Risky Business: The First Three Years Last Forever

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Back to the Future
2000 = Y2K
Effects Of Extreme Deprivation

Healthy Child

Neglected Child

Courtesy of Dr. H.T. Chugani from the Children’s Hospital of Michigan, Wayne State University

From Neurons to Neighborhoods: The Science of Early Childhood Development

Committee on Integrating the Science of Early Childhood Development

Board on Children, Youth, and Families
Institute of Medicine
National Research Council
2000 – The Early Childhood Conversation

- Importance of the early years
- Missed opportunities
- The right thing to do
- Brain development

2014+
2013

- Brain architecture
- Toxic stress
- Disparities in development
- Economic development/impact
- National security
- Executive Function
Early experience is the “smoking gun” for both education success and long-term health. Things that happen early in life leave biological memories in your body — “Gets under your skin.”
Importance of Early Experience

- Moral
- Disparities
- Economic
- Biology

Disparities Emerge at a Very Young Age

Hart & Risley (1995, p. 234)
Disparities in Early Learning and Development: Lessons from the Early Childhood Longitudinal Study – Birth Cohort (ECLS-B)
- Across Cognitive, Social, Behavioral, Health
- Gaps apparent at just nine months old
- Grow larger by 24 months

For Council of Chief State School Officers, by Child Trends, 2009

The Economic Sales Pitch

<table>
<thead>
<tr>
<th>Abecedarian</th>
<th>Chicago</th>
<th>Perry</th>
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<tbody>
<tr>
<td>Year started</td>
<td>1972</td>
<td>1985</td>
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</table>

Return on Investment

(In 2006 dollars, 3% discount rate)

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
<th>Benefits</th>
<th>B/C</th>
</tr>
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<tbody>
<tr>
<td>Perry Pre-K</td>
<td>$17,599</td>
<td>$284,086</td>
<td>16</td>
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<tr>
<td>Abecedarian</td>
<td>$70,697</td>
<td>$176,284</td>
<td>2.5</td>
</tr>
<tr>
<td>Chicago</td>
<td>$8,224</td>
<td>$83,511</td>
<td>10</td>
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</table>


Quality Early Care and Education Pays Off: Cost/Benefit Analyses Show Positive Returns

Total Return per $1 Invested

- Abecedarian Project (early care and education aged 0-5)
  - Karoly et al. (2005)
  - Break-Even Point: $3.23
- Nurse Family Partnership (home visiting prenatal – age 2 for high risk group)
  - Heckman et al. (2009)
  - Break-Even Point: $5.70
- Perry Preschool (early education age 3-4)
  - Total Return: $9.20
  - Break-Even Point: $2.23
Return on Investment

Long-Term rate of return on investment in U.S. stocks (7%)

Rate of Return on Investment in the High Scope/Perry Preschool Project (16%)

Return on $1,000 investment, US Stocks vs. High Scope/ Perry Preschool Programs

Return on Investment

Rates of return to human capital investment

Programs targeting the earliest years

- Preschool programs
- K-12 schooling
- Job training
- 19+ Post School

Heckman, J. (2007)
Return on Investment

- James Heckman, Nobel Prize winning economist at the University of Chicago.
  - The benefits of investing in human capital

- Cognitive abilities alone < Package of cognitive skills and social skills
  - Attentiveness
  - Perseverance
  - Impulse control
  - Sociability

  (Heckman, Pinto & Savelyev, 2012)

Perry Preschool Program Benefits

- Cognition

- Academic Motivation

- Externalizing Behavior
  - 70% of the benefit

  (Heckman, Pinto & Savelyev, 2012)
Return on Investment

As states are under constant pressure to improve the efficient use of ever dwindling financial resources, any investment away from young children can be viewed as a diversion of resources from the most efficient use of those funds.

James Heckman, Nobel Laureate in Economics, University of Chicago
Striking disparities in what children know and can do are evident well before they enter kindergarten.

Major Stages of Brain Development

- Neural tube formation
- Cell proliferation
- Cell differentiation
- Cell migration
- Cell connections
- Synaptic pruning
- Myelination

Gilkerson & Klein/Zero to Three (2008)
Synapse formation peaks at the rate of 40,000 per second between 3 and 15 months of age.

Pruning is a highly selective process. It is the phase of brain development in which experience most obviously influences the brain.
Synapse Formation and Pruning

The Brain Changes its Structure and Function in Response to Experience

- **Plasticity**
  - The brain is adaptable and can be influenced by positive experiences
  - The brain is vulnerable and can be harmed by negative experiences
Toxic Stress

Some causes

- Extreme poverty
- Physical or emotional abuse
- Chronic neglect
- Severe maternal depression
- Substance abuse
- Family violence
Tolerable Stress

Alarm

Relaxation

Lally (2007)

Tolerable and Toxic Stress

Alarm

Relaxation

Alarm, Alarm

Lally (2007)
The Body’s Response to Stress

- Increase in heart rate
- Increase in blood pressure
- Increase in breathing rate

Cortisol

- Suppresses the immune system
- Reduces number of cell connections
- Impairs memory - shrinks hippocampus
- Impairs selective attention
- Impairs thinking
- Creates anxious behavior
Cortisol

- If exposed to chronic stress, then level of production of hormones becomes “normal”

- Over arousal and tendency toward impulsive
  - Over active
  - Over reactive
  - More aggressive
  - Less attentive

The Brain Architecture of Anxiety and Fear
The Brain Architecture of Memory and Learning

Telomeres
Telomeres

- The biological clock of the cell
- At end of chromosomes
  - Naturally shorten with age as cells divide and replicate
  - When the length gets too short, it tells a cell when to die

Shorter telomere lengths in adults are associated with higher risks for
- Cardiovascular disease
- Cognitive decline
- Diabetes
- Mental illness
Cortisol and Telomeres

- Increased cortisol exposure has been found to reduce telomere length in children.

Adverse Childhood Experiences Study (ACE)

- Examines the health and social effects of ACEs throughout the lifespan

- Studied among 17,421 members of the Kaiser Health Plan in San Diego County
### Adverse Childhood Experiences Study (ACE)

<table>
<thead>
<tr>
<th>ACE Score</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>33%</td>
</tr>
<tr>
<td>1</td>
<td>26%</td>
</tr>
<tr>
<td>2</td>
<td>16%</td>
</tr>
<tr>
<td>3</td>
<td>10%</td>
</tr>
<tr>
<td>4 or more</td>
<td>16%</td>
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</tbody>
</table>

ACEs increase the risk of:
- Heart disease
- Chronic lung disease
- Liver disease
- Suicides
- HIV and STDs
- And other risks for the leading causes of death
Trajectories of Aggression from 2-9 years

Executive Function and Self-Regulation

What are executive functions?
- Working Memory
- Inhibitory Control
- Attention Shifting/Cognitive or Mental Flexibility
Executive Function and Self-Regulation

- Skills associated with planning, reasoning, problem solving
- Connecting current and past information and actions

Peg Tapping Task
Executive functions and educational disparities

Executive function abilities predict academic and social readiness for school
- Over and above other child characteristics
  - Intelligence
  - Prior academic knowledge
Importance of Attention

From the ECLS-K
- 14,537 children in 2,109 classrooms in 895 public and private kindergarten programs

Attention
- Attentiveness
- Task persistence
- Eagerness to learn
- Learning independence
- Flexibility
- Organization

Georges et al., 2012

Importance of Attention

Test score gaps
- Attention problems > aggressive behavior, SES, race/ethnicity, and gender

Georges et al., 2012
Preschool Attention Span

- Attention span-persistence at age 4 had a significant effect on college completion by age 25.

- Reading or math at age 7 or 21 had no significant effect on college completion by age 25

McClelland et al., 2012

Self-Regulation in Childhood Predicts Later Outcomes: Health

- Poor Physical Health Index
- Substance Dependence Index

Moffitt et al., 2011
**Self-Regulation in Childhood Predicts Later Outcomes: Wealth**

![Graph](image1.png)

Moffitt et al., 2011

**Self-Regulation in Childhood Predicts Later Outcomes: Crime**

![Graph](image2.png)

Moffitt et al., 2011
Single-parent Child-rearing

Moffitt et al., 2011

School Readiness

- Acquiring Self-Regulation
  - Emotions, behaviors and attention
- Communicating and Learning
  - Language, reasoning and problem solving
- Getting Along with Peers
  - Parent-child relationship is the first opportunity to experience trust, love, and nurturance and forms the basis for learning to relate well to others

(National Research Council and Institute of Medicine, 2000)
Relationships are the "Active Ingredients" of Early Experience
Secure Relationships

- The impact of secure relationships is not just emotional or psychological
  - It is biochemical
- Any time you see resilient outcomes, there was at least one supportive relationship
  - Kids don’t become resilient alone

Systems Building
  - Budget
  - Data
Basic Assumption (1)

- The budget is the most significant POLICY DOCUMENT used in government planning.
  - “The budget process is the spinal column of public policymaking.”

Basic Assumption (2)

A cross-system plan without a cross-system budget is difficult to implement.

State Budget

Federal
44%

State
56%
Early Childhood Budget as a Percentage of Total State Budget (FY 12 Appropriated)

- Of Total State Funds: 2.8%
- Of Total Federal Funds: 8.9%
- Of Total State Budget: 5.5%

Early Childhood Budget as a Percentage of Total State Budget (FY 13 Appropriated)

- Of Total State Funds: 2.7%
- Of Total Federal Funds: 8.4%
- Of Total State Budget: 5.2%
Early Childhood Budget as a Percentage of Total State Budget (FY 14 Appropriated)

- 2.2% of Total State Funds
- 6.9% of Total Federal Funds
- 4.1% of Total State Budget

Early Childhood Budget as a Percentage of Total State Budget (FY 14 Appropriated) – Excluding Medicaid*

- 1.3% of Total State Funds
- 8.2% of Total Federal Funds
- 3.3% of Total State Budget

*estimate
Early Childhood Budget FY 10 – FY 14

-27%
-15%

Early Childhood Risk and Reach in Louisiana
FALL 2012
Executive Office of Louisiana Early Childhood Office
### Estimating Risk

<table>
<thead>
<tr>
<th>Economic Factors</th>
<th>Health Factors</th>
<th>Education Factors</th>
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</thead>
<tbody>
<tr>
<td>Unemployment Rate</td>
<td>Low Birth Rate</td>
<td>DIBELS (At High Risk)</td>
</tr>
<tr>
<td>Births to Single Mothers</td>
<td>Teen Birth Rate</td>
<td>Availability of High Quality Early Care and Education</td>
</tr>
<tr>
<td>Mothers w/ Less than High School</td>
<td>Infant Mortality Rate</td>
<td></td>
</tr>
<tr>
<td>Children 0-5 in Poverty</td>
<td>Uninsured Rate (0-5)</td>
<td></td>
</tr>
<tr>
<td>Median Income as Percent of FPL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Attend High Quality Publicly Funded Early Education

Overall Risk
Overall Risk - County

- High: 12%
- Moderate: 19%
- Low: 14%

Overall Risk - Children

- High: 12%
- Moderate: 23%
- Low: 26%
- Low-Moderate: 39%
Overall Risk - Children

- High: 12%
- Moderate: 39%
- Low: 26%
- Low-Moderate: 39%

Health Risk in Louisiana – Low Birth Weight

- 9 counties better than national

- LA: 10.7%
- US: 8.2%
**Health Risk in Louisiana – Teen Birth Rate**

- 4 counties better than national

![Bar Chart showing LA and US teenage birth rates](chart_1.png)

**Health Risk in Louisiana – Infant Mortality**

- 8 counties better than national

![Bar Chart showing LA and US infant mortality rates](chart_2.png)
Mental Health Program - ECSS

Part C
Part C – Low Birth Weight

Head Start
There are approximately 314,260 children in Louisiana under 5 years old.
SCHOOL READINESS TAX CREDITS

5 Years
2008-2012

Tax Credits to Parents

<table>
<thead>
<tr>
<th>Year</th>
<th>Tax Credits</th>
</tr>
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<tbody>
<tr>
<td>2008</td>
<td>$870,689</td>
</tr>
<tr>
<td>2009</td>
<td>$1,068,363</td>
</tr>
<tr>
<td>2011</td>
<td>$2,368,614</td>
</tr>
<tr>
<td>2012</td>
<td>$2,856,286</td>
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</tbody>
</table>
Tax Credits to Providers

2008: $1,631,129
2009: $3,281,385
2011: $5,421,509

Tax Credits to Teachers

2008: $1,503,902
2009: $3,294,524
2011: $5,949,614
2012: $6,722,040

3,351
Tax Credits to Businesses

To Centers  To R&Rs

2008  $30,396  $30,396
2009  $332,175  $337,007
2012  $365,831  $370,465

Total Impact

2008  $4,154,456  141
2009  $8,279,454  74%
2012  $14,379,329  74%
Closing Thoughts

- Invest in early experience, not just early education
  - Risk stays with you your entire life
  - Be comprehensive
- Focus on the right skills
  - Executive Function
  - Self-Regulation
- Need to build from prenatal/birth up
  - Not from K-12 down
THANK YOU
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Citations


Citations

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The President’s Proposal

- Expand Pre-K (4 year-olds)
  - State-Federal partnership
  - Under 200% poverty
- Expand Early Head Start (0-3)
  - Early education, child care, parental education and health services
- Home Visiting