A series of Randomized Controlled Trials (RCT’s) called the Abecedarian Studies demonstrate the significant benefits of high quality early childhood education for vulnerable and at-risk children and their families. Children in the studies included those at risk from multiple social conditions such as poverty, young maternal age, or low parental education. Other children in 2 orphanage studies were at risk due to parental abandonment. But, importantly, children in some of the studies came from a wide range of social classes. Many of these children had no additional risk other than being born at low birth weight or with cerebral palsy. The educational program or intervention in all of the studies was the full Abecedarian Approach (LearningGames, Conversational Reading, Language Priority, and Enriched Caregiving) except the Cerebral Palsy study which used only the LearningGames element of the Abecedarian Approach. The most recent study, initiated in February 2012, focuses on Aboriginal children and families in Winnipeg, Canada. These are the RCT’s:

<table>
<thead>
<tr>
<th>Randomized Samples</th>
<th>Location</th>
<th>N</th>
<th>Duration of Program</th>
<th>Type of Program</th>
<th>Oldest age of follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abecedarian 1</td>
<td>Chapel Hill, NC</td>
<td>111 children</td>
<td>Birth to age 5 years</td>
<td>Center + social work visits + health care</td>
<td>age 30</td>
</tr>
<tr>
<td>Abecedarian 2</td>
<td>Chapel Hill, NC</td>
<td>64 children</td>
<td>Birth to age 5 years</td>
<td>Center + social work + educational home visits + health care</td>
<td>age 21</td>
</tr>
<tr>
<td>Abecedarian 3</td>
<td>Boston, MA</td>
<td>138 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 4</td>
<td>New Haven, CT</td>
<td>112 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 5</td>
<td>Bronx, NY</td>
<td>138 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 6</td>
<td>Philadelphia, PA</td>
<td>101 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 7</td>
<td>Miami, FL</td>
<td>100 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 8</td>
<td>Little Rock, AK</td>
<td>128 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 9</td>
<td>Dallas, TX</td>
<td>137 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 10</td>
<td>Seattle, WA</td>
<td>131 children</td>
<td>Birth to age 3 years</td>
<td>Center + educational home visits</td>
<td>age 18</td>
</tr>
<tr>
<td>Abecedarian 11</td>
<td>Baltimore, MD</td>
<td>48 children</td>
<td>Age 1 to 2 years</td>
<td>Parent training for home intervention</td>
<td>age 2</td>
</tr>
<tr>
<td>Abecedarian 12</td>
<td>Iasi, Romania</td>
<td>65 children</td>
<td>Age 1 to 2 years</td>
<td>Home (small group in orphanage)</td>
<td>age 2</td>
</tr>
<tr>
<td>Abecedarian 13</td>
<td>Iasi, Romania</td>
<td>104 children</td>
<td>Age 2 to 3 years</td>
<td>Home (small group in orphanage)</td>
<td>age 3</td>
</tr>
<tr>
<td>Abecedarian 14</td>
<td>USA, national</td>
<td>2,430 parents</td>
<td>Age 3 to 4 years</td>
<td>Preschool + daily parent education groups</td>
<td>age 5</td>
</tr>
<tr>
<td>Abecedarian 15</td>
<td>Massachusetts, state-wide</td>
<td>150 family childcare providers</td>
<td>2 years (between Birth and 5 years)</td>
<td>Family child care homes</td>
<td>caregiver data only</td>
</tr>
<tr>
<td>Abecedarian 16</td>
<td>Winnipeg, Manitoba</td>
<td>64 children (first cohort)</td>
<td>Birth to age 5 years</td>
<td>Center + educational home visits</td>
<td>Study began Feb. 2012</td>
</tr>
</tbody>
</table>
What were some of the outcomes for participants in these scientific investigations? The following figures and very brief paragraphs highlight some key findings: first for the parents of the children, then for the children in the early years of life, children in the middle and adolescent years, and in the young adult years. Finally, some results are shown for caregiver behavior effects of Abecedarian staff training.

**Post-high School Education for Teen Mothers whose Children Were in the Abecedarian Project**

Many of the mothers in Abecedarian Study 1 were teen-agers. The percentages of teen parents who got education beyond high school over a 15 year period are shown in the first figure. Of the mothers whose children received the program (shown in the line with the red triangles), 80% had some education beyond high school. This was a substantial level of educational attainment, since these young mothers were from severely disadvantaged families (Ramey, et al., 2000).

**Percent of Child Sample in Normal IQ Range (>84) by Age, Longitudinal Analysis**

Almost all of the at-risk children in both the experimental and control groups of Abecedarian Study 1 were in the normal IQ range at the beginning of the study. Most of those who received the Abecedarian intervention continued to stay in the normal IQ range, while more than half of those who did not receive the intervention fell out of the normal range by 36 months of age. This decline is seen in the descending line with yellow squares in the accompanying figure. The difference between groups begins to be statistically significant at age 18 months (Martin, Ramey, & Ramey, 1990).

**Child’s Age-36-months Stanford-Binet IQ by Mother’s Education**

In one set of studies (Abecedarian Studies 3 - 10) there were nearly 1,000 babies, chosen by their birth weight. Dividing the children by their mother’s educational level, produced a classic pattern in the control group (the yellow bars) with a clear, stair-step relationship between the children’s Stanford Binet scores at age 3 and their
mother’s education. This “social gradient,” is common in a variety of child health and educational outcomes. But when we look at the randomly-assigned group that got the Abecedarian Approach for the first 3 years of life, the gradient is substantially flattened. The 3 red bars on the left are very close to the same height. To achieve this equalization, a substantial difference has to occur between the treated and untreated group of children of moms with the lowest education. So there is good news: Children from families who need it most, reap big benefits from a strong, early Abecedarian Approach program. And there is more good news: Children from most families benefit – although not quite as much as the neediest. The only children who did as well without the program were children of moms with university degrees (Ramey & Ramey, 1998). Curiously, even though evidence shows they do not really need it, those moms still valued and sought out this and other early childhood programs.

**Reading and Math Achievement During the School Years**

Using standardized tests, both reading and math achievement were measured for all children at 8, 12, 15, and 21 years of age in Abecedarian Study 1. The treatment group (those who received the Abecedarian Approach from birth to age 5) were significantly higher in both reading and math achievement at all ages. The accompanying figure shows reading achievement only. (Campbell & Ramey, 1995).

**Special Education Placements by Age 15**

When the at-risk young children entered public school, those who did not receive the Abecedarian Approach in the first 5 years of life in Abecedarian Study 1 were more than twice as likely to be placed in special education for 1 or more years by the time they reached age 15 (Ramey & Ramey, 1999).

**Adolescent Outcomes for Low Birth Weight Babies**
What about the later results for low birth weight babies who received the Abecedarian program? When the intervention and control groups (pooled from 8 sites in Abecedarian Studies 3-10) were compared at age 18, the intervention group in the 2000-2500 grams birth weight range had these characteristics:

- higher math achievement
- higher receptive vocabulary
- fewer risk-taking behaviors (McCormick, et al., 2006).

These long-term, positive findings are particularly encouraging because they were achieved in a program that lasted from birth to 36 months of age rather than from birth to 60 months of age as in Abecedarian Studies 1 and 2 – underscoring the importance of the first 3 years of life.

Young Adult Educational Attainment: Percent University Attendance and Graduation

In Abecedarian Study 1, at age 21, almost three times as many individuals in the treated group (39.5%) compared to the control group (13.7%) had attended, or were still attending, a 4-year university (Campbell et al., 2002). By the time these young adults had reached age 30, almost four times as many individuals in the treated group (23%) compared to the control group (6%) had **graduated** from a 4-year university (Campbell et al., 2012). Early intervention had allowed the percent of graduates in this extremely at-risk group to be almost exactly equal to the proportion of the general population of adults aged 25 to 64 with a university degree in a number of developed countries (e.g., 23% Canada, 23% United States, 24% Australia, and 22% New Zealand).¹

Effect of Training in the Abecedarian Approach on Child Care Workers

Abecedarian Study 15 focused on the behavior of child care workers (family child care providers) who received training in the Abecedarian Approach. The training had a positive effect over a 2-year period on the observed behaviors of the care providers. The training was delivered to leadership individuals in the family child care systems who, in turn, delivered training to the family child care home caregivers. The training was on the full Abecedarian Approach. The research has not yet been published and the following table is from the researchers’ final report to the government funding agency (Administration for Children and Families, 2010).

<table>
<thead>
<tr>
<th>Impacts of Abecedarian Approach Training on Caregiver Behavior</th>
<th>Control Group Mean</th>
<th>Treatment Group Mean</th>
<th>Treatment Effect</th>
<th>SE</th>
<th>Statistical Significance of Impact (t-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rich oral language interactions</td>
<td>-0.18</td>
<td>0.22</td>
<td>0.40**</td>
<td>0.11</td>
<td>3.72</td>
</tr>
<tr>
<td>Support for development of vocabulary/comprehension</td>
<td>0.17</td>
<td>0.20</td>
<td>0.37**</td>
<td>0.10</td>
<td>3.58</td>
</tr>
<tr>
<td>Responsiveness to children</td>
<td>-0.19</td>
<td>0.23</td>
<td>0.47**</td>
<td>0.16</td>
<td>2.97</td>
</tr>
</tbody>
</table>

Key: *=p<0.05; **=p<0.01

What Curriculum Approach Produced these Multiple, Long-term Results?

Since we attempted to equalize social services, health care, and to some degree early nutrition for both the control and experimental groups in the major longitudinal studies, the educational program received by children appears to be the source of experimental/control group differences. That educational program, called the Abecedarian Approach, was comprised of (1) Learning Games, (2) Conversational Reading, (3) Language Priority, and (4) Enriched Caregiving. In the various Abecedarian Studies these components were combined and delivered through a number of service delivery modalities:

- Child care centers
- Pre-K classrooms
- Home visiting
- Parent education sessions
- Family child care homes
- Family literacy programs
- Hospital clinic visits

Since the Abecedarian Approach is a set of strategies and standards, not only can it be applied through various service modalities, it may be used in conjunction with any basic early childhood curriculum.

Partial List of Abecedarian Research Publications
(In chronological order)


There are over 200 research publications, in juried journals and in book chapters, presenting the results of the Abecedarian Studies.

A book, summarizing the research results and elaborating the educational approach is forthcoming: