Rationale for Quality Early Childhood Interventions

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Overview

I. ECD and Disadvantage
II. Why to Invest
III. How to Invest
IV. Policies and Future Directions
ECD and Disadvantage

New data from neuroscience, genetics, and the social sciences indicate that early enriched environments can mitigate the effects of disadvantage on later cognitive outcomes, mental health, and executive functioning.

New science on the benefits of enriched early environments suggests an important rationale for investments in the quality of ECD services, with particular attention to the most vulnerable children and families.

Sources: Britto, Yoshikawa, & Boller, 2011; Engle, et al, 2011; Kaul & Sankar, 2009
Socioeconomic Status and Child Development

Source: Hackman, Farah, & Meaney, 2010
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Cost/benefit analyses show positive returns

Early Childhood Programs Demonstrating Range of Benefits to Society

<table>
<thead>
<tr>
<th>Program</th>
<th>Total Return per $1 Invested</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abecedarian Project (through age 21)</td>
<td>$3.23</td>
</tr>
<tr>
<td>Nurse Family Partnership (High Risk Group)</td>
<td>$5.70</td>
</tr>
<tr>
<td>Perry Preschool (through age 40)</td>
<td>$9.20</td>
</tr>
</tbody>
</table>

Sources: Karoly et al, 2005; Heckman et al, 2009
Rates of return to human capital investment

Source: Heckman, 2006
Gaps are more difficult and costly to correct later on

“Investing in disadvantaged young children is a rare public policy initiative that promotes fairness and social justice and at the same time promotes productivity in the economy and in society at large. Early interventions targeted toward disadvantaged children have much higher returns than later inventions such as reduced pupil-teacher ratios, public job training, convict rehabilitation programs, tuition subsidies, and or expenditures on police. At current levels of resources, society overinvests in remedial skill investments at later ages and underinvests in the early years.”

Source: Heckman, 2006
3 Core Concepts in Early Development

1. Experiences build brain architecture
2. Interaction shapes brain circuitry
3. Toxic stress derails healthy development

Sources: Center on the Developing Child at Harvard University, National Scientific Council on the Developing Child
1. Experiences build brain architecture
Synapse overproduction, followed by pruning

Photo credit: Public Library Association
Source: Center on the Developing Child at Harvard University
Synapse overproduction, followed by pruning

Source: Huttenlocher, 1990
2. Interaction shapes brain circuitry
3. Toxic stress derails healthy development
3 Levels of Stress Response

Positive
Brief increases in heart rate, mild elevations in stress hormone levels.

Tolerable
Serious, temporary stress responses, buffered by supportive relationships.

Toxic
Prolonged activation of stress response systems in the absence of protective relationships.

Source: National Forum on Early Childhood Program Evaluation
Sources of Toxic Stress Response

- Poverty
- Maternal deprivation
- Maltreatment
- Paternal substance abuse
- Postpartum depression
Toxic Stress Changes Brain Architecture

Normal

Typical neuron—many connections

Toxic Stress

Damaged neuron—fewer connections

Prefrontal Cortex and Hippocampus

Source: Radley et al, 2004; Bock et al, 2005
Extreme Adversity Disrupts Body Chemistry

Source: Gunnar & Fisher, 2006
Maternal Depression in Low-Income Families

Percentage of moderately or severely depressed mothers with a 9-month-old infant

<table>
<thead>
<tr>
<th>Income Status</th>
<th>Depression Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor</td>
<td>25%</td>
</tr>
<tr>
<td>Near Poor</td>
<td>17%</td>
</tr>
<tr>
<td>Not Poor</td>
<td>11%</td>
</tr>
</tbody>
</table>

Source: Gunnar & Fisher, 2006
Targeted Services for Children Experiencing Toxic or Tolerable Stress

For vulnerable parents expecting a first child, early, intensive support by a skilled home visitor can produce significant benefits.

Effectiveness factors for home visiting include:

- More highly trained visitors = larger effects.
- No evidence that 1-3 visits have any impact.
- Engaging and maintaining participation of families is a key challenge.
- Opportunities for practice and skill-building.
- Some successful programs specifically target populations at high risk with focused curricula.

Source: National Forum on Early Childhood Program Evaluation
Delayed Intervention Harms Development

Bucharest Early Intervention Program

Tested at 4 1/2 Years Old

IQ/DQ (Mean)

“normal” range

Age (months) Placed in Therapeutic Family Setting

Source: Nelson et al, 2007
I. ECD and Disadvantage

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IV. Policies and Future Directions
36 months: Child care quality by income, as a predictor of school readiness

Fifth grade: Child care quality by income, applied problems

Source: Dearing, McCartney, & Taylor, 2009
Fifth grade: Child care quality by income, letter-word

Source: Dearing, McCartney, & Taylor, 2009
NICHD 15-year old follow up: Persistent effects of early child care

Source: Vandell, et al, 2010
NICHD 15-year old follow up: Persistent effects of early child care

Source: Vandell, et al, 2010
Vocabulary Scores of Kindergarten-Bound Children by Age of Entry into Educare, all sites 2007-2011

Source: Yazejian & Bryant, 2012
Long-Term Effects of Head Start

- Deming compared siblings who differ in their Head Start participation
- Long-term impact is large despite “fade-out” of test score gains
- Head Start costs one-third of the gap between median and bottom quartile family income on a summary of young adult outcomes:
  - High school graduation
  - College attendance
  - Idleness (not in high school, no wages)
  - Crime
  - Teen parenthood
  - Health status

Source: Deming, 2009
Children who did not receive a strong education from PK through 3rd grade were three times more likely to be held back and more likely to be placed in special education than those who had a strong PK-3 foundation.

Source: Reynolds et al, 2004
Importance of Parents and Communities

Parenting education programs can have added impact on child outcomes but only if they are well designed.

![Graph showing adjusted mean effect size for cognitive and pre-academic skills with and without high quality parenting education.](image)

- **ECE with high quality parenting education** (Parenting education that includes modeling of or opportunities to practice stimulating parent/child interactions)
- **ECE without high quality parenting education**

Source: National Forum on Early Childhood Program Evaluation
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Effective Services Improve Relationships and Environments

Positive relationships and emotional, social, cognitive, and language learning experiences can be promoted both at home and through a range of evidence-based programs:

- Parent education
- Family support
- Early care and education
- Intervention services

Source: National Forum on Early Childhood Program Evaluation
Effectiveness Factors for Early Care and Education Programs

For children from birth to age 5:

- Small group sizes and high adult-child ratios
- Developmentally appropriate “curriculum”
- Safe physical setting
- Skilled and well-compensated personnel
- Language-rich environment
- Warm and responsive adult-child interactions

Source: National Forum on Early Childhood Program Evaluation
Professional Development

Didactic course only effective when accompanied by on-site coaching for center- and home-based child care providers

Source: Neuman & Cunningham, 2009
Similar Findings: Landry, Crawford, Gunnewink & Swank, 2001
Professional Development

New evidence of positive impacts in early childhood professional development

- Technology:
  - Video + feedback with online coach (My Teaching Partner: Bob Pianta)

- Domains:
  - Math (Building Blocks; Doug Clements & Julie Sarama)
  - Executive Function (Tools of the Mind; Deborah Leong)

- Other evidence-based PD approaches for child care providers
  - Project Upgrade; Layzer, Layzer, Goodson, & Price, 2007

- PD, coaching + self-care component to reduce caregiver/teacher stress and reduce behavior problems
  - Chicago School Readiness Project; Cybele Raver)

- Future Directions: cellphone-based PD

Source: National Forum on Early Childhood Program Evaluation
Future Directions

- Integrate universal screening with evidence-based programs with effectiveness factors to target focused interventions from birth to age 5
- Address barriers to take-up, implementation and PD related to transportation and distance in rural areas.
- Invest in the development and retention of a skilled early childhood workforce.
- Recruit business leaders for private / public partnerships
- Social entrepreneurship and venture capital in EC
- Links to new industry development using dual-generation approaches

Source: National Forum on Early Childhood Program Evaluation