	<b>0.04</b>	45.360	-1.315	0.63	0.63
Mccarthy quantitative	43.28	3.416	0.13	0.19	45.429	-0.621	0.62	0.85	41.90	5.980	<b>0.01</b>	<b>0.02</b>	44.320	1.907	0.15	0.35
Mccarthy verbal sale	49.20	4.104	<b>0.05</b>	<b>0.10</b>	53.000	-2.808	0.89	0.93	46.71	8.978	<b>0.00</b>	<b>0.01</b>	51.120	1.198	0.30	<b>0.48</b>
WPPSI IQ Score	96.64	5.273	0.17	0.32	101.524	-4.191	0.88	0.92	90.81	10.191	<b>0.02</b>	<b>0.04</b>	96.080	0.784	0.42	0.51
WPPSI Performance IQ Score	96.76	4.240	0.29	0.46	101.191	-4.265	0.91	0.91	92.19	6.425	<b>0.03</b>	<b>0.05</b>	96.080	-0.716	0.53	0.53
WPPSI Verbal IQ Score	97.16	5.362	<b>0.11</b>	0.24	101.619	-3.360	0.83	0.90	91.24	11.570	<b>0.02</b>	<b>0.05</b>	96.680	2.047	0.34	0.50
WPPSI Comprehension IQ Score	10.17	0.539	0.46	0.46	9.917	1.146	0.15	0.34	10.21	-0.907	0.82	0.82	9.154	1.203	0.22	0.46
W-J Reading Score	84.60	11.971	<b>0.00</b>	<b>0.00</b>	90.941	-0.358	0.57	0.71	84.00	5.458	<b>0.10</b>	0.17	85.476	3.524	0.18	0.18
W-J Reading Score	85.14	12.191	<b>0.00</b>	<b>0.00</b>	91.389	-0.264	0.54	0.72	83.89	7.413	<b>0.03</b>	<b>0.06</b>	85.240	6.610	<b>0.03</b>	<b>0.06</b>
W-J Reading Score	84.28	9.200	<b>0.00</b>	<b>0.00</b>	88.750	-1.365	0.66	0.66	85.00	3.923	0.14	0.14	84.792	4.527	0.11	0.17
W-J Math Score	88.29	6.169	<b>0.02</b>	<b>0.05</b>	93.167	-2.967	0.82	0.91	89.47	4.985	0.12	0.21	91.609	1.391	0.38	0.38
W-J Math Score	91.33	6.167	0.12	0.12	93.667	1.413	0.33	0.54	92.84	5.081	0.19	0.28	92.960	6.340	<b>0.09</b>	0.14
W-J Math Score	84.52	10.040	<b>0.03</b>	<b>0.04</b>	91.050	-4.165	0.89	0.89	87.59	1.948	0.22	0.22	85.917	5.492	<b>0.08</b>	0.16
W-J Reading Score	85.14	12.191	<b>0.00</b>	<b>0.00</b>	91.389	-0.264	0.54	0.54	83.89	7.413	<b>0.03</b>	<b>0.05</b>	85.240	6.610	<b>0.03</b>	<b>0.05</b>
W-J Math Score	91.33	6.167	0.12	0.12	93.667	1.413	0.33	0.44	92.84	5.081	0.19	0.19	92.960	6.340	<b>0.09</b>	<b>0.09</b>
W-J Reading Score	84.60	11.971	<b>0.00</b>	<b>0.00</b>	90.941	-0.358	0.57	0.70	84.00	5.458	<b>0.10</b>	0.19	85.476	3.524	0.18	0.30
W-J Math Score	88.29	6.169	<b>0.02</b>	<b>0.02</b>	93.167	-2.967	0.82	0.82	89.47	4.985	0.12	0.12	91.609	1.391	0.38	0.38

Note: (a) “C Mean” refers to the mean value in the control group and “Treat” is the difference in means between the control and the treatment group; (b) “p-val” refers to the p-value for sigle hypothesis testing obtained by the permutation procedure and “S.D.” is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 40: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
	78 Month	92.73	0.621	0.66	0.66	95.150	-3.790	0.78	0.86	92.05	3.077	0.16	0.16	92.792	1.923	0.33
WISC-R Performance	93.68	3.883	0.30	0.41	96.950	-2.310	0.72	0.85	93.48	5.941	<b>0.08</b>	0.13	95.750	1.917	0.34	0.34
WISC-R Verbal	92.41	5.156	0.19	0.34	98.400	-6.040	0.97	0.97	92.10	7.196	<b>0.02</b>	<b>0.06</b>	93.667	4.857	<b>0.09</b>	0.17
WIC-R Full scale IQ score	94.17	3.144	0.43	0.43	97.800	-3.760	0.87	0.87	96.37	3.247	<b>0.11</b>	<b>0.11</b>	99.720	-3.320	0.80	0.80
WISC-R Performance	92.26	5.421	0.16	0.25	95.600	-1.240	0.65	0.78	93.05	5.024	<b>0.04</b>	<b>0.08</b>	94.600	3.050	0.16	0.26
WISC-R Verbal	92.61	4.573	0.25	0.32	96.300	-2.620	0.79	0.85	94.21	4.174	<b>0.05</b>	<b>0.07</b>	96.600	0.050	0.45	0.53
WIC-R Full scale IQ score	92.73	0.621	0.66	0.66	95.150	-3.790	0.78	0.93	92.05	3.077	0.16	0.16	92.792	1.923	0.33	0.59
WISC-R Performance IQ	94.17	3.144	0.43	0.55	97.800	-3.760	0.87	0.95	96.37	3.247	<b>0.11</b>	0.26	99.720	-3.320	0.80	0.80
WISC-R Performance IQ	90.48	7.600	<b>0.03</b>	<b>0.07</b>	99.050	-8.973	1.00	1.00	93.95	1.661	0.16	0.26	95.000	-0.909	0.55	0.69
WISC-R Performance IQ	93.04	5.921	0.12	0.22	99.300	-6.531	0.96	0.98	99.64	2.292	0.16	0.31	100.615	0.521	0.44	0.65
Year 10																
78 Month	93.68	3.883	0.30	0.30	96.950	-2.310	0.72	0.85	93.48	5.941	<b>0.08</b>	<b>0.08</b>	95.750	1.917	0.34	0.34
WISC-R Verbal	92.26	5.421	0.16	0.22	95.600	-1.240	0.65	0.82	93.05	5.024	<b>0.04</b>	<b>0.11</b>	94.600	3.050	0.16	0.25
WISC-R Verbal	85.28	9.440	<b>0.00</b>	<b>0.01</b>	89.000	0.539	0.46	0.69	88.64	5.094	<b>0.08</b>	0.13	88.917	4.129	0.14	0.30
WISC-R Verbal	83.56	7.819	<b>0.03</b>	<b>0.07</b>	88.000	-2.462	0.79	0.79	88.36	5.672	<b>0.03</b>	<b>0.09</b>	89.654	3.437	0.16	0.31
Year 10																
78 Month	92.41	5.156	0.19	0.26	98.400	-6.040	0.97	0.97	92.10	7.196	<b>0.02</b>	<b>0.07</b>	93.667	4.857	<b>0.09</b>	0.20
WISC-R Full scale IQ	92.61	4.573	0.25	0.25	96.300	-2.620	0.79	0.91	94.21	4.174	<b>0.05</b>	<b>0.09</b>	96.600	0.050	0.45	0.45
WISC-R Full scale IQ	86.44	9.520	<b>0.00</b>	<b>0.01</b>	92.850	-3.965	0.94	0.97	90.14	3.556	<b>0.07</b>	<b>0.07</b>	90.708	1.928	0.27	0.37
WISC-R Full scale IQ	87.26	7.032	<b>0.04</b>	<b>0.09</b>	92.950	-5.027	0.93	0.98	92.82	4.325	<b>0.04</b>	<b>0.09</b>	93.962	2.311	0.24	0.39
Year 10																

Note: (a) “C Mean” refers to the mean value in the control group and “Treat” is the difference in means between the control and the treatment group; (b) “p-val” refers to the p-value for single hypothesis testing obtained by the permutation procedure and “S.D.” is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 41: Comparison of Early versus Later Treatment : Female and Male (continued)

		Female Day Care				Female School Age				Male Day Care				Male School Age			
		C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
W-J Reading Score	Year 7	84.28	9.200	<b>0.00</b>	<b>0.01</b>	88.750	-1.365	0.66	0.79	85.00	3.923	0.14	0.23	84.792	4.527	0.11	0.11
	Year 7	84.52	10.040	<b>0.03</b>	<b>0.03</b>	91.050	-4.165	0.89	0.89	87.59	1.948	0.22	0.22	85.917	5.492	<b>0.08</b>	0.13
WISC-R Performance	Year 7	90.48	7.600	<b>0.03</b>	<b>0.03</b>	99.050	-8.973	1.00	1.00	93.95	1.661	0.16	0.16	95.000	-0.909	0.55	0.55
	Year 7	85.28	9.440	<b>0.00</b>	<b>0.01</b>	89.000	0.539	0.46	0.62	88.64	5.094	<b>0.08</b>	0.14	88.917	4.129	0.14	0.25
WIC-R Full scale IQ score	Year 7	86.44	9.520	<b>0.00</b>	<b>0.01</b>	92.850	-3.965	0.94	0.96	90.14	3.556	<b>0.07</b>	0.14	90.708	1.928	0.27	0.35
	Year 7	47.16	1.520	0.39	0.39	47.000	1.577	0.22	0.48	43.57	2.544	<b>0.05</b>	<b>0.10</b>	44.435	0.429	0.44	0.44
Achenbach - activities	Year 7	34.72	7.988	<b>0.00</b>	<b>0.00</b>	38.947	-0.947	0.64	0.84	38.77	5.112	<b>0.03</b>	<b>0.09</b>	39.667	4.061	<b>0.09</b>	0.22
	Year 7	43.76	1.490	0.15	0.28	44.750	-0.790	0.66	0.66	42.86	0.263	0.13	0.13	41.609	2.820	<b>0.09</b>	0.16
HARTER - cognition	Year 7	2.67	0.013	0.64	0.64	2.639	0.042	0.45	0.80	2.82	-0.197	0.84	0.84	2.500	0.409	<b>0.01</b>	<b>0.04</b>
	Year 7	2.71	0.271	<b>0.06</b>	0.17	3.033	-0.225	0.88	0.98	3.04	-0.087	0.78	0.89	2.917	0.121	0.17	0.36
HARTER - self esteem	Year 7	2.76	0.250	<b>0.10</b>	0.18	3.150	-0.304	0.99	0.99	3.00	0.115	0.40	0.72	3.095	-0.056	0.60	0.60
	Year 7	3.04	0.230	<b>0.09</b>	0.20	3.361	-0.287	0.97	0.99	3.14	0.211	0.16	0.42	3.240	0.026	0.41	0.55
CAT - Language	Year 7	35.38	20.169	<b>0.02</b>	<b>0.03</b>	43.833	5.310	0.28	0.28	30.05	0.950	0.42	0.57	25.773	10.027	<b>0.07</b>	0.13
	Year 7	29.81	18.641	<b>0.01</b>	<b>0.01</b>	37.944	4.722	0.25	0.34	29.90	0.646	0.45	0.52	26.318	8.232	0.15	0.15
CAT - Reading	Year 7	29.29	15.864	<b>0.01</b>	<b>0.02</b>	34.333	5.238	0.25	0.38	30.55	4.586	0.43	0.56	28.182	10.018	<b>0.10</b>	0.16
	Year 7	36.00	13.000	<b>0.09</b>	<b>0.09</b>	40.438	6.720	0.20	0.35	30.53	0.721	0.52	0.52	24.000	14.222	<b>0.04</b>	<b>0.09</b>

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.



Table 42: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
Achenbach - externalizing sum	59.36	-3.520	<b>0.08</b>	0.17	57.450	0.627	0.66	0.88	58.18	-1.490	0.43	0.57	56.792	1.390	0.68	0.68
Achenbach - internalizing sum	57.92	-3.080	0.11	0.23	55.050	2.335	0.87	0.95	59.91	-2.025	0.38	0.54	58.458	0.678	0.60	0.70
Achenbach of sum of 1s and 2s	62.64	-4.400	<b>0.07</b>	0.16	60.100	0.977	0.67	0.88	60.41	-3.178	0.23	0.53	58.333	0.939	0.63	0.68
Achenbach - aggressive	62.48	-2.920	0.13	0.22	60.550	1.027	0.74	0.91	61.18	-1.836	0.23	0.54	60.250	-0.159	0.42	0.77
Achenbach - delinquent	63.96	-2.920	<b>0.05</b>	0.19	62.050	0.412	0.64	0.92	61.59	-0.976	0.36	0.60	61.000	0.000	0.45	0.78
Achenbach - somatic complaints	62.68	-2.960	<b>0.06</b>	0.16	59.900	2.062	0.89	0.89	62.05	-0.815	0.62	0.62	62.083	-1.265	0.32	0.70
Achenbach - schizoid	62.08	-1.440	0.35	0.35	60.950	0.550	0.66	0.92	62.14	-1.175	0.34	0.67	61.292	0.299	0.55	0.80
Achenbach - -social competence	40.80	3.635	<b>0.05</b>	0.19	42.316	0.244	0.48	0.92	38.80	4.120	<b>0.00</b>	<b>0.02</b>	38.773	3.942	<b>0.08</b>	0.29
Hours Reading	1.50	-0.100	0.55	0.55	1.300	0.082	0.47	0.82	0.25	0.473	<b>0.00</b>	<b>0.01</b>	0.573	-0.108	0.67	0.67
Schooling Intentions	1.92	0.160	<b>0.08</b>	0.15	2.056	-0.094	0.60	0.60	1.90	0.211	0.15	0.15	1.792	0.458	<b>0.05</b>	<b>0.10</b>
	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
Last grade completed (Father)	10.72	0.609	<b>0.10</b>	0.37	10.556	0.593	0.16	0.58	10.36	1.252	<b>0.01</b>	<b>0.03</b>	10.875	0.268	0.33	0.68
Father absent? (y/n)	-0.17	0.013	0.52	0.52	-0.238	0.090	0.77	0.77	-0.35	0.134	0.93	0.99	-0.231	-0.087	0.26	0.66
Welfare payments? (y/n)	-0.37	-0.249	0.12	0.32	-0.429	-0.090	0.20	0.51	-0.83	0.326	0.97	0.97	-0.654	-0.028	0.34	0.58
Father's work unstable/unskilled?	-0.07	-0.049	0.17	0.34	0.000	-0.074	0.25	0.47	-0.17	-0.005	0.30	0.72	-0.231	0.094	0.86	0.86
W-J Math Score	84.59	11.491	<b>0.00</b>	<b>0.00</b>	90.850	-3.465	0.84	0.84	88.64	3.078	<b>0.09</b>	0.16	87.885	4.252	0.11	0.11
W-J Reading Score	87.44	9.806	<b>0.00</b>	<b>0.00</b>	92.400	-1.708	0.66	0.76	89.14	2.364	0.15	0.15	87.808	5.465	<b>0.04</b>	<b>0.07</b>
WISC-R Performance	93.04	5.921	0.12	0.12	99.300	-6.531	0.96	0.96	99.64	2.292	0.16	0.16	100.615	0.521	0.44	0.44
WISC-R Verbal	83.56	7.819	<b>0.03</b>	<b>0.05</b>	88.000	-2.462	0.79	0.90	88.36	5.672	<b>0.03</b>	<b>0.06</b>	89.654	3.437	0.16	0.26
WIC-R Full scale IQ score	87.26	7.032	<b>0.04</b>	<b>0.06</b>	92.950	-5.027	0.93	0.95	92.82	4.325	<b>0.04</b>	<b>0.06</b>	93.962	2.311	0.24	0.29

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 43: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C	Treat	P-val	S.D.	C	Treat	P-val	S.D.	C	Treat	P-val	S.D.	C	Treat	P-val	S.D.
	Mean				Mean				Mean				Mean			
W-J Broad Reasoning	85.37	7.671	<b>0.01</b>	<b>0.09</b>	89.950	-2.142	0.73	0.99	89.73	1.701	0.29	0.76	90.231	0.269	0.47	0.55
W-J Knowledge aptitude	86.67	8.917	<b>0.01</b>	<b>0.08</b>	90.550	-1.281	0.68	0.99	91.77	3.120	<b>0.10</b>	0.50	91.385	3.843	<b>0.10</b>	0.38
W-J Memory	97.37	4.588	<b>0.06</b>	0.19	102.900	-6.669	0.91	1.00	101.14	-1.994	0.67	0.88	98.385	2.843	0.27	0.62
W-J Math aptitude	92.56	6.319	0.12	0.28	96.850	-2.312	0.72	0.99	94.00	0.500	0.40	0.83	93.192	2.171	0.27	0.57
W-J Non-School Int.	96.30	2.412	0.19	0.33	102.750	-8.596	0.99	0.99	102.36	1.815	0.29	0.84	103.000	1.046	0.39	0.67
W-J Oral Language	81.30	10.704	<b>0.02</b>	<b>0.10</b>	84.850	0.035	0.51	0.96	89.09	2.552	0.14	0.60	88.192	4.171	0.15	0.47
W-J Reading Aptitude	90.15	9.227	<b>0.01</b>	<b>0.08</b>	94.100	-1.600	0.69	0.99	95.14	2.149	0.19	0.71	93.846	4.745	<b>0.10</b>	0.39
W-J Reasoning	89.26	5.157	<b>0.03</b>	0.15	93.350	-2.235	0.73	0.99	91.23	0.558	0.48	0.88	92.231	-2.004	0.75	0.75
W-J Scholastic Int.	98.37	5.546	<b>0.06</b>	0.22	95.700	7.454	<b>0.03</b>	0.18	98.00	-6.571	0.92	0.92	91.577	5.969	<b>0.05</b>	0.26
W-J Skills	87.22	9.403	<b>0.00</b>	<b>0.03</b>	91.400	-1.592	0.68	0.99	88.45	2.081	0.12	0.55	87.423	4.622	<b>0.06</b>	0.27
W-J Visual-per speed	106.81	0.560	0.58	0.58	111.850	-6.196	0.90	1.00	99.00	-2.286	0.60	0.89	96.846	2.381	0.26	0.66
W-J Written language aptitude	90.63	8.745	<b>0.02</b>	<b>0.10</b>	96.250	-3.135	0.82	1.00	93.45	2.224	0.16	0.66	92.769	3.640	0.13	0.44
W-J Written language	93.44	5.514	<b>0.04</b>	0.18	95.900	-1.631	0.68	0.99	90.41	0.662	0.35	0.82	87.077	8.150	<b>0.02</b>	<b>0.11</b>
PIAT - General Information	92.50	9.633	<b>0.02</b>	<b>0.11</b>	96.500	0.214	0.49	0.68	94.24	9.554	<b>0.00</b>	<b>0.01</b>	97.667	3.867	0.13	0.40
PIAT - Mathematics	96.20	0.333	0.70	0.70	94.786	2.595	0.26	0.56	88.47	10.372	<b>0.03</b>	<b>0.09</b>	93.048	2.152	0.26	0.62
PIAT - Reading Comprehension	119.40	-0.067	0.21	0.38	117.200	5.800	<b>0.06</b>	0.23	114.00	2.000	0.50	0.50	117.750	-7.250	0.78	0.78
PIAT - Reading Recognition	103.35	7.717	0.11	0.36	106.571	0.143	0.49	0.71	96.59	6.096	0.12	0.24	99.667	0.333	0.41	0.76
PIAT - Spelling	100.75	7.750	0.15	0.43	107.357	-5.807	0.91	0.91	96.18	6.455	<b>0.11</b>	0.26	101.238	-3.971	0.72	0.93
PIAT - Total Test	93.65	9.750	<b>0.08</b>	0.27	98.429	-1.000	0.59	0.70	89.65	8.406	<b>0.04</b>	0.12	94.095	-0.029	0.43	0.75

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 44: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care			Female School Age			Male Day Care			Male School Age		
	C Mean	Treat	P-val	C Mean	Treat	P-val	C Mean	Treat	P-val	C Mean	Treat	P-val
BSI - Global Severity Index	62.32	-6.613	<b>0.02</b>	60.200	-0.123	0.52	60.26	0.275	0.49	61.615	-3.252	0.15
BSI - Positive Symptom Distress Index	61.61	-6.857	<b>0.01</b>	57.950	1.089	0.68	56.74	1.582	0.50	60.923	-7.878	<b>0.00</b>
BSI - Positive Symptom Total	60.21	-5.974	<b>0.04</b>	59.250	-1.435	0.35	58.83	-0.040	0.54	58.962	-0.689	0.37
BSI - Anxiety	56.96	-6.548	<b>0.02</b>	55.500	-1.462	0.35	55.96	2.758	0.76	59.539	-4.539	<b>0.07</b>
BSI - Depression	59.64	-5.601	<b>0.01</b>	57.150	0.196	0.55	57.39	-2.820	0.19	55.269	0.140	0.49
BSI - Hostility	64.64	-3.768	<b>0.10</b>	63.700	-1.200	0.36	59.96	-1.814	0.30	60.231	-3.276	0.14
BSI - International Sensitivity	57.54	-4.994	<b>0.08</b>	55.300	0.200	0.53	55.22	2.818	0.88	56.692	-0.192	0.44
BSI - Obsessive-Compulsive	61.36	-5.732	<b>0.03</b>	58.800	0.854	0.65	58.65	-2.438	0.20	57.154	0.301	0.55
BSI - Paranoid Ideation	64.75	-4.375	<b>0.07</b>	64.900	-1.785	0.28	64.30	1.589	0.65	67.077	-4.668	<b>0.06</b>
BSI - Phobic Anxiety	56.82	-4.530	<b>0.05</b>	55.250	-0.058	0.53	58.39	-2.141	0.36	58.462	-2.825	0.16
BSI - sychoticism	64.71	-5.964	<b>0.04</b>	61.950	0.319	0.58	60.22	-2.360	0.20	59.000	-1.227	0.33
BSI - Somatization	54.18	-2.845	0.30	52.150	2.427	0.82	54.43	-1.613	0.17	52.731	1.087	0.62
WAIS-R Full Scale IQ Score	84.18	7.261	<b>0.02</b>	87.950	-1.246	0.72	86.52	1.550	<b>0.08</b>	85.962	1.720	0.23
WAIS-R Performance IQ Score	88.71	5.966	<b>0.07</b>	94.050	-4.124	0.93	91.30	0.946	0.21	91.308	-0.217	0.49
WAIS-R Verbal IQ Score	82.75	7.450	<b>0.01</b>	85.500	0.093	0.54	86.00	0.857	0.19	84.692	2.762	<b>0.10</b>
SWJ - Applied Problems	82.96	4.676	<b>0.07</b>	85.800	-3.319	0.94	86.91	0.158	0.37	85.423	2.168	0.20
SWJ - Calculation	83.57	10.869	<b>0.00</b>	88.650	-1.761	0.70	88.78	2.253	0.20	88.231	2.997	0.22
SWJ - Word Identification	88.32	13.079	<b>0.01</b>	94.300	-2.633	0.75	90.13	3.227	0.13	88.154	6.937	<b>0.07</b>
SWJ - Broad Math	82.39	7.767	<b>0.01</b>	86.400	-2.733	0.85	86.96	1.294	0.24	85.846	2.790	0.19
SWJ - Passage Comprehension	86.93	6.071	<b>0.08</b>	90.100	-2.063	0.77	90.78	-1.568	0.43	85.923	6.713	<b>0.01</b>
SWJ - Broad Reading	86.21	10.466	<b>0.02</b>	91.000	-2.222	0.76	89.22	1.068	0.18	85.692	7.580	<b>0.02</b>

Note: (a) “C Mean” refers to the mean value in the control group and “Treat” is the difference in means between the control and the treatment group; (b) “p-val” refers to the p-value for sigle hypothesis testing obtained by the permutation procedure and “S.D.” is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 45: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care			Female School Age			Male Day Care			Male School Age						
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
Hollingshead Occupation	2.44	1.164	<b>0.02</b>	<b>0.06</b>	3.053	-0.053	0.57	0.81	2.59	0.695	<b>0.08</b>	<b>0.22</b>	2.885	-0.066	0.62	0.74
Hollingshead Low Occupation	-0.59	-0.147	0.20	0.20	-0.737	0.070	0.71	0.71	-0.59	-0.088	0.25	0.25	-0.654	0.063	0.75	0.75
Hollingshead Education	3.78	0.570	<b>0.03</b>	<b>0.06</b>	4.053	-0.127	0.67	0.86	3.73	0.130	<b>0.09</b>	0.20	3.731	0.087	0.28	0.58
Hollingshead Junior high	-0.96	-0.037	0.36	0.36	-1.000	0.037	0.51	0.93	-0.95	-0.046	0.19	0.34	-0.962	-0.039	0.47	0.72
Hollingshead Partial college	0.11	0.324	<b>0.03</b>	<b>0.08</b>	0.316	-0.094	0.77	0.93	0.09	0.088	<b>0.05</b>	0.28	0.115	0.021	0.18	0.56
Highest grade completed	11.32	1.239	<b>0.02</b>	0.12	12.050	-0.272	0.79	0.79	11.91	0.055	0.22	0.22	11.880	0.029	0.44	0.73
University Enrollment	0.04	0.204	<b>0.03</b>	0.11	0.150	-0.039	0.76	0.97	0.09	0.199	<b>0.01</b>	<b>0.06</b>	0.192	-0.011	0.49	0.49
Married	-0.89	-0.027	0.43	0.43	-0.950	0.098	0.88	0.88	-0.96	-0.044	<b>0.10</b>	0.21	-1.000	0.046	0.96	0.99
Separated	-	-	-	-	-	-	-	-	-0.96	-0.044	0.15	0.15	-1.000	0.046	0.99	0.99
Single	0.89	0.027	0.43	0.43	0.950	-0.098	0.88	0.88	0.91	0.087	<b>0.05</b>	0.21	1.000	-0.091	0.99	0.99
Respondent's alone	15068	3741.0	0.18	0.46	13776.3	4753.7	<b>0.10</b>	0.30	14212	6621.9	0.13	0.41	14094.7	5083.8	0.15	0.36
Total Available Income	25394	6514.2	0.15	0.50	23726.5	9511.2	<b>0.06</b>	0.21	28469	1077.5	0.29	0.49	25834.1	5789.8	0.16	0.29
Are you working now? (y/n)	0.54	0.104	0.28	0.49	0.600	0.030	0.37	0.63	0.45	0.188	0.20	0.46	0.560	-0.015	0.59	0.59
Month since last held job	8.00	-4.500	0.84	0.84	7.500	-0.722	0.54	0.54	7.60	0.511	0.45	0.45	4.273	6.870	0.11	0.38
Carried a weapon? (past 30 days)	-	-	-	-	-	-	-	-	1.11	0.433	0.91	0.91	1.435	-0.119	0.37	0.69
Carried a gun? (past 30 days)	-	-	-	-	-	-	-	-	1.00	0.385	0.82	0.88	1.261	-0.050	0.46	0.46
Physical fight? (past 12 months)	1.07	-0.071	0.25	0.25	1.000	0.074	0.49	0.49	1.32	-0.124	<b>0.09</b>	0.34	1.304	-0.094	0.30	0.66
Injured in a fight? (past 12 months)	1.04	-0.036	0.25	0.25	1.000	0.037	0.49	0.49	1.11	-0.067	0.18	0.42	1.087	-0.034	0.44	0.69

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

Table 46: Comparison of Early versus Later Treatment : Female and Male (continued)

	Female Day Care				Female School Age				Male Day Care				Male School Age			
	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.	C Mean	Treat	P-val	S.D.
Smoked at least once?																
Age 30	-1.64	0.283	0.65	0.91	-1.600	0.267	0.86	0.86	-1.50	-0.278	0.13	0.13	-1.565	-0.149	0.35	0.74
Age 30 (past 30 days)	1.36	0.083	0.85	0.85	1.450	-0.006	0.53	0.82	2.55	-1.069	<b>0.09</b>	0.19	1.652	0.491	0.86	0.86
Age 30 (past 30 days)	1.07	-0.071	0.31	0.71	1.100	-0.100	<b>0.00</b>	<b>0.00</b>	1.10	-0.100	<b>0.05</b>	0.16	1.000	0.095	0.83	0.97
Age of first smoking																
Age 30	3.86	-0.457	0.55	0.94	3.600	-0.156	0.64	0.82	3.30	0.959	<b>0.05</b>	0.16	3.609	0.391	0.31	0.75
Age 30 (regularly)	3.46	-1.064	0.84	0.84	3.050	-0.124	0.51	0.74	2.95	0.532	0.22	0.53	3.087	0.151	0.43	0.77
Age 30 (past month)	2.21	-0.134	0.66	0.96	2.750	-0.824	<b>0.08</b>	0.24	2.45	0.365	0.74	0.74	2.522	0.097	0.56	0.56
Age 30 (past 6 months)	1.61	-0.127	0.53	0.97	1.700	-0.144	0.71	0.71	1.70	0.078	0.35	0.69	1.696	0.114	0.34	0.75
Age at first drink?																
Age 30	4.86	-0.537	<b>0.06</b>	0.15	5.150	-0.965	<b>0.01</b>	<b>0.03</b>	4.05	0.357	0.42	0.69	4.261	0.025	0.55	0.84
Age 30 (past 30 days)	2.11	-0.027	0.62	0.62	2.200	-0.126	0.43	0.43	2.30	0.700	0.86	0.86	2.478	0.665	0.93	0.93
Age 30 (past 30 days)	1.64	-0.243	0.47	0.57	1.750	-0.269	0.31	0.39	1.65	0.276	0.76	0.86	1.609	0.487	0.92	0.97

Note: (a) "C Mean" refers to the mean value in the control group and "Treat" is the difference in means between the control and the treatment group; (b) "p-val" refers to the p-value for single hypothesis testing obtained by the permutation procedure and "S.D." is the p-value for multiple hypothesis testing obtained by the stepdown procedure.

However, this does not necessarily mean that later intervention is useless. Tables 34–37 present results where we test for interactions between early and late treatment. The results show the presence of such interaction effect for females, such that later treatment enhances the effects of early treatment. This corresponds to the idea of “dynamic complementarity” in human skill formation (Cunha and Heckman (2008)). If early investments are complementary with later investments, then low early investments, associated with disadvantaged childhoods, make later investments less productive. In other words, high early investments have a multiplier effect and make later investments more productive. On the other hand, if early investments are followed up by later investments, their productivity could be enhanced. Our results for females provide evidence in support of this. However, somewhat surprisingly, for males, the interaction effect turns out to be negative: later investment seems deteriorating the effects of early investment rather than enhancing them. This negative effect needs to be examined in a greater detail.

#### 6.4 Center-based versus Home-visit Treatment

Lastly, Tables 47–48 and 75–100 present our results for the CARE program. Given that CARE has two treatment groups and one control group, pairwise tests were conducted. We first compare the control group (CCC) and the Family Education group (CTT), then the Family Education group and the full treatment group (TTT).<sup>42</sup> In the final block of columns, we compare the control group and the full treatment group.

The main message which emerges clearly is that the home visit based family education intervention alone do not produce desirable results. We only find positive effects when center based-service is used in combination with daycare. This finding confirms findings in the previous literature (see Wasik et al. (1990) and Burchinal et al. (1997)).

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<sup>42</sup>As described in the previous sections, the full treatment group (TTT) received all three treatment components: daycare service and family education until age 5, and school age treatment for the first three years of school. The Family Education group (CTT), instead, did not receive daycare service.

Table 47: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Cognitive Development

Variable	Age	Descriptive Statistics						Single p-values					
		Reversed		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
		CCC	CTT	TTT	TTT	CCC	CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT		
Bayley Scales of Infant Development - Mental Development Index	6M	8	9	4	106.000	110.756	113.842	0.682	0.318	0.680	0.320	0.819	0.181
Bayley Scales of Infant Development - Mental Development Index Age Placement	6M	8	9	4	6.375	6.324	6.464	0.508	0.492	0.370	0.630	0.620	0.380
Bayley Scales of Infant Development - Mental Development Index	12M	8	9	5	108.000	110.425	115.429	0.596	0.404	0.711	0.289	0.933	<b>0.067</b>
Bayley Scales of Infant Development - Mental Development Index Age Placement	12M	8	9	5	12.675	13.052	13.098	0.772	0.228	0.626	0.374	0.910	<b>0.090</b>
Bayley Scales of Infant Development - Mental Development Index	18M	8	8	5	100.375	95.344	105.714	0.191	0.809	0.746	0.254	0.831	0.169
Bayley Scales of Infant Development - Mental Development Index Age Placement	18M	8	8	5	18.450	17.501	19.441	0.146	0.854	0.742	0.258	0.817	0.183
Bayley Scales of Infant Development - Mental Development Index	24M	8	9	5	97.000	91.815	103.895	0.297	0.703	0.728	0.272	0.942	<b>0.058</b>
Bayley Scales of Infant Development - Mental Development Index Age Placement	24M	8	9	5	23.375	22.486	24.645	0.298	0.702	0.775	0.225	0.973	<b>0.027</b>
Bayley Scales of Infant Development - Psychomotor Development Index	6M	8	9	4	107.500	107.472	115.300	0.551	0.449	0.736	0.264	0.829	0.171
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	6M	8	9	4	6.762	6.328	6.873	0.267	0.733	0.449	0.551	0.591	0.409
Bayley Scales of Infant Development - Psychomotor Development Index	12M	8	9	5	110.000	102.943	111.579	0.247	0.753	0.383	0.617	0.597	0.403
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	12M	8	9	5	13.263	12.275	13.351	0.237	0.763	0.408	0.592	0.532	0.468
Bayley Scales of Infant Development - Psychomotor Development Index	18M	8	8	5	103.875	99.451	107.171	0.238	0.762	0.586	0.414	0.736	0.264
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	18M	8	8	5	20.112	18.795	20.948	0.214	0.786	0.568	0.432	0.735	0.265
Bayley Scales of Infant Development - Psychomotor Development Index	24M	8	9	5	103.250	99.639	105.362	0.250	0.749	0.792	0.208	0.689	0.311
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	24M	8	9	5	24.712	24.118	25.263	0.321	0.679	0.769	0.231	0.770	0.230
Stanford Binet IQ Score	24M	8	9	5	89.250	89.038	93.614	0.532	0.468	0.637	0.363	0.819	0.181
Stanford Binet IQ Score	36M	8	9	4	89.500	89.496	98.181	0.653	0.347	0.710	0.290	0.953	<b>0.047</b>
Stanford Binet IQ Score	48M	8	9	4	95.500	94.279	97.639	0.430	0.570	0.639	0.361	0.693	0.307
Stanford Binet IQ Score	60M	8	9	3	94.125	91.414	96.705	0.324	0.676	0.348	0.652	0.609	0.391
McCarthy Scales of Children's Development - General Cognitive	30M	8	9	5	96.250	96.666	100.521	0.621	0.379	0.672	0.328	0.885	0.115
McCarthy Scales of Children's Development - General Cognitive	42M	8	9	4	96.875	99.545	105.469	0.638	0.362	0.589	0.411	0.856	0.144
McCarthy Scales of Children's Development - General Cognitive	54M	8	9	3	93.625	92.384	102.193	0.424	0.576	0.784	0.216	0.928	<b>0.072</b>
Bankson Total Raw Scores: Items 1 to 64	54M	8	9	3	92.000	90.098	100.695	0.451	0.549	0.715	0.285	0.937	<b>0.063</b>
Miller-Yoder Correct: Individual Items, sum	54M	8	9	3	57.375	49.662	58.397	0.180	0.820	0.665	0.335	0.543	0.457
Kaufman Standardized Score: Sequential Processing	72M	8	9	4	104.250	110.456	112.638	0.720	0.280	0.759	0.241	0.892	0.108
Kaufman Standardized Score: Simultaneous Processing	72M	8	9	4	98.500	101.852	105.714	0.752	0.248	0.544	0.456	0.828	0.172
Kaufman Standardized Score: Mental Processing	72M	8	9	4	101.000	105.990	109.516	0.734	0.266	0.692	0.308	0.877	0.123

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 48: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	TTT	TTT	CTT	TTT	CCC	CTT
Bayley Scales of Infant Development - Mental Development Index	6M		13	15	9	103.692	102.526	106.365	0.398	0.602	0.579	0.421	0.733	0.267
Bayley Scales of Infant Development - Mental Development Index Age Placement	6M		13	15	9	6.146	6.115	6.362	0.436	0.564	0.588	0.412	0.780	0.220
Bayley Scales of Infant Development - Mental Development Index	12M		12	15	9	108.250	106.546	116.815	0.378	0.622	0.990	0.009	0.944	0.056
Bayley Scales of Infant Development - Mental Development Index Age Placement	12M		12	15	9	12.742	12.640	13.497	0.402	0.598	0.982	0.018	0.957	0.043
Bayley Scales of Infant Development - Mental Development Index	18M		12	15	9	106.500	98.671	115.826	0.046	0.954	1.000	0.000	0.959	0.041
Bayley Scales of Infant Development - Mental Development Index Age Placement	18M		12	15	9	19.033	18.494	20.204	0.205	0.795	0.999	0.001	0.936	0.064
Bayley Scales of Infant Development - Mental Development Index	24M		12	15	9	96.667	89.704	111.069	0.094	0.906	1.000	0.000	0.990	0.010
Bayley Scales of Infant Development - Mental Development Index Age Placement	24M		12	15	9	23.600	22.512	25.472	0.140	0.860	1.000	0.000	0.975	0.024
Bayley Scales of Infant Development - Psychomotor Development Index	6M		13	15	9	107.154	106.231	113.395	0.411	0.589	0.935	0.065	0.973	0.027
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	6M		13	15	9	6.531	6.461	6.962	0.331	0.669	0.988	0.012	0.996	0.004
Bayley Scales of Infant Development - Psychomotor Development Index	12M		12	15	9	104.667	107.186	109.616	0.705	0.295	0.826	0.174	0.935	0.065
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	12M		12	15	9	12.542	13.055	13.245	0.824	0.176	0.730	0.270	0.945	0.055
Bayley Scales of Infant Development - Psychomotor Development Index	18M		12	15	9	99.833	103.350	103.961	0.797	0.203	0.678	0.322	0.807	0.193
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	18M		12	15	9	18.783	20.354	19.544	0.947	0.053	0.271	0.729	0.752	0.248
Bayley Scales of Infant Development - Psychomotor Development Index	24M		11	15	9	97.364	100.341	106.375	0.693	0.307	0.928	0.072	0.909	0.091
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	24M		11	15	9	24.100	24.825	25.570	0.724	0.276	0.910	0.090	0.880	0.120
Stanford Binet IQ Score	24M		12	15	9	90.083	82.679	99.809	0.082	0.918	1.000	0.000	0.962	0.038
Stanford Binet IQ Score	36M		12	14	9	96.333	92.206	102.396	0.179	0.821	0.999	0.001	0.885	0.115
Stanford Binet IQ Score	48M		12	14	9	95.583	92.141	98.931	0.192	0.808	0.990	0.010	0.743	0.257
Stanford Binet IQ Score	60M		12	13	9	97.583	92.069	96.998	0.105	0.895	0.996	0.004	0.413	0.587
McCarthy Scales of Children's Development - General Cognitive	30M		12	14	9	102.250	90.913	105.078	0.033	0.967	0.999	0.001	0.659	0.341
McCarthy Scales of Children's Development - General Cognitive	42M		12	13	9	97.917	93.584	103.227	0.190	0.811	0.997	0.003	0.867	0.133
McCarthy Scales of Children's Development - General Cognitive	54M		12	14	9	98.667	93.693	100.732	0.125	0.875	0.988	0.012	0.680	0.320
Bankson Total Raw Scores: Items 1 to 64	54M		12	13	9	98.583	93.972	101.998	0.195	0.805	0.967	0.033	0.783	0.217
Miller-Yoder Correct Individual Items, sum	54M		12	13	9	57.583	53.705	57.560	0.115	0.885	0.955	0.045	0.420	0.580
Kaufman Standardized Score: Sequential Processing	72M		12	13	9	98.167	91.478	102.857	0.105	0.895	0.992	0.008	0.802	0.198
Kaufman Standardized Score: Simultaneous Processing	72M		12	13	9	98.417	96.721	108.663	0.325	0.675	1.000	0.000	0.994	0.006
Kaufman Standardized Score: Mental Processing	72M		12	13	9	98.000	93.938	106.974	0.176	0.824	1.000	0.000	0.976	0.024

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 49: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		7	8	3	18.857	19.032	19.923	0.916	0.493	0.338	0.266	0.359	0.179
Classroom Behavior Inventory - Creativity	72M		7	8	3	12.714	13.027	15.147	0.908	0.356	0.702	0.414	0.279	0.175
Classroom Behavior Inventory - Distractibility	72M	Yes	7	8	3	-10.714	-10.175	-11.074	0.490	0.311	0.979	0.515	0.826	0.591
Classroom Behavior Inventory - Independence	72M		7	8	3	12.286	15.491	13.744	0.232	0.147	0.683	0.725	0.613	0.304
Classroom Behavior Inventory - Hostility	72M	Yes	7	8	3	-8.000	-5.968	-10.041	<b>0.098</b>	<b>0.087</b>	0.766	0.715	0.496	0.767
Classroom Behavior Inventory - Verbal Intelligence	72M		7	8	3	11.857	12.599	14.288	0.803	0.313	0.425	0.220	0.350	0.193
Classroom Behavior Inventory - Task Orientation	72M		7	8	3	13.000	14.836	12.096	0.410	0.230	0.598	0.673	0.712	0.638
Classroom Behavior Inventory - Introversion	72M		7	8	3	7.714	7.016	8.326	0.676	0.511	0.575	0.757	0.682	0.365
Classroom Behavior Inventory - Considerateness	72M		6	8	3	15.500	16.812	13.565	0.302	0.282	0.664	0.678	0.402	0.807
Classroom Behavior Inventory - Dependence	72M	Yes	7	8	3	-9.714	-6.830	-9.586	<b>0.074</b>	<b>0.073</b>	0.474	0.166	0.950	0.477
Classroom Behavior Inventory - Extraversion	8		8	9	3	18.375	17.950	19.302	0.849	0.512	0.480	0.404	0.541	0.276
Classroom Behavior Inventory - Creativity	8		8	9	3	15.000	14.380	15.088	0.723	0.641	0.520	0.701	0.933	0.475
Classroom Behavior Inventory - Distractibility	8	Yes	8	9	3	-9.500	-10.391	-10.238	0.550	0.896	0.220	0.809	0.522	0.744
Classroom Behavior Inventory - Independence	8		8	9	3	13.750	15.741	14.914	0.355	0.321	0.927	0.329	0.572	0.289
Classroom Behavior Inventory - Hostility	8	Yes	8	9	3	-7.250	-8.847	-8.367	0.354	0.933	0.623	0.678	0.677	0.666
Classroom Behavior Inventory - Verbal Intelligence	8		8	9	3	13.250	13.224	14.339	0.990	0.624	0.873	0.486	0.392	0.234
Classroom Behavior Inventory - Task Orientation	8		8	9	3	14.875	14.577	14.597	0.905	0.727	0.534	0.549	0.867	0.562
Classroom Behavior Inventory - Introversion	8		8	9	3	6.500	8.577	6.330	0.151	<b>0.053</b>	0.257	0.836	0.839	0.546
Classroom Behavior Inventory - Considerateness	8		8	9	3	15.875	14.806	15.027	0.615	0.859	0.746	0.536	0.732	0.634
Classroom Behavior Inventory - Dependence	8	Yes	8	9	3	-9.625	-7.025	-8.013	0.115	0.115	0.786	0.225	0.410	0.181
Achenbach Teacher - School Performance	8		8	9	3	45.500	47.766	46.765	0.546	0.397	0.383	0.332	0.773	0.395
Achenbach Teacher - Works Hard	8		8	9	3	51.750	49.330	45.617	0.647	0.737	0.436	0.642	0.237	0.846
Achenbach Teacher - Behaves Appropriately	8		8	9	3	46.000	44.639	41.236	0.805	0.749	0.440	0.690	0.254	0.869
Achenbach Teacher - Learns	8		8	9	3	46.375	50.249	43.864	0.507	0.663	0.624	0.565	0.609	0.679
Achenbach Teacher - Happy	8		8	9	3	49.500	46.245	40.443	0.548	0.741	0.911	0.589	0.291	0.833
Harter Self-Perception Assessment - Teacher - Cognitive	12		8	9	4	2.625	2.441	2.896	0.544	0.771	0.525	0.237	0.463	0.246
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		8	9	4	2.839	2.835	2.744	0.984	0.536	0.248	0.821	0.666	0.661
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		8	9	4	2.804	2.812	2.820	0.977	0.205	0.896	0.637	0.966	0.504
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		8	9	4	3.125	3.079	3.035	0.892	0.257	0.124	<b>0.099</b>	0.737	0.640
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		8	9	4	2.875	2.815	2.528	0.870	0.441	0.990	0.691	0.545	0.741
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		8	9	4	3.313	3.493	3.627	0.457	0.217	0.362	0.771	0.449	0.232
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		8	9	4	2.813	2.340	3.270	0.189	0.906	0.190	0.135	0.151	<b>0.091</b>
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		8	9	4	3.500	3.541	3.575	0.877	0.430	0.459	0.656	0.865	0.449
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		8	9	4	2.813	2.413	2.929	0.193	0.853	0.639	0.379	0.711	0.346

Note: “CCC”, “CTT”, and “TTT” refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother’s working status before pregnancy, father’s presence at home at the subject’s birth, the number of older siblings in the household, and mother’s IQ.

Table 50: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values								
			Obs.			Means			CCC vs CTT			CTT vs TTT					
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CCC=CTT	CTT>TTT	CTT<TTT	CTT=TTT	CCC>TTT	CCC<TTT	CCC=TTT
Classroom Behavior Inventory - Considerateness	12		4	4	3	9.500	16.087	9.952	<b>0.067</b>	<b>0.053</b>		0.975	0.230		0.819	0.397	
Classroom Behavior Inventory - Creativity	12		4	4	3	11.500	9.206	12.746	0.213	0.844		0.276	0.227		0.625	0.284	
Classroom Behavior Inventory - Dependence	12	Yes	4	4	3	-11.000	-7.800	-10.419	<b>0.009</b>	<b>0.009</b>		0.384	0.744		0.757	0.379	
Classroom Behavior Inventory - Distractibility	12	Yes	4	4	3	-12.500	-8.359	-12.185	<b>0.029</b>	<b>0.020</b>		0.499	0.570		0.431	0.230	
Classroom Behavior Inventory - Extraversion	12		4	4	3	15.000	12.359	15.841	0.278	0.773		0.241	0.228		0.633	0.322	
Classroom Behavior Inventory - Hostility	12	Yes	4	4	3	-9.500	-6.999	-10.424	0.279	0.199		0.611	0.201		0.577	0.686	
Classroom Behavior Inventory - Independence	12		4	4	3	10.500	14.659	11.002	<b>0.039</b>	<b>0.030</b>		0.472	0.661		0.827	0.421	
Classroom Behavior Inventory - Introversiion	12		4	4	3	7.750	8.778	7.666	0.314	0.236		0.148	0.865		0.851	0.590	
Classroom Behavior Inventory - Task Orientation	12		4	4	3	9.500	14.156	9.134	0.133	0.109		0.462	0.658		0.847	0.600	
Classroom Behavior Inventory - Verbal Intelligence	12		4	4	3	11.000	11.409	12.309	0.813	0.378		0.721	0.547		0.544	0.262	
Child's Behavior Toward Teacher - Control	12		4	4	3	15.750	11.456	15.501	<b>0.066</b>	0.947		0.774	0.787		0.707	0.657	
Child's Behavior Toward Teacher - Detachment	12		4	4	3	8.750	9.185	9.159	0.591	0.273		0.350	0.741		0.673	0.351	
Child's Behavior Toward Teacher - Obedient	12	Yes	4	4	3	-11.750	-14.508	-12.410	0.126	0.904		0.969	0.680		0.781	0.617	
Child's Behavior Toward Teacher - Positive Involvement	12		4	4	3	14.500	12.368	14.863	<b>0.082</b>	0.940		0.183	0.143		0.773	0.409	
Achenbach Parent - Total Competence	12		8	8	4	40.125	41.175	46.972	0.794	0.423		0.673	0.646		<b>0.077</b>	<b>0.049</b>	
Achenbach Parent - Activities	12		8	8	4	44.000	44.596	49.742	0.863	0.456		0.820	0.335		0.171	0.100	
Achenbach Parent - Social	12		8	8	4	42.125	41.131	47.308	0.731	0.643		0.568	0.822		0.257	0.137	
Achenbach Parent - School	12		8	8	4	40.500	40.285	45.948	0.963	0.600		0.584	0.809		0.210	<b>0.089</b>	

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 51: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		10	11	8	20.000	19.154	17.122	0.206	0.794	0.261	0.739	0.017	0.984
Classroom Behavior Inventory - Creativity	72M		10	11	7	15.300	14.604	13.083	0.263	0.737	0.503	0.497	0.040	0.960
Classroom Behavior Inventory - Distractibility	72M	Yes	10	11	8	-8.300	-9.562	-10.688	0.072	0.928	0.429	0.571	0.035	0.965
Classroom Behavior Inventory - Independence	72M		10	11	8	16.600	14.328	13.498	0.085	0.915	0.362	0.639	0.063	0.937
Classroom Behavior Inventory - Hostility	72M	Yes	10	11	7	-6.400	-8.805	-9.050	0.010	0.990	0.222	0.779	0.006	0.995
Classroom Behavior Inventory - Verbal Intelligence	72M		10	10	8	13.700	12.373	11.481	0.080	0.920	0.762	0.238	0.041	0.959
Classroom Behavior Inventory - Task Orientation	72M		10	11	8	16.800	14.707	13.166	0.081	0.920	0.138	0.862	0.039	0.961
Classroom Behavior Inventory - Introversion	72M		10	11	8	5.800	5.808	7.073	0.508	0.493	0.736	0.264	0.880	0.120
Classroom Behavior Inventory - Considerateness	72M		10	10	8	18.100	14.982	14.075	0.017	0.984	0.282	0.718	0.009	0.991
Classroom Behavior Inventory - Dependence	72M	Yes	10	11	8	-6.700	-6.749	-6.807	0.479	0.521	0.515	0.485	0.515	0.485
Classroom Behavior Inventory - Extraversion	8		13	14	9	18.385	17.463	18.563	0.194	0.806	0.599	0.401	0.487	0.513
Classroom Behavior Inventory - Creativity	8		13	14	9	16.077	15.193	17.006	0.261	0.739	0.645	0.355	0.622	0.378
Classroom Behavior Inventory - Distractibility	8	Yes	13	14	9	-10.000	-11.223	-10.716	0.171	0.829	0.359	0.641	0.292	0.708
Classroom Behavior Inventory - Independence	8		13	14	9	16.000	13.632	11.672	0.073	0.927	0.035	0.965	0.009	0.991
Classroom Behavior Inventory - Hostility	8	Yes	13	14	9	-8.308	-9.535	-8.433	0.145	0.855	0.686	0.314	0.477	0.523
Classroom Behavior Inventory - Verbal Intelligence	8		13	14	9	14.308	12.577	13.455	0.087	0.913	0.632	0.368	0.243	0.757
Classroom Behavior Inventory - Task Orientation	8		13	13	9	15.308	12.914	13.016	0.106	0.894	0.242	0.758	0.123	0.877
Classroom Behavior Inventory - Introversion	8		13	14	9	6.000	7.518	6.827	0.952	0.048	0.359	0.641	0.820	0.181
Classroom Behavior Inventory - Considerateness	8		12	14	9	15.417	13.458	16.796	0.057	0.943	0.732	0.268	0.798	0.202
Classroom Behavior Inventory - Dependence	8	Yes	13	14	9	-6.923	-8.261	-9.530	0.112	0.888	0.043	0.957	0.014	0.986
Achenbach Teacher - School Performance			13	14	9	46.846	42.128	45.458	0.107	0.893	0.751	0.249	0.324	0.676
Achenbach Teacher - Works Hard			13	14	9	54.077	46.612	48.866	0.067	0.933	0.269	0.731	0.143	0.857
Achenbach Teacher - Behaves Appropriately			13	14	9	48.462	43.244	43.727	0.125	0.876	0.162	0.838	0.130	0.870
Achenbach Teacher - Learns			13	14	9	48.385	44.590	46.821	0.189	0.811	0.439	0.561	0.321	0.679
Achenbach Teacher - Happy			13	14	8	52.231	42.196	47.087	0.018	0.982	0.709	0.291	0.181	0.819
Harter Self-Perception Assessment - Teacher - Cognitive	12		12	14	9	3.036	2.866	2.442	0.251	0.749	0.260	0.740	0.008	0.992
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		12	14	9	3.440	3.280	2.765	0.129	0.871	0.115	0.885	0.002	0.998
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		12	14	9	3.298	3.324	3.117	0.551	0.450	0.216	0.784	0.217	0.783
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		12	14	9	3.560	3.323	3.220	0.094	0.906	0.405	0.595	0.086	0.914
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		12	14	9	2.958	2.728	3.472	0.256	0.744	0.952	0.049	0.876	0.124
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		12	14	9	3.542	3.518	3.537	0.477	0.523	0.825	0.175	0.425	0.575
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		12	14	9	2.542	2.350	3.059	0.259	0.741	0.978	0.022	0.941	0.059
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		12	14	9	3.667	3.590	3.617	0.353	0.647	0.487	0.513	0.376	0.624
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		12	14	9	2.667	2.450	2.746	0.231	0.769	0.923	0.077	0.586	0.414

Note: “CCC”, “CTT”, and “TTT” refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother’s working status before pregnancy, father’s presence at home at the subject’s birth, the number of older siblings in the household, and mother’s IQ.

Table 52: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	CCC	CTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT		
Classroom Behavior Inventory - Considerateness	12		8	8	17,000	14,408	14,349	14,349	0.131	0.869	0.679	0.321	0.132	0.868
Classroom Behavior Inventory - Creativity	12		8	8	14,125	13,082	14,345	14,345	0.319	0.681	0.851	0.149	0.552	0.448
Classroom Behavior Inventory - Dependence	12	Yes	8	8	-6,125	-7,909	-7,059	-7,059	<b>0.072</b>	0.928	0.221	0.779	0.112	0.888
Classroom Behavior Inventory - Distractibility	12	Yes	8	8	-11,125	-10,285	-11,576	-11,576	0.711	0.289	0.568	0.432	0.380	0.620
Classroom Behavior Inventory - Extraversion	12		8	8	19,625	19,054	18,057	18,057	0.348	0.652	0.750	0.250	0.143	0.857
Classroom Behavior Inventory - Hostility	12	Yes	8	8	-8,125	-9,066	-11,744	-11,744	0.269	0.731	<b>0.062</b>	0.938	<b>0.041</b>	0.959
Classroom Behavior Inventory - Independence	12		8	8	14,875	12,681	13,645	13,645	0.104	0.896	0.378	0.622	0.238	0.762
Classroom Behavior Inventory - Introversian	12		8	8	6,125	7,248	6,662	6,662	0.908	<b>0.092</b>	0.139	0.861	0.765	0.235
Classroom Behavior Inventory - Task Orientation	12		8	8	13,000	11,880	11,674	11,674	0.339	0.661	0.833	0.167	0.319	0.681
Classroom Behavior Inventory - Verbal Intelligence	12		8	8	12,500	11,512	12,569	12,569	0.277	0.723	0.557	0.443	0.482	0.518
Child's Behavior Toward Teacher - Control	12		8	8	12,000	12,054	14,230	14,230	0.515	0.485	0.848	0.152	0.837	0.163
Child's Behavior Toward Teacher - Detachment	12		8	8	9,000	9,610	6,626	6,626	0.628	0.372	<b>0.029</b>	0.971	<b>0.063</b>	0.937
Child's Behavior Toward Teacher - Obedient	12	Yes	8	8	-15,000	-13,699	-13,045	-13,045	0.779	0.221	0.253	0.747	0.890	0.110
Child's Behavior Toward Teacher - Positive Involvement	12		8	8	13,625	13,717	13,207	13,207	0.511	0.489	0.598	0.402	0.434	0.566
Achenbach Parent - Total Competence	12		12	14	43,750	41,952	47,449	47,449	0.282	0.718	0.969	<b>0.032</b>	0.902	<b>0.098</b>
Achenbach Parent - Activities	12		12	14	47,833	46,209	46,210	46,210	0.262	0.738	0.607	0.393	0.243	0.757
Achenbach Parent - Social	12		12	14	44,333	43,485	49,331	49,331	0.419	0.582	0.873	0.127	0.875	0.125
Achenbach Parent - School	12		12	14	43,667	40,866	44,975	44,975	0.238	0.762	0.952	<b>0.049</b>	0.669	0.331

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 53: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics										Single p-values					
			Obs.			Means			CCC vs CTT			CTT vs TTT			CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		8	9	3	26.000	24.296	31.455	0.444	0.837	0.156	0.044	0.120	0.053				
HOME - Total	12M		8	7	5	26.250	25.757	27.875	0.824	0.608	0.260	0.139	0.584	0.290				
HOME - Total	18M		8	8	5	25.250	29.774	29.405	<b>0.072</b>	<b>0.055</b>	0.520	0.285	0.117	<b>0.070</b>				
HOME - Total	30M		8	9	5	28.500	29.731	32.586	0.508	0.424	0.867	0.197	<b>0.078</b>	<b>0.035</b>				
HOME - Total	42M		8	9	4	55.875	57.125	61.937	0.746	0.471	0.157	<b>0.076</b>	0.217	0.107				
HOME - Total	54M		8	9	3	56.000	56.439	63.159	0.918	0.518	0.481	0.206	0.215	0.121				
Knowledge of Infant Development Inventory : Attempted	30M		7	8	4	0.885	0.844	0.872	0.240	0.884	0.203	0.123	0.459	0.779				
Knowledge of Infant Development Inventory : Accuracy	30M		7	8	4	0.763	0.755	0.762	0.795	0.521	0.445	0.270	0.970	0.575				
Knowledge of Infant Development Inventory : Corret	30M		7	8	4	0.676	0.637	0.665	0.189	0.883	<b>0.064</b>	<b>0.040</b>	0.687	0.709				
Family Environment Scale - Child - Cohesion	12		8	9	4	46.500	55.250	54.460	0.269	0.135	0.398	0.701	0.382	0.207				
Family Environment Scale - Child - Expressiveness	12		8	9	4	44.750	42.301	44.344	0.632	0.717	0.851	0.221	0.944	0.554				
Family Environment Scale - Child - Conflict	12	Yes	8	9	4	-47.750	-46.403	-46.122	0.825	0.401	0.514	0.567	0.803	0.396				
Family Environment Scale - Child - Independence	12		8	9	4	33.250	45.912	39.310	<b>0.038</b>	<b>0.030</b>	0.830	0.420	0.297	0.142				
Family Environment Scale - Child - Achievement Orientation	12		8	9	4	47.125	53.730	53.731	<b>0.094</b>	<b>0.019</b>	0.456	0.670	0.357	0.175				
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		8	9	4	42.000	53.726	47.611	<b>0.021</b>	<b>0.015</b>	0.517	0.807	0.335	0.157				
Family Environment Scale - Child - Active-Recreational Orientation	12		8	9	4	47.375	58.209	46.841	<b>0.063</b>	<b>0.002</b>	0.274	0.901	0.914	0.530				
Family Environment Scale - Child - Moral-Religious Emphasis	12		8	9	4	52.375	58.253	57.907	0.125	<b>0.044</b>	0.475	0.324	0.164	<b>0.086</b>				
Family Environment Scale - Child - Organization	12		8	9	4	51.875	49.966	51.372	0.653	0.582	0.914	0.342	0.955	0.508				
Family Environment Scale - Child - Control	12		8	9	4	52.250	54.394	56.896	0.618	0.264	0.676	0.728	0.295	0.153				
Family Environment Scale - Parent - Cohesion	12		8	7	4	44.750	54.349	41.859	0.178	<b>0.095</b>	0.294	0.747	0.758	0.619				
Family Environment Scale - Parent - Expressiveness	12		8	7	4	53.375	54.153	47.740	0.865	0.306	0.217	0.845	0.251	0.800				
Family Environment Scale - Parent - Conflict	12	Yes	8	7	4	-51.125	-40.853	-54.353	<b>0.063</b>	<b>0.043</b>	0.363	0.654	0.651	0.672				
Family Environment Scale - Parent - Independence	12		8	7	4	49.000	52.340	47.517	0.612	0.322	0.730	0.443	0.867	0.582				
Family Environment Scale - Parent - Achievement Orientation	12		8	7	4	56.375	57.756	58.668	0.645	0.479	0.431	0.682	0.482	0.250				
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		8	7	4	45.625	49.373	50.718	0.447	0.289	0.856	0.548	0.431	0.218				
Family Environment Scale - Parent - Active-Recreational Orientation	12		8	7	4	39.750	50.702	44.135	<b>0.087</b>	<b>0.030</b>	0.789	0.582	0.439	0.243				
Family Environment Scale - Parent - Moral-Religious Emphasis	12		8	7	4	56.500	64.752	62.484	<b>0.022</b>	<b>0.013</b>	0.771	0.680	<b>0.065</b>	<b>0.031</b>				
Family Environment Scale - Parent - Organization	12		8	7	4	55.250	50.010	57.465	0.383	0.817	0.270	0.170	0.671	0.354				
Family Environment Scale - Parent - Control	12		8	7	4	58.500	55.078	65.490	0.461	0.909	0.524	0.344	<b>0.083</b>	<b>0.053</b>				

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 54: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		13	15	9	30.308	26.082	30.269	0.031	0.969	0.951	0.050	0.316	0.684
HOME - Total	12M		12	14	9	29.500	30.744	33.803	0.698	0.302	0.993	0.008	0.950	0.050
HOME - Total	18M		12	14	9	33.667	29.738	32.310	0.037	0.963	0.974	0.026	0.155	0.845
HOME - Total	30M		12	13	9	31.500	30.046	32.078	0.271	0.729	0.673	0.327	0.509	0.491
HOME - Total	42M		11	13	9	57.818	55.045	60.818	0.271	0.730	0.963	0.037	0.716	0.284
HOME - Total	54M		12	13	9	65.167	58.935	64.883	0.026	0.974	0.967	0.034	0.326	0.674
Knowledge of Infant Development Inventory : Attempted	30M		11	12	6	0.838	0.825	0.852	0.402	0.599	0.919	0.082	0.657	0.343
Knowledge of Infant Development Inventory : Accuracy	30M		11	12	6	0.729	0.720	0.760	0.390	0.610	0.897	0.103	0.836	0.164
Knowledge of Infant Development Inventory : Corret	30M		11	12	6	0.618	0.596	0.647	0.337	0.663	0.977	0.023	0.734	0.267
Family Environment Scale - Child - Cohesion	12		12	14	9	54.167	56.671	51.266	0.725	0.275	0.132	0.868	0.251	0.749
Family Environment Scale - Child - Expressiveness	12		12	14	9	44.000	42.373	43.739	0.296	0.704	0.782	0.218	0.443	0.557
Family Environment Scale - Child - Conflict	12	Yes	12	14	9	-44.417	-45.983	-47.727	0.350	0.650	0.288	0.712	0.191	0.809
Family Environment Scale - Child - Independence	12		12	14	9	48.333	46.414	46.504	0.362	0.638	0.422	0.578	0.316	0.684
Family Environment Scale - Child - Achievement Orientation	12		12	14	9	58.583	56.291	62.202	0.214	0.786	0.970	0.030	0.895	0.105
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		12	14	9	48.833	50.241	49.253	0.645	0.355	0.143	0.857	0.524	0.476
Family Environment Scale - Child - Active-Recreational Orientation	12		12	14	9	52.333	51.708	55.548	0.423	0.577	0.833	0.168	0.814	0.186
Family Environment Scale - Child - Moral-Religious Orientation	12		12	14	9	55.500	58.302	56.009	0.842	0.158	0.662	0.338	0.540	0.460
Family Environment Scale - Child - Organization	12		12	14	9	51.000	54.473	56.263	0.810	0.191	0.756	0.244	0.899	0.101
Family Environment Scale - Child - Control	12		12	14	9	59.250	57.110	56.139	0.233	0.767	0.424	0.576	0.111	0.889
Family Environment Scale - Parent - Cohesion	12		12	14	9	52.333	50.350	56.458	0.345	0.655	0.969	0.031	0.769	0.231
Family Environment Scale - Parent - Expressiveness	12		12	14	9	52.417	51.143	51.887	0.378	0.622	0.896	0.104	0.435	0.565
Family Environment Scale - Parent - Conflict	12	Yes	12	14	9	-50.083	-51.232	-46.100	0.400	0.600	0.995	0.005	0.795	0.205
Family Environment Scale - Parent - Independence	12		12	14	9	48.333	54.423	53.804	0.893	0.107	0.699	0.301	0.903	0.097
Family Environment Scale - Parent - Achievement Orientation	12		12	14	9	53.833	57.385	54.275	0.903	0.097	0.318	0.682	0.562	0.438
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		12	14	9	55.667	51.372	53.292	0.208	0.792	0.776	0.224	0.331	0.669
Family Environment Scale - Parent - Active-Recreational Orientation	12		12	14	9	52.083	50.823	53.197	0.372	0.628	0.628	0.345	0.655	0.683
Family Environment Scale - Parent - Moral-Religious Emphasis	12		12	14	9	60.333	57.552	59.943	0.186	0.814	0.913	0.087	0.373	0.627
Family Environment Scale - Parent - Organization	12		12	14	9	53.750	50.400	55.754	0.226	0.774	0.862	0.138	0.676	0.324
Family Environment Scale - Parent - Control	12		12	14	9	55.667	60.050	60.206	0.906	0.094	0.280	0.720	0.911	0.089

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 55: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Health

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.			Means			CCC vs CTT		CTT vs TTT		CCC vs TTT	
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		8	9	4	7.738	7.349	7.445	0.300	0.782	<b>0.063</b>	<b>0.051</b>	0.401	0.786
Weight in kg	12M		8	7	5	10.150	9.447	9.681	<b>0.086</b>	0.920	0.288	0.178	<b>0.067</b>	0.963
Weight in kg	18M		8	8	5	11.813	11.689	11.218	0.804	0.487	0.953	0.402	0.262	0.880
Weight in kg	24M		7	9	5	13.386	12.517	12.922	0.124	0.914	0.956	0.461	0.487	0.760
Weight in kg	36M		8	9	3	15.225	14.668	15.157	0.347	0.780	0.136	<b>0.032</b>	0.834	0.588
Weight in kg	48M		7	9	4	17.643	17.060	18.183	0.528	0.623	0.148	<b>0.049</b>	0.447	0.196
Weight in kg	60M		7	9	3	20.886	19.343	22.915	0.274	0.807	<b>0.059</b>	<b>0.016</b>	0.147	<b>0.087</b>
Weight in kg	8		8	7	2	32.341	30.942	37.742	0.727	0.488	0.382	0.189	0.270	0.145
Height in cm	6M		8	9	4	66.000	65.678	66.081	0.725	0.690	0.280	<b>0.025</b>	0.910	0.469
Height in cm	12M		8	7	5	74.750	75.331	73.984	0.650	0.276	0.946	0.481	0.592	0.732
Height in cm	18M		8	8	5	81.750	82.393	82.214	0.602	0.314	0.937	0.304	0.619	0.317
Height in cm	24M		7	9	5	87.857	87.101	87.409	0.462	0.832	0.539	0.517	0.773	0.641
Height in cm	36M		8	9	3	96.000	96.737	97.861	0.535	0.307	0.596	0.149	0.195	0.111
Height in cm	48M		7	9	4	104.429	105.325	105.773	0.604	0.278	0.953	0.337	0.393	0.215
Height in cm	60M		7	9	3	113.286	112.903	116.630	0.843	0.531	0.304	<b>0.085</b>	0.215	0.109
Height in cm	8		8	7	2	129.621	131.420	135.121	0.495	0.114	0.303	<b>0.052</b>	0.280	0.144
Brief Symptom Inventory - Somatization	21	Yes	7	9	4	-50.143	-53.664	-46.230	0.438	0.723	0.471	0.529	0.793	0.207
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	7	9	4	-57.571	-55.614	-53.073	0.607	0.213	0.385	0.615	0.887	0.113
Brief Symptom Inventory - Interpersonal Sens	21	Yes	7	9	4	-54.571	-53.704	-49.508	0.863	0.457	0.476	0.524	0.872	0.128
Brief Symptom Inventory - Depression	21	Yes	7	9	4	-55.571	-52.880	-51.290	0.561	0.311	0.387	0.613	0.824	0.176
Brief Symptom Inventory - Anxiety	21	Yes	7	9	4	-52.571	-53.664	-48.147	0.795	0.519	0.393	0.607	0.899	0.101
Brief Symptom Inventory - Hostility	21	Yes	7	9	4	-63.857	-57.765	-57.081	0.119	<b>0.033</b>	0.389	0.611	0.954	<b>0.046</b>
Brief Symptom Inventory - Psychoticism	21	Yes	7	9	4	-54.857	-52.834	-47.348	0.655	0.267	0.686	0.314	0.928	<b>0.072</b>
Brief Symptom Inventory - Global Severity Index	21	Yes	7	9	4	-66.857	-62.593	-59.957	<b>0.082</b>	<b>0.025</b>	0.478	0.522	0.945	<b>0.055</b>
Brief Symptom Inventory - Positive Symptom total	21	Yes	7	9	4	-64.286	-58.488	-55.819	0.133	<b>0.098</b>	0.588	0.412	0.939	<b>0.061</b>
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	7	9	4	-60.429	-56.888	-54.455	0.279	<b>0.088</b>	0.362	0.638	0.943	<b>0.057</b>
Brief Symptom Inventory - Phobic Anxiety	21	Yes	7	9	4	-60.143	-54.930	-52.223	0.231	0.102	0.361	0.639	0.954	<b>0.046</b>
Brief Symptom Inventory - Paranoid ideation	21	Yes	7	9	4	-59.714	-58.251	-56.866	0.608	0.119	0.509	0.491	0.860	0.140

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 56: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Health

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.			Means			CCC vs CTT		CTT vs TTT		CCC vs TTT	
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		12	15	9	7.908	8.271	8.062	0.863	0.137	0.350	0.650	0.637	0.363
Weight in kg	12M		12	13	9	10.175	10.747	10.619	0.889	0.111	0.405	0.595	0.788	0.213
Weight in kg	18M		12	13	9	11.483	11.863	12.185	0.767	0.233	0.485	0.515	0.850	0.150
Weight in kg	24M		12	14	9	13.075	12.901	13.976	0.372	0.628	0.938	<b>0.062</b>	0.848	0.152
Weight in kg	36M		10	12	9	14.560	15.135	15.631	0.798	0.202	0.884	0.116	0.797	0.203
Weight in kg	48M		12	14	9	16.983	17.168	18.701	0.590	0.410	0.968	<b>0.032</b>	0.919	<b>0.081</b>
Weight in kg	60M		9	11	9	19.489	19.163	20.866	0.389	0.611	0.993	<b>0.007</b>	0.773	0.227
Weight in kg	8		12	14	9	28.446	29.320	32.436	0.609	0.391	0.792	0.209	0.888	0.112
Height in cm	6M		12	15	9	67.417	68.148	67.031	0.771	0.229	0.180	0.820	0.335	0.665
Height in cm	12M		12	13	9	76.250	76.679	76.839	0.635	0.365	0.542	0.458	0.745	0.255
Height in cm	18M		12	13	9	82.333	82.291	81.050	0.489	0.511	0.251	0.749	0.141	0.859
Height in cm	24M		12	13	9	87.333	86.708	87.722	0.316	0.684	0.871	0.129	0.583	0.417
Height in cm	36M		10	12	9	96.000	96.214	95.276	0.555	0.445	0.547	0.453	0.367	0.633
Height in cm	48M		12	14	9	103.583	103.187	103.965	0.397	0.603	0.889	0.111	0.569	0.431
Height in cm	60M		9	11	9	112.000	111.103	111.697	0.348	0.652	0.835	0.166	0.399	0.601
Height in cm	8		12	14	9	129.809	129.196	129.488	0.374	0.626	0.762	0.238	0.470	0.530
Brief Symptom Inventory - Somatization	21	Yes	11	13	7	-53.091	-50.966	-47.792	0.695	0.305	0.590	0.410	0.913	<b>0.087</b>
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	10	12	7	-58.200	-54.223	-56.838	0.842	0.158	0.423	0.577	0.642	0.358
Brief Symptom Inventory - Interpersonal Sens	21	Yes	11	13	7	-54.091	-52.286	-48.693	0.698	0.302	0.646	0.354	0.932	<b>0.068</b>
Brief Symptom Inventory - Depression	21	Yes	11	13	7	-54.545	-52.408	-51.105	0.685	0.315	0.604	0.396	0.816	0.184
Brief Symptom Inventory - Anxiety	21	Yes	11	13	7	-53.000	-49.520	-47.076	0.842	0.158	0.678	0.322	0.949	<b>0.051</b>
Brief Symptom Inventory - Hostility	21	Yes	11	11	7	-57.000	-58.166	-55.077	0.368	0.632	0.953	<b>0.047</b>	0.737	0.263
Brief Symptom Inventory - Psychoticism	21	Yes	11	13	7	-52.182	-53.202	-45.141	0.398	0.602	0.688	0.312	0.974	<b>0.026</b>
Brief Symptom Inventory - Global Severity Index	21	Yes	10	12	7	-63.800	-63.926	-61.849	0.485	0.515	0.799	0.201	0.747	0.253
Brief Symptom Inventory - Positive Symptom total	21	Yes	11	13	7	-62.000	-57.975	-54.816	0.803	0.197	0.539	0.461	0.947	<b>0.053</b>
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	10	13	7	-58.000	-57.000	-54.914	0.606	0.394	0.864	0.136	0.797	0.203
Brief Symptom Inventory - Phobic Anxiety	21	Yes	11	13	8	-57.091	-55.415	-57.080	0.709	0.291	0.410	0.590	0.573	0.426
Brief Symptom Inventory - Paranoid ideation	21	Yes	10	13	7	-56.700	-56.190	-54.776	0.559	0.441	0.901	<b>0.099</b>	0.709	0.291

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 57: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Single p-values						
			Obs.			Means			CCC vs CTT			CTT vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CCC=CTT	CTT>TTT	CTT<TTT	CTT=TTT	CCC>TTT
High School end Age (graduate/drop-out)	21		8	9	4	16,750	17,476	19,068	<b>0.095</b>	<b>0.089</b>		0.726	0.115	0.134	<b>0.061</b>
High School Graduation or GED Age	21		3	8	4	18,333	18,847	18,096	0.324	0.160		0.549	0.565	0.799	0.621
Individual Income at age - 21 interview	21		7	9	4	6057.1	6048.0	12211.4	0.998	0.532		0.261	<b>0.080</b>	0.254	0.115
Spouse's Income at age - 21 interview	21	Yes	2	2	1	11000.0	11000.0	11000.0	0.671	0.662					
Other Income at age - 21 interview	21		8	9	5	-1541.5	-1101.5	-101.3	0.612	0.356		<b>0.042</b>	<b>0.022</b>	<b>0.084</b>	<b>0.051</b>
Total Available Household Income at age - 21 interview	21		5	7	4	14951.2	16357.7	27168.9	0.815	0.294		0.599	0.198	0.232	0.103
Wage Income at age - 30 interview	30		8	9	4	12630.8	16922.9	18967.4	0.597	0.448		0.912	0.423	0.244	0.124
Other Income at age - 30 interview	30	Yes	7	9	4	-6426.9	-3391.9	-3128.8	0.334	0.224		0.597	0.302	0.295	0.171
Spouse's Income at age - 30 interview	30		8	9	4	7500.0	17085.7	11236.9	0.246	<b>0.055</b>		0.733	0.548	0.813	0.395
Total Available Household Income at age - 30 interview	30		8	9	4	25866.8	37490.6	33009.9	0.322	0.181		0.721	0.488	0.632	0.310
Graduated High School? at age - 30 interview	21		8	9	5	0.250	0.490	0.389	0.226	0.157		0.273	0.142	0.575	0.261
Graduated High School? at age 21	21		8	9	5	0.375	0.523	0.630	0.481	0.392		0.273	0.142	0.361	0.169
Graduated High School? at age - 30 interview	30		8	9	5	0.375	0.523	0.746	0.481	0.392		0.318	0.106	0.185	0.102
Graduated High School? at age 30	30		8	9	5	0.375	0.523	0.746	0.481	0.392		0.318	0.106	0.185	0.102
Ever Attended a 4 Year University? at age - 21 interview	21		7	9	4	0.143	0.327	0.212	0.361	0.303		0.520	0.156	0.791	0.405
Ever Attended a 4 Year University? at age 21	21		8	9	5	0.250	0.375	0.389	0.535	0.467		0.590	0.193	0.563	0.266
Ever Attended a 4 Year University? at age - 30 interview	30		8	9	4	0.250	0.375	0.500	0.535	0.467		0.346	<b>0.057</b>	0.189	<b>0.085</b>
Ever Attended a 4 Year University? at age 30	30		8	9	5	0.250	0.375	0.505	0.535	0.467		0.503	<b>0.097</b>	0.274	0.119
Have a 4 Year Degree? at age - 30 interview	30		8	9	5	0.250	0.306	0.320	0.789	0.563		0.946	0.321	0.636	0.311
Have a 4 Year Degree? at age 30	30		8	9	5	0.250	0.306	0.320	0.789	0.563		0.946	0.321	0.636	0.311
Working? at age - 21 interview	21		7	9	4	0.571	0.517	0.629	0.821	0.545		0.236	0.213	0.811	0.369
Working? at age 21	21		8	9	5	0.125	0.209	0.125	0.614	0.424		0.975	0.307	0.987	0.559
Working? at age - 30 interview	30		8	9	4	0.625	0.667	0.853	0.804	0.496		0.957	0.575	0.348	0.201
Working? at age 30	30		8	9	5	0.625	0.667	0.764	0.804	0.496		0.700	0.682	0.545	0.265

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 58: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	8	9	4	-50.250	-53.050	-50.101	<b>0.072</b>	0.928	0.565	0.435	0.630	0.370
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	8	9	4	-53.750	-52.813	-53.489	0.754	0.245	0.350	0.650	0.609	0.391
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	8	9	4	-50.125	-54.141	-50.290	0.101	0.899	0.563	0.437	0.216	0.784
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	8	9	4	-53.250	-54.741	-51.361	<b>0.100</b>	0.900	0.804	0.196	0.840	0.160
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	8	9	4	-51.750	-52.670	-51.087	0.356	0.644	0.516	0.484	0.669	0.331
Adult Self-Report - Problem Scales - Aggressive	30	Yes	8	9	4	-55.125	-54.642	-52.008	0.618	0.382	0.398	0.602	0.794	0.206
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	8	9	4	-53.625	-54.150	-53.845	0.508	0.492	0.394	0.606	0.420	0.580
Adult Self-Report - Problem Scales - Intrusive	30	Yes	8	9	4	-55.250	-53.990	-51.764	0.690	0.310	0.405	0.595	0.843	0.157
Adult Self-Report - Problem Scales - Critical Items	30	Yes	8	9	4	-54.250	-55.107	-52.256	0.335	0.665	0.665	0.335	0.813	0.188
Adult Self-Report - Problem Scales - Internalizing	30	Yes	8	9	4	-40.250	-47.516	-43.216	<b>0.054</b>	0.947	0.612	0.388	<b>0.054</b>	0.946
Adult Self-Report - Problem Scales - Externalizing	30	Yes	8	9	4	-51.500	-48.492	-47.829	0.776	0.224	0.374	0.626	0.782	0.218
Adult Self-Report - Problem Scales - Total Problems	30	Yes	8	9	4	-44.875	-47.441	-44.063	0.281	0.719	0.559	0.441	0.577	0.423
Adult Self-Report - Adaptive Functioning : Friends	30		8	9	4	50.625	49.300	52.132	0.715	0.595	0.827	0.593	0.765	0.384
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		2	6	2	51.000	55.358	51.000	0.396	0.212	0.486	0.792	0.500	0.253
Adult Self-Report - Adaptive Functioning : Family	30		7	9	4	50.857	44.916	51.859	<b>0.087</b>	0.913	0.272	0.267	0.720	0.381
Adult Self-Report - Adaptive Functioning : Job	30		4	8	3	44.000	47.900	44.268	0.242	0.125	0.483	0.338	0.640	0.328
Adult Self-Report - Adaptive Functioning : Education	30		2	3	1	43.500	42.043	43.500	0.840	0.553	<b>0.000</b>	<b>0.000</b>	0.640	0.328
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		8	9	4	50.750	48.640	53.535	0.556	0.601	0.581	0.421	0.402	0.190
Adult Self-Report - Substance Use Scales - Tobacco	30		8	9	4	-52.875	-53.428	-52.265	0.250	0.750	0.319	0.681	0.586	0.414
Adult Self-Report - Substance Use Scales - Alcohol	30		8	9	4	-52.250	-52.965	-52.271	0.177	0.823	0.601	0.399	0.502	0.498
Adult Self-Report - Substance Use Scales - Drugs	30		8	9	4	-51.875	-51.203	-52.957	0.568	0.432	0.125	0.875	0.372	0.628
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30		8	9	4	-53.125	-53.563	-53.457	0.235	0.765	0.340	0.660	0.450	0.550
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	8	9	4	-50.500	-53.881	-50.997	0.106	0.894	0.494	0.506	0.134	0.866
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	8	9	4	-51.000	-54.015	-50.402	<b>0.094</b>	0.905	0.613	0.387	0.641	0.359
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	8	9	4	-50.125	-54.832	-50.720	<b>0.055</b>	0.945	0.509	0.491	0.254	0.746
Adult Self-Report - DSM Scales - Avoidant Personality	30	Yes	8	9	4	-53.250	-53.415	-54.781	0.576	0.424	0.221	0.779	0.192	0.808
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	8	9	4	-52.875	-52.658	-51.100	0.354	0.446	0.352	0.648	0.759	0.241
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	8	9	4	-56.625	-55.512	-53.506	0.667	0.333	0.400	0.600	0.789	0.211
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	8	9	4	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	8	9	4	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 59: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	TTT	TTT	CCC > CTT	CCC < CTT	CTT > TTT	CTT < TTT
High School end Age (graduate/drop-out)	21		12	15	9	18.167	17.516	17.877	0.127	0.874	0.678	0.323	0.308	0.692
High School Graduation or GED Age	21		10	9	7	18.900	20.129	19.442	0.954	<b>0.046</b>	0.145	0.855	0.834	0.166
Individual Income at age - 21 interview	21		12	14	9	18693.3	11264.0	17352.8	<b>0.047</b>	0.953	0.824	0.176	0.378	0.622
Spouse's Income at age - 21 interview	21		6	3	2	18100.0	9900.4	29422.7	<b>0.003</b>	0.997	0.863	0.137	0.888	0.112
Other Income at age - 21 interview	21	Yes	13	15	9	-738.5	-3787.8	-7426.1	0.300	0.700	0.347	0.653	<b>0.093</b>	0.907
Total Available Household Income at age - 21 interview	21		12	12	9	28543.3	19278.0	33953.8	0.151	0.849	0.746	0.254	0.704	0.296
Wage Income at age - 30 interview	30		9	15	8	15697.5	16189.9	7740.8	0.506	0.494	0.350	0.650	0.101	0.899
Other Income at age - 30 interview	30	Yes	9	15	8	-593.3	-1862.4	67.7	0.124	0.876	0.988	<b>0.012</b>	0.900	0.100
Spouse's Income at age - 30 interview	30		9	12	8	12277.7	13574.0	19449.6	0.569	0.431	0.701	0.299	0.741	0.259
Total Available Household Income at age - 30 interview	30		8	15	8	34172.1	32680.0	93080.1	0.452	0.548	0.727	0.273	0.904	<b>0.096</b>
Graduated High School? at age - 30 interview	21		13	15	9	0.692	0.333	0.632	<b>0.032</b>	0.968	0.909	<b>0.091</b>	0.400	0.600
Graduated High School? at age 21	21		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Graduated High School? at age - 30 interview	30		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Graduated High School? at age 30	30		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Ever Attended a 4 Year University? at age - 21 interview	21		11	14	8	0.091	0.006	0.529	0.165	0.835	0.994	<b>0.007</b>	0.991	<b>0.009</b>
Ever Attended a 4 Year University? at age 21	21		13	15	9	0.077	0.038	0.273	0.414	0.586	0.942	<b>0.058</b>	0.906	<b>0.094</b>
Ever Attended a 4 Year University? at age - 30 interview	30		9	15	8	0.222	0.174	0.408	0.360	0.640	0.962	<b>0.038</b>	0.827	0.174
Ever Attended a 4 Year University? at age 30	30		13	15	9	0.154	0.162	0.351	0.516	0.484	0.932	<b>0.069</b>	0.877	0.123
Have a 4 Year Degree? at age - 30 interview	30		13	15	9	0.077	0.026	0.232	0.454	0.546	0.920	<b>0.080</b>	0.847	0.153
Have a 4 Year Degree? at age 30	30		13	15	9	0.077	0.026	0.232	0.454	0.546	0.920	<b>0.080</b>	0.847	0.153
Working? at age - 21 interview	21		12	14	9	0.833	0.607	0.771	0.108	0.893	0.788	0.212	0.392	0.608
Working? at age 21	21		13	15	9	0.077	0.282	0.340	0.932	<b>0.068</b>	0.684	0.316	0.969	<b>0.031</b>
Working? at age - 30 interview	30		9	15	8	0.778	0.522	0.571	<b>0.094</b>	0.906	0.770	0.230	0.120	0.881
Working? at age 30	30		13	15	9	0.538	0.590	0.532	0.607	0.393	0.362	0.638	0.437	0.564

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 60: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	9	15	8	-50.333	-52.071	-49.900	0.213	0.787	0.846	0.154	0.976	<b>0.024</b>
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	9	15	8	-51.333	-53.115	-53.106	0.275	0.725	0.472	0.528	0.176	0.825
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	9	15	8	-51.778	-52.559	-53.223	0.360	0.640	0.387	0.613	0.262	0.738
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	9	15	8	-50.778	-53.224	-54.224	0.186	0.814	0.373	0.627	<b>0.065</b>	0.935
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	9	15	8	-53.667	-53.873	-51.288	0.474	0.526	0.729	0.271	0.988	<b>0.012</b>
Adult Self-Report - Problem Scales - Aggressive	30	Yes	9	15	8	-50.778	-53.491	-51.973	<b>0.050</b>	0.950	0.784	0.216	0.152	0.848
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	9	15	8	-51.556	-56.901	-52.844	<b>0.003</b>	0.997	0.838	0.162	0.147	0.853
Adult Self-Report - Problem Scales - Intrusive	30	Yes	9	15	8	-51.556	-53.114	-51.737	0.184	0.816	0.735	0.265	0.428	0.572
Adult Self-Report - Problem Scales - Critical Items	30	Yes	9	15	8	-50.556	-54.016	-51.020	<b>0.047</b>	0.953	0.806	0.104	0.162	0.838
Adult Self-Report - Problem Scales - Internalizing	30	Yes	9	15	8	-41.222	-45.355	-39.063	0.144	0.856	0.854	0.147	0.746	0.254
Adult Self-Report - Problem Scales - Externalizing	30	Yes	9	15	8	-45.889	-51.393	-46.297	<b>0.086</b>	0.964	0.784	0.216	0.428	0.572
Adult Self-Report - Problem Scales - Total Problems	30	Yes	9	15	8	-42.333	-45.764	-41.282	0.190	0.810	0.725	0.275	0.680	0.320
Adult Self-Report - Adaptive Functioning : Friends	30		8	15	8	52.250	44.732	52.641	<b>0.012</b>	0.988			0.625	0.375
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		6	9	5	46.833	44.132	48.080	0.207	0.793			0.682	0.318
Adult Self-Report - Adaptive Functioning : Family	30		9	15	8	49.000	48.634	54.096	0.444	0.556			0.968	<b>0.032</b>
Adult Self-Report - Adaptive Functioning : Job	30		7	6	6	54.857	51.711	55.458	0.153	0.847			0.674	0.326
Adult Self-Report - Adaptive Functioning : Education	30		2	0	0	55.000	55.000	55.000						
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		9	15	8	51.556	45.713	55.850	<b>0.033</b>	0.968			0.969	<b>0.031</b>
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	9	15	8	-52.222	-53.765	-54.099	0.204	0.796	0.184	0.816	0.193	0.807
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	9	15	8	-53.111	-55.285	-52.698	0.264	0.736	0.803	0.197	0.635	0.365
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	9	15	8	-54.778	-52.904	-53.302	0.742	0.258	0.180	0.820	0.622	0.379
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	9	15	8	-54.111	-54.512	-53.848	0.438	0.562	0.281	0.719	0.563	0.437
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	9	15	8	-50.222	-51.613	-50.523	0.280	0.720	0.540	0.460	0.243	0.757
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	9	15	8	-51.000	-52.412	-50.288	0.130	0.870	0.958	<b>0.042</b>	0.919	<b>0.081</b>
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	9	15	8	-53.667	-53.128	-53.058	0.594	0.406	0.419	0.581	0.642	0.357
Adult Self-Report - DSM Scales - Avoidant Personality	30	Yes	9	15	8	-52.333	-51.618	-50.936	0.625	0.375	0.493	0.507	0.815	0.185
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	9	15	8	-53.000	-53.563	-52.166	0.404	0.596	0.669	0.331	0.756	0.244
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	9	15	8	-51.000	-56.322	-52.431	<b>0.012</b>	0.988	0.829	0.171	0.137	0.863
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	9	15	8	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	9	15	8	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 61: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Bayley Scales of Infant Development - Mental Development Index	6M		8	9	4	106.000	110.756	113.842	0.818	0.608	0.787	0.442	0.983	0.328
Bayley Scales of Infant Development - Mental Development Index Age Placement	6M		8	9	4	6.375	6.324	6.464	0.657	0.736	0.540	0.630	0.912	0.380
Bayley Scales of Infant Development - Mental Development Index	12M		8	9	5	108.000	110.425	115.429	0.781	0.631	0.845	0.385	0.990	0.243
Bayley Scales of Infant Development - Mental Development Index Age Placement	12M		8	9	5	12.675	13.052	13.098	0.772	0.489	0.820	0.437	0.984	0.279
Bayley Scales of Infant Development - Mental Development Index	18M		8	8	5	100.375	95.344	105.714	0.473	0.853	0.811	0.398	0.988	0.341
Bayley Scales of Infant Development - Mental Development Index Age Placement	18M		8	8	5	18.450	17.501	19.441	0.414	0.854	0.824	0.391	0.979	0.361
Bayley Scales of Infant Development - Mental Development Index	24M		8	9	5	97.000	91.815	103.895	0.455	0.865	0.742	0.411	0.963	0.211
Bayley Scales of Infant Development - Mental Development Index Age Placement	24M		8	9	5	23.375	22.486	24.645	0.457	0.867	0.775	0.361	0.973	<b>0.091</b>
Bayley Scales of Infant Development - Psychomotor Development Index	6M		8	9	4	107.500	107.472	115.300	0.551	0.763	0.819	0.615	0.829	0.531
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	6M		8	9	4	6.762	6.328	6.873	0.499	0.871	0.764	0.551	0.904	0.617
Bayley Scales of Infant Development - Psychomotor Development Index	12M		8	9	5	110.000	102.943	111.579	0.474	0.900	0.762	0.681	0.931	0.445
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	12M		8	9	5	13.263	12.275	13.351	0.470	0.901	0.771	0.684	0.898	0.468
Bayley Scales of Infant Development - Psychomotor Development Index	18M		8	8	5	103.875	99.451	107.171	0.421	0.923	0.823	0.686	0.936	0.572
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	18M		8	8	5	20.112	18.795	20.948	0.436	0.786	0.831	0.698	0.928	0.584
Bayley Scales of Infant Development - Psychomotor Development Index	24M		8	9	5	103.250	99.639	105.362	0.443	0.907	0.807	0.531	0.900	0.572
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	24M		8	9	5	24.712	24.118	25.263	0.464	0.901	0.769	0.531	0.887	0.595
Stanford Binet IQ Score	24M		8	9	5	89.250	89.038	93.614	0.789	0.689	0.862	0.477	0.983	0.383
Stanford Binet IQ Score	36M		8	9	4	89.500	89.496	98.181	0.791	0.680	0.710	0.467	0.953	0.260
Stanford Binet IQ Score	48M		8	9	4	95.500	94.279	97.639	0.743	0.698	0.858	0.491	0.957	0.466
Stanford Binet IQ Score	60M		8	9	3	94.125	91.414	96.705	0.658	0.726	0.647	0.652	0.926	0.465
McCarthy Scales of Children's Development - General Cognitive	30M		8	9	5	96.250	96.666	100.521	0.787	0.670	0.803	0.515	0.980	0.359
McCarthy Scales of Children's Development - General Cognitive	42M		8	9	4	96.875	99.545	105.469	0.793	0.543	0.833	0.498	0.978	0.344
McCarthy Scales of Children's Development - General Cognitive	54M		8	9	3	93.625	92.384	102.193	0.744	0.722	0.800	0.457	0.980	0.266
Bankson Total Raw Scores: Items 1 to 64	54M		8	9	3	92.000	90.098	100.695	0.744	0.726	0.769	0.521	0.975	0.268
Miller-Yoder Correct Individual Items, sum	54M		8	9	3	57.375	49.662	58.397	0.380	0.820	0.881	0.475	0.916	0.457
Kaufman Standardized Score: Sequential Processing	72M		8	9	4	104.250	110.456	112.638	0.720	0.465	0.877	0.507	0.971	0.341
Kaufman Standardized Score: Simultaneous Processing	72M		8	9	4	98.500	101.852	105.714	0.797	0.498	0.796	0.548	0.983	0.363
Kaufman Standardized Score: Mental Processing	72M		8	9	4	101.000	105.990	109.516	0.765	0.472	0.849	0.495	0.969	0.368

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 62: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Bayley Scales of Infant Development - Mental Development Index	6M		13	15	9	103.692	102.526	106.365	0.473	0.867	0.923	0.421	0.982	0.267
Bayley Scales of Infant Development - Mental Development Index	6M		13	15	9	6.146	6.115	6.362	0.436	0.863	0.926	0.477	0.985	0.295
Bayley Scales of Infant Development - Mental Development Index	12M		12	15	9	108.250	106.546	116.815	0.576	0.832	1.000	0.022	0.994	0.152
Bayley Scales of Infant Development - Mental Development Index	12M		12	15	9	12.742	12.640	13.497	0.588	0.825	0.999	0.044	0.996	0.125
Bayley Scales of Infant Development - Mental Development Index	18M		12	15	9	106.500	98.671	115.826	0.165	0.954	1.000	0.000	0.993	0.116
Bayley Scales of Infant Development - Mental Development Index	18M		12	15	9	19.033	18.494	20.204	0.444	0.909	1.000	0.003	0.994	0.136
Bayley Scales of Infant Development - Mental Development Index	24M		12	15	9	96.667	89.704	111.069	0.251	0.956	1.000	0.001	0.990	0.058
Bayley Scales of Infant Development - Mental Development Index	24M		12	15	9	23.600	22.512	25.472	0.340	0.931	1.000	0.001	0.984	0.101
Bayley Scales of Infant Development - Psychomotor Development Index	6M		13	15	9	107.154	106.231	113.395	0.753	0.688	0.961	0.161	0.994	0.129
Bayley Scales of Infant Development - Psychomotor Development Index	6M		13	15	9	6.531	6.461	6.962	0.701	0.699	0.988	0.047	0.996	0.017
Bayley Scales of Infant Development - Psychomotor Development Index	12M		12	15	9	104.667	107.186	109.616	0.927	0.580	0.960	0.293	0.996	0.190
Bayley Scales of Infant Development - Psychomotor Development Index	12M		12	15	9	12.542	13.055	13.245	0.925	0.491	0.925	0.396	0.997	0.178
Bayley Scales of Infant Development - Psychomotor Development Index	18M		12	15	9	99.833	103.350	108.961	0.923	0.501	0.915	0.373	0.997	0.214
Bayley Scales of Infant Development - Psychomotor Development Index	18M		12	15	9	18.783	20.354	19.544	0.947	0.206	0.599	0.729	0.993	0.248
Bayley Scales of Infant Development - Psychomotor Development Index	24M		11	15	9	97.364	100.341	106.375	0.935	0.509	0.973	0.225	0.997	0.194
Bayley Scales of Infant Development - Psychomotor Development Index	24M		11	15	9	24.100	24.825	25.570	0.936	0.555	0.962	0.265	0.996	0.219
Stanford Binet IQ Score	24M		12	15	9	90.083	82.679	99.809	0.357	0.956	1.000	0.003	0.994	0.202
Stanford Binet IQ Score	36M		12	14	9	96.333	92.206	102.396	0.419	0.991	1.000	0.007	0.989	0.410
Stanford Binet IQ Score	48M		12	14	9	95.583	92.141	98.931	0.336	0.992	1.000	0.038	0.981	0.511
Stanford Binet IQ Score	60M		12	13	9	97.583	92.069	96.998	0.388	0.991	1.000	0.018	0.871	0.587
McCarthy Scales of Children's Development - General Cognitive	30M		12	14	9	102.250	90.913	105.078	0.195	0.967	0.999	0.003	0.958	0.605
McCarthy Scales of Children's Development - General Cognitive	42M		12	13	9	97.917	93.584	103.227	0.445	0.985	1.000	0.013	0.991	0.420
McCarthy Scales of Children's Development - General Cognitive	54M		12	14	9	98.667	93.693	100.732	0.362	0.994	1.000	0.038	0.964	0.590
Banison Total Raw Scores: Items 1 to 64	54M		12	13	9	98.583	93.972	101.998	0.383	0.992	1.000	0.056	0.983	0.514
Miller-Yoder Correct Individual Items, sum	54M		12	13	9	57.583	53.705	57.560	0.402	0.993	1.000	0.045	0.897	0.709
Kaufman Standardized Score: Sequential Processing	72M		12	13	9	98.167	91.478	102.857	0.382	0.988	1.000	0.033	0.985	0.549
Kaufman Standardized Score: Simultaneous Processing	72M		12	13	9	98.417	96.721	108.663	0.325	0.976	1.000	0.006	0.994	0.032
Kaufman Standardized Score: Mental Processing	72M		12	13	9	98.000	93.938	106.974	0.432	0.988	1.000	0.003	0.987	0.122

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 63: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values								
			Obs.			Means			CCC vs CTT			CTT vs TTT			CCC vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CCC=CTT	CTT>TTT	CTT<TTT	CTT=TTT	CCC>TTT	CCC<TTT	CCC=TTT
Classroom Behavior Inventory - Extraversion	72M		7	8	3	18.857	19.082	19.923	0.985	0.754	0.734	0.772	0.875	0.664			
Classroom Behavior Inventory - Creativity	72M		7	8	3	12.714	13.027	15.147	0.919	0.806	0.981	0.970	0.825	0.585			
Classroom Behavior Inventory - Distractibility	72M	Yes	7	8	3	-10.714	-10.175	-11.074	0.959	0.681	0.961	0.972	0.931	0.832			
Classroom Behavior Inventory - Independence	72M		7	8	3	12.286	15.491	13.744	0.986	0.517	0.801	0.951	0.826	0.876			
Classroom Behavior Inventory - Hostility	72M	Yes	7	8	3	-8.000	-5.968	-10.041	0.988	0.320	0.908	0.900	0.814	0.828			
Classroom Behavior Inventory - Verbal Intelligence	72M		7	8	3	11.857	12.599	14.288	0.922	0.773	0.879	0.779	0.872	0.672			
Classroom Behavior Inventory - Task Orientation	72M		7	8	3	13.000	14.836	12.096	0.969	0.607	0.801	0.974	0.859	0.879			
Classroom Behavior Inventory - Introversion	72M		7	8	3	7.714	7.016	8.326	0.947	0.511	0.893	0.757	0.998	0.897			
Classroom Behavior Inventory - Considerateness	72M		6	8	3	15.500	16.812	13.565	0.985	0.571	0.831	0.997	0.712	0.809			
Classroom Behavior Inventory - Dependence	72M	Yes	7	8	3	-9.714	-6.830	-9.586	0.927	0.255	0.989	0.910	0.980	0.776			
Classroom Behavior Inventory - Extraversion	8		8	9	3	18.375	17.950	19.302	0.927	0.965	0.596	0.778	0.861	0.791			
Classroom Behavior Inventory - Creativity	8		8	9	3	15.000	14.380	15.088	0.892	0.966	0.824	0.985	0.756	0.982			
Classroom Behavior Inventory - Distractibility	8	Yes	8	9	3	-9.500	-10.391	-10.238	0.778	0.953	0.627	0.809	0.803	0.744			
Classroom Behavior Inventory - Independence	8		8	9	3	13.750	15.741	14.914	0.979	0.701	0.793	0.970	0.848	0.805			
Classroom Behavior Inventory - Hostility	8	Yes	8	9	3	-7.250	-8.847	-8.367	0.558	0.933	0.880	0.987	0.927	0.860			
Classroom Behavior Inventory - Verbal Intelligence	8		8	9	3	13.250	13.224	14.339	0.852	0.958	0.914	0.975	0.766	0.651			
Classroom Behavior Inventory - Task Orientation	8		8	9	3	14.875	14.577	14.597	0.839	0.961	0.826	0.929	0.704	0.993			
Classroom Behavior Inventory - Introversion	8		8	9	3	6.500	8.577	6.330	0.995	0.481	0.706	0.956	0.947	0.963			
Classroom Behavior Inventory - Considerateness	8		8	9	3	15.875	14.806	15.027	0.822	0.951	0.937	0.950	0.927	0.865			
Classroom Behavior Inventory - Dependence	8	Yes	8	9	3	-9.625	-7.025	-8.013	0.885	0.388	0.848	0.908	0.894	0.689			
Achenbach Teacher - School Performance	8		8	9	3	45.500	47.766	46.765	0.687	0.750	0.813	0.477	0.635	0.736			
Achenbach Teacher - Works Hard	8		8	9	3	51.750	49.330	45.617	0.456	0.932	0.594	0.752	0.376	0.873			
Achenbach Teacher - Behaves Appropriately	8		8	9	3	46.000	44.639	41.236	0.474	0.900	0.586	0.690	0.370	0.988			
Achenbach Teacher - Learns	8		8	9	3	46.375	50.249	43.864	0.576	0.730	0.667	0.697	0.419	0.924			
Achenbach Teacher - Happy	8		8	9	3	49.500	46.245	40.443	0.500	0.748	0.789	0.750	0.361	0.933			
Harter Self-Perception Assessment - Teacher - Cognitive	12		8	9	4	2.625	2.441	2.896	0.953	0.989	0.911	0.745	0.967	0.647			
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		8	9	4	2.839	2.835	2.744	0.947	0.959	0.557	0.821	0.842	0.799			
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		8	9	4	2.804	2.812	2.820	0.942	0.956	0.849	0.820	0.920	0.805			
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		8	9	4	3.125	3.079	3.035	0.981	0.962	0.901	0.410	0.833	0.896			
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		8	9	4	2.875	2.815	2.928	0.960	0.974	0.874	0.855	0.806	0.741			
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		8	9	4	3.313	3.493	3.627	0.783	0.824	0.655	0.888	0.913	0.671			
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		8	9	4	2.813	2.340	3.270	0.666	0.996	0.970	0.490	0.909	0.448			
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		8	9	4	3.500	3.541	3.575	0.834	0.958	0.680	0.927	0.938	0.765			
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		8	9	4	2.813	2.413	2.929	0.689	0.853	0.972	0.766	0.948	0.713			

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 64: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values						
			Obs.		Means		CCC vs. CTT		CTT vs. TTT		CCC vs. TTT				
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	
Classroom Behavior Inventory - Considerateness	12		4	4	3	9.500	16.087	9.952	0.984	0.243	0.614	0.908	0.644	0.946	0.973
Classroom Behavior Inventory - Creativity	12		4	4	3	11.500	9.206	12.746	0.499	0.844	0.451	0.865	0.451	0.850	0.956
Classroom Behavior Inventory - Dependence	12	Yes	4	4	3	-11.000	-7.800	-10.419	0.991	0.115	0.821	0.570	0.821	0.833	0.973
Classroom Behavior Inventory - Distractibility	12	Yes	4	4	3	-12.500	-8.359	-12.185	0.996	0.204	0.832	0.733	0.832	0.770	0.817
Classroom Behavior Inventory - Extraversion	12		4	4	3	15.000	12.359	15.841	0.544	0.898	0.488	0.772	0.488	0.783	0.925
Classroom Behavior Inventory - Hostility	12	Yes	4	4	3	-9.500	-6.999	-10.424	0.932	0.529	0.693	0.888	0.693	0.930	0.686
Classroom Behavior Inventory - Independence	12		4	4	3	10.500	14.659	11.002	0.984	0.140	0.685	0.685	0.830	0.962	0.873
Classroom Behavior Inventory - Introversiion	12		4	4	3	7.750	8.778	7.666	0.964	0.425	0.865	0.483	0.865	0.961	0.799
Classroom Behavior Inventory - Task Orientation	12		4	4	3	9.500	14.156	9.134	0.976	0.268	0.976	0.686	0.830	0.882	0.936
Classroom Behavior Inventory - Verbal Intelligence	12		4	4	3	11.000	11.409	12.309	0.955	0.568	0.714	0.915	0.714	0.854	0.944
Child's Behavior Toward Teacher - Control	12		4	4	3	15.750	11.456	15.501	0.133	0.947	0.918	0.556	0.918	0.643	0.637
Child's Behavior Toward Teacher - Detachment	12		4	4	3	8.750	9.185	9.159	0.727	0.558	0.741	0.426	0.741	0.649	0.645
Child's Behavior Toward Teacher - Obedient	12	Yes	4	4	3	-11.750	-14.508	-12.410	0.190	0.941	0.930	0.536	0.930	0.570	0.801
Child's Behavior Toward Teacher - Positive Involvement	12		4	4	3	14.500	12.368	14.863	0.121	0.982	0.460	0.857	0.460	0.704	0.641
Achenbach Parent - Total Competence	12		8	8	4	40.125	41.175	46.972	0.690	0.765	0.265	0.878	0.265	0.955	<b>0.082</b>
Achenbach Parent - Activities	12		8	8	4	44.000	44.596	49.742	0.702	0.783	0.211	0.883	0.211	0.953	0.175
Achenbach Parent - Social	12		8	8	4	42.125	41.131	47.308	0.654	0.643	0.410	0.879	0.410	0.973	0.153
Achenbach Parent - School	12		8	8	4	40.500	40.285	45.948	0.768	0.778	0.363	0.887	0.363	0.953	0.167

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 65: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		10	11	8	20.000	19.154	17.122	0.591	0.995	0.885	0.973	0.122	0.999
Classroom Behavior Inventory - Creativity	72M		10	11	7	15.300	14.604	13.083	0.643	0.900	0.918	0.936	0.187	0.998
Classroom Behavior Inventory - Distractibility	72M	Yes	10	11	8	-8.300	-9.562	-10.688	0.369	0.985	0.911	0.969	0.143	0.999
Classroom Behavior Inventory - Independence	72M		10	11	8	16.600	14.328	13.498	0.354	0.995	0.904	0.963	0.198	0.998
Classroom Behavior Inventory - Hostility	72M	Yes	10	11	7	-6.400	-8.805	-9.050	<b>0.089</b>	0.900	0.812	0.913	<b>0.037</b>	0.995
Classroom Behavior Inventory - Verbal Intelligence	72M		10	10	8	13.700	12.373	11.481	0.337	0.999	0.762	0.853	0.191	0.998
Classroom Behavior Inventory - Task Orientation	72M		10	11	8	16.800	14.707	13.166	0.343	0.995	0.658	0.862	0.153	0.998
Classroom Behavior Inventory - Introversion	72M		10	11	8	5.800	5.808	7.073	0.508	0.981	0.979	0.892	0.880	0.968
Classroom Behavior Inventory - Considerateness	72M		10	10	8	18.100	14.982	14.075	0.101	0.997	0.877	0.972	<b>0.053</b>	0.996
Classroom Behavior Inventory - Dependence	72M	Yes	10	11	8	-6.700	-6.749	-6.807	0.687	0.954	0.973	0.928	0.785	0.902
						0.000	0.000	0.000						
						0.000	0.000	0.000						
Classroom Behavior Inventory - Extraversion	8		13	14	9	18.385	17.463	18.563	0.458	0.994	0.966	0.867	0.979	0.892
Classroom Behavior Inventory - Creativity	8		13	14	9	16.077	15.193	17.006	0.460	0.989	0.959	0.847	0.989	0.805
Classroom Behavior Inventory - Distractibility	8	Yes	13	14	9	-10.000	-11.223	-10.716	0.489	0.994	0.784	0.957	0.823	0.889
Classroom Behavior Inventory - Independence	8		13	14	9	16.000	13.632	11.672	0.345	0.983	0.230	0.965	<b>0.077</b>	0.991
Classroom Behavior Inventory - Hostility	8	Yes	13	14	9	-8.308	-9.535	-8.433	0.501	0.995	0.793	0.869	0.954	0.911
Classroom Behavior Inventory - Verbal Intelligence	8		13	14	9	14.308	12.577	13.455	0.445	0.992	0.968	0.803	0.838	0.936
Classroom Behavior Inventory - Task Orientation	8		13	13	9	15.308	12.914	13.016	0.433	0.983	0.780	0.891	0.471	0.961
Classroom Behavior Inventory - Introversion	8		13	14	9	6.000	7.518	6.827	0.952	0.982	0.850	0.965	0.922	0.832
Classroom Behavior Inventory - Considerateness	8		12	14	9	15.417	13.458	16.796	0.349	0.943	0.732	0.823	0.798	0.743
Classroom Behavior Inventory - Dependence	8	Yes	13	14	9	-6.923	-8.261	-9.530	0.424	0.997	0.265	0.972	0.117	0.993
Achenbach Teacher - School Performance	8		13	14	9	46.846	42.128	45.458	0.233	0.984	0.751	0.619	0.343	0.900
Achenbach Teacher - Works Hard	8		13	14	9	54.077	46.612	48.866	0.179	0.989	0.518	0.913	0.313	0.935
Achenbach Teacher - Behaves Appropriately	8		13	14	9	48.462	43.244	43.727	0.257	0.984	0.451	0.838	0.285	0.870
Achenbach Teacher - Learns	8		13	14	9	48.385	44.590	46.821	0.252	0.970	0.663	0.836	0.430	0.881
Achenbach Teacher - Happy	8		13	14	8	52.231	42.196	47.087	<b>0.066</b>	0.982	0.858	0.632	0.341	0.932
Harter Self-Perception Assessment - Teacher - Cognitive	12		12	14	9	3.036	2.866	2.442	0.573	0.994	0.770	0.908	<b>0.064</b>	0.998
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		12	14	9	3.440	3.280	2.765	0.545	0.945	0.494	0.885	<b>0.017</b>	0.998
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		12	14	9	3.298	3.324	3.117	0.551	0.944	0.702	0.899	0.552	0.953
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		12	14	9	3.560	3.323	3.220	0.444	0.966	0.887	0.830	0.368	0.975
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		12	14	9	2.958	2.728	3.472	0.719	0.976	0.981	0.233	0.962	0.440
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		12	14	9	3.542	3.518	3.537	0.666	0.968	0.990	0.520	0.829	0.900
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		12	14	9	2.542	2.350	3.059	0.687	0.989	0.978	0.146	0.941	0.323
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		12	14	9	3.667	3.590	3.617	0.623	0.985	0.897	0.842	0.795	0.899
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		12	14	9	2.667	2.450	2.746	0.726	0.959	0.987	0.357	0.855	0.848

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 66: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Considerateness	12		8	8	4	17.000	14.408	14.349	0.443	0.989	0.916	0.905	0.453	0.912
Classroom Behavior Inventory - Creativity	12		8	8	4	14.125	13.082	14.345	0.716	0.980	0.907	0.656	0.803	0.932
Classroom Behavior Inventory - Dependence	12	Yes	8	8	4	-6.125	-7.909	-7.659	0.365	0.928	0.664	0.988	0.566	0.966
Classroom Behavior Inventory - Distractibility	12	Yes	8	8	4	-11.125	-10.285	-11.576	0.904	0.779	0.913	0.956	0.756	0.966
Classroom Behavior Inventory - Extraversion	12		8	8	4	19.625	19.054	18.057	0.731	0.984	0.901	0.873	0.537	1.000
Classroom Behavior Inventory - Hostility	12	Yes	8	8	4	-8.125	-9.066	-11.744	0.693	0.962	0.461	0.938	0.179	0.959
Classroom Behavior Inventory - Independence	12		8	8	4	14.875	12.681	13.645	0.392	0.994	0.762	0.966	0.577	0.997
Classroom Behavior Inventory - Introversion	12		8	8	4	6.125	7.248	6.662	0.908	0.524	0.584	0.973	0.765	0.870
Classroom Behavior Inventory - Task Orientation	12		8	8	4	13.000	11.880	11.674	0.577	0.986	0.833	0.659	0.662	0.987
Classroom Behavior Inventory - Verbal Intelligence	12		8	8	4	12.500	11.512	12.569	0.668	0.982	0.887	0.895	0.837	0.933
Child's Behavior Toward Teacher - Control	12		8	8	4	12.000	12.054	14.230	0.992	0.485	0.848	0.587	0.884	0.504
Child's Behavior Toward Teacher - Detachment	12		8	8	4	9.000	9.610	6.626	0.784	0.868	<b>0.097</b>	0.971	0.207	0.937
Child's Behavior Toward Teacher - Obedient	12	Yes	8	8	4	-15.000	-13.699	-13.045	0.779	0.613	0.526	0.825	0.890	0.328
Child's Behavior Toward Teacher - Positive Involvement	12		8	8	4	13.625	13.717	13.207	0.983	0.879	0.991	0.754	0.837	0.867
Achenbach Parent - Total Competence	12		12	14	8	43.750	41.952	47.449	0.616	0.927	0.970	<b>0.098</b>	0.944	0.274
Achenbach Parent - Activities	12		12	14	9	47.833	46.209	46.210	0.601	0.934	0.902	0.414	0.675	0.768
Achenbach Parent - Social	12		12	14	9	44.333	43.485	49.331	0.419	0.928	0.987	0.222	0.895	0.336
Achenbach Parent - School	12		12	14	8	43.667	40.866	44.975	0.572	0.894	0.986	0.140	0.936	0.634

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 67: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values								
			Obs.			Means			CCC vs CTT			CTT vs TTT			CCC vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	CTT>TTT	CTT<TTT	
HOME - Total	6M		8	9	3	26.000	24.296	31.455	0.564	0.837	0.973	0.263	0.947	0.138			
HOME - Total	12M		8	7	5	26.250	25.757	27.875	0.817	0.778	0.979	0.339	0.952	0.290			
HOME - Total	18M		8	8	5	25.250	29.774	29.405	0.945	0.266	0.979	0.328	0.982	0.195			
HOME - Total	30M		8	9	5	28.500	29.731	32.586	0.889	0.802	0.962	0.197	0.983	0.157			
HOME - Total	42M		8	9	4	55.875	57.125	61.937	0.847	0.835	0.924	0.262	0.977	0.216			
HOME - Total	54M		8	9	3	56.000	56.439	63.159	0.824	0.877	0.971	0.461	0.982	0.216			
Knowledge of Infant Development Inventory : Attempted	30M		7	8	4	0.885	0.844	0.872	0.284	0.943	0.937	0.228	0.366	0.779			
Knowledge of Infant Development Inventory : Accuracy	30M		7	8	4	0.763	0.755	0.762	0.479	0.867	0.985	0.270	0.425	0.737			
Knowledge of Infant Development Inventory : Corret	30M		7	8	4	0.676	0.637	0.665	0.265	0.883	0.960	0.122	0.336	0.823			
Family Environment Scale - Child - Cohesion	12		8	9	4	46.500	55.250	54.460	0.998	0.405	0.888	0.907	0.995	0.504			
Family Environment Scale - Child - Expressiveness	12		8	9	4	44.750	42.301	44.344	0.849	0.815	0.862	0.887	0.943	0.761			
Family Environment Scale - Child - Conflict	12	Yes	8	9	4	-47.750	-46.403	-46.122	0.960	0.662	0.874	0.968	0.968	0.739			
Family Environment Scale - Child - Independence	12		8	9	4	33.250	45.912	39.310	1.000	0.102	0.930	0.958	0.993	0.519			
Family Environment Scale - Child - Achievement Orientation	12		8	9	4	47.125	53.730	53.731	1.000	0.207	0.904	0.966	0.995	0.508			
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		8	9	4	42.000	53.726	47.611	0.985	0.091	0.887	0.966	0.992	0.517			
Family Environment Scale - Child - Active-Recreational Orientation	12		8	9	4	47.375	58.299	46.841	1.000	0.122	0.716	0.901	0.943	0.530			
Family Environment Scale - Child - Moral-Religious Emphasis	12		8	9	4	52.375	58.253	57.907	1.000	0.228	0.676	0.677	0.914	0.384			
Family Environment Scale - Child - Organization	12		8	9	4	51.875	49.966	51.372	0.881	0.583	0.930	0.885	0.920	0.810			
Family Environment Scale - Child - Control	12		8	9	4	52.250	54.394	56.896	0.980	0.652	0.886	0.932	0.993	0.470			
Family Environment Scale - Parent - Cohesion	12		8	7	4	44.750	54.349	41.859	0.992	0.500	0.648	0.841	0.854	0.770			
Family Environment Scale - Parent - Expressiveness	12		8	7	4	53.375	54.153	47.740	0.943	0.882	0.550	0.845	0.505	0.860			
Family Environment Scale - Parent - Conflict	12	Yes	8	7	4	-51.125	-40.853	-54.353	0.996	0.291	0.707	0.841	0.811	0.789			
Family Environment Scale - Parent - Independence	12		8	7	4	49.000	52.340	47.517	0.975	0.904	0.846	0.758	0.884	0.798			
Family Environment Scale - Parent - Achievement Orientation	12		8	7	4	56.375	57.756	58.668	0.980	0.834	0.708	0.855	0.950	0.665			
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		8	7	4	45.625	49.373	50.718	0.961	0.820	0.826	0.717	0.912	0.629			
Family Environment Scale - Parent - Active-Recreational Orientation	12		8	7	4	39.750	50.702	44.135	0.997	0.323	0.730	0.789	0.951	0.636			
Family Environment Scale - Parent - Moral-Religious Emphasis	12		8	7	4	56.500	64.752	62.484	0.987	0.145	0.848	0.880	0.975	0.217			
Family Environment Scale - Parent - Organization	12		8	7	4	55.250	50.010	57.465	0.691	0.817	0.830	0.550	0.963	0.648			
Family Environment Scale - Parent - Control	12		8	7	4	58.500	55.078	65.490	0.705	0.982	0.914	0.763	0.947	0.232			

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 68: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		13	15	9	30.308	26.082	30.269	0.119	0.996	0.998	0.092	0.778	0.872
HOME - Total	12M		12	14	9	29.500	30.744	33.803	0.698	0.691	0.993	0.083	0.950	0.179
HOME - Total	18M		12	14	9	33.667	29.738	32.310	0.150	0.997	0.998	0.083	0.476	0.845
HOME - Total	30M		12	13	9	31.500	30.046	32.078	0.456	0.950	0.948	0.327	0.816	0.822
HOME - Total	42M		11	13	9	57.818	55.045	60.818	0.496	0.943	0.999	0.079	0.838	0.648
HOME - Total	54M		12	13	9	65.167	58.935	64.883	0.101	0.974	0.999	0.075	0.746	0.860
						0	0.000	0.000						
						0	0.000	0.000						
Knowledge of Infant Development Inventory - Attempted	30M		11	12	6	0.838	0.825	0.852	0.402	0.772	0.989	0.082	0.786	0.343
Knowledge of Infant Development Inventory - Accuracy	30M		11	12	6	0.729	0.720	0.760	0.562	0.717	0.955	0.162	0.836	0.257
Knowledge of Infant Development Inventory - Corret	30M		11	12	6	0.618	0.596	0.647	0.505	0.663	0.977	0.058	0.809	0.303
						0.000	0.000	0.000						
Family Environment Scale - Child - Cohesion	12		12	14	9	54.167	56.671	51.266	0.934	0.845	0.612	0.868	0.794	0.966
Family Environment Scale - Child - Expressiveness	12		12	14	9	44.000	42.373	43.739	0.854	0.960	0.993	0.743	0.945	0.956
Family Environment Scale - Child - Conflict	12	Yes	12	14	9	-44.417	-45.993	-47.727	0.850	0.983	0.840	0.963	0.768	0.956
Family Environment Scale - Child - Independence	12		12	14	9	48.333	46.414	46.504	0.852	0.995	0.930	0.960	0.921	0.952
Family Environment Scale - Child - Achievement Orientation	12		12	14	9	58.583	56.291	62.202	0.812	0.786	0.970	0.239	0.994	0.594
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		12	14	9	48.833	50.241	49.253	0.940	0.906	0.795	0.955	0.954	0.927
Family Environment Scale - Child - Active-Recreational Orientation	12		12	14	9	52.333	51.798	55.548	0.848	0.990	0.980	0.675	0.994	0.734
Family Environment Scale - Child - Moral-Religious Emphasis	12		12	14	9	55.500	58.302	56.009	0.842	0.703	0.980	0.862	0.966	0.934
Family Environment Scale - Child - Organization	12		12	14	9	51.000	54.473	56.263	0.954	0.739	0.996	0.687	0.899	0.578
Family Environment Scale - Child - Control	12		12	14	9	59.250	57.110	56.139	0.821	0.928	0.944	0.929	0.552	0.889
						0	0	0						
						0	0	0						
Family Environment Scale - Parent - Cohesion	12		12	14	9	52.333	50.350	56.458	0.947	0.931	0.990	0.168	0.995	0.778
Family Environment Scale - Parent - Expressiveness	12		12	14	9	52.417	51.143	51.887	0.927	0.980	0.997	0.477	0.981	0.844
Family Environment Scale - Parent - Conflict	12	Yes	12	14	9	-50.083	-51.232	-46.100	0.900	0.985	0.995	0.040	0.996	0.764
Family Environment Scale - Parent - Independence	12		12	14	9	48.333	54.423	53.804	1.000	0.488	0.978	0.860	0.997	0.612
Family Environment Scale - Parent - Achievement Orientation	12		12	14	9	53.833	57.385	54.275	0.903	0.524	0.924	0.682	0.987	0.926
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		12	14	9	55.667	51.372	53.292	0.821	0.927	0.989	0.688	0.951	0.669
Family Environment Scale - Parent - Active-Recreational Orientation	12		12	14	9	52.083	50.823	53.197	0.954	0.951	0.917	0.915	0.993	0.875
Family Environment Scale - Parent - Moral-Religious Emphasis	12		12	14	9	60.333	57.552	59.943	0.816	0.814	0.989	0.380	0.965	0.958
Family Environment Scale - Parent - Organization	12		12	14	9	53.750	50.460	55.754	0.852	0.945	0.986	0.499	0.996	0.841
Family Environment Scale - Parent - Control	12		12	14	9	55.667	60.050	60.206	0.978	0.496	0.880	0.855	0.911	0.546

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 69: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Health

Variable	Age	Reversed	Descriptive Statistics										Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	TTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT		
Weight in kg	6M		8	9	4	7.738	7.349	7.445	7.738	7.349	7.445	0.461	0.932	0.983	0.154	0.572	0.941	
Weight in kg	12M		8	7	5	10.150	9.447	9.681	10.150	9.447	9.681	0.209	0.920	0.963	0.366	0.143	0.963	
Weight in kg	18M		8	8	5	11.813	11.689	11.218	11.813	11.689	11.218	0.513	0.782	0.899	0.402	0.395	0.947	
Weight in kg	24M		7	9	5	13.386	12.517	12.922	13.386	12.517	12.922	0.281	0.961	0.881	0.540	0.542	0.937	
Weight in kg	36M		8	9	3	15.225	14.668	15.157	15.225	14.668	15.157	0.471	0.919	0.984	0.186	0.748	0.865	
Weight in kg	48M		7	9	4	17.643	17.060	18.183	17.643	17.060	18.183	0.581	0.863	0.984	0.234	0.930	0.567	
Weight in kg	60M		7	9	3	20.886	19.343	22.915	20.886	19.343	22.915	0.426	0.923	0.984	0.146	0.913	0.383	
Weight in kg	8		8	7	2	32.341	30.942	37.742	32.341	30.942	37.742	0.664	0.787	0.961	0.358	0.897	0.504	
Height in cm	6M		8	9	4	66.000	65.678	66.081	66.000	65.678	66.081	0.796	0.848	0.975	0.237	0.789	0.799	
Height in cm	12M		8	7	5	74.750	75.331	73.984	74.750	75.331	73.984	0.950	0.676	0.881	0.634	0.688	0.732	
Height in cm	18M		8	8	5	81.750	82.393	82.214	81.750	82.393	82.214	0.901	0.682	0.904	0.392	0.855	0.687	
Height in cm	24M		7	9	5	87.857	87.101	87.409	87.857	87.101	87.409	0.641	0.832	0.770	0.504	0.735	0.792	
Height in cm	36M		8	9	3	96.000	96.737	97.861	96.000	96.737	97.861	0.896	0.658	0.942	0.450	0.889	0.476	
Height in cm	48M		7	9	4	104.429	105.325	105.773	104.429	105.325	105.773	0.900	0.672	0.884	0.490	0.896	0.572	
Height in cm	60M		7	9	3	113.286	112.903	116.630	113.286	112.903	116.630	0.798	0.853	0.971	0.267	0.928	0.499	
Height in cm	8		8	7	2	129.621	131.420	135.121	129.621	131.420	135.121	0.886	0.636	0.948	0.251	0.924	0.488	
Brief Symptom Inventory - Somatization	21	Yes	7	9	4	-50.143	-53.664	-46.230	-50.143	-53.664	-46.230	0.763	0.714	0.904	0.789	0.990	0.207	
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	7	9	4	-57.571	-55.614	-53.073	-57.571	-55.614	-53.073	0.980	0.559	0.828	0.913	0.977	0.321	
Brief Symptom Inventory - Interpersonal Sens	21	Yes	7	9	4	-54.571	-53.704	-49.508	-54.571	-53.704	-49.508	0.974	0.627	0.919	0.895	0.972	0.376	
Brief Symptom Inventory - Depression	21	Yes	7	9	4	-55.571	-52.880	-51.290	-55.571	-52.880	-51.290	0.940	0.642	0.850	0.613	0.989	0.314	
Brief Symptom Inventory - Anxiety	21	Yes	7	9	4	-52.571	-53.664	-48.147	-52.571	-53.664	-48.147	0.913	0.621	0.894	0.774	0.986	0.334	
Brief Symptom Inventory - Hostility	21	Yes	7	9	4	-63.857	-57.765	-57.081	-63.857	-57.765	-57.081	0.991	0.234	0.912	0.797	0.954	0.191	
Brief Symptom Inventory - Psychoticism	21	Yes	7	9	4	-54.857	-52.834	-47.348	-54.857	-52.834	-47.348	0.984	0.570	0.686	0.781	0.967	0.230	
Brief Symptom Inventory - Global Severity Index	21	Yes	7	9	4	-66.857	-62.593	-59.957	-66.857	-62.593	-59.957	0.973	0.191	0.882	0.763	0.990	0.320	
Brief Symptom Inventory - Positive Symptom total	21	Yes	7	9	4	-64.286	-58.488	-55.819	-64.286	-58.488	-55.819	0.993	0.240	0.899	0.871	0.981	0.229	
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	7	9	4	-60.429	-56.888	-54.455	-60.429	-56.888	-54.455	0.980	0.383	0.908	0.754	0.973	0.197	
Brief Symptom Inventory - Phobic Anxiety	21	Yes	7	9	4	-60.143	-54.930	-52.223	-60.143	-54.930	-52.223	0.983	0.329	0.877	0.717	0.975	0.224	
Brief Symptom Inventory - Paranoid Ideation	21	Yes	7	9	4	-59.714	-58.251	-56.866	-59.714	-58.251	-56.866	0.978	0.593	0.832	0.892	0.972	0.354	

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 70: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Health

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		12	15	9	7.908	8.271	8.062	0.935	0.363	0.769	0.650	0.886	0.363
Weight in kg	12M		12	13	9	10.175	10.747	10.619	0.889	0.323	0.792	0.755	0.942	0.346
Weight in kg	18M		12	13	9	11.483	11.863	12.185	0.929	0.453	0.853	0.757	0.951	0.331
Weight in kg	24M		12	14	9	13.075	12.901	13.976	0.715	0.628	0.984	0.216	0.950	0.316
Weight in kg	36M		10	12	9	14.560	15.135	15.631	0.929	0.431	0.976	0.338	0.941	0.390
Weight in kg	48M		12	14	9	16.983	17.168	18.701	0.860	0.564	0.989	0.139	0.919	0.245
Weight in kg	60M		9	11	9	19.489	19.163	20.866	0.719	0.728	0.993	<b>0.050</b>	0.938	0.338
Weight in kg	8		12	14	9	28.446	29.320	32.436	0.872	0.603	0.939	0.488	0.931	0.296
						0.000	0.000	0						
						0.000	0.000	0						
Height in cm	6M		12	15	9	67.417	68.148	67.031	0.771	0.554	0.556	0.820	0.702	0.792
Height in cm	12M		12	13	9	76.250	76.679	76.839	0.820	0.673	0.852	0.714	0.745	0.621
Height in cm	18M		12	13	9	82.333	82.291	81.050	0.783	0.745	0.615	0.872	0.405	0.859
Height in cm	24M		12	13	9	87.333	86.708	87.722	0.686	0.684	0.956	0.367	0.740	0.742
Height in cm	36M		10	12	9	96.000	96.214	95.276	0.820	0.686	0.846	0.748	0.642	0.869
Height in cm	48M		12	14	9	103.583	103.187	103.965	0.720	0.783	0.889	0.376	0.766	0.741
Height in cm	60M		9	11	9	112.000	111.103	111.697	0.700	0.767	0.958	0.433	0.665	0.844
Height in cm	8		12	14	9	129.809	129.196	129.488	0.713	0.787	0.907	0.588	0.691	0.836
Brief Symptom Inventory - Somatization	21	Yes	11	13	7	-53.091	-50.966	-47.792	0.954	0.758	0.986	0.713	1.000	0.351
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	10	12	7	-58.200	-54.223	-56.838	0.842	0.608	0.928	0.727	0.989	0.458
Brief Symptom Inventory - Interpersonal Sens	21	Yes	11	13	7	-54.091	-52.286	-48.693	0.947	0.778	0.978	0.759	0.991	0.352
Brief Symptom Inventory - Depression	21	Yes	11	13	7	-54.545	-52.408	-51.105	0.953	0.765	0.981	0.735	0.996	0.546
Brief Symptom Inventory - Anxiety	21	Yes	11	13	7	-53.000	-49.520	-47.076	0.942	0.637	0.986	0.740	0.999	0.341
Brief Symptom Inventory - Hostility	21	Yes	11	11	7	-57.000	-58.166	-55.077	0.879	0.632	0.953	0.406	0.995	0.564
Brief Symptom Inventory - Psychoticism	21	Yes	11	13	7	-52.182	-53.202	-45.141	0.866	0.875	0.989	0.726	0.974	0.163
Brief Symptom Inventory - Global Severity Index	21	Yes	10	12	7	-63.800	-63.926	-61.849	0.899	0.884	0.979	0.661	0.995	0.465
Brief Symptom Inventory - Positive Symptom total	21	Yes	11	13	7	-62.000	-57.975	-54.816	0.970	0.632	0.978	0.742	1.000	0.336
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	10	13	7	-58.000	-57.000	-54.914	0.921	0.837	0.983	0.546	0.995	0.543
Brief Symptom Inventory - Phobic Anxiety	21	Yes	11	13	8	-57.091	-55.415	-57.080	0.932	0.770	0.911	0.590	0.969	0.426
Brief Symptom Inventory - Paranoid Ideation	21	Yes	10	13	7	-56.700	-56.190	-54.776	0.922	0.868	0.988	0.443	0.996	0.514

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 71: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
High School end Age (graduate/drop-out)	21		8	9	4	16.750	17.476	19.068	0.911	0.497	0.993	0.749	0.977	0.555
High School Graduation or GED Age	21		3	8	4	18.333	18.847	18.096	0.997	0.804	0.959		0.952	
Individual Income at age - 21 interview	21		7	9	4	6057.1	6048.0	12211.4	0.974	0.751	0.963	0.498	0.986	0.593
Spouse's Income at age - 21 interview	21		2	2	1	11000.0	11000.0	11000.0	0.975	0.635		<b>0.000</b>		<b>0.000</b>
Other Income at age - 21 interview	21	Yes	8	9	5	-1541.5	-1101.5	-101.3	0.990	0.830	0.978	0.242	0.949	0.373
Total Available Household Income at age - 21 interview	21		5	7	4	14951.2	16357.7	27168.9	0.985	0.864	0.987	0.706	0.988	0.656
Wage Income at age - 30 interview	30		8	9	4	12630.8	16922.9	18967.4	0.991	0.824	0.981	0.866	0.981	0.602
Other Income at age - 30 interview	30	Yes	7	9	4	-6426.9	-3391.9	-3128.8	0.998	0.759	0.989	0.691	0.985	0.654
Spouse's Income at age - 30 interview	30		8	9	4	7500.0	17085.7	11236.9	0.988	0.775	0.956	0.894	0.979	0.608
Total Available Household Income at age - 30 interview	30		8	9	4	25866.8	37490.6	33009.9	0.998	0.762	0.956	0.900	0.980	0.666
Graduated High School? at age - 30 interview	21		8	9	5	0.250	0.490	0.389	0.944	0.753	0.976	0.506	0.988	0.767
Graduated High School? at age21	21		8	9	5	0.375	0.523	0.630	0.994	0.852	0.976	0.506	0.991	0.649
Graduated High School? at age30	30		8	9	5	0.375	0.523	0.746	0.994	0.852	0.994	0.551	0.948	0.553
Ever Attended a 4 Year University? at age - 21 interview	21		8	9	4	0.143	0.327	0.212	0.998	0.784	0.986	0.686	0.977	0.793
Ever Attended a 4 Year University? at age21	21		7	9	4	0.143	0.327	0.212	0.998	0.784	0.986	0.686	0.977	0.793
Ever Attended a 4 Year University? at age - 30 interview	30		8	9	4	0.250	0.375	0.389	0.992	0.868	0.988	0.708	0.988	0.750
Ever Attended a 4 Year University? at age30	30		8	9	4	0.250	0.375	0.590	0.992	0.868	0.988	0.548	0.983	0.560
Have a 4 Year Degree? at age30	30		8	9	5	0.250	0.375	0.505	0.992	0.808	0.986	0.706	0.991	0.638
Have a 4 Year Degree? at age - 30 interview	30		8	9	5	0.250	0.306	0.320	0.977	0.878	0.974	0.848	0.985	0.721
Have a 4 Year Degree? at age 30	30		8	9	5	0.250	0.306	0.320	0.977	0.878	0.974	0.848	0.985	0.721
Working? at age - 21 interview	21		7	9	4	0.571	0.517	0.629	0.972	0.545	0.954	0.472	0.977	0.750
Working? at age21	21		8	9	5	0.125	0.209	0.125	0.993	0.854	0.977	0.874	0.976	0.641
Working? at age - 30 interview	30		8	9	4	0.625	0.667	0.853	0.987	0.859	0.985	0.868	0.991	0.643
Working? at age30	30		8	9	5	0.625	0.667	0.764	0.987	0.859	0.950	0.858	0.988	0.779

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 72: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	8	9	4	-50.250	-53.050	-50.101	0.258	0.971	0.939	0.814	0.870	0.848
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	8	9	4	-53.750	-52.813	-53.489	0.910	0.783	0.921	0.804	0.858	0.949
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	8	9	4	-50.125	-54.141	-50.290	0.345	0.954	0.967	0.864	0.740	0.988
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	8	9	4	-53.250	-54.741	-51.361	0.653	0.966	0.807	0.759	0.922	0.638
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	8	9	4	-51.750	-52.670	-51.087	0.679	0.970	0.941	0.795	0.865	0.831
Adult Self-Report - Problem Scales - Aggressive	30	Yes	8	9	4	-55.125	-54.642	-52.008	0.844	0.865	0.968	0.880	0.885	0.628
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	8	9	4	-53.625	-54.150	-53.845	0.747	0.943	0.961	0.882	0.807	0.980
Adult Self-Report - Problem Scales - Intrusive	30	Yes	8	9	4	-55.250	-53.990	-51.764	0.913	0.776	0.928	0.804	0.843	0.575
Adult Self-Report - Problem Scales - Critical Items	30	Yes	8	9	4	-54.250	-55.107	-52.256	0.728	0.957	0.941	0.782	0.919	0.679
Adult Self-Report - Problem Scales - Internalizing	30	Yes	8	9	4	-40.250	-47.516	-43.216	0.234	0.956	0.968	0.850	0.348	0.946
Adult Self-Report - Problem Scales - Externalizing	30	Yes	8	9	4	-51.500	-48.492	-47.829	0.901	0.773	0.871	0.750	0.887	0.758
Adult Self-Report - Problem Scales - Total Problems	30	Yes	8	9	4	-44.875	-47.441	-44.063	0.650	0.965	0.952	0.793	0.858	0.951
Adult Self-Report - Adaptive Functioning : Friends	30		8	9	4	50.625	49.300	52.132	0.805	0.743	0.650	0.837	0.931	
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		2	6	2	51.000	55.358	51.000	0.993	0.449	0.533	1.000	0.747	0.528
Adult Self-Report - Adaptive Functioning : Family	30		7	9	4	50.857	44.916	51.859	0.288	0.913	0.777	0.663	0.940	0.623
Adult Self-Report - Adaptive Functioning : Job	30		4	8	3	44.000	47.900	44.268	0.875	0.388	0.842	0.678	0.909	0.678
Adult Self-Report - Adaptive Functioning : Education	30		2	3	1	43.500	42.043	43.500	0.754	0.837	1.000	0.000	0.000	0.000
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		8	9	4	50.750	48.640	53.535	0.754	0.731	0.865	0.574	0.806	0.535
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	8	9	4	-52.875	-53.428	-52.265	0.551	0.903	0.629	0.896	0.623	0.798
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	8	9	4	-52.250	-52.965	-52.271	0.551	0.890	0.661	0.866	0.810	0.895
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	8	9	4	-51.875	-51.203	-52.957	0.571	0.867	0.620	0.899	0.795	0.632
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	8	9	4	-53.125	-53.563	-53.457	0.550	0.903	0.627	0.895	0.765	0.926
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	8	9	4	-50.500	-53.881	-50.997	0.342	0.986	0.762	0.881	0.563	0.931
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	8	9	4	-51.000	-54.015	-50.402	0.342	0.986	0.753	0.727	0.834	0.793
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	8	9	4	-50.125	-54.832	-50.720	0.278	0.983	0.845	0.797	0.620	0.938
Adult Self-Report - DSM Scales - A voidant Personality	30	Yes	8	9	4	-53.250	-53.415	-54.781	0.787	0.878	0.652	0.803	0.630	0.916
Adult Self-Report - DSM Scales - AD/HD Problems	30	Yes	8	9	4	-52.875	-52.658	-51.100	0.723	0.826	0.820	0.873	0.858	0.675
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	8	9	4	-56.625	-55.512	-53.506	0.704	0.758	0.670	0.879	0.858	0.672
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	8	9	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	8	9	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 73: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.			Means			CCC vs CTT			CTT vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
High School end Age (graduate/drop-out)	21		12	15	9	18.167	17.516	17.877	0.787	0.999	0.997	0.868	0.968	0.984
High School Graduation or GED Age	21		10	9	7	18.900	20.129	19.442	0.954	0.450	0.807	0.855	0.999	0.835
Individual Income at age - 21 interview	21		12	14	9	18693.3	11264.0	17352.8	0.484	0.998	0.998	0.812	0.984	0.981
Spouse's Income at age - 21 interview	21		6	3	2	18100.0	9900.4	29422.7	0.161	0.997	0.993	0.449	0.996	0.681
Other Income at age - 21 interview	21	Yes	13	15	9	-738.5	-3787.8	-7426.1	0.942	1.000	0.982	0.830	0.795	0.907
Total Available Household Income at age - 21 interview	21		12	12	9	28543.3	19278.0	33953.8	0.836	1.000	0.999	0.861	1.000	0.855
Wage Income at age - 30 interview	30		9	15	8	15697.5	16189.9	7740.8	0.989	0.999	0.961	0.963	0.826	0.968
Other Income at age - 30 interview	30	Yes	9	15	8	-593.3	-1862.4	67.7	0.790	0.999	0.988	0.134	0.987	0.667
Spouse's Income at age - 30 interview	30		9	12	8	12277.7	13574.0	19449.6	0.970	1.000	0.998	0.862	0.997	0.871
Total Available Household Income at age - 30 interview	30		8	15	8	34172.1	32689.0	93080.1	0.975	0.999	0.999	0.863	1.000	0.722
Graduated High School? at age - 30 interview	21		13	15	9	0.692	0.333	0.632	0.304	0.998	0.996	0.621	0.983	0.983
Graduated High School? at age21	21		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Graduated High School? at age - 30 interview	30		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Graduated High School? at age30	30		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Ever Attended a 4 Year University? at age - 21 interview	21		11	14	8	0.091	0.006	0.329	0.830	1.000	0.999	0.129	0.991	0.112
Ever Attended a 4 Year University? at age21	21		13	15	9	0.077	0.038	0.273	0.926	1.000	0.995	0.551	0.999	0.697
Ever Attended a 4 Year University? at age - 30 interview	30		9	15	8	0.222	0.174	0.408	0.940	1.000	0.996	0.409	0.999	0.826
Ever Attended a 4 Year University? at age30	30		13	15	9	0.154	0.162	0.351	0.980	0.999	0.994	0.565	1.000	0.726
Have a 4 Year Degree? at age - 30 interview	30		13	15	9	0.077	0.026	0.232	0.967	0.999	0.998	0.615	1.000	0.804
Have a 4 Year Degree? at age21	30		13	15	9	0.077	0.026	0.232	0.967	0.999	0.998	0.615	1.000	0.804
Working? at age - 21 interview	21		12	14	9	0.833	0.607	0.771	0.758	0.998	0.999	0.861	0.989	0.976
Working? at age21	21		13	15	9	0.077	0.282	0.340	0.999	0.999	0.999	0.846	0.991	0.374
Working? at age - 30 interview	30		9	15	8	0.778	0.522	0.571	0.705	0.998	0.999	0.859	0.896	0.982
Working? at age30	30		13	15	9	0.538	0.590	0.532	0.970	0.999	0.973	0.966	0.992	0.966

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 74: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	CTT > TTT	CTT < TTT	CCC > TTT	CCC < TTT		
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	9	15	8	-50.333	-52.071	-49.900	0.213	0.787	0.846	0.154	0.976	<b>0.024</b>
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	9	15	8	-51.333	-53.115	-53.106	0.275	0.725	0.472	0.528	0.176	0.825
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	9	15	8	-51.778	-52.559	-53.223	0.360	0.640	0.387	0.613	0.262	0.738
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	9	15	8	-50.778	-53.224	-54.224	0.186	0.814	0.373	0.627	<b>0.065</b>	0.935
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	9	15	8	-53.667	-53.873	-51.288	0.474	0.526	0.729	0.271	0.988	<b>0.012</b>
Adult Self-Report - Problem Scales - Aggressive	30	Yes	9	15	8	-50.778	-53.491	-51.973	<b>0.050</b>	0.950	0.784	0.216	0.152	0.848
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	9	15	8	-51.556	-56.901	-52.844	<b>0.003</b>	0.997	0.838	0.162	0.147	0.853
Adult Self-Report - Problem Scales - Intrusive	30	Yes	9	15	8	-51.556	-53.114	-51.737	0.184	0.816	0.735	0.265	0.428	0.572
Adult Self-Report - Problem Scales - Critical Items	30	Yes	9	15	8	-50.556	-54.016	-51.020	<b>0.047</b>	0.953	0.806	0.104	0.162	0.838
Adult Self-Report - Problem Scales - Internalizing	30	Yes	9	15	8	-41.222	-45.355	-39.063	0.144	0.856	0.854	0.147	0.746	0.254
Adult Self-Report - Problem Scales - Externalizing	30	Yes	9	15	8	-45.889	-51.393	-46.297	<b>0.086</b>	0.964	0.784	0.216	0.428	0.572
Adult Self-Report - Problem Scales - Total Problems	30	Yes	9	15	8	-42.333	-45.764	-41.282	0.190	0.810	0.725	0.275	0.680	0.320
Adult Self-Report - Adaptive Functioning : Friends	30		8	15	8	52.250	44.732	52.641	<b>0.012</b>	0.988			0.625	0.375
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		6	9	5	46.833	44.132	48.080	0.207	0.793			0.682	0.318
Adult Self-Report - Adaptive Functioning : Family	30		9	15	8	49.000	48.634	54.096	0.444	0.556			0.968	<b>0.032</b>
Adult Self-Report - Adaptive Functioning : Job	30		7	6	6	54.857	51.711	55.458	0.153	0.847			0.674	0.326
Adult Self-Report - Adaptive Functioning : Education	30		2	0	0	55.000	55.000	55.000						
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		9	15	8	51.556	45.713	55.850	<b>0.033</b>	0.968			0.969	<b>0.031</b>
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	9	15	8	-52.222	-53.765	-54.099	0.204	0.796	0.184	0.816	0.193	0.807
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	9	15	8	-53.111	-55.285	-52.698	0.264	0.736	0.803	0.197	0.635	0.365
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	9	15	8	-54.778	-52.904	-53.302	0.742	0.258	0.180	0.820	0.622	0.379
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	9	15	8	-54.111	-54.512	-53.848	0.438	0.562	0.281	0.719	0.563	0.437
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	9	15	8	-50.222	-51.613	-50.523	0.280	0.720	0.540	0.460	0.243	0.757
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	9	15	8	-51.000	-52.412	-50.288	0.130	0.870	0.958	<b>0.042</b>	0.919	<b>0.081</b>
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	9	15	8	-53.667	-53.128	-53.058	0.594	0.406	0.419	0.581	0.642	0.357
Adult Self-Report - DSM Scales - Avoidant Personality	30	Yes	9	15	8	-52.333	-51.618	-50.936	0.625	0.375	0.493	0.507	0.815	0.185
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	9	15	8	-53.000	-53.563	-52.166	0.404	0.596	0.669	0.331	0.756	0.244
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	9	15	8	-51.000	-56.322	-52.431	<b>0.012</b>	0.988	0.829	0.171	0.137	0.863
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	9	15	8	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	9	15	8	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 75: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		7	8	3	18.857	19.032	19.923	0.916	0.493	0.338	0.266	0.359	0.179
Classroom Behavior Inventory - Creativity	72M		7	8	3	12.714	13.027	15.147	0.908	0.356	0.702	0.414	0.279	0.175
Classroom Behavior Inventory - Distractibility	72M	Yes	7	8	3	-10.714	-10.175	-11.074	0.490	0.311	0.979	0.515	0.826	0.591
Classroom Behavior Inventory - Independence	72M		7	8	3	12.286	15.491	13.744	0.232	0.147	0.683	0.725	0.613	0.304
Classroom Behavior Inventory - Hostility	72M	Yes	7	8	3	-8.000	-5.968	-10.041	<b>0.098</b>	<b>0.087</b>	0.766	0.715	0.496	0.767
Classroom Behavior Inventory - Verbal Intelligence	72M		7	8	3	11.857	12.599	14.288	0.803	0.313	0.425	0.220	0.350	0.193
Classroom Behavior Inventory - Task Orientation	72M		7	8	3	13.000	14.836	12.096	0.410	0.230	0.598	0.673	0.712	0.638
Classroom Behavior Inventory - Introversion	72M		7	8	3	7.714	7.016	8.326	0.676	0.511	0.575	0.757	0.682	0.365
Classroom Behavior Inventory - Considerateness	72M		6	8	3	15.500	16.812	13.565	0.302	0.282	0.664	0.678	0.402	0.807
Classroom Behavior Inventory - Dependence	72M	Yes	7	8	3	-9.714	-6.830	-9.586	<b>0.074</b>	<b>0.073</b>	0.474	0.166	0.950	0.477
Classroom Behavior Inventory - Extraversion	8		8	9	3	18.375	17.950	19.302	0.849	0.512	0.480	0.404	0.541	0.276
Classroom Behavior Inventory - Creativity	8		8	9	3	15.000	14.380	15.088	0.723	0.641	0.520	0.701	0.933	0.475
Classroom Behavior Inventory - Distractibility	8	Yes	8	9	3	-9.500	-10.391	-10.238	0.550	0.896	0.220	0.809	0.522	0.744
Classroom Behavior Inventory - Independence	8		8	9	3	13.750	15.741	14.914	0.355	0.321	0.927	0.329	0.572	0.289
Classroom Behavior Inventory - Hostility	8	Yes	8	9	3	-7.250	-8.847	-8.367	0.354	0.933	0.623	0.678	0.677	0.666
Classroom Behavior Inventory - Verbal Intelligence	8		8	9	3	13.250	13.224	14.339	0.990	0.624	0.873	0.486	0.392	0.234
Classroom Behavior Inventory - Task Orientation	8		8	9	3	14.875	14.577	14.597	0.905	0.727	0.534	0.549	0.867	0.562
Classroom Behavior Inventory - Introversion	8		8	9	3	6.500	8.577	6.330	0.151	<b>0.053</b>	0.257	0.836	0.839	0.546
Classroom Behavior Inventory - Considerateness	8		8	9	3	15.875	14.806	15.027	0.615	0.859	0.746	0.536	0.732	0.634
Classroom Behavior Inventory - Dependence	8	Yes	8	9	3	-9.625	-7.025	-8.013	0.115	0.115	0.786	0.225	0.410	0.181
Achenbach Teacher - School Performance	8		8	9	3	45.500	47.766	46.765	0.546	0.397	0.383	0.332	0.773	0.395
Achenbach Teacher - Works Hard	8		8	9	3	51.750	49.330	45.617	0.647	0.737	0.436	0.642	0.237	0.846
Achenbach Teacher - Behaves Appropriately	8		8	9	3	46.000	44.639	41.236	0.805	0.749	0.440	0.690	0.254	0.869
Achenbach Teacher - Learns	8		8	9	3	46.375	50.249	43.864	0.507	0.663	0.663	0.565	0.609	0.679
Achenbach Teacher - Happy	8		8	9	3	49.500	46.245	40.443	0.548	0.741	0.911	0.589	0.291	0.833
Harter Self-Perception Assessment - Teacher - Cognitive	12		8	9	4	2.625	2.441	2.896	0.544	0.771	0.525	0.237	0.463	0.246
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		8	9	4	2.839	2.835	2.744	0.984	0.536	0.248	0.821	0.666	0.661
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		8	9	4	2.804	2.812	2.820	0.977	0.205	0.896	0.637	0.966	0.504
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		8	9	4	3.125	3.079	3.035	0.892	0.257	0.124	<b>0.099</b>	0.737	0.640
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		8	9	4	2.875	2.815	2.528	0.870	0.441	0.990	0.691	0.545	0.741
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		8	9	4	3.313	3.493	3.627	0.457	0.217	0.362	0.771	0.449	0.232
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		8	9	4	2.813	2.340	3.270	0.189	0.906	0.190	0.135	0.151	<b>0.091</b>
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		8	9	4	3.500	3.541	3.575	0.877	0.430	0.459	0.656	0.865	0.449
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		8	9	4	2.813	2.413	2.929	0.193	0.853	0.639	0.379	0.711	0.346

Note: “CCC”, “CTT”, and “TTT” refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother’s working status before pregnancy, father’s presence at home at the subject’s birth, the number of older siblings in the household, and mother’s IQ.

Table 76: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values								
			Obs.			Means			CCC vs CTT			CTT vs TTT					
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CCC=CTT	CTT>TTT	CTT<TTT	CTT=TTT	CCC>TTT	CCC<TTT	CCC=TTT
Classroom Behavior Inventory - Considerateness	12		4	4	3	9.500	16.087	9.952	<b>0.067</b>	<b>0.053</b>		0.975	0.230		0.819	0.397	
Classroom Behavior Inventory - Creativity	12		4	4	3	11.500	9.206	12.746	0.213	0.844		0.276	0.227		0.625	0.284	
Classroom Behavior Inventory - Dependence	12	Yes	4	4	3	-11.000	-7.800	-10.419	<b>0.009</b>	<b>0.009</b>		0.384	0.744		0.757	0.379	
Classroom Behavior Inventory - Distractibility	12	Yes	4	4	3	-12.500	-8.359	-12.185	<b>0.029</b>	<b>0.020</b>		0.499	0.570		0.431	0.230	
Classroom Behavior Inventory - Extraversion	12		4	4	3	15.000	12.359	15.841	0.278	0.773		0.241	0.228		0.633	0.322	
Classroom Behavior Inventory - Hostility	12	Yes	4	4	3	-9.500	-6.999	-10.424	0.279	0.199		0.611	0.201		0.577	0.686	
Classroom Behavior Inventory - Independence	12		4	4	3	10.500	14.659	11.002	<b>0.039</b>	<b>0.030</b>		0.472	0.661		0.827	0.421	
Classroom Behavior Inventory - Introversiion	12		4	4	3	7.750	8.778	7.666	0.314	0.236		0.148	0.865		0.851	0.590	
Classroom Behavior Inventory - Task Orientation	12		4	4	3	9.500	14.156	9.134	0.133	0.109		0.462	0.658		0.847	0.600	
Classroom Behavior Inventory - Verbal Intelligence	12		4	4	3	11.000	11.409	12.309	0.813	0.378		0.721	0.547		0.544	0.262	
Child's Behavior Toward Teacher - Control	12		4	4	3	15.750	11.456	15.501	<b>0.066</b>	0.947		0.774	0.787		0.707	0.657	
Child's Behavior Toward Teacher - Detachment	12		4	4	3	8.750	9.185	9.159	0.591	0.273		0.350	0.741		0.673	0.351	
Child's Behavior Toward Teacher - Obedient	12	Yes	4	4	3	-11.750	-14.508	-12.410	0.126	0.904		0.969	0.680		0.781	0.617	
Child's Behavior Toward Teacher - Positive Involvement	12		4	4	3	14.500	12.368	14.863	<b>0.082</b>	0.940		0.183	0.143		0.773	0.409	
Achenbach Parent - Total Competence	12		8	8	4	40.125	41.175	46.972	0.794	0.423		0.673	0.646		<b>0.077</b>	<b>0.049</b>	
Achenbach Parent - Activities	12		8	8	4	44.000	44.596	49.742	0.863	0.456		0.820	0.335		0.171	0.100	
Achenbach Parent - Social	12		8	8	4	42.125	41.131	47.308	0.731	0.643		0.568	0.822		0.257	0.137	
Achenbach Parent - School	12		8	8	4	40.500	40.285	45.948	0.963	0.600		0.584	0.809		0.210	<b>0.089</b>	

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 77: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		10	11	8	20.000	19.154	17.122	0.206	0.794	0.261	0.739	0.017	0.984
Classroom Behavior Inventory - Creativity	72M		10	11	7	15.300	14.604	13.083	0.263	0.737	0.503	0.497	0.040	0.960
Classroom Behavior Inventory - Distractibility	72M	Yes	10	11	8	-8.300	-9.562	-10.688	0.072	0.928	0.429	0.571	0.035	0.965
Classroom Behavior Inventory - Independence	72M		10	11	8	16.600	14.328	13.498	0.085	0.915	0.362	0.639	0.063	0.937
Classroom Behavior Inventory - Hostility	72M	Yes	10	11	7	-6.400	-8.805	-9.050	0.010	0.990	0.222	0.779	0.006	0.995
Classroom Behavior Inventory - Verbal Intelligence	72M		10	10	8	13.700	12.373	11.481	0.080	0.920	0.762	0.238	0.041	0.959
Classroom Behavior Inventory - Task Orientation	72M		10	11	8	16.800	14.707	13.166	0.081	0.920	0.138	0.862	0.039	0.961
Classroom Behavior Inventory - Introversion	72M		10	11	8	5.800	5.808	7.073	0.508	0.493	0.736	0.264	0.880	0.120
Classroom Behavior Inventory - Considerateness	72M		10	10	8	18.100	14.982	14.075	0.017	0.984	0.282	0.718	0.009	0.991
Classroom Behavior Inventory - Dependence	72M	Yes	10	11	8	-6.700	-6.749	-6.807	0.479	0.521	0.515	0.485	0.515	0.485
Classroom Behavior Inventory - Extraversion	8		13	14	9	18.385	17.463	18.563	0.194	0.806	0.599	0.401	0.487	0.513
Classroom Behavior Inventory - Creativity	8		13	14	9	16.077	15.193	17.006	0.261	0.739	0.645	0.355	0.622	0.378
Classroom Behavior Inventory - Distractibility	8	Yes	13	14	9	-10.000	-11.223	-10.716	0.171	0.829	0.359	0.641	0.292	0.708
Classroom Behavior Inventory - Independence	8		13	14	9	16.000	13.632	11.672	0.073	0.927	0.035	0.965	0.009	0.991
Classroom Behavior Inventory - Hostility	8	Yes	13	14	9	-8.308	-9.535	-8.433	0.145	0.855	0.686	0.314	0.477	0.523
Classroom Behavior Inventory - Verbal Intelligence	8		13	14	9	14.308	12.577	13.455	0.087	0.913	0.632	0.368	0.243	0.757
Classroom Behavior Inventory - Task Orientation	8		13	13	9	15.308	12.914	13.016	0.106	0.894	0.242	0.758	0.123	0.877
Classroom Behavior Inventory - Introversion	8		13	14	9	6.000	7.518	6.827	0.952	0.048	0.359	0.641	0.820	0.181
Classroom Behavior Inventory - Considerateness	8		12	14	9	15.417	13.458	16.796	0.057	0.943	0.732	0.268	0.798	0.202
Classroom Behavior Inventory - Dependence	8	Yes	13	14	9	-6.923	-8.261	-9.530	0.112	0.888	0.043	0.957	0.014	0.986
Achenbach Teacher - School Performance	8		13	14	9	46.846	42.128	45.458	0.107	0.893	0.751	0.249	0.324	0.676
Achenbach Teacher - Works Hard	8		13	14	9	54.077	46.612	48.866	0.067	0.933	0.269	0.731	0.143	0.857
Achenbach Teacher - Behaves Appropriately	8		13	14	9	48.462	43.244	43.727	0.125	0.876	0.162	0.838	0.130	0.870
Achenbach Teacher - Learns	8		13	14	9	48.385	44.590	46.821	0.189	0.811	0.439	0.561	0.321	0.679
Achenbach Teacher - Happy	8		13	14	8	52.231	42.196	47.087	0.018	0.982	0.709	0.291	0.181	0.819
Harter Self-Perception Assessment - Teacher - Cognitive	12		12	14	9	3.036	2.866	2.442	0.251	0.749	0.260	0.740	0.008	0.992
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		12	14	9	3.440	3.280	2.765	0.129	0.871	0.115	0.885	0.002	0.998
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		12	14	9	3.298	3.324	3.117	0.551	0.450	0.216	0.784	0.217	0.783
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		12	14	9	3.560	3.323	3.220	0.094	0.906	0.405	0.595	0.086	0.914
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		12	14	9	2.958	2.728	3.472	0.256	0.744	0.952	0.049	0.876	0.124
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		12	14	9	3.542	3.518	3.537	0.477	0.523	0.825	0.175	0.425	0.575
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		12	14	9	2.542	2.350	3.059	0.259	0.741	0.978	0.022	0.941	0.059
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		12	14	9	3.667	3.590	3.617	0.353	0.647	0.487	0.513	0.376	0.624
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		12	14	9	2.667	2.450	2.746	0.231	0.769	0.923	0.077	0.586	0.414

Note: “CCC”, “CTT”, and “TTT” refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother’s working status before pregnancy, father’s presence at home at the subject’s birth, the number of older siblings in the household, and mother’s IQ.

Table 78: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.			Means			CCC vs CTT		CTT vs TTT		CCC vs TTT	
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Considerateness	12		8	8	4	17.000	14.408	14.349	0.131	0.869	0.679	0.321	0.132	0.868
Classroom Behavior Inventory - Creativity	12		8	8	4	14.125	13.082	14.345	0.319	0.681	0.851	0.149	0.552	0.448
Classroom Behavior Inventory - Dependence	12	Yes	8	8	4	-6.125	-7.909	-7.059	<b>0.072</b>	0.928	0.221	0.779	0.112	0.888
Classroom Behavior Inventory - Distractibility	12	Yes	8	8	4	-11.125	-10.285	-11.576	0.711	0.289	0.568	0.432	0.380	0.620
Classroom Behavior Inventory - Extraversion	12		8	8	4	19.625	19.054	18.057	0.348	0.652	0.750	0.250	0.143	0.857
Classroom Behavior Inventory - Hostility	12	Yes	8	8	4	-8.125	-9.066	-11.744	0.269	0.731	<b>0.062</b>	0.938	<b>0.041</b>	0.959
Classroom Behavior Inventory - Independence	12		8	8	4	14.875	12.681	13.645	0.104	0.896	0.378	0.622	0.238	0.702
Classroom Behavior Inventory - Introversiion	12		8	8	4	6.125	7.248	6.662	0.908	<b>0.092</b>	0.139	0.861	0.765	0.235
Classroom Behavior Inventory - Task Orientation	12		8	8	4	13.000	11.880	11.674	0.339	0.661	0.833	0.167	0.319	0.681
Classroom Behavior Inventory - Verbal Intelligence	12		8	8	4	12.500	11.512	12.569	0.277	0.723	0.557	0.443	0.482	0.518
Child's Behavior Toward Teacher - Control	12		8	8	4	12.000	12.054	14.230	0.515	0.485	0.848	0.152	0.837	0.163
Child's Behavior Toward Teacher - Detachment	12		8	8	4	9.000	9.610	6.626	0.628	0.372	<b>0.029</b>	0.971	<b>0.063</b>	0.937
Child's Behavior Toward Teacher - Obedient	12	Yes	8	8	4	-15.000	-13.699	-13.045	0.779	0.221	0.253	0.747	0.890	0.110
Child's Behavior Toward Teacher - Positive Involvement	12		8	8	4	13.625	13.717	13.207	0.511	0.489	0.598	0.402	0.434	0.566
Achenbach Parent - Total Competence	12		12	14	8	43.750	41.952	47.449	0.282	0.718	0.969	<b>0.032</b>	0.902	<b>0.098</b>
Achenbach Parent - Activities	12		12	14	9	47.833	46.209	46.210	0.262	0.738	0.607	0.393	0.243	0.757
Achenbach Parent - Social	12		12	14	9	44.333	43.485	49.331	0.419	0.582	0.873	0.127	0.875	0.125
Achenbach Parent - School	12		12	14	8	43.667	40.866	44.975	0.238	0.762	0.952	<b>0.049</b>	0.669	0.331

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 79: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics										Single p-values					
			Obs.			Means			CCC vs CTT			CTT vs TTT			CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		8	9	3	26.000	24.296	31.455	0.444	0.837	0.156	0.044	0.120	0.053				
HOME - Total	12M		8	7	5	26.250	25.757	27.875	0.824	0.608	0.260	0.139	0.584	0.290				
HOME - Total	18M		8	8	5	25.250	29.774	29.405	<b>0.072</b>	<b>0.055</b>	0.520	0.285	0.117	<b>0.070</b>				
HOME - Total	30M		8	9	5	28.500	29.731	32.586	0.508	0.424	0.867	0.197	<b>0.078</b>	<b>0.035</b>				
HOME - Total	42M		8	9	4	55.875	57.125	61.937	0.746	0.471	0.157	<b>0.076</b>	0.217	0.107				
HOME - Total	54M		8	9	3	56.000	56.439	63.159	0.918	0.518	0.481	0.206	0.215	0.121				
Knowledge of Infant Development Inventory : Attempted	30M		7	8	4	0.885	0.844	0.872	0.240	0.884	0.203	0.123	0.459	0.779				
Knowledge of Infant Development Inventory : Accuracy	30M		7	8	4	0.763	0.755	0.762	0.795	0.521	0.445	0.270	0.970	0.575				
Knowledge of Infant Development Inventory : Corret	30M		7	8	4	0.676	0.637	0.665	0.189	0.883	<b>0.064</b>	<b>0.040</b>	0.687	0.709				
Family Environment Scale - Child - Cohesion	12		8	9	4	46.500	55.250	54.460	0.269	0.135	0.398	0.701	0.382	0.207				
Family Environment Scale - Child - Expressiveness	12		8	9	4	44.750	42.301	44.344	0.632	0.717	0.851	0.221	0.944	0.554				
Family Environment Scale - Child - Conflict	12	Yes	8	9	4	-47.750	-46.403	-46.122	0.825	0.401	0.514	0.567	0.803	0.396				
Family Environment Scale - Child - Independence	12		8	9	4	33.250	45.912	39.310	<b>0.038</b>	<b>0.030</b>	0.830	0.420	0.297	0.142				
Family Environment Scale - Child - Achievement Orientation	12		8	9	4	47.125	53.730	53.731	<b>0.094</b>	<b>0.019</b>	0.456	0.670	0.357	0.175				
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		8	9	4	42.000	53.726	47.611	<b>0.021</b>	<b>0.015</b>	0.517	0.807	0.335	0.157				
Family Environment Scale - Child - Active-Recreational Orientation	12		8	9	4	47.375	58.209	46.841	<b>0.063</b>	<b>0.002</b>	0.274	0.901	0.914	0.530				
Family Environment Scale - Child - Moral-Religious Emphasis	12		8	9	4	52.375	58.253	57.907	0.125	<b>0.044</b>	0.475	0.324	0.164	<b>0.086</b>				
Family Environment Scale - Child - Organization	12		8	9	4	51.875	49.966	51.372	0.653	0.582	0.914	0.342	0.955	0.508				
Family Environment Scale - Child - Control	12		8	9	4	52.250	54.394	56.896	0.618	0.264	0.676	0.728	0.295	0.153				
Family Environment Scale - Parent - Cohesion	12		8	7	4	44.750	54.349	41.859	0.178	<b>0.095</b>	0.294	0.747	0.758	0.619				
Family Environment Scale - Parent - Expressiveness	12		8	7	4	53.375	54.153	47.740	0.865	0.306	0.217	0.845	0.251	0.800				
Family Environment Scale - Parent - Conflict	12	Yes	8	7	4	-51.125	-40.853	-54.353	<b>0.063</b>	<b>0.043</b>	0.363	0.654	0.651	0.672				
Family Environment Scale - Parent - Independence	12		8	7	4	49.000	52.340	47.517	0.612	0.322	0.730	0.443	0.867	0.582				
Family Environment Scale - Parent - Achievement Orientation	12		8	7	4	56.375	57.756	58.668	0.645	0.479	0.431	0.682	0.482	0.250				
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		8	7	4	45.625	49.373	50.718	0.447	0.289	0.856	0.548	0.431	0.218				
Family Environment Scale - Parent - Active-Recreational Orientation	12		8	7	4	39.750	50.702	44.135	<b>0.087</b>	<b>0.030</b>	0.789	0.582	0.439	0.243				
Family Environment Scale - Parent - Moral-Religious Emphasis	12		8	7	4	56.500	64.752	62.484	<b>0.022</b>	<b>0.013</b>	0.771	0.680	<b>0.065</b>	<b>0.031</b>				
Family Environment Scale - Parent - Organization	12		8	7	4	55.250	50.010	57.465	0.383	0.817	0.270	0.170	0.671	0.354				
Family Environment Scale - Parent - Control	12		8	7	4	58.500	55.078	65.490	0.461	0.909	0.524	0.344	<b>0.083</b>	<b>0.053</b>				

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 80: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		13	15	9	30.308	26.082	30.269	0.031	0.969	0.951	0.050	0.316	0.684
HOME - Total	12M		12	14	9	29.500	30.744	33.803	0.698	0.302	0.993	0.008	0.950	0.050
HOME - Total	18M		12	14	9	33.667	29.738	32.310	0.037	0.963	0.974	0.026	0.155	0.845
HOME - Total	30M		12	13	9	31.500	30.046	32.078	0.271	0.729	0.673	0.327	0.509	0.491
HOME - Total	42M		11	13	9	57.818	55.045	60.818	0.271	0.730	0.963	0.037	0.716	0.284
HOME - Total	54M		12	13	9	65.167	58.935	64.883	0.026	0.974	0.967	0.034	0.326	0.674
Knowledge of Infant Development Inventory : Attempted	30M		11	12	6	0.838	0.825	0.852	0.402	0.599	0.919	0.082	0.657	0.343
Knowledge of Infant Development Inventory : Accuracy	30M		11	12	6	0.729	0.720	0.760	0.390	0.610	0.897	0.103	0.836	0.164
Knowledge of Infant Development Inventory : Corret	30M		11	12	6	0.618	0.596	0.647	0.337	0.663	0.977	0.023	0.734	0.267
Family Environment Scale - Child - Cohesion	12		12	14	9	54.167	56.671	51.266	0.725	0.275	0.132	0.868	0.251	0.749
Family Environment Scale - Child - Expressiveness	12		12	14	9	44.000	42.373	43.739	0.296	0.704	0.782	0.218	0.443	0.557
Family Environment Scale - Child - Conflict	12	Yes	12	14	9	-44.417	-45.983	-47.727	0.350	0.650	0.288	0.712	0.191	0.809
Family Environment Scale - Child - Independence	12		12	14	9	48.333	46.414	46.504	0.362	0.638	0.422	0.578	0.316	0.684
Family Environment Scale - Child - Achievement Orientation	12		12	14	9	58.583	56.291	62.202	0.214	0.786	0.970	0.030	0.895	0.105
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		12	14	9	48.833	50.241	49.253	0.645	0.355	0.143	0.857	0.524	0.476
Family Environment Scale - Child - Active-Recreational Orientation	12		12	14	9	52.333	51.708	55.548	0.423	0.577	0.833	0.168	0.814	0.186
Family Environment Scale - Child - Moral-Religious Orientation	12		12	14	9	55.500	58.302	56.009	0.842	0.158	0.662	0.338	0.540	0.460
Family Environment Scale - Child - Organization	12		12	14	9	51.000	54.473	56.263	0.810	0.191	0.756	0.244	0.899	0.101
Family Environment Scale - Child - Control	12		12	14	9	59.250	57.110	56.139	0.233	0.767	0.424	0.576	0.111	0.889
Family Environment Scale - Parent - Cohesion	12		12	14	9	52.333	50.350	56.458	0.345	0.655	0.969	0.031	0.769	0.231
Family Environment Scale - Parent - Expressiveness	12		12	14	9	52.417	51.143	51.887	0.378	0.622	0.896	0.104	0.435	0.565
Family Environment Scale - Parent - Conflict	12	Yes	12	14	9	-50.083	-51.232	-46.100	0.400	0.600	0.995	0.005	0.795	0.205
Family Environment Scale - Parent - Independence	12		12	14	9	48.333	54.423	53.804	0.893	0.107	0.699	0.301	0.903	0.097
Family Environment Scale - Parent - Achievement Orientation	12		12	14	9	53.833	57.385	54.275	0.903	0.097	0.318	0.682	0.562	0.438
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		12	14	9	55.667	51.372	53.292	0.208	0.792	0.776	0.224	0.331	0.669
Family Environment Scale - Parent - Active-Recreational Orientation	12		12	14	9	52.083	50.823	53.197	0.372	0.628	0.628	0.345	0.655	0.683
Family Environment Scale - Parent - Moral-Religious Emphasis	12		12	14	9	60.333	57.552	59.943	0.186	0.814	0.913	0.087	0.373	0.627
Family Environment Scale - Parent - Organization	12		12	14	9	53.750	50.400	55.754	0.226	0.774	0.862	0.138	0.676	0.324
Family Environment Scale - Parent - Control	12		12	14	9	55.667	60.050	60.206	0.906	0.094	0.280	0.720	0.911	0.089

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 81: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Health

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.			Means			CCC vs CTT		CTT vs TTT		CCC vs TTT	
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		8	9	4	7.738	7.349	7.445	0.300	0.782	<b>0.063</b>	<b>0.051</b>	0.401	0.786
Weight in kg	12M		8	7	5	10.150	9.447	9.681	<b>0.086</b>	0.920	0.288	0.178	<b>0.067</b>	0.963
Weight in kg	18M		8	8	5	11.813	11.689	11.218	0.804	0.487	0.953	0.402	0.262	0.880
Weight in kg	24M		7	9	5	13.386	12.517	12.922	0.124	0.914	0.956	0.461	0.487	0.760
Weight in kg	36M		8	9	3	15.225	14.668	15.157	0.347	0.780	0.136	<b>0.032</b>	0.834	0.588
Weight in kg	48M		7	9	4	17.643	17.060	18.183	0.528	0.623	0.148	<b>0.049</b>	0.447	0.196
Weight in kg	60M		7	9	3	20.886	19.343	22.915	0.274	0.807	<b>0.059</b>	<b>0.016</b>	0.147	<b>0.087</b>
Weight in kg	8		8	7	2	32.341	30.942	37.742	0.727	0.488	0.382	0.189	0.270	0.145
Height in cm	6M		8	9	4	66.000	65.678	66.081	0.725	0.690	0.280	<b>0.025</b>	0.910	0.469
Height in cm	12M		8	7	5	74.750	75.331	73.984	0.650	0.276	0.946	0.481	0.592	0.732
Height in cm	18M		8	8	5	81.750	82.393	82.214	0.602	0.314	0.937	0.304	0.619	0.317
Height in cm	24M		7	9	5	87.857	87.101	87.409	0.462	0.832	0.539	0.517	0.773	0.641
Height in cm	36M		8	9	3	96.000	96.737	97.861	0.535	0.307	0.596	0.149	0.195	0.111
Height in cm	48M		7	9	4	104.429	105.325	105.773	0.604	0.278	0.953	0.337	0.393	0.215
Height in cm	60M		7	9	3	113.286	112.903	116.630	0.843	0.531	0.304	<b>0.085</b>	0.215	0.109
Height in cm	8		8	7	2	129.621	131.420	135.121	0.495	0.114	0.303	<b>0.052</b>	0.280	0.144
Brief Symptom Inventory - Somatization	21	Yes	7	9	4	-50.143	-53.664	-46.230	0.438	0.723	0.471	0.529	0.793	0.207
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	7	9	4	-57.571	-55.614	-53.073	0.607	0.213	0.385	0.615	0.887	0.113
Brief Symptom Inventory - Interpersonal Sens	21	Yes	7	9	4	-54.571	-53.704	-49.508	0.863	0.457	0.476	0.524	0.872	0.128
Brief Symptom Inventory - Depression	21	Yes	7	9	4	-55.571	-52.880	-51.290	0.561	0.311	0.387	0.613	0.824	0.176
Brief Symptom Inventory - Anxiety	21	Yes	7	9	4	-52.571	-53.664	-48.147	0.795	0.519	0.393	0.607	0.899	0.101
Brief Symptom Inventory - Hostility	21	Yes	7	9	4	-63.857	-57.765	-57.081	0.119	<b>0.033</b>	0.389	0.611	0.954	<b>0.046</b>
Brief Symptom Inventory - Psychoticism	21	Yes	7	9	4	-54.857	-52.834	-47.348	0.655	0.267	0.686	0.314	0.928	<b>0.072</b>
Brief Symptom Inventory - Global Severity Index	21	Yes	7	9	4	-66.857	-62.593	-59.957	<b>0.082</b>	<b>0.025</b>	0.478	0.522	0.945	<b>0.055</b>
Brief Symptom Inventory - Positive Symptom total	21	Yes	7	9	4	-64.286	-58.488	-55.819	0.133	<b>0.098</b>	0.588	0.412	0.939	<b>0.061</b>
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	7	9	4	-60.429	-56.888	-54.455	0.279	<b>0.088</b>	0.362	0.638	0.943	<b>0.057</b>
Brief Symptom Inventory - Phobic Anxiety	21	Yes	7	9	4	-60.143	-54.930	-52.223	0.231	0.102	0.361	0.639	0.954	<b>0.046</b>
Brief Symptom Inventory - Paranoid ideation	21	Yes	7	9	4	-59.714	-58.251	-56.866	0.608	0.119	0.509	0.491	0.860	0.140

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 82: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Health

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.			Means			CCC vs CTT			CTT vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		12	15	9	7.908	8.271	8.062	0.863	0.137	0.350	0.650	0.637	0.363
Weight in kg	12M		12	13	9	10.175	10.747	10.619	0.889	0.111	0.405	0.595	0.788	0.213
Weight in kg	18M		12	13	9	11.483	11.863	12.185	0.767	0.233	0.485	0.515	0.850	0.150
Weight in kg	24M		12	14	9	13.075	12.901	13.976	0.372	0.628	0.938	<b>0.062</b>	0.848	0.152
Weight in kg	36M		10	12	9	14.560	15.135	15.631	0.798	0.202	0.884	0.116	0.797	0.203
Weight in kg	48M		12	14	9	16.983	17.168	18.701	0.590	0.410	0.968	<b>0.032</b>	0.919	<b>0.081</b>
Weight in kg	60M		9	11	9	19.489	19.163	20.866	0.389	0.611	0.993	<b>0.007</b>	0.773	0.227
Weight in kg	8		12	14	9	28.446	29.320	32.436	0.609	0.391	0.792	0.209	0.888	0.112
Height in cm	6M		12	15	9	67.417	68.148	67.031	0.771	0.229	0.180	0.820	0.335	0.665
Height in cm	12M		12	13	9	76.250	76.679	76.839	0.635	0.365	0.542	0.458	0.745	0.255
Height in cm	18M		12	13	9	82.333	82.291	81.050	0.489	0.511	0.251	0.749	0.141	0.859
Height in cm	24M		12	13	9	87.333	86.708	87.722	0.316	0.684	0.871	0.129	0.583	0.417
Height in cm	36M		10	12	9	96.000	96.214	95.276	0.555	0.445	0.547	0.453	0.367	0.633
Height in cm	48M		12	14	9	103.583	103.187	103.965	0.397	0.603	0.889	0.111	0.569	0.431
Height in cm	60M		9	11	9	112.000	111.103	111.697	0.348	0.652	0.835	0.166	0.399	0.601
Height in cm	8		12	14	9	129.809	129.196	129.488	0.374	0.626	0.762	0.238	0.470	0.530
Brief Symptom Inventory - Somatization	21	Yes	11	13	7	-53.091	-50.966	-47.792	0.695	0.305	0.590	0.410	0.913	<b>0.087</b>
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	10	12	7	-58.200	-54.223	-56.838	0.842	0.158	0.423	0.577	0.642	0.358
Brief Symptom Inventory - Interpersonal Sens	21	Yes	11	13	7	-54.091	-52.286	-48.693	0.698	0.302	0.646	0.354	0.932	<b>0.068</b>
Brief Symptom Inventory - Depression	21	Yes	11	13	7	-54.545	-52.408	-51.105	0.685	0.315	0.604	0.396	0.816	0.184
Brief Symptom Inventory - Anxiety	21	Yes	11	13	7	-53.000	-49.520	-47.076	0.842	0.158	0.678	0.322	0.949	<b>0.051</b>
Brief Symptom Inventory - Hostility	21	Yes	11	11	7	-57.000	-58.166	-55.077	0.368	0.632	0.953	<b>0.047</b>	0.737	0.263
Brief Symptom Inventory - Psychoticism	21	Yes	11	13	7	-52.182	-53.202	-45.141	0.398	0.602	0.688	0.312	0.974	<b>0.026</b>
Brief Symptom Inventory - Global Severity Index	21	Yes	10	12	7	-63.800	-63.926	-61.849	0.485	0.515	0.799	0.201	0.747	0.253
Brief Symptom Inventory - Positive Symptom total	21	Yes	11	13	7	-62.000	-57.975	-54.816	0.803	0.197	0.539	0.461	0.947	<b>0.053</b>
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	10	13	7	-58.000	-57.000	-54.914	0.606	0.394	0.864	0.136	0.797	0.203
Brief Symptom Inventory - Phobic Anxiety	21	Yes	11	13	8	-57.091	-55.415	-57.080	0.709	0.291	0.410	0.590	0.573	0.426
Brief Symptom Inventory - Paranoid ideation	21	Yes	10	13	7	-56.700	-56.190	-54.776	0.559	0.441	0.901	<b>0.099</b>	0.709	0.291

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 83: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics										Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	CCC	CTT	CCC>CTT	CTT>CCC	CTT>TTT	TTT<CTT	CCC>CTT	CTT>CCC	CTT>TTT	TTT<CTT	CCC>TTT	CTT<TTT	CCC<TTT	
High School end Age (graduate/drop-out)	21		8	9	16,750	17,476	19,068			0.095	0.089	0.726	0.115	0.134	0.061			
High School Graduation or GED Age	21		3	8	18,333	18,847	18,096			0.324	0.160	0.549	0.565	0.799	0.621			
Individual Income at age - 21 interview	21		7	9	6057.1	6048.0	12211.4			0.998	0.532	0.261	0.080	0.254	0.115			
Spouse's Income at age - 21 interview	21	Yes	2	2	11000.0	11000.0	11000.0			0.671	0.662							
Other Income at age - 21 interview	21		8	9	-1541.5	-1101.5	-101.3			0.612	0.356	0.042	0.022	0.084	0.051			
Total Available Household Income at age - 21 interview	21		5	7	14951.2	16357.7	27168.9			0.815	0.294	0.599	0.198	0.232	0.103			
Wage Income at age - 30 interview	30		8	9	12630.8	16922.9	18967.4			0.597	0.448	0.912	0.423	0.244	0.124			
Other Income at age - 30 interview	30	Yes	7	9	-6426.9	-3391.9	-3128.8			0.334	0.224	0.597	0.302	0.295	0.171			
Spouse's Income at age - 30 interview	30		8	9	7500.0	17085.7	11236.9			0.246	0.055	0.733	0.548	0.813	0.395			
Total Available Household Income at age - 30 interview	30		8	9	25866.8	37490.6	33009.9			0.322	0.181	0.721	0.488	0.632	0.310			
Graduated High School? at age - 30 interview	21		8	9	0.250	0.490	0.389			0.226	0.157	0.273	0.142	0.575	0.261			
Graduated High School? at age21	21		8	9	0.375	0.523	0.630			0.481	0.392	0.273	0.142	0.361	0.169			
Graduated High School? at age - 30 interview	30		8	9	0.375	0.523	0.746			0.481	0.392	0.318	0.106	0.185	0.102			
Graduated High School? at age30	30		8	9	0.375	0.523	0.746			0.481	0.392	0.318	0.106	0.185	0.102			
Ever Attended a 4 Year University? at age - 21 interview	21		7	9	0.143	0.327	0.212			0.361	0.303	0.520	0.156	0.791	0.405			
Ever Attended a 4 Year University? at age21	21		8	9	0.250	0.375	0.389			0.535	0.467	0.590	0.193	0.563	0.266			
Ever Attended a 4 Year University? at age - 30 interview	30		8	9	0.250	0.375	0.500			0.535	0.467	0.346	0.057	0.189	0.085			
Ever Attended a 4 Year University? at age30	30		8	9	0.250	0.375	0.505			0.535	0.467	0.503	0.097	0.274	0.119			
Have a 4 Year Degree? at age - 30 interview	30		8	9	0.250	0.306	0.320			0.789	0.563	0.946	0.321	0.636	0.311			
Have a 4 Year Degree? at age 30	30		8	9	0.250	0.306	0.320			0.789	0.563	0.946	0.321	0.636	0.311			
Working? at age - 21 interview	21		7	9	0.571	0.517	0.629			0.821	0.545	0.236	0.213	0.811	0.369			
Working? at age21	21		8	9	0.125	0.209	0.125			0.614	0.424	0.975	0.307	0.987	0.559			
Working? at age - 30 interview	30		8	9	0.625	0.667	0.853			0.804	0.496	0.957	0.575	0.348	0.201			
Working? at age30	30		8	9	0.625	0.667	0.764			0.804	0.496	0.700	0.682	0.545	0.205			

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 84: Single Hypothesis Testing by Permutation Procedure: CARE, Female, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	8	9	4	-50.250	-53.050	-50.101	<b>0.072</b>	0.928	0.565	0.435	0.630	0.370
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	8	9	4	-53.750	-52.813	-53.489	0.754	0.245	0.350	0.650	0.609	0.391
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	8	9	4	-50.125	-54.141	-50.290	0.101	0.899	0.563	0.437	0.216	0.784
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	8	9	4	-53.250	-54.741	-51.361	<b>0.100</b>	0.900	0.804	0.196	0.840	0.160
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	8	9	4	-51.750	-52.670	-51.087	0.356	0.644	0.516	0.484	0.669	0.331
Adult Self-Report - Problem Scales - Aggressive	30	Yes	8	9	4	-55.125	-54.642	-52.008	0.618	0.382	0.398	0.602	0.794	0.206
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	8	9	4	-53.625	-54.150	-53.845	0.508	0.492	0.394	0.606	0.420	0.580
Adult Self-Report - Problem Scales - Intrusive	30	Yes	8	9	4	-55.250	-53.990	-51.764	0.690	0.310	0.405	0.595	0.843	0.157
Adult Self-Report - Problem Scales - Critical Items	30	Yes	8	9	4	-54.250	-55.107	-52.256	0.335	0.665	0.665	0.335	0.813	0.188
Adult Self-Report - Problem Scales - Internalizing	30	Yes	8	9	4	-40.250	-47.516	-43.216	<b>0.054</b>	0.947	0.612	0.388	<b>0.054</b>	0.946
Adult Self-Report - Problem Scales - Externalizing	30	Yes	8	9	4	-51.500	-48.492	-47.829	0.776	0.224	0.374	0.626	0.782	0.218
Adult Self-Report - Problem Scales - Total Problems	30	Yes	8	9	4	-44.875	-47.441	-44.063	0.281	0.719	0.559	0.441	0.577	0.423
Adult Self-Report - Adaptive Functioning : Friends	30		8	9	4	50.625	49.300	52.132	0.715	0.595	0.827	0.593	0.765	0.384
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		2	6	2	51.000	55.358	51.000	0.396	0.212	0.486	0.792	0.500	0.253
Adult Self-Report - Adaptive Functioning : Family	30		7	9	4	50.857	44.916	51.859	<b>0.087</b>	0.913	0.272	0.267	0.720	0.381
Adult Self-Report - Adaptive Functioning : Job	30		4	8	3	44.000	47.900	44.268	0.242	0.125	0.483	0.338	0.640	0.328
Adult Self-Report - Adaptive Functioning : Education	30		2	3	1	43.500	42.043	43.500	0.840	0.553	<b>0.000</b>	<b>0.000</b>	0.640	0.328
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		8	9	4	50.750	48.640	53.535	0.556	0.601	0.581	0.421	0.402	0.190
Adult Self-Report - Substance Use Scales - Tobacco	30		8	9	4	-52.875	-53.428	-52.265	0.250	0.750	0.319	0.681	0.586	0.414
Adult Self-Report - Substance Use Scales - Alcohol	30		8	9	4	-52.250	-52.965	-52.271	0.177	0.823	0.601	0.399	0.502	0.498
Adult Self-Report - Substance Use Scales - Drugs	30		8	9	4	-51.875	-51.203	-52.957	0.568	0.432	0.125	0.875	0.372	0.628
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30		8	9	4	-53.125	-53.563	-53.457	0.235	0.765	0.340	0.660	0.450	0.550
Adult Self-Report - DSM Scales - Depressive Problems	30		8	9	4	-50.500	-53.881	-50.997	0.106	0.894	0.494	0.506	0.134	0.866
Adult Self-Report - DSM Scales - Anxiety Problems	30		8	9	4	-51.000	-54.015	-50.402	<b>0.094</b>	0.905	0.613	0.387	0.641	0.359
Adult Self-Report - DSM Scales - Somatic Problems	30		8	9	4	-50.125	-54.832	-50.720	<b>0.055</b>	0.945	0.509	0.491	0.254	0.746
Adult Self-Report - DSM Scales - Avoidant Personality	30		8	9	4	-53.250	-53.415	-54.781	0.576	0.424	0.221	0.779	0.192	0.808
Adult Self-Report - DSM Scales - AD/H Problems	30		8	9	4	-52.875	-52.658	-51.100	0.554	0.446	0.352	0.648	0.759	0.241
Adult Self-Report - DSM Scales - Antisocial Personality	30		8	9	4	-56.625	-55.512	-53.506	0.667	0.333	0.400	0.600	0.789	0.211
Adult Self-Report - DSM Scales - Inattention Subscale	30		8	9	4	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30		8	9	4	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 85: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	TTT	TTT	CCC > CTT	CCC < CTT	CTT > TTT	CTT < TTT
High School end Age (graduate/drop-out)	21		12	15	9	18.167	17.516	17.877	0.127	0.874	0.678	0.323	0.308	0.692
High School Graduation or GED Age	21		10	9	7	18.900	20.129	19.442	0.954	<b>0.046</b>	0.145	0.855	0.834	0.166
Individual Income at age - 21 interview	21		12	14	9	18693.3	11264.0	17352.8	<b>0.047</b>	0.953	0.824	0.176	0.378	0.622
Spouse's Income at age - 21 interview	21		6	3	2	18100.0	9900.4	29422.7	<b>0.003</b>	0.997	0.863	0.137	0.888	0.112
Other Income at age - 21 interview	21	Yes	13	15	9	-738.5	-3787.8	-7426.1	0.300	0.700	0.347	0.653	<b>0.093</b>	0.907
Total Available Household Income at age - 21 interview	21		12	12	9	28543.3	19278.0	33953.8	0.151	0.849	0.746	0.254	0.704	0.296
Wage Income at age - 30 interview	30		9	15	8	15697.5	16189.9	7740.8	0.506	0.494	0.350	0.650	0.101	0.899
Other Income at age - 30 interview	30	Yes	9	15	8	-593.3	-1862.4	67.7	0.124	0.876	0.988	<b>0.012</b>	0.900	0.100
Spouse's Income at age - 30 interview	30		9	12	8	12277.7	13574.0	19449.6	0.569	0.431	0.701	0.299	0.741	0.259
Total Available Household Income at age - 30 interview	30		8	15	8	34172.1	32689.0	93080.1	0.452	0.548	0.727	0.273	0.904	<b>0.096</b>
Graduated High School? at age - 30 interview	21		13	15	9	0.692	0.333	0.632	<b>0.032</b>	0.968	0.909	<b>0.091</b>	0.400	0.600
Graduated High School? at age 21	21		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Graduated High School? at age - 30 interview	30		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Graduated High School? at age 30	30		13	15	9	0.692	0.432	0.632	<b>0.093</b>	0.907	0.842	0.158	0.400	0.600
Ever Attended a 4 Year University? at age - 21 interview	21		11	14	8	0.091	0.006	0.529	0.165	0.835	0.994	<b>0.007</b>	0.991	<b>0.009</b>
Ever Attended a 4 Year University? at age 21	21		13	15	9	0.077	0.038	0.273	0.414	0.586	0.942	<b>0.058</b>	0.906	<b>0.094</b>
Ever Attended a 4 Year University? at age - 30 interview	30		9	15	8	0.222	0.174	0.408	0.360	0.640	0.962	<b>0.038</b>	0.827	0.174
Ever Attended a 4 Year University? at age 30	30		13	15	9	0.154	0.162	0.351	0.516	0.484	0.932	<b>0.069</b>	0.877	0.123
Have a 4 Year Degree? at age - 30 interview	30		13	15	9	0.077	0.026	0.232	0.454	0.546	0.920	<b>0.080</b>	0.847	0.153
Have a 4 Year Degree? at age 30	30		13	15	9	0.077	0.026	0.232	0.454	0.546	0.920	<b>0.080</b>	0.847	0.153
Working? at age - 21 interview	21		12	14	9	0.833	0.607	0.771	0.108	0.893	0.788	0.212	0.392	0.608
Working? at age 21	21		13	15	9	0.077	0.282	0.340	0.932	<b>0.068</b>	0.684	0.316	0.969	<b>0.031</b>
Working? at age - 30 interview	30		9	15	8	0.778	0.522	0.571	<b>0.094</b>	0.906	0.770	0.230	0.120	0.881
Working? at age 30	30		13	15	9	0.538	0.590	0.532	0.607	0.393	0.362	0.638	0.437	0.564

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 86: Single Hypothesis Testing by Permutation Procedure: CARE, Male, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	9	15	8	-50.333	-52.071	-49.900	0.213	0.787	0.846	0.154	0.976	<b>0.024</b>
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	9	15	8	-51.333	-53.115	-53.106	0.275	0.725	0.472	0.528	0.176	0.825
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	9	15	8	-51.778	-52.559	-53.223	0.360	0.640	0.387	0.613	0.262	0.738
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	9	15	8	-50.778	-53.224	-54.224	0.186	0.814	0.373	0.627	<b>0.065</b>	0.935
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	9	15	8	-53.667	-53.873	-51.288	0.474	0.526	0.729	0.271	0.988	<b>0.012</b>
Adult Self-Report - Problem Scales - Aggressive	30	Yes	9	15	8	-50.778	-53.491	-51.973	<b>0.050</b>	0.950	0.784	0.216	0.152	0.848
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	9	15	8	-51.556	-56.901	-52.844	<b>0.003</b>	0.997	0.838	0.162	0.147	0.853
Adult Self-Report - Problem Scales - Intrusive	30	Yes	9	15	8	-51.556	-53.114	-51.737	0.184	0.816	0.735	0.265	0.428	0.572
Adult Self-Report - Problem Scales - Critical Items	30	Yes	9	15	8	-50.556	-54.016	-51.020	<b>0.047</b>	0.953	0.806	0.104	0.162	0.838
Adult Self-Report - Problem Scales - Internalizing	30	Yes	9	15	8	-41.222	-45.355	-39.063	0.144	0.856	0.854	0.147	0.746	0.254
Adult Self-Report - Problem Scales - Externalizing	30	Yes	9	15	8	-45.889	-51.393	-46.297	<b>0.086</b>	0.964	0.784	0.216	0.428	0.572
Adult Self-Report - Problem Scales - Total Problems	30	Yes	9	15	8	-42.333	-45.764	-41.282	0.190	0.810	0.725	0.275	0.680	0.320
Adult Self-Report - Adaptive Functioning : Friends	30		8	15	8	52.250	44.732	52.641	<b>0.012</b>	0.988			0.625	0.375
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		6	9	5	46.833	44.132	48.080	0.207	0.793			0.682	0.318
Adult Self-Report - Adaptive Functioning : Family	30		9	15	8	49.000	48.634	54.096	0.444	0.556			0.968	<b>0.032</b>
Adult Self-Report - Adaptive Functioning : Job	30		7	6	6	54.857	51.711	55.458	0.153	0.847			0.674	0.326
Adult Self-Report - Adaptive Functioning : Education	30		2	0	0	55.000	55.000	55.000						
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		9	15	8	51.556	45.713	55.850	<b>0.033</b>	0.968			0.969	<b>0.031</b>
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	9	15	8	-52.222	-53.765	-54.099	0.204	0.796	0.184	0.816	0.193	0.807
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	9	15	8	-53.111	-55.285	-52.698	0.264	0.736	0.803	0.197	0.635	0.365
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	9	15	8	-54.778	-52.904	-53.302	0.742	0.258	0.180	0.820	0.622	0.379
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	9	15	8	-54.111	-54.512	-53.848	0.438	0.562	0.281	0.719	0.563	0.437
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	9	15	8	-50.222	-51.613	-50.523	0.280	0.720	0.540	0.460	0.243	0.757
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	9	15	8	-51.000	-52.412	-50.288	0.130	0.870	0.958	<b>0.042</b>	0.919	<b>0.081</b>
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	9	15	8	-53.667	-53.128	-53.058	0.594	0.406	0.419	0.581	0.642	0.357
Adult Self-Report - DSM Scales - Avoidant Personality	30	Yes	9	15	8	-52.333	-51.618	-50.936	0.625	0.375	0.493	0.507	0.815	0.185
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	9	15	8	-53.000	-53.563	-52.166	0.404	0.596	0.669	0.331	0.756	0.244
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	9	15	8	-51.000	-56.322	-52.431	<b>0.012</b>	0.988	0.829	0.171	0.137	0.863
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	9	15	8	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	9	15	8	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 87: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Bayley Scales of Infant Development - Mental Development Index	6M		8	9	4	106.000	110.756	113.842	0.818	0.608	0.787	0.442	0.983	0.328
Bayley Scales of Infant Development - Mental Development Index Age Placement	6M		8	9	4	6.375	6.324	6.464	0.657	0.736	0.540	0.630	0.912	0.380
Bayley Scales of Infant Development - Mental Development Index	12M		8	9	5	108.000	110.425	115.429	0.781	0.631	0.845	0.385	0.990	0.243
Bayley Scales of Infant Development - Mental Development Index Age Placement	12M		8	9	5	12.675	13.052	13.098	0.772	0.489	0.820	0.437	0.984	0.279
Bayley Scales of Infant Development - Mental Development Index	18M		8	8	5	100.375	95.344	105.714	0.473	0.853	0.811	0.398	0.988	0.341
Bayley Scales of Infant Development - Mental Development Index Age Placement	18M		8	8	5	18.450	17.501	19.441	0.414	0.854	0.824	0.391	0.979	0.361
Bayley Scales of Infant Development - Mental Development Index	24M		8	9	5	97.000	91.815	103.895	0.455	0.865	0.742	0.411	0.963	0.211
Bayley Scales of Infant Development - Mental Development Index Age Placement	24M		8	9	5	23.375	22.486	24.645	0.457	0.867	0.775	0.361	0.973	<b>0.091</b>
Bayley Scales of Infant Development - Psychomotor Development Index	6M		8	9	4	107.500	107.472	115.300	0.551	0.763	0.819	0.615	0.829	0.531
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	6M		8	9	4	6.762	6.328	6.873	0.499	0.871	0.764	0.551	0.904	0.617
Bayley Scales of Infant Development - Psychomotor Development Index	12M		8	9	5	110.000	102.943	111.579	0.474	0.900	0.762	0.681	0.931	0.445
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	12M		8	9	5	13.263	12.275	13.351	0.470	0.901	0.771	0.684	0.898	0.468
Bayley Scales of Infant Development - Psychomotor Development Index	18M		8	8	5	103.875	99.451	107.171	0.421	0.923	0.823	0.686	0.936	0.572
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	18M		8	8	5	20.112	18.795	20.948	0.436	0.786	0.831	0.698	0.928	0.584
Bayley Scales of Infant Development - Psychomotor Development Index	24M		8	9	5	103.250	99.639	105.362	0.443	0.907	0.807	0.531	0.900	0.572
Bayley Scales of Infant Development - Psychomotor Development Index Age Placement	24M		8	9	5	24.712	24.118	25.263	0.464	0.901	0.769	0.531	0.887	0.595
Stanford Binet IQ Score	24M		8	9	5	89.250	89.038	93.614	0.789	0.689	0.862	0.477	0.983	0.383
Stanford Binet IQ Score	36M		8	9	4	89.500	89.496	98.181	0.791	0.680	0.710	0.467	0.953	0.260
Stanford Binet IQ Score	48M		8	9	4	95.500	94.279	97.639	0.743	0.698	0.858	0.491	0.957	0.466
Stanford Binet IQ Score	60M		8	9	3	94.125	91.414	96.705	0.658	0.726	0.647	0.652	0.926	0.465
McCarthy Scales of Children's Development - General Cognitive	30M		8	9	5	96.250	96.666	100.521	0.787	0.670	0.803	0.515	0.980	0.359
McCarthy Scales of Children's Development - General Cognitive	42M		8	9	4	96.875	99.545	105.469	0.793	0.543	0.833	0.498	0.978	0.344
McCarthy Scales of Children's Development - General Cognitive	54M		8	9	3	93.625	92.384	102.193	0.744	0.722	0.800	0.457	0.980	0.266
Bankson Total Raw Scores: Items 1 to 64	54M		8	9	3	92.000	90.098	100.695	0.744	0.726	0.769	0.521	0.975	0.268
Miller-Yoder Correct Individual Items, sum	54M		8	9	3	57.375	49.662	58.397	0.380	0.820	0.881	0.475	0.916	0.457
Kaufman Standardized Score: Sequential Processing	72M		8	9	4	104.250	110.456	112.638	0.720	0.465	0.877	0.507	0.971	0.341
Kaufman Standardized Score: Simultaneous Processing	72M		8	9	4	98.500	101.852	105.714	0.797	0.498	0.796	0.548	0.983	0.363
Kaufman Standardized Score: Mental Processing	72M		8	9	4	101.000	105.990	109.516	0.765	0.472	0.849	0.495	0.969	0.368

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 88: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means				CCC vs CTT		CTT vs TTT		CCC vs TTT	
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Bayley Scales of Infant Development - Mental Development Index	6M		13	15	9	103.692	102.526	106.365	0.473	0.867	0.923	0.421	0.982	0.267
Bayley Scales of Infant Development - Mental Development Index	6M		13	15	9	6.146	6.115	6.362	0.436	0.863	0.926	0.477	0.985	0.295
Bayley Scales of Infant Development - Mental Development Index	12M		12	15	9	108.250	106.546	116.815	0.576	0.832	1.000	0.022	0.994	0.152
Bayley Scales of Infant Development - Mental Development Index	12M		12	15	9	12.742	12.640	13.497	0.588	0.825	0.999	0.044	0.996	0.125
Bayley Scales of Infant Development - Mental Development Index	18M		12	15	9	106.500	98.671	115.826	0.165	0.954	1.000	0.000	0.993	0.116
Bayley Scales of Infant Development - Mental Development Index	18M		12	15	9	19.033	18.494	20.204	0.444	0.909	1.000	0.003	0.994	0.136
Bayley Scales of Infant Development - Mental Development Index	24M		12	15	9	96.667	89.704	111.069	0.251	0.956	1.000	0.001	0.990	0.058
Bayley Scales of Infant Development - Mental Development Index	24M		12	15	9	23.600	22.512	25.472	0.340	0.931	1.000	0.001	0.984	0.101
Bayley Scales of Infant Development - Psychomotor Development Index	6M		13	15	9	107.154	106.231	113.395	0.753	0.688	0.961	0.161	0.994	0.129
Bayley Scales of Infant Development - Psychomotor Development Index	6M		13	15	9	6.531	6.461	6.962	0.701	0.699	0.988	0.047	0.996	0.017
Bayley Scales of Infant Development - Psychomotor Development Index	12M		12	15	9	104.667	107.186	109.616	0.927	0.580	0.960	0.293	0.996	0.190
Bayley Scales of Infant Development - Psychomotor Development Index	12M		12	15	9	12.542	13.055	13.245	0.925	0.491	0.925	0.396	0.997	0.178
Bayley Scales of Infant Development - Psychomotor Development Index	18M		12	15	9	99.833	103.350	108.961	0.923	0.501	0.915	0.373	0.997	0.214
Bayley Scales of Infant Development - Psychomotor Development Index	18M		12	15	9	18.783	20.354	19.544	0.947	0.206	0.599	0.729	0.993	0.248
Bayley Scales of Infant Development - Psychomotor Development Index	24M		11	15	9	97.364	100.341	106.375	0.935	0.509	0.973	0.225	0.997	0.194
Bayley Scales of Infant Development - Psychomotor Development Index	24M		11	15	9	24.100	24.825	25.570	0.936	0.555	0.962	0.265	0.996	0.219
Stanford Binet IQ Score	24M		12	15	9	90.083	82.679	99.809	0.357	0.956	1.000	0.003	0.994	0.202
Stanford Binet IQ Score	36M		12	14	9	96.333	92.206	102.396	0.419	0.991	1.000	0.007	0.989	0.410
Stanford Binet IQ Score	48M		12	14	9	95.583	92.141	98.931	0.336	0.992	1.000	0.038	0.981	0.511
Stanford Binet IQ Score	60M		12	13	9	97.583	92.069	96.998	0.388	0.991	1.000	0.018	0.871	0.587
McCarthy Scales of Children's Development - General Cognitive	30M		12	14	9	102.250	90.913	105.078	0.195	0.967	0.999	0.003	0.958	0.605
McCarthy Scales of Children's Development - General Cognitive	42M		12	13	9	97.917	93.584	103.227	0.445	0.985	1.000	0.013	0.991	0.420
McCarthy Scales of Children's Development - General Cognitive	54M		12	14	9	98.667	93.693	100.732	0.362	0.994	1.000	0.038	0.964	0.590
Banxson Total Raw Scores: Items 1 to 64	54M		12	13	9	98.583	93.972	101.998	0.383	0.992	1.000	0.056	0.983	0.514
Miller-Yoder Correct Individual Items, sum	54M		12	13	9	57.583	53.705	57.560	0.402	0.993	1.000	0.045	0.897	0.709
Kaufman Standardized Score: Sequential Processing	72M		12	13	9	98.167	91.478	102.857	0.382	0.988	1.000	0.033	0.985	0.549
Kaufman Standardized Score: Simultaneous Processing	72M		12	13	9	98.417	96.721	108.663	0.325	0.976	1.000	0.006	0.994	0.032
Kaufman Standardized Score: Mental Processing	72M		12	13	9	98.000	93.938	106.974	0.432	0.988	1.000	0.003	0.987	0.122

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 89: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	CCC<CTT	CCC>CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	
Classroom Behavior Inventory - Extraversion	72M		7	8	3	18.857	19.082	19.923	0.985	0.754	0.734	0.772	0.875	0.664
Classroom Behavior Inventory - Creativity	72M		7	8	3	12.714	13.027	15.147	0.919	0.806	0.981	0.970	0.825	0.585
Classroom Behavior Inventory - Distractibility	72M	Yes	7	8	3	-10.714	-10.175	-11.074	0.959	0.681	0.961	0.972	0.931	0.832
Classroom Behavior Inventory - Independence	72M		7	8	3	12.286	15.491	13.744	0.986	0.517	0.801	0.951	0.826	0.876
Classroom Behavior Inventory - Hostility	72M	Yes	7	8	3	-8.000	-5.968	-10.041	0.988	0.320	0.908	0.900	0.814	0.828
Classroom Behavior Inventory - Verbal Intelligence	72M		7	8	3	11.857	12.599	14.288	0.922	0.773	0.879	0.779	0.872	0.672
Classroom Behavior Inventory - Task Orientation	72M		7	8	3	13.000	14.836	12.096	0.969	0.607	0.801	0.974	0.859	0.879
Classroom Behavior Inventory - Introversion	72M		7	8	3	7.714	7.016	8.326	0.947	0.511	0.893	0.757	0.998	0.897
Classroom Behavior Inventory - Considerateness	72M		6	8	3	15.500	16.812	13.565	0.985	0.571	0.831	0.997	0.712	0.809
Classroom Behavior Inventory - Dependence	72M	Yes	7	8	3	-9.714	-6.830	-9.586	0.927	0.255	0.989	0.910	0.980	0.776
Classroom Behavior Inventory - Extraversion	8		8	9	3	18.375	17.950	19.302	0.927	0.965	0.596	0.778	0.861	0.791
Classroom Behavior Inventory - Creativity	8		8	9	3	15.000	14.380	15.088	0.892	0.966	0.824	0.985	0.756	0.982
Classroom Behavior Inventory - Distractibility	8	Yes	8	9	3	-9.500	-10.391	-10.238	0.778	0.953	0.627	0.809	0.803	0.744
Classroom Behavior Inventory - Independence	8		8	9	3	13.750	15.741	14.914	0.979	0.701	0.793	0.970	0.848	0.805
Classroom Behavior Inventory - Hostility	8	Yes	8	9	3	-7.250	-8.847	-8.367	0.558	0.933	0.880	0.987	0.927	0.860
Classroom Behavior Inventory - Verbal Intelligence	8		8	9	3	13.250	13.224	14.339	0.852	0.958	0.914	0.975	0.766	0.651
Classroom Behavior Inventory - Task Orientation	8		8	9	3	14.875	14.577	14.597	0.839	0.961	0.826	0.929	0.704	0.993
Classroom Behavior Inventory - Introversion	8		8	9	3	6.500	8.577	6.330	0.995	0.481	0.706	0.956	0.947	0.963
Classroom Behavior Inventory - Considerateness	8		8	9	3	15.875	14.806	15.027	0.822	0.951	0.937	0.950	0.927	0.865
Classroom Behavior Inventory - Dependence	8	Yes	8	9	3	-9.625	-7.025	-8.013	0.885	0.388	0.848	0.908	0.894	0.689
Achenbach Teacher - School Performance	8		8	9	3	45.500	47.766	46.765	0.687	0.750	0.813	0.477	0.635	0.736
Achenbach Teacher - Works Hard	8		8	9	3	51.750	49.330	45.617	0.456	0.932	0.594	0.752	0.376	0.873
Achenbach Teacher - Behaves Appropriately	8		8	9	3	46.000	44.639	41.236	0.474	0.900	0.586	0.690	0.370	0.988
Achenbach Teacher - Learns	8		8	9	3	46.375	50.249	43.864	0.576	0.730	0.667	0.697	0.419	0.924
Achenbach Teacher - Happy	8		8	9	3	49.500	46.245	40.443	0.500	0.748	0.789	0.750	0.361	0.933
Harter Self-Perception Assessment - Teacher - Cognitive	12		8	9	4	2.625	2.441	2.896	0.953	0.989	0.911	0.745	0.967	0.647
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		8	9	4	2.839	2.835	2.744	0.947	0.959	0.557	0.821	0.842	0.799
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		8	9	4	2.804	2.812	2.820	0.942	0.956	0.849	0.820	0.920	0.805
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		8	9	4	3.125	3.079	3.035	0.981	0.962	0.901	0.410	0.833	0.896
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		8	9	4	2.875	2.815	2.928	0.960	0.974	0.874	0.855	0.806	0.741
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		8	9	4	3.313	3.493	3.627	0.783	0.824	0.655	0.888	0.913	0.671
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		8	9	4	2.813	2.340	3.270	0.666	0.996	0.970	0.490	0.909	0.448
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		8	9	4	3.500	3.541	3.575	0.834	0.958	0.680	0.927	0.938	0.765
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		8	9	4	2.813	2.413	2.929	0.689	0.853	0.972	0.766	0.948	0.713

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 90: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values						
			Obs.		Means		CCC vs. CTT		CTT vs. TTT		CCC vs. TTT				
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	
Classroom Behavior Inventory - Considerateness	12		4	4	3	9.500	16.087	9.952	0.984	0.243	0.614	0.908	0.644	0.946	0.973
Classroom Behavior Inventory - Creativity	12		4	4	3	11.500	9.206	12.746	0.499	0.844	0.451	0.865	0.451	0.850	0.956
Classroom Behavior Inventory - Dependence	12	Yes	4	4	3	-11.000	-7.800	-10.419	0.991	0.115	0.821	0.570	0.821	0.833	0.973
Classroom Behavior Inventory - Distractibility	12	Yes	4	4	3	-12.500	-8.359	-12.185	0.996	0.204	0.832	0.733	0.832	0.770	0.817
Classroom Behavior Inventory - Extraversion	12		4	4	3	15.000	12.359	15.841	0.544	0.898	0.488	0.772	0.488	0.783	0.925
Classroom Behavior Inventory - Hostility	12	Yes	4	4	3	-9.500	-6.999	-10.424	0.932	0.529	0.693	0.888	0.693	0.930	0.686
Classroom Behavior Inventory - Independence	12		4	4	3	10.500	14.659	11.002	0.984	0.140	0.830	0.685	0.830	0.962	0.873
Classroom Behavior Inventory - Introversiion	12		4	4	3	7.750	8.778	7.666	0.964	0.425	0.865	0.483	0.865	0.961	0.799
Classroom Behavior Inventory - Task Orientation	12		4	4	3	9.500	14.156	9.134	0.976	0.268	0.830	0.686	0.830	0.882	0.936
Classroom Behavior Inventory - Verbal Intelligence	12		4	4	3	11.000	11.409	12.309	0.955	0.568	0.714	0.915	0.714	0.854	0.944
Child's Behavior Toward Teacher - Control	12		4	4	3	15.750	11.456	15.501	0.133	0.947	0.918	0.556	0.918	0.643	0.637
Child's Behavior Toward Teacher - Detachment	12		4	4	3	8.750	9.185	9.159	0.727	0.558	0.741	0.426	0.741	0.649	0.645
Child's Behavior Toward Teacher - Obedient	12	Yes	4	4	3	-11.750	-14.508	-12.410	0.190	0.941	0.930	0.536	0.930	0.570	0.801
Child's Behavior Toward Teacher - Positive Involvement	12		4	4	3	14.500	12.368	14.863	0.121	0.982	0.460	0.857	0.460	0.704	0.641
Achenbach Parent - Total Competence	12		8	8	4	40.125	41.175	46.972	0.690	0.765	0.265	0.878	0.265	0.955	<b>0.082</b>
Achenbach Parent - Activities	12		8	8	4	44.000	44.596	49.742	0.702	0.783	0.211	0.883	0.211	0.953	0.175
Achenbach Parent - Social	12		8	8	4	42.125	41.131	47.308	0.654	0.643	0.410	0.879	0.410	0.973	0.153
Achenbach Parent - School	12		8	8	4	40.500	40.285	45.948	0.768	0.778	0.363	0.887	0.363	0.953	0.167

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 91: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Non-cognitive Development

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Extraversion	72M		10	11	8	20.000	19.154	17.122	0.591	0.995	0.885	0.973	0.122	0.999
Classroom Behavior Inventory - Creativity	72M		10	11	7	15.300	14.604	13.083	0.643	0.990	0.918	0.936	0.187	0.998
Classroom Behavior Inventory - Distractibility	72M	Yes	10	11	8	-8.300	-9.562	-10.688	0.369	0.985	0.911	0.969	0.143	0.999
Classroom Behavior Inventory - Independence	72M		10	11	8	16.600	14.328	13.498	0.354	0.995	0.904	0.963	0.198	0.998
Classroom Behavior Inventory - Hostility	72M	Yes	10	11	7	-6.400	-8.805	-9.050	<b>0.089</b>	0.990	0.812	0.913	<b>0.037</b>	0.995
Classroom Behavior Inventory - Verbal Intelligence	72M		10	10	8	13.700	12.373	11.481	0.337	0.999	0.762	0.853	0.191	0.998
Classroom Behavior Inventory - Task Orientation	72M		10	11	8	16.800	14.707	13.166	0.343	0.995	0.658	0.862	0.153	0.998
Classroom Behavior Inventory - Introversion	72M		10	11	8	5.800	5.808	7.073	0.508	0.981	0.979	0.892	0.880	0.968
Classroom Behavior Inventory - Considerateness	72M		10	10	8	18.100	14.982	14.075	0.101	0.997	0.877	0.972	<b>0.053</b>	0.996
Classroom Behavior Inventory - Dependence	72M	Yes	10	11	8	-6.700	-6.749	-6.807	0.687	0.954	0.973	0.928	0.785	0.902
						0.000	0.000	0.000						
						0.000	0.000	0.000						
Classroom Behavior Inventory - Extraversion	8		13	14	9	18.385	17.463	18.563	0.458	0.994	0.966	0.867	0.979	0.892
Classroom Behavior Inventory - Creativity	8		13	14	9	16.077	15.193	17.006	0.460	0.989	0.959	0.847	0.989	0.805
Classroom Behavior Inventory - Distractibility	8	Yes	13	14	9	-10.000	-11.223	-10.716	0.489	0.994	0.784	0.957	0.823	0.889
Classroom Behavior Inventory - Independence	8		13	14	9	16.000	13.632	11.672	0.345	0.983	0.230	0.965	<b>0.077</b>	0.991
Classroom Behavior Inventory - Hostility	8	Yes	13	14	9	-8.308	-9.535	-8.433	0.501	0.995	0.793	0.869	0.954	0.911
Classroom Behavior Inventory - Verbal Intelligence	8		13	14	9	14.308	12.577	13.455	0.445	0.992	0.968	0.803	0.838	0.936
Classroom Behavior Inventory - Task Orientation	8		13	13	9	15.308	12.914	13.016	0.433	0.983	0.780	0.891	0.471	0.961
Classroom Behavior Inventory - Introversion	8		13	14	9	6.000	7.518	6.827	0.952	0.282	0.850	0.965	0.922	0.832
Classroom Behavior Inventory - Considerateness	8		12	14	9	15.417	13.458	16.796	0.349	0.943	0.732	0.823	0.798	0.743
Classroom Behavior Inventory - Dependence	8	Yes	13	14	9	-6.923	-8.261	-9.530	0.424	0.997	0.265	0.972	0.117	0.993
Achenbach Teacher - School Performance	8		13	14	9	46.846	42.128	45.458	0.233	0.984	0.751	0.619	0.343	0.900
Achenbach Teacher - Works Hard	8		13	14	9	54.077	46.612	48.866	0.179	0.989	0.518	0.913	0.313	0.935
Achenbach Teacher - Behaves Appropriately	8		13	14	9	48.462	43.244	43.727	0.257	0.984	0.451	0.838	0.285	0.870
Achenbach Teacher - Learns	8		13	14	9	48.385	44.590	46.821	0.252	0.970	0.663	0.836	0.430	0.881
Achenbach Teacher - Happy	8		13	14	8	52.231	42.196	47.087	<b>0.066</b>	0.982	0.858	0.632	0.341	0.932
Harter Self-Perception Assessment - Teacher - Cognitive	12		12	14	9	3.036	2.866	2.442	0.573	0.994	0.770	0.908	<b>0.064</b>	0.998
Harter Self-Perception Assessment - Teacher - Self-Esteem	12		12	14	9	3.440	3.280	2.765	0.545	0.945	0.494	0.885	<b>0.017</b>	0.998
Harter Self-Perception Assessment - Teacher - Physical Appearance	12		12	14	9	3.298	3.324	3.117	0.551	0.944	0.702	0.899	0.552	0.953
Harter Self-Perception Assessment - Teacher - Social Acceptance	12		12	14	9	3.560	3.323	3.220	0.444	0.966	0.887	0.830	0.368	0.975
Harter Self-Perception Assessment - Child - Athletic Competence Importance	12		12	14	9	2.958	2.728	3.472	0.719	0.976	0.981	0.233	0.962	0.440
Harter Self-Perception Assessment - Child - Behavioral Conduct Importance	12		12	14	9	3.542	3.518	3.537	0.666	0.968	0.990	0.520	0.829	0.900
Harter Self-Perception Assessment - Child - Physical Appearance Importance	12		12	14	9	2.542	2.350	3.059	0.687	0.989	0.978	0.146	0.941	0.323
Harter Self-Perception Assessment - Child - Scholastic Competence Importance	12		12	14	9	3.667	3.590	3.617	0.623	0.985	0.897	0.842	0.795	0.899
Harter Self-Perception Assessment - Child - Social Acceptance Importance	12		12	14	9	2.667	2.450	2.746	0.726	0.959	0.987	0.357	0.855	0.848

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 92: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Non-cognitive Development (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Classroom Behavior Inventory - Considerateness	12		8	8	4	17.000	14.408	14.349	0.443	0.989	0.916	0.905	0.453	0.912
Classroom Behavior Inventory - Creativity	12		8	8	4	14.125	13.082	14.345	0.716	0.980	0.907	0.656	0.803	0.932
Classroom Behavior Inventory - Dependence	12	Yes	8	8	4	-6.125	-7.909	-7.659	0.365	0.928	0.664	0.988	0.566	0.966
Classroom Behavior Inventory - Distractibility	12	Yes	8	8	4	-11.125	-10.285	-11.576	0.904	0.779	0.913	0.956	0.756	0.966
Classroom Behavior Inventory - Extraversion	12		8	8	4	19.625	19.054	18.057	0.731	0.984	0.901	0.873	0.537	1.000
Classroom Behavior Inventory - Hostility	12	Yes	8	8	4	-8.125	-9.066	-11.744	0.693	0.962	0.461	0.938	0.179	0.959
Classroom Behavior Inventory - Independence	12		8	8	4	14.875	12.681	13.645	0.392	0.994	0.762	0.966	0.577	0.997
Classroom Behavior Inventory - Introversion	12		8	8	4	6.125	7.248	6.662	0.908	0.524	0.584	0.973	0.765	0.870
Classroom Behavior Inventory - Task Orientation	12		8	8	4	13.000	11.880	11.674	0.577	0.986	0.833	0.659	0.662	0.987
Classroom Behavior Inventory - Verbal Intelligence	12		8	8	4	12.500	11.512	12.569	0.668	0.982	0.887	0.895	0.837	0.933
Child's Behavior Toward Teacher - Control	12		8	8	4	12.000	12.054	14.230	0.992	0.485	0.848	0.587	0.884	0.504
Child's Behavior Toward Teacher - Detachment	12		8	8	4	9.000	9.610	6.626	0.784	0.868	<b>0.097</b>	0.971	0.207	0.937
Child's Behavior Toward Teacher - Obedient	12	Yes	8	8	4	-15.000	-13.699	-13.045	0.779	0.613	0.526	0.825	0.890	0.328
Child's Behavior Toward Teacher - Positive Involvement	12		8	8	4	13.625	13.717	13.207	0.983	0.879	0.991	0.754	0.837	0.867
Achenbach Parent - Total Competence	12		12	14	8	43.750	41.952	47.449	0.616	0.927	0.970	<b>0.098</b>	0.944	0.274
Achenbach Parent - Activities	12		12	14	9	47.833	46.209	46.210	0.601	0.934	0.902	0.414	0.675	0.768
Achenbach Parent - Social	12		12	14	9	44.333	43.485	49.331	0.419	0.928	0.987	0.222	0.895	0.336
Achenbach Parent - School	12		12	14	8	43.667	40.866	44.975	0.572	0.894	0.986	0.140	0.936	0.634

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 93: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values								
			Obs.			Means			CCC vs CTT			CTT vs TTT			CCC vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT	CTT>TTT	CTT<TTT	
HOME - Total	6M		8	9	3	26.000	24.296	31.455	0.564	0.837	0.973	0.263	0.947	0.138			
HOME - Total	12M		8	7	5	26.250	25.757	27.875	0.817	0.778	0.979	0.339	0.952	0.290			
HOME - Total	18M		8	8	5	25.250	29.774	29.405	0.945	0.266	0.979	0.328	0.982	0.195			
HOME - Total	30M		8	9	5	28.500	29.731	32.586	0.889	0.802	0.962	0.197	0.983	0.157			
HOME - Total	42M		8	9	4	55.875	57.125	61.937	0.847	0.835	0.924	0.262	0.977	0.216			
HOME - Total	54M		8	9	3	56.000	56.439	63.159	0.824	0.877	0.971	0.461	0.982	0.216			
Knowledge of Infant Development Inventory : Attempted	30M		7	8	4	0.885	0.844	0.872	0.284	0.943	0.937	0.228	0.366	0.779			
Knowledge of Infant Development Inventory : Accuracy	30M		7	8	4	0.763	0.755	0.762	0.479	0.867	0.985	0.270	0.425	0.737			
Knowledge of Infant Development Inventory : Corret	30M		7	8	4	0.676	0.637	0.665	0.265	0.883	0.960	0.122	0.336	0.823			
Family Environment Scale - Child - Cohesion	12		8	9	4	46.500	55.250	54.460	0.998	0.405	0.888	0.907	0.995	0.504			
Family Environment Scale - Child - Expressiveness	12		8	9	4	44.750	42.301	44.344	0.849	0.815	0.862	0.887	0.943	0.761			
Family Environment Scale - Child - Conflict	12	Yes	8	9	4	-47.750	-46.403	-46.122	0.960	0.662	0.874	0.968	0.968	0.739			
Family Environment Scale - Child - Independence	12		8	9	4	33.250	45.912	39.310	1.000	0.102	0.930	0.958	0.993	0.519			
Family Environment Scale - Child - Achievement Orientation	12		8	9	4	47.125	53.730	53.731	1.000	0.207	0.904	0.966	0.995	0.508			
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		8	9	4	42.000	53.726	47.611	0.985	<b>0.091</b>	0.887	0.966	0.992	0.517			
Family Environment Scale - Child - Active-Recreational Orientation	12		8	9	4	47.375	58.299	46.841	1.000	0.122	0.716	0.901	0.943	0.530			
Family Environment Scale - Child - Moral-Religious Emphasis	12		8	9	4	52.375	58.253	57.907	1.000	0.228	0.676	0.677	0.914	0.384			
Family Environment Scale - Child - Organization	12		8	9	4	51.875	49.966	51.372	0.881	0.583	0.930	0.885	0.920	0.810			
Family Environment Scale - Child - Control	12		8	9	4	52.250	54.394	56.896	0.980	0.652	0.886	0.932	0.993	0.470			
Family Environment Scale - Parent - Cohesion	12		8	7	4	44.750	54.349	41.859	0.992	0.500	0.648	0.841	0.854	0.770			
Family Environment Scale - Parent - Expressiveness	12		8	7	4	53.375	54.153	47.740	0.943	0.882	0.550	0.845	0.505	0.860			
Family Environment Scale - Parent - Conflict	12	Yes	8	7	4	-51.125	-40.853	-54.353	0.996	0.291	0.707	0.841	0.811	0.789			
Family Environment Scale - Parent - Independence	12		8	7	4	49.000	52.340	47.517	0.975	0.904	0.846	0.758	0.884	0.798			
Family Environment Scale - Parent - Achievement Orientation	12		8	7	4	56.375	57.756	58.668	0.980	0.834	0.708	0.855	0.950	0.665			
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		8	7	4	45.625	49.373	50.718	0.961	0.820	0.826	0.717	0.912	0.629			
Family Environment Scale - Parent - Active-Recreational Orientation	12		8	7	4	39.750	50.702	44.135	0.997	0.323	0.730	0.789	0.951	0.636			
Family Environment Scale - Parent - Moral-Religious Emphasis	12		8	7	4	56.500	64.752	62.484	0.987	0.145	0.848	0.880	0.975	0.217			
Family Environment Scale - Parent - Organization	12		8	7	4	55.250	50.010	57.465	0.691	0.817	0.830	0.550	0.963	0.648			
Family Environment Scale - Parent - Control	12		8	7	4	58.500	55.078	65.490	0.705	0.982	0.914	0.763	0.947	0.232			

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 94: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Parenting and Home Environment

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
HOME - Total	6M		13	15	9	30.308	26.082	30.269	0.119	0.996	0.998	0.092	0.778	0.872
HOME - Total	12M		12	14	9	29.500	30.744	33.803	0.698	0.691	0.993	0.083	0.950	0.179
HOME - Total	18M		12	14	9	33.667	29.738	32.310	0.150	0.997	0.998	0.083	0.476	0.845
HOME - Total	30M		12	13	9	31.500	30.046	32.078	0.456	0.950	0.948	0.327	0.816	0.822
HOME - Total	42M		11	13	9	57.818	55.045	60.818	0.496	0.943	0.999	0.079	0.838	0.648
HOME - Total	54M		12	13	9	65.167	58.935	64.883	0.101	0.974	0.999	0.075	0.746	0.860
						0	0.000	0.000						
						0	0.000	0.000						
Knowledge of Infant Development Inventory - Attempted	30M		11	12	6	0.838	0.825	0.852	0.402	0.772	0.989	0.082	0.786	0.343
Knowledge of Infant Development Inventory - Accuracy	30M		11	12	6	0.729	0.720	0.760	0.562	0.717	0.955	0.162	0.836	0.257
Knowledge of Infant Development Inventory - Corret	30M		11	12	6	0.618	0.596	0.647	0.505	0.663	0.977	0.058	0.809	0.303
						0.000	0.000	0.000						
Family Environment Scale - Child - Cohesion	12		12	14	9	54.167	56.671	51.266	0.934	0.845	0.612	0.868	0.794	0.966
Family Environment Scale - Child - Expressiveness	12		12	14	9	44.000	42.373	43.739	0.854	0.960	0.993	0.743	0.945	0.956
Family Environment Scale - Child - Conflict	12	Yes	12	14	9	-44.417	-45.993	-47.727	0.850	0.983	0.840	0.963	0.768	0.956
Family Environment Scale - Child - Independence	12		12	14	9	48.333	46.414	46.504	0.852	0.995	0.930	0.960	0.921	0.952
Family Environment Scale - Child - Achievement Orientation	12		12	14	9	58.583	56.291	62.202	0.812	0.786	0.970	0.239	0.994	0.594
Family Environment Scale - Child - Intellectual-Cultural Orientation	12		12	14	9	48.833	50.241	49.253	0.940	0.906	0.795	0.955	0.954	0.927
Family Environment Scale - Child - Active-Recreational Orientation	12		12	14	9	52.333	51.798	55.548	0.848	0.990	0.980	0.675	0.994	0.734
Family Environment Scale - Child - Moral-Religious Emphasis	12		12	14	9	55.500	58.302	56.009	0.842	0.703	0.980	0.862	0.966	0.934
Family Environment Scale - Child - Organization	12		12	14	9	51.000	54.473	56.263	0.954	0.739	0.996	0.687	0.899	0.578
Family Environment Scale - Child - Control	12		12	14	9	59.250	57.110	56.139	0.821	0.928	0.944	0.929	0.552	0.889
						0	0.000	0.000						
						0	0.000	0.000						
Family Environment Scale - Parent - Cohesion	12		12	14	9	52.333	50.350	56.458	0.947	0.931	0.990	0.168	0.995	0.778
Family Environment Scale - Parent - Expressiveness	12		12	14	9	52.417	51.143	51.887	0.927	0.980	0.997	0.477	0.981	0.844
Family Environment Scale - Parent - Conflict	12	Yes	12	14	9	-50.083	-51.232	-46.100	0.900	0.985	0.995	0.040	0.996	0.764
Family Environment Scale - Parent - Independence	12		12	14	9	48.333	54.423	53.804	1.000	0.488	0.978	0.860	0.997	0.612
Family Environment Scale - Parent - Achievement Orientation	12		12	14	9	53.833	57.385	54.275	0.903	0.524	0.924	0.682	0.987	0.926
Family Environment Scale - Parent - Intellectual-Cultural Orientation	12		12	14	9	55.667	51.372	53.292	0.821	0.927	0.989	0.688	0.951	0.669
Family Environment Scale - Parent - Active-Recreational Orientation	12		12	14	9	52.083	50.823	53.197	0.954	0.951	0.917	0.915	0.993	0.875
Family Environment Scale - Parent - Moral-Religious Emphasis	12		12	14	9	60.333	57.552	59.943	0.816	0.814	0.989	0.380	0.965	0.958
Family Environment Scale - Parent - Organization	12		12	14	9	53.750	50.460	55.754	0.852	0.945	0.986	0.499	0.996	0.841
Family Environment Scale - Parent - Control	12		12	14	9	55.667	60.050	60.206	0.978	0.496	0.880	0.855	0.911	0.546

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 95: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Health

Variable	Age	Reversed	Descriptive Statistics										Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	TTT	CCC	CTT	TTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT		
Weight in kg	6M		8	9	4	7.738	7.349	7.445	7.738	7.349	7.445	0.461	0.932	0.983	0.154	0.572	0.941	
Weight in kg	12M		8	7	5	10.150	9.447	9.681	10.150	9.447	9.681	0.209	0.920	0.963	0.366	0.143	0.963	
Weight in kg	18M		8	8	5	11.813	11.689	11.218	11.813	11.689	11.218	0.513	0.782	0.899	0.402	0.395	0.947	
Weight in kg	24M		7	9	5	13.386	12.517	12.922	13.386	12.517	12.922	0.281	0.961	0.881	0.540	0.542	0.937	
Weight in kg	36M		8	9	3	15.225	14.668	15.157	15.225	14.668	15.157	0.471	0.919	0.984	0.186	0.748	0.865	
Weight in kg	48M		7	9	4	17.643	17.060	18.183	17.643	17.060	18.183	0.581	0.863	0.984	0.234	0.930	0.567	
Weight in kg	60M		7	9	3	20.886	19.343	22.915	20.886	19.343	22.915	0.426	0.923	0.984	0.146	0.913	0.383	
Weight in kg	8		8	7	2	32.341	30.942	37.742	32.341	30.942	37.742	0.664	0.787	0.961	0.358	0.897	0.504	
Height in cm	6M		8	9	4	66.000	65.678	66.081	66.000	65.678	66.081	0.796	0.848	0.975	0.237	0.789	0.799	
Height in cm	12M		8	7	5	74.750	75.331	73.984	74.750	75.331	73.984	0.950	0.676	0.881	0.634	0.688	0.732	
Height in cm	18M		8	8	5	81.750	82.393	82.214	81.750	82.393	82.214	0.901	0.682	0.904	0.392	0.855	0.687	
Height in cm	24M		7	9	5	87.857	87.101	87.409	87.857	87.101	87.409	0.641	0.832	0.770	0.504	0.735	0.792	
Height in cm	36M		8	9	3	96.000	96.737	97.861	96.000	96.737	97.861	0.896	0.658	0.942	0.450	0.889	0.476	
Height in cm	48M		7	9	4	104.429	105.325	105.773	104.429	105.325	105.773	0.900	0.672	0.884	0.490	0.896	0.572	
Height in cm	60M		7	9	3	113.286	112.903	116.630	113.286	112.903	116.630	0.798	0.853	0.971	0.267	0.928	0.499	
Height in cm	8		8	7	2	129.621	131.420	135.121	129.621	131.420	135.121	0.886	0.636	0.948	0.251	0.924	0.488	
Brief Symptom Inventory - Somatization	21	Yes	7	9	4	-50.143	-53.664	-46.230	-50.143	-53.664	-46.230	0.763	0.714	0.904	0.789	0.990	0.207	
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	7	9	4	-57.571	-55.614	-53.073	-57.571	-55.614	-53.073	0.980	0.559	0.828	0.913	0.977	0.321	
Brief Symptom Inventory - Interpersonal Sens	21	Yes	7	9	4	-54.571	-53.704	-49.508	-54.571	-53.704	-49.508	0.974	0.627	0.919	0.895	0.972	0.376	
Brief Symptom Inventory - Depression	21	Yes	7	9	4	-55.571	-52.880	-51.290	-55.571	-52.880	-51.290	0.940	0.642	0.850	0.613	0.989	0.314	
Brief Symptom Inventory - Anxiety	21	Yes	7	9	4	-52.571	-53.664	-48.147	-52.571	-53.664	-48.147	0.913	0.621	0.894	0.774	0.986	0.334	
Brief Symptom Inventory - Hostility	21	Yes	7	9	4	-63.857	-57.765	-57.081	-63.857	-57.765	-57.081	0.991	0.234	0.912	0.797	0.954	0.191	
Brief Symptom Inventory - Psychoticism	21	Yes	7	9	4	-54.857	-52.834	-47.348	-54.857	-52.834	-47.348	0.984	0.570	0.686	0.781	0.967	0.230	
Brief Symptom Inventory - Global Severity Index	21	Yes	7	9	4	-66.857	-62.593	-59.957	-66.857	-62.593	-59.957	0.973	0.191	0.882	0.763	0.990	0.320	
Brief Symptom Inventory - Positive Symptom total	21	Yes	7	9	4	-64.286	-58.488	-55.819	-64.286	-58.488	-55.819	0.993	0.240	0.899	0.871	0.981	0.229	
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	7	9	4	-60.429	-56.888	-54.455	-60.429	-56.888	-54.455	0.980	0.383	0.908	0.754	0.973	0.197	
Brief Symptom Inventory - Phobic Anxiety	21	Yes	7	9	4	-60.143	-54.930	-52.223	-60.143	-54.930	-52.223	0.983	0.329	0.877	0.717	0.975	0.224	
Brief Symptom Inventory - Paranoid Ideation	21	Yes	7	9	4	-59.714	-58.251	-56.866	-59.714	-58.251	-56.866	0.978	0.593	0.832	0.892	0.972	0.354	

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 96: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Health

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Weight in kg	6M		12	15	9	7.908	8.271	8.062	0.935	0.363	0.769	0.650	0.886	0.363
Weight in kg	12M		12	13	9	10.175	10.747	10.619	0.889	0.323	0.792	0.755	0.942	0.346
Weight in kg	18M		12	13	9	11.483	11.863	12.185	0.929	0.453	0.853	0.757	0.951	0.331
Weight in kg	24M		12	14	9	13.075	12.901	13.976	0.715	0.628	0.984	0.216	0.950	0.316
Weight in kg	36M		10	12	9	14.560	15.135	15.631	0.929	0.431	0.976	0.338	0.941	0.390
Weight in kg	48M		12	14	9	16.983	17.168	18.701	0.860	0.564	0.989	0.139	0.919	0.245
Weight in kg	60M		9	11	9	19.489	19.163	20.866	0.719	0.728	0.993	<b>0.050</b>	0.938	0.338
Weight in kg	8		12	14	9	28.446	29.320	32.436	0.872	0.603	0.939	0.488	0.931	0.296
						0.000	0.000	0						
						0.000	0.000	0						
Height in cm	6M		12	15	9	67.417	68.148	67.031	0.771	0.554	0.556	0.820	0.702	0.792
Height in cm	12M		12	13	9	76.250	76.679	76.839	0.820	0.673	0.852	0.714	0.745	0.621
Height in cm	18M		12	13	9	82.333	82.291	81.050	0.783	0.745	0.615	0.872	0.405	0.859
Height in cm	24M		12	13	9	87.333	86.708	87.722	0.686	0.684	0.956	0.367	0.740	0.742
Height in cm	36M		10	12	9	96.000	96.214	95.276	0.820	0.686	0.846	0.748	0.642	0.869
Height in cm	48M		12	14	9	103.583	103.187	103.965	0.720	0.783	0.889	0.376	0.766	0.741
Height in cm	60M		9	11	9	112.000	111.103	111.697	0.700	0.767	0.958	0.433	0.665	0.844
Height in cm	8		12	14	9	129.809	129.196	129.488	0.713	0.787	0.907	0.588	0.691	0.836
Brief Symptom Inventory - Somatization	21	Yes	11	13	7	-53.091	-50.966	-47.792	0.954	0.758	0.986	0.713	1.000	0.351
Brief Symptom Inventory - Obsessive-compulsive	21	Yes	10	12	7	-58.200	-54.223	-56.838	0.842	0.608	0.928	0.727	0.989	0.458
Brief Symptom Inventory - Interpersonal Sens	21	Yes	11	13	7	-54.091	-52.286	-48.693	0.947	0.778	0.978	0.759	0.991	0.352
Brief Symptom Inventory - Depression	21	Yes	11	13	7	-54.545	-52.408	-51.105	0.953	0.765	0.981	0.735	0.996	0.546
Brief Symptom Inventory - Anxiety	21	Yes	11	13	7	-53.000	-49.520	-47.076	0.942	0.637	0.986	0.740	0.999	0.341
Brief Symptom Inventory - Hostility	21	Yes	11	11	7	-57.000	-58.166	-55.077	0.879	0.632	0.953	0.406	0.995	0.564
Brief Symptom Inventory - Psychoticism	21	Yes	11	13	7	-52.182	-53.202	-45.141	0.866	0.875	0.989	0.726	0.974	0.163
Brief Symptom Inventory - Global Severity Index	21	Yes	10	12	7	-63.800	-63.926	-61.849	0.899	0.884	0.979	0.661	0.995	0.465
Brief Symptom Inventory - Positive Symptom total	21	Yes	11	13	7	-62.000	-57.975	-54.816	0.970	0.632	0.978	0.742	1.000	0.336
Brief Symptom Inventory - Positive Symptom Distress	21	Yes	10	13	7	-58.000	-57.000	-54.914	0.921	0.837	0.983	0.546	0.995	0.543
Brief Symptom Inventory - Phobic Anxiety	21	Yes	11	13	8	-57.091	-55.415	-57.080	0.932	0.770	0.911	0.590	0.969	0.426
Brief Symptom Inventory - Paranoid Ideation	21	Yes	10	13	7	-56.700	-56.190	-54.776	0.922	0.868	0.988	0.443	0.996	0.514

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.



Table 97: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Adult Outcome

Variable	Age			Age Reversed			Descriptive Statistics						Stepdown p-Values					
	Obs.			Means			CCC	CTT	TTT	CCC	CTT	TTT	CCC vs CTT		CTT vs TTT		CCC vs TTT	
	CCC	CTT	TTT	CCC	CTT	TTT							CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
High School end Age (graduate/drop-out)	21	8	9	4	16.750	17.476	19.068	0.911	0.497	0.993	0.749	0.977	0.977	0.555				
High School Graduation or GED Age	21	3	8	4	18.333	18.847	18.096	0.997	0.804	0.959		0.952						
Individual Income at age - 21 interview	21	7	9	4	6057.1	6048.0	12211.4	0.974	0.751	0.963	0.498	0.986	0.593					
Spouse's Income at age - 21 interview	21	2	2	1	11000.0	11000.0	11000.0	0.975	0.635		<b>0.000</b>		<b>0.000</b>					
Other Income at age - 21 interview	21	8	9	5	-1541.5	-1101.5	-101.3	0.990	0.830	0.978	0.242	0.949	0.373					
Total Available Household Income at age - 21 interview	21	5	7	4	14951.2	16357.7	27168.9	0.985	0.864	0.987	0.706	0.988	0.656					
Wage Income at age - 30 interview	30	8	9	4	12630.8	16922.9	18967.4	0.991	0.824	0.981	0.866	0.981	0.602					
Other Income at age - 30 interview	30	7	9	4	-6426.9	-3391.9	-3128.8	0.998	0.759	0.989	0.691	0.985	0.654					
Spouse's Income at age - 30 interview	30	8	9	4	7500.0	17085.7	11236.9	0.988	0.775	0.956	0.894	0.979	0.608					
Total Available Household Income at age - 30 interview	30	8	9	4	25866.8	37490.6	33009.9	0.998	0.762	0.956	0.900	0.980	0.666					
Graduated High School? at age - 30 interview	21	8	9	5	0.250	0.490	0.389	0.944	0.753	0.976	0.506	0.988	0.767					
Graduated High School? at age21	21	8	9	5	0.375	0.523	0.630	0.994	0.852	0.976	0.506	0.991	0.649					
Graduated High School? at age30	30	8	9	5	0.375	0.523	0.746	0.994	0.852	0.994	0.551	0.948	0.553					
Ever Attended a 4 Year University? at age21	21	7	9	4	0.143	0.327	0.212	0.998	0.784	0.986	0.686	0.977	0.793					
Ever Attended a 4 Year University? at age30	30	8	9	5	0.250	0.375	0.389	0.992	0.868	0.988	0.708	0.988	0.750					
Ever Attended a 4 Year University? at age21	21	8	9	4	0.250	0.375	0.590	0.992	0.868	0.988	0.548	0.983	0.560					
Ever Attended a 4 Year University? at age30	30	8	9	5	0.250	0.375	0.505	0.992	0.808	0.986	0.706	0.991	0.638					
Have a 4 Year Degree? at age - 30 interview	30	8	9	5	0.250	0.306	0.320	0.977	0.878	0.974	0.848	0.985	0.721					
Have a 4 Year Degree? at age 30	30	8	9	5	0.250	0.306	0.320	0.977	0.878	0.974	0.848	0.985	0.721					
Working? at age - 21 interview	21	7	9	4	0.571	0.517	0.629	0.972	0.545	0.954	0.472	0.977	0.750					
Working? at age21	21	8	9	5	0.125	0.209	0.125	0.993	0.854	0.977	0.874	0.976	0.641					
Working? at age - 30 interview	30	8	9	4	0.625	0.667	0.853	0.987	0.859	0.985	0.868	0.991	0.643					
Working? at age30	30	8	9	5	0.625	0.667	0.764	0.987	0.859	0.950	0.858	0.988	0.779					

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 98: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Female, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.		Means		CCC vs. CTT		CTT vs. TTT		CCC vs. TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	8	9	4	-50.250	-53.050	-50.101	0.258	0.971	0.939	0.814	0.870	0.848
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	8	9	4	-53.750	-52.813	-53.489	0.910	0.783	0.921	0.804	0.858	0.949
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	8	9	4	-50.125	-54.141	-50.290	0.345	0.954	0.967	0.864	0.740	0.988
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	8	9	4	-53.250	-54.741	-51.361	0.653	0.966	0.807	0.759	0.922	0.638
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	8	9	4	-51.750	-52.670	-51.087	0.679	0.970	0.941	0.795	0.865	0.831
Adult Self-Report - Problem Scales - Aggressive	30	Yes	8	9	4	-55.125	-54.642	-52.008	0.844	0.865	0.968	0.880	0.885	0.628
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	8	9	4	-53.625	-54.150	-53.845	0.747	0.943	0.961	0.882	0.807	0.980
Adult Self-Report - Problem Scales - Intrusive	30	Yes	8	9	4	-55.250	-53.990	-51.764	0.913	0.776	0.928	0.804	0.843	0.575
Adult Self-Report - Problem Scales - Critical Items	30	Yes	8	9	4	-54.250	-55.107	-52.256	0.728	0.957	0.941	0.782	0.919	0.679
Adult Self-Report - Problem Scales - Internalizing	30	Yes	8	9	4	-40.250	-47.516	-43.216	0.234	0.956	0.968	0.850	0.348	0.946
Adult Self-Report - Problem Scales - Externalizing	30	Yes	8	9	4	-51.500	-48.492	-47.829	0.901	0.773	0.871	0.750	0.887	0.758
Adult Self-Report - Problem Scales - Total Problems	30	Yes	8	9	4	-44.875	-47.441	-44.063	0.650	0.965	0.952	0.793	0.858	0.951
Adult Self-Report - Adaptive Functioning : Friends	30		8	9	4	50.625	49.300	52.132	0.805	0.743	0.650	0.837	0.931	
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		2	6	2	51.000	55.358	51.000	0.903	0.449	0.533	1.000	0.747	0.528
Adult Self-Report - Adaptive Functioning : Family	30		7	9	4	50.857	44.916	51.859	0.288	0.913	0.777	0.663	0.940	0.623
Adult Self-Report - Adaptive Functioning : Job	30		4	8	3	44.000	47.900	44.268	0.875	0.388	0.842	0.678	0.909	0.678
Adult Self-Report - Adaptive Functioning : Education	30		2	3	1	43.500	42.043	43.500	0.754	0.837	1.000	0.000	0.000	0.000
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		8	9	4	50.750	48.640	53.535	0.754	0.731	0.865	0.574	0.806	0.535
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	8	9	4	-52.875	-53.428	-52.265	0.551	0.903	0.629	0.896	0.623	0.798
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	8	9	4	-52.250	-52.965	-52.271	0.551	0.890	0.661	0.866	0.810	0.895
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	8	9	4	-51.875	-51.203	-52.957	0.571	0.867	0.620	0.899	0.795	0.632
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	8	9	4	-53.125	-53.563	-53.457	0.550	0.903	0.627	0.895	0.765	0.926
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	8	9	4	-50.500	-53.881	-50.997	0.342	0.986	0.762	0.881	0.563	0.931
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	8	9	4	-51.000	-54.015	-50.402	0.342	0.986	0.753	0.727	0.834	0.793
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	8	9	4	-50.125	-54.832	-50.720	0.278	0.983	0.845	0.797	0.620	0.938
Adult Self-Report - DSM Scales - A voidant Personality	30	Yes	8	9	4	-53.250	-53.415	-54.781	0.787	0.878	0.652	0.803	0.630	0.916
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	8	9	4	-52.875	-52.658	-51.100	0.723	0.826	0.820	0.873	0.858	0.675
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	8	9	4	-56.625	-55.512	-53.506	0.704	0.758	0.670	0.879	0.858	0.672
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	8	9	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	8	9	4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 99: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Adult Outcome

Variable	Age	Reversed	Descriptive Statistics						Stepdown p-Values					
			Obs.			Means			CCC vs CTT			CTT vs TTT		
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
High School end Age (graduate/drop-out)	21		12	15	9	18.167	17.516	17.877	0.787	0.999	0.997	0.868	0.968	0.984
High School Graduation or GED Age	21		10	9	7	18.900	20.129	19.442	0.954	0.450	0.807	0.855	0.999	0.835
Individual Income at age - 21 interview	21		12	14	9	18693.3	11264.0	17352.8	0.484	0.998	0.998	0.812	0.984	0.981
Spouse's Income at age - 21 interview	21		6	3	2	18100.0	9900.4	29422.7	0.161	0.997	0.993	0.449	0.996	0.681
Other Income at age - 21 interview	21	Yes	13	15	9	-738.5	-3787.8	-7426.1	0.942	1.000	0.982	0.830	0.795	0.907
Total Available Household Income at age - 21 interview	21		12	12	9	28543.3	19278.0	33953.8	0.836	1.000	0.999	0.861	1.000	0.855
Wage Income at age - 30 interview	30		9	15	8	15697.5	16189.9	7740.8	0.989	0.999	0.961	0.963	0.826	0.968
Other Income at age - 30 interview	30	Yes	9	15	8	-593.3	-1862.4	67.7	0.790	0.999	0.988	0.134	0.987	0.667
Spouse's Income at age - 30 interview	30		9	12	8	12277.7	13574.0	19449.6	0.970	1.000	0.998	0.862	0.997	0.871
Total Available Household Income at age - 30 interview	30		8	15	8	34172.1	32689.0	93080.1	0.975	0.999	0.999	0.863	1.000	0.722
Graduated High School? at age - 30 interview	21		13	15	9	0.692	0.333	0.632	0.304	0.998	0.996	0.621	0.983	0.983
Graduated High School? at age21	21		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Graduated High School? at age - 30 interview	30		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Graduated High School? at age30	30		13	15	9	0.692	0.432	0.632	0.685	0.995	0.994	0.808	0.983	0.983
Ever Attended a 4 Year University? at age - 21 interview	21		11	14	8	0.091	0.006	0.329	0.830	1.000	0.999	0.129	0.991	0.112
Ever Attended a 4 Year University? at age21	21		13	15	9	0.077	0.038	0.273	0.926	1.000	0.995	0.551	0.999	0.697
Ever Attended a 4 Year University? at age - 30 interview	30		9	15	8	0.222	0.174	0.408	0.940	1.000	0.996	0.409	0.999	0.826
Ever Attended a 4 Year University? at age30	30		13	15	9	0.154	0.162	0.351	0.980	0.999	0.994	0.565	1.000	0.726
Have a 4 Year Degree? at age - 30 interview	30		13	15	9	0.077	0.026	0.232	0.967	0.999	0.998	0.615	1.000	0.804
Have a 4 Year Degree? at age21	30		13	15	9	0.077	0.026	0.232	0.967	0.999	0.998	0.615	1.000	0.804
Working? at age - 21 interview	21		12	14	9	0.833	0.607	0.771	0.758	0.998	0.999	0.861	0.989	0.976
Working? at age21	21		13	15	9	0.077	0.282	0.340	0.999	0.999	0.999	0.846	0.991	0.374
Working? at age - 30 interview	30		9	15	8	0.778	0.522	0.571	0.705	0.998	0.999	0.859	0.896	0.982
Working? at age30	30		13	15	9	0.538	0.590	0.532	0.970	0.999	0.973	0.966	0.992	0.966

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

Table 100: Multiple Hypothesis Testing by Stepdown Procedure: CARE, Male, Adult Outcome (continued)

Variable	Age	Reversed	Descriptive Statistics						Single p-values					
			Obs.		Means		CCC vs CTT		CTT vs TTT		CCC vs TTT			
			CCC	CTT	TTT	CCC	CTT	TTT	CCC>CTT	CCC<CTT	CTT>TTT	CTT<TTT	CCC>TTT	CCC<TTT
Adult Self-Report - Problem Scales - Anxious/Depressed	30	Yes	9	15	8	-50.333	-52.071	-49.900	0.213	0.787	0.846	0.154	0.976	<b>0.024</b>
Adult Self-Report - Problem Scales - Withdrawn	30	Yes	9	15	8	-51.333	-53.115	-53.106	0.275	0.725	0.472	0.528	0.176	0.825
Adult Self-Report - Problem Scales - Somatic Complaints	30	Yes	9	15	8	-51.778	-52.559	-53.223	0.360	0.640	0.387	0.613	0.262	0.738
Adult Self-Report - Problem Scales - Thought Problems	30	Yes	9	15	8	-50.778	-53.224	-54.224	0.186	0.814	0.373	0.627	<b>0.065</b>	0.935
Adult Self-Report - Problem Scales - Attention Problem	30	Yes	9	15	8	-53.667	-53.873	-51.288	0.474	0.526	0.729	0.271	0.988	<b>0.012</b>
Adult Self-Report - Problem Scales - Aggressive	30	Yes	9	15	8	-50.778	-53.491	-51.973	<b>0.050</b>	0.950	0.784	0.216	0.152	0.848
Adult Self-Report - Problem Scales - Rule Breaking	30	Yes	9	15	8	-51.556	-56.901	-52.844	<b>0.003</b>	0.997	0.838	0.162	0.147	0.853
Adult Self-Report - Problem Scales - Intrusive	30	Yes	9	15	8	-51.556	-53.114	-51.737	0.184	0.816	0.735	0.265	0.428	0.572
Adult Self-Report - Problem Scales - Critical Items	30	Yes	9	15	8	-50.556	-54.016	-51.020	<b>0.047</b>	0.953	0.806	0.104	0.162	0.838
Adult Self-Report - Problem Scales - Internalizing	30	Yes	9	15	8	-41.222	-45.355	-39.063	0.144	0.856	0.854	0.147	0.746	0.254
Adult Self-Report - Problem Scales - Externalizing	30	Yes	9	15	8	-45.889	-51.393	-46.297	<b>0.086</b>	0.964	0.784	0.216	0.428	0.572
Adult Self-Report - Problem Scales - Total Problems	30	Yes	9	15	8	-42.333	-45.764	-41.282	0.190	0.810	0.725	0.275	0.680	0.320
Adult Self-Report - Adaptive Functioning : Friends	30		8	15	8	52.250	44.732	52.641	<b>0.012</b>	0.988			0.625	0.375
Adult Self-Report - Adaptive Functioning : Spouse/Parent	30		6	9	5	46.833	44.132	48.080	0.207	0.793			0.682	0.318
Adult Self-Report - Adaptive Functioning : Family	30		9	15	8	49.000	48.634	54.096	0.444	0.556			0.968	<b>0.032</b>
Adult Self-Report - Adaptive Functioning : Job	30		7	6	6	54.857	51.711	55.458	0.153	0.847			0.674	0.326
Adult Self-Report - Adaptive Functioning : Education	30		2	0	0	55.000	55.000	55.000						
Adult Self-Report - Adaptive Functioning : Mean Adaptive	30		9	15	8	51.556	45.713	55.850	<b>0.033</b>	0.968			0.969	<b>0.031</b>
Adult Self-Report - Substance Use Scales - Tobacco	30	Yes	9	15	8	-52.222	-53.765	-54.099	0.204	0.796	0.184	0.816	0.193	0.807
Adult Self-Report - Substance Use Scales - Alcohol	30	Yes	9	15	8	-53.111	-55.285	-52.698	0.264	0.736	0.803	0.197	0.635	0.365
Adult Self-Report - Substance Use Scales - Drugs	30	Yes	9	15	8	-54.778	-52.904	-53.302	0.742	0.258	0.180	0.820	0.622	0.379
Adult Self-Report - Substance Use Scales - Mean Substance Abuse	30	Yes	9	15	8	-54.111	-54.512	-53.848	0.438	0.562	0.281	0.719	0.563	0.437
Adult Self-Report - DSM Scales - Depressive Problems	30	Yes	9	15	8	-50.222	-51.613	-50.523	0.280	0.720	0.540	0.460	0.243	0.757
Adult Self-Report - DSM Scales - Anxiety Problems	30	Yes	9	15	8	-51.000	-52.412	-50.288	0.130	0.870	0.958	<b>0.042</b>	0.919	<b>0.081</b>
Adult Self-Report - DSM Scales - Somatic Problems	30	Yes	9	15	8	-53.667	-53.128	-53.058	0.594	0.406	0.419	0.581	0.642	0.357
Adult Self-Report - DSM Scales - Avoidant Personality	30	Yes	9	15	8	-52.333	-51.618	-50.936	0.625	0.375	0.493	0.507	0.815	0.185
Adult Self-Report - DSM Scales - AD/H Problems	30	Yes	9	15	8	-53.000	-53.563	-52.166	0.404	0.596	0.669	0.331	0.756	0.244
Adult Self-Report - DSM Scales - Antisocial Personality	30	Yes	9	15	8	-51.000	-56.322	-52.431	<b>0.012</b>	0.988	0.829	0.171	0.137	0.863
Adult Self-Report - DSM Scales - Inattention Subscale	30	Yes	9	15	8	0.000	0.000	0.000						
Adult Self-Report - DSM Scales - Hyperactivity- Impulsivity Subscale	30	Yes	9	15	8	0.000	0.000	0.000						

Note: "CCC", "CTT", and "TTT" refer to the control group, the family education only group, and the full treatment group who received all three components of treatment, respectively. p-values are obtained by Freedman-Lane permutation procedure which adjusts for imbalanced pre-program variables. A dummy indicator for high or low HRI is used for non-linear conditioning and four other variables are used for linear conditioning, which are mother's working status before pregnancy, father's presence at home at the subject's birth, the number of older siblings in the household, and mother's IQ.

## 7 Conclusion

This report presents the results from our analysis of the ABC/CARE interventions through subjects' mid-30s. We view these results as a *lower bound* from what would be expected from a long term evaluation of Educare. Our main findings are as follows. First, there are lasting effects of the ABC preschool treatment on various domains such as cognitive, socio-emotional, and physical development in early years and education, healthy behaviors, physical health, labor market performance, and criminal activity. Second, these effects differ somewhat between males and females. The benefits for female participants were primarily in the areas of cognitive development, educational attainment, and mental health consistently throughout adulthood. Treated males, instead, show persistent benefits in terms of better labor market outcomes and improved physical health from early childhood up to mid-30s as well as reduced criminal engagement in adult years. Third, we do not find strong evidence of effects for the school-age treatment. Fourth, we find no significant program effects for home-visit-based family programs alone.

All of these results are robust to corrections for small sample size, multiple hypotheses testing, compromised randomization, and non-random attrition. They are strengthened when we also account for contamination of the control group.

We have not performed a proper cost-benefit analysis. Estimates by [Barnett and Masse \(2007\)](#) through age 21 suggest a much lower benefit-to-cost ratio (2.5 dollars per 1 dollar invested) than that found for the Perry Preschool (that is, 7-10% per annum or 7-12 dollars per 1 dollar invested. See [Heckman et al., 2010b](#)). The analysis of [Barnett and Masse \(2007\)](#) is highly speculative in part because the sample they use stops at age 21 before adult labor market histories are available for most participants. Moreover, at the time they were conducting the cost-benefit analysis, no reliable health data nor adult crime records had been collected. As shown before, major benefits from the ABC project are through its effect on health and crime.

There are major challenges in converting the estimated health treatment effects into benefit and cost estimates. Two further steps have to be taken. (1) We need to forecast how the bio-markers at study subjects' mid-30s translate into reduced incidence of disease throughout the the remaining life cycle.<sup>43</sup> (2) Second, we need to convert the estimated lifetime health benefits into long run

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<sup>43</sup>We are actively engaged in doing these tasks but it will take time and additional resources to do so satisfactorily. We are reluctant to issue any estimates in the current politically charged environment where critics of early childhood

benefits on earnings and health care costs. We hope to undertake these projects in the near future.

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programs are seizing on any shred of unfavorable evidence to oppose them. We feel that a proper cost-benefit analysis will show much higher rates of return. Preliminary calculations based on crude estimates of the value of the program induced health benefits suggest that the benefit-to-cost ratio of ABC daycare treatment ranges between 3-5 dollars per 1 dollar invested when 3% of real discount rate is applied.

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