



Graduate Center for the Study of Early Learning

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The Graduate Center for the Study of Early Learning serves all stakeholders in early childhood education across Mississippi and beyond. Our team of researchers and pre-K specialists seek to provide collaborative leadership and research-based information concerning child development, education, policy decisions and more. We believe that all children have the right to learn and grow in an environment that supports a natural ability to explore, create and wonder.

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Latest Tweets



Early Childhood Speaker Series

Drs. Craig and Sharon Ramey
December 11-12, 2017



Professor James Heckman
January 25, 2018



Dr. Pat Levitt
February 6, 2018



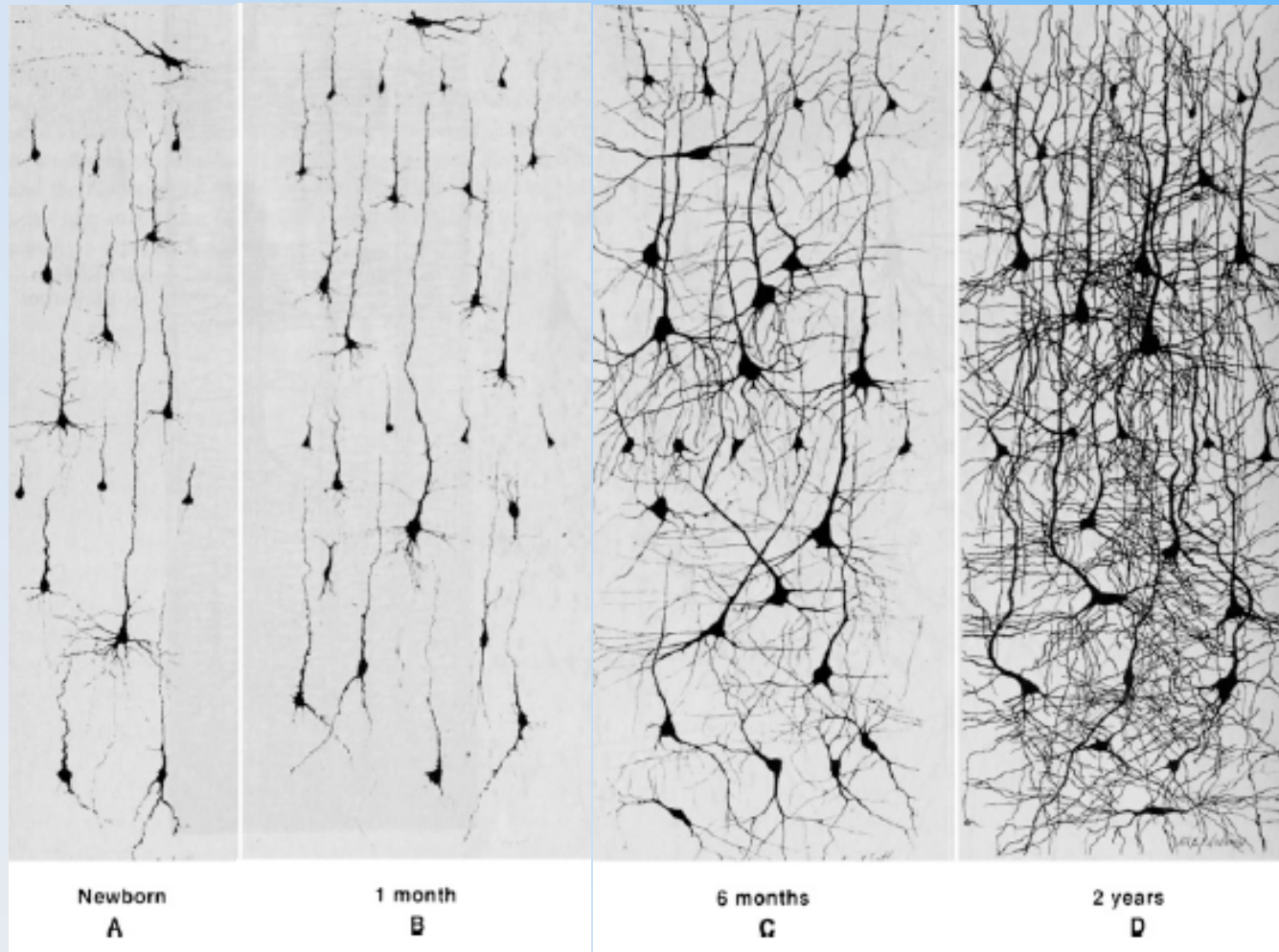
What does research say about brain development?

1. Brains are built over time, from the bottom up (*skill begets skill*).

It's like building a house; if the foundation is weak, the house will forever be unstable.

Dramatic Growth of Neuronal Architecture - Birth - 2 yrs

(1 million synapses formed per second in the early years)



Courchesne et al, Neuron 56,
2007

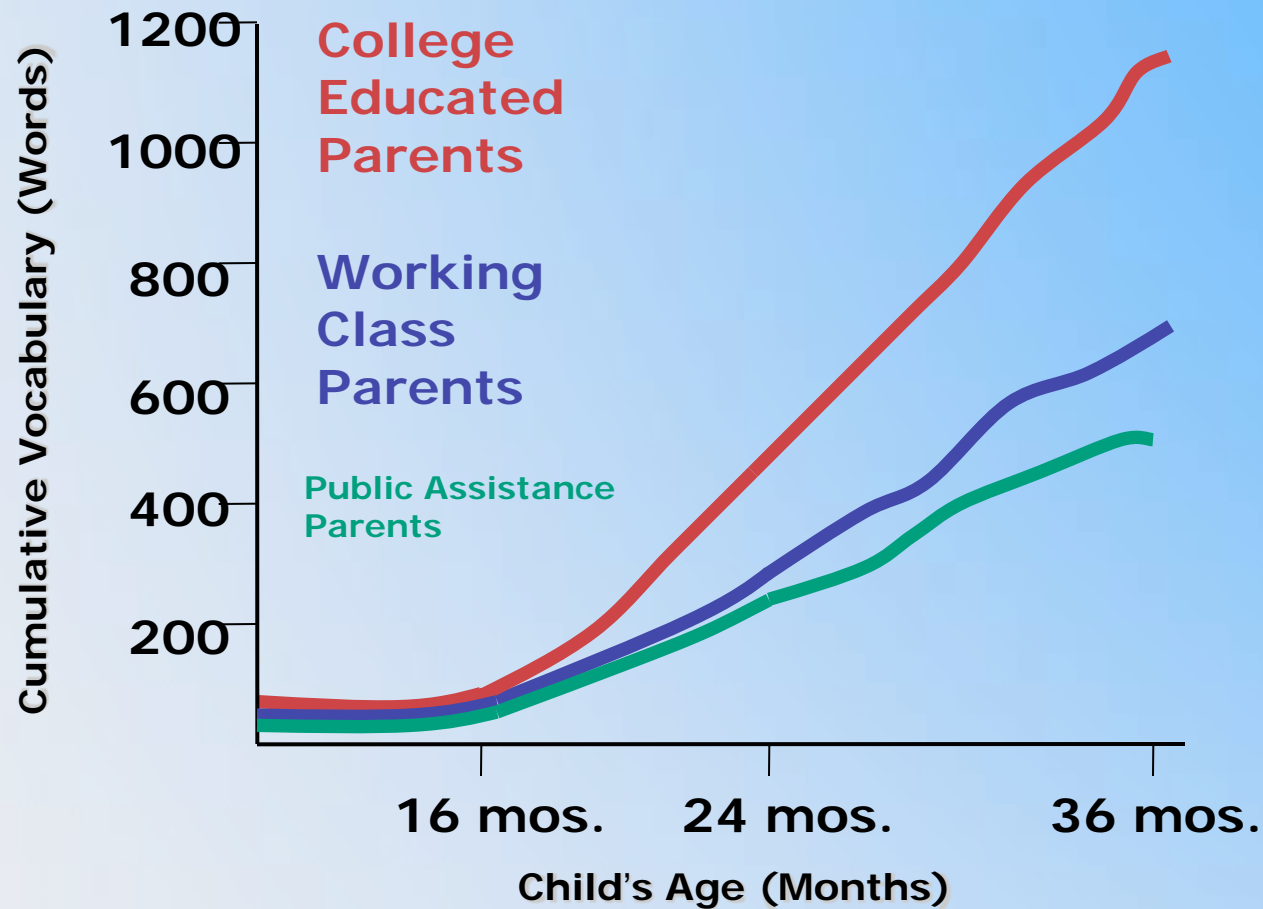
Extreme Early Experiences Can Dramatically Disrupt the Precision of Sensory Information Processing



Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*.
Feb. 6, 2018 <http://gcsel.education.olemiss.edu>

Source: Chang & Merzenich (2003)

Exposure to Complex Language Repertoire Begets Complex Language Repertoire



Source: Hart & Risley (1995)
Fernald et al 2012

Hart & Risley, 1995

Children enter school with “meaningful differences” in vocabulary knowledge.

1. Emergence of the Problem

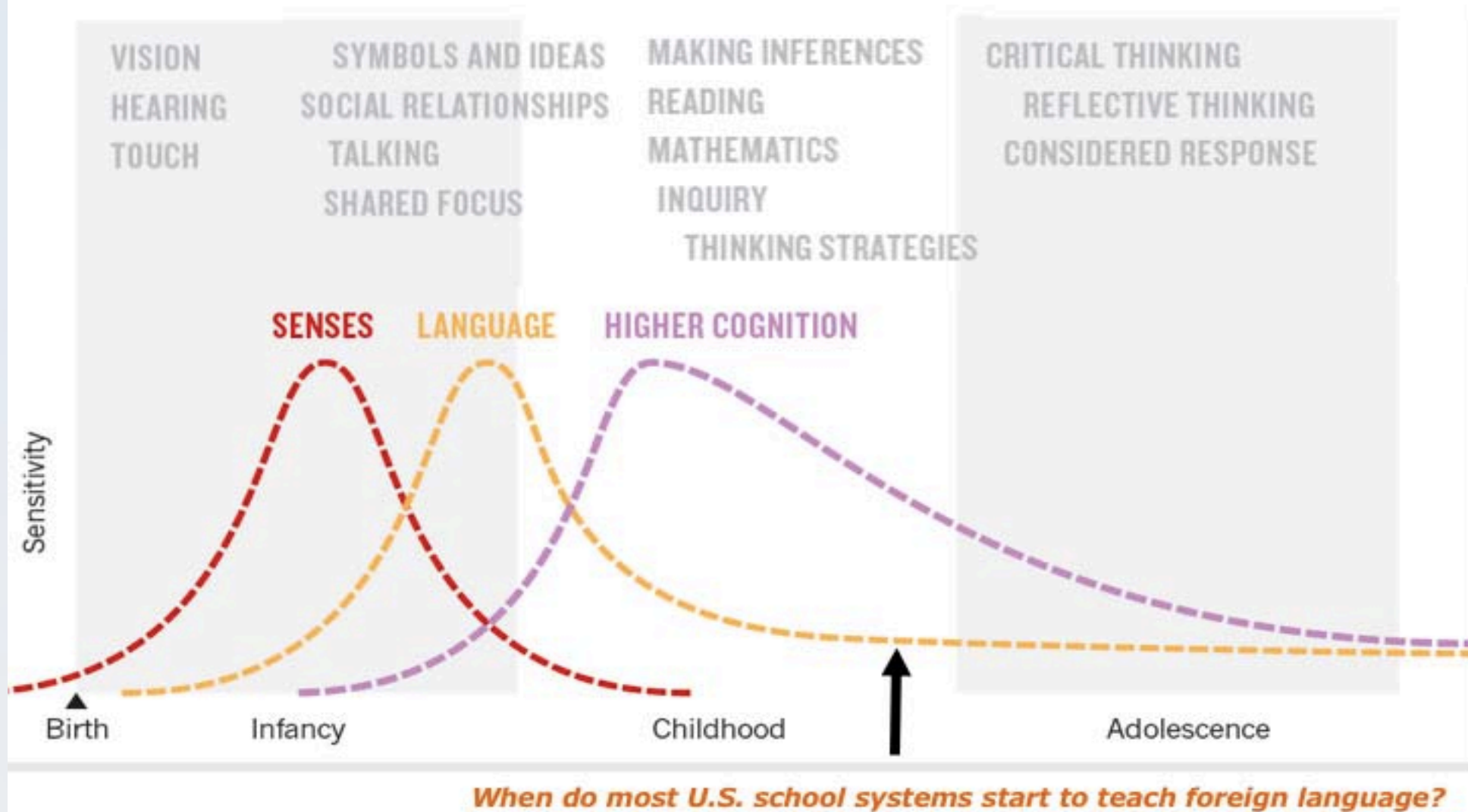
In a typical hour, the average child hears:

Family Status	Actual Differences in Quantity of Words Heard	Actual Differences in Quality of Words Heard
Welfare	616 Words	5 affirmatives, 11 prohibitions
Working Class	1,251 Words	12 affirmatives, 7 prohibitions
Professional	2,153 Words	32 affirmatives, 5 prohibitions

2. Cumulative Vocabulary at Age 3

Cumulative Vocabulary at Age 3	
Children from welfare families:	500 words
Children from working class families:	700 words
Children from professional families:	1,100 words

Open and Shut - Critical Periods of Brain and Child Development

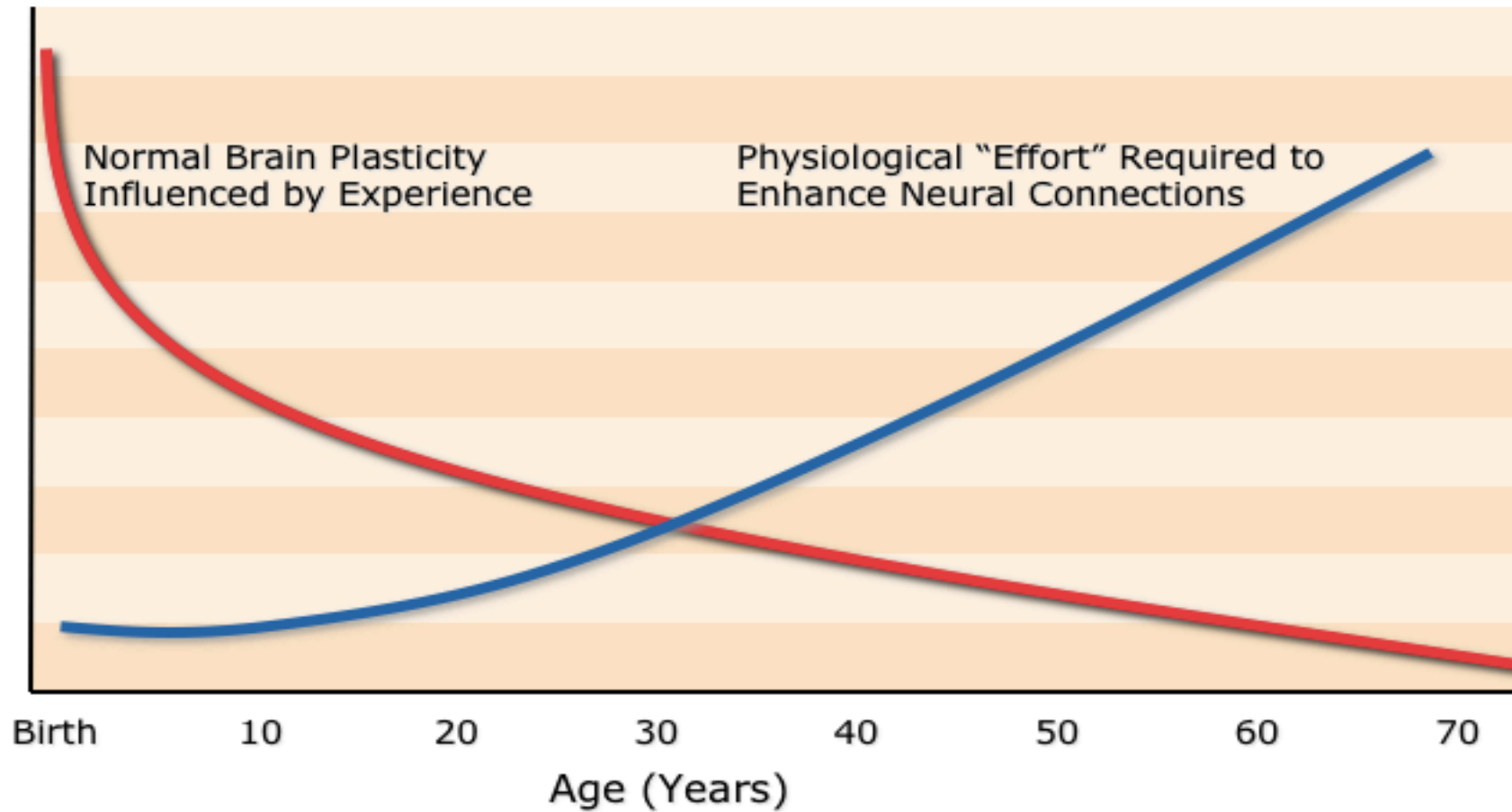


Bardin et al, Nature 2012

Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*. Feb. 6, 2018

<http://gscei.education.clemson.edu>

The Ability to Change Brains Decreases Over Time



Source: Levitt (2009)

Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*.
Feb. 6, 2018 <http://gcseleducation.olemiss.edu>

What does research say about brain development?

2. Genes and experiences together build brains.

Our brains are hard-wired for relationships.

An “environment of relationships” is crucial for the development of a child’s brain architecture, which lays the foundation for later outcomes such as academic performance, mental health, and interpersonal skills.

National Scientific Council on the Developing Child (2004).
Young Children Develop in an Environment of Relationships:
Working Paper No. 1.

Retrieved from www.developingchild.harvard.edu.

Serve & Return

What does research say about brain development?

3. Cognitive, social and emotional development are inextricably intertwined.

Yet, even with early adversity, there is a neural system that is key to social-emotional and cognitive resilience...the brain's "air traffic controller" ... executive functioning.

Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*.
Feb. 6, 2018 <http://gcsel.education.olemiss.edu>

Executive Functioning

Executive function and self-regulation skills depend on three types of brain function: working memory, mental flexibility, and self-control. These functions are highly interrelated, and the successful application of executive function skills requires them to operate in coordination with each other.

Each type of executive function skill draws on elements of the others.

- **Working memory** governs our ability to retain and manipulate distinct pieces of information over short periods of time.
- **Mental flexibility** helps us to sustain or shift attention in response to different demands or to apply different rules in different settings.
- **Self-control** enables us to set priorities and resist impulsive actions or responses.

What does research say about brain development?

4. *Toxic stress* damages *brain architecture*

The environment in which one develops before and soon after birth provides powerful experiences that chemically modify certain genes in ways that then define how much and when they are expressed. Thus, while genetic factors exert potent influences on human development, environmental factors have the ability to alter family inheritance. For example, children are born with the capacity to *learn* to control impulses, focus attention, and retain information in memory, but their experiences as early as the first year of life lay a foundation for how well these and other executive function skills develop.

National Scientific Council on the Developing Child (2004).
Young Children Develop in an Environment of Relationships:
Working Paper No. 1.

Retrieved from www.developingchild.harvard.edu.

What does research say about brain development?

5. Child development is the foundation of prosperous communities.

Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*.
Feb. 6, 2018 <http://gcsel.education.olemiss.edu>

States with low child achievement are falling off the education and economic cliff.

Dr. Pat Levitt

Dr. Pat Levitt, *Translating the Neuroscience of Early Brain and Child Development to Public Policy*.
Feb. 6, 2018 <http://gcsel.education.olemiss.edu>

Mississippi: Key Facts

- A [third](#) of all children in MS live in poverty.
- MS consistently has among the nation's worst [rates of premature births](#) which can lead to [cognitive and neurodevelopmental impairments](#).
- Only [57%](#) of Mississippians are participating in the labor force (2nd worst).
- In the [Top 5](#) for residents collecting disability benefits.
- MS [incarcerates](#) a higher percentage of its population than China or Russia.
- Our state's economy is growing far slower than other southern states and behind the rest of the country.
- Mississippi is the only Deep South state that has lost population for [three years in a row](#).
- According to a report from the College Board, only a little more than half of the graduates of Mississippi's eight public universities are working in the state five years after graduation.

About Professor Heckman



James J. Heckman is the Henry Schultz Distinguished Service Professor of Economics at the University of Chicago, a Nobel Memorial Prize winner in economics and an expert in the economics of human development. Through the university's Center for the Economics of Human Development, he has conducted groundbreaking work with a consortium of economists, developmental psychologists, sociologists, statisticians and neuroscientists showing that quality early childhood development heavily influences health, economic and social outcomes for individuals and society at large. Heckman has shown that there are great economic gains to be had by investing in early

childhood development.



WE RECOMMEND

- [Research Summary: The Lifecycle Benefits of an Influential Early Childhood Program](#)
- [FAQ for The Lifecycle Benefits of an Influential Early Childhood Program](#)
- [Gender Differences in the Benefits of an Influential Early Childhood Program Summary](#)
- [Outcomes of quality birth-to-five early childhood education](#)
- [Nurse-Family Partnership: Parental Education and Early Health Result in Better Child Outcomes](#)
- [4 Big Benefits of Investing in Early Childhood Development](#)

Human Development is Economic Development

James J. Heckman



CENTER FOR THE ECONOMICS
OF HUMAN DEVELOPMENT
THE UNIVERSITY OF CHICAGO

Making the Case for Investing in High Quality Early Childhood
Education in Mississippi: A Conversation with Dr. James Heckman

January 25th, 2018

<http://gcsel.education.olemiss.edu/wp-content/uploads/sites/21/2018/02/HeckmanPres.pdf>

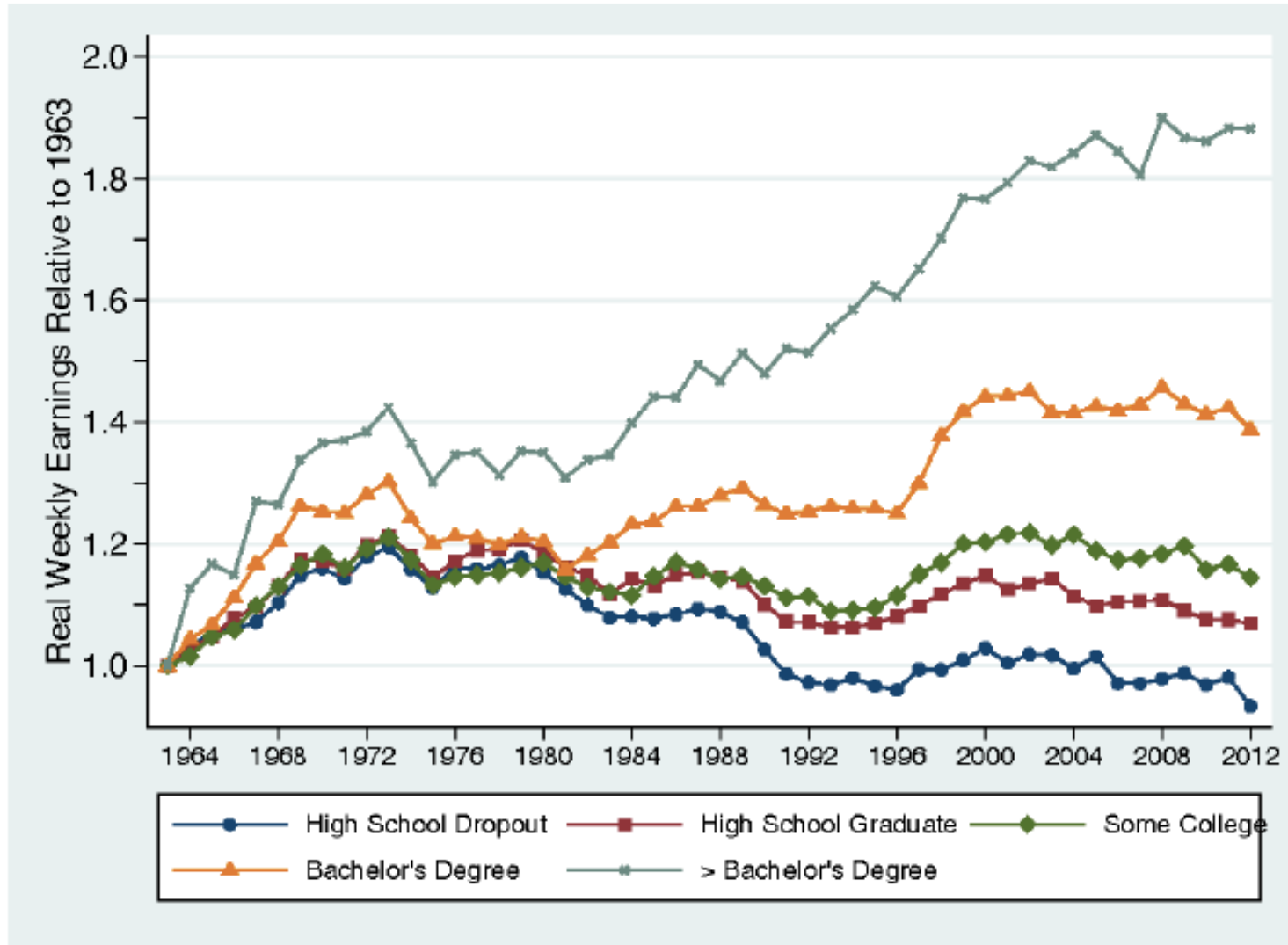
The most effective way to alleviate poverty and inequality is through the development of skills, not handouts.

Professor James Heckman

Human Development is Economic Development

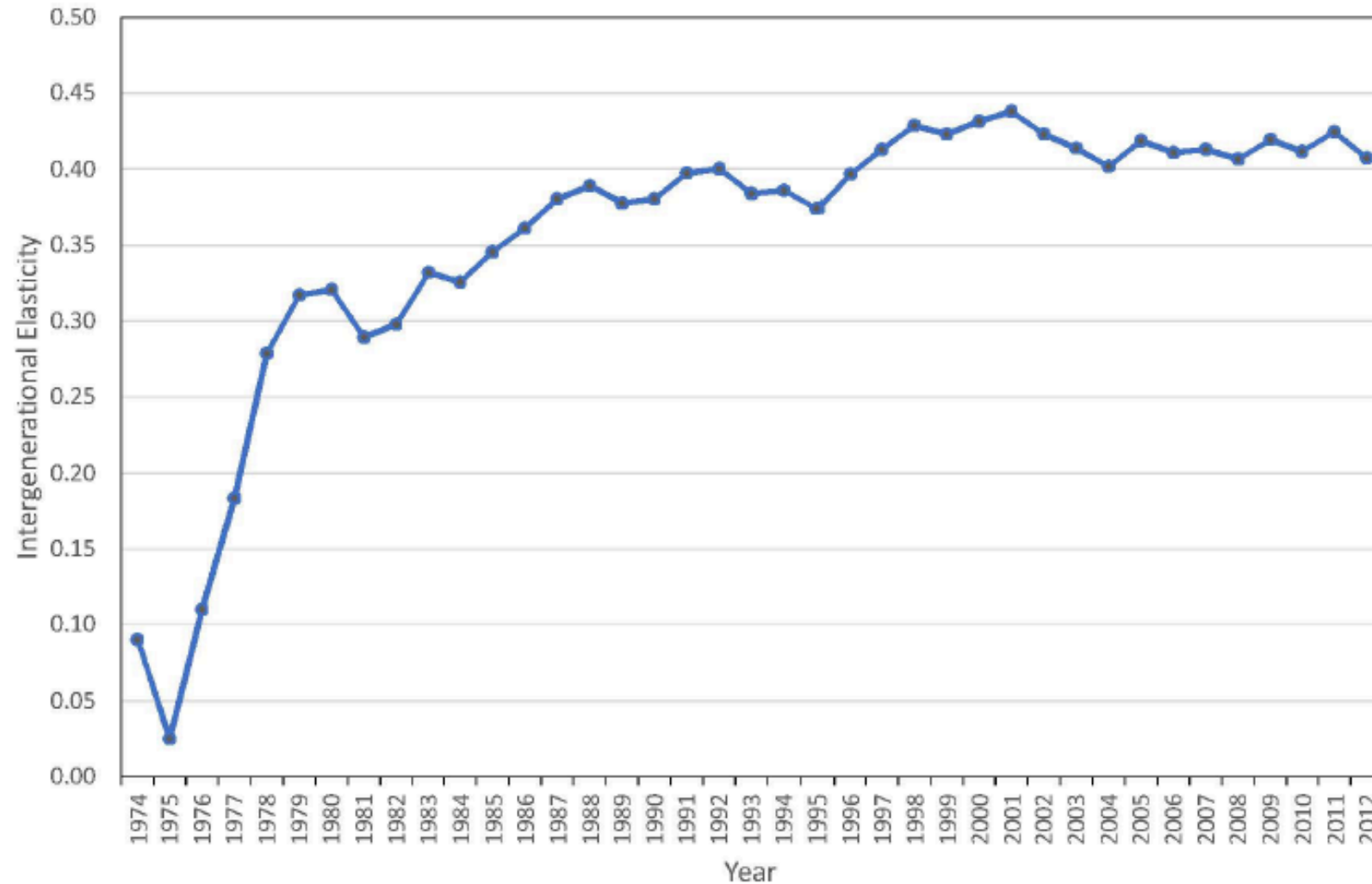
Jan. 25, 2018

Changes in Real Wage Levels of Full-time U.S. Workers by Education, 1963-2012, Males



[Source: Autor 2014, Skills, Education, and the Rise of Earnings Inequality Among the "Other 99 Percent."]

Trends in the Intergenerational Correlation of Welfare Participation



Source: Hartley et al. 2016

Note: Welfare participation includes AFDC/TANF, SSI, Food Stamps and Other Welfare.

Skills beget skills.

- Help troubled American families develop the skills of their children through voluntary programs.
- We can reduce inequality and promote inclusion and social mobility by solving the skills problem.
- A comprehensive approach to skill development makes dollars and sense.

<http://gcsel.education.olemiss.edu/wp-content/uploads/sites/21/2018/02/HeckmanPres.pdf>

Pareto Principle

named for Italian sociologist and economist,
Vilfredo Pareto

20% of the actors account for 80% of the results

Summary of Findings

- 20% of the people account for 80% of social & health problems.
- A high need/high cost segment uses at least 50% of the resources in multiple sectors.
- Most high need/high cost people in this segment share risk factors in the first decade of life.

Childhood risk factors of high cost group:

IQ

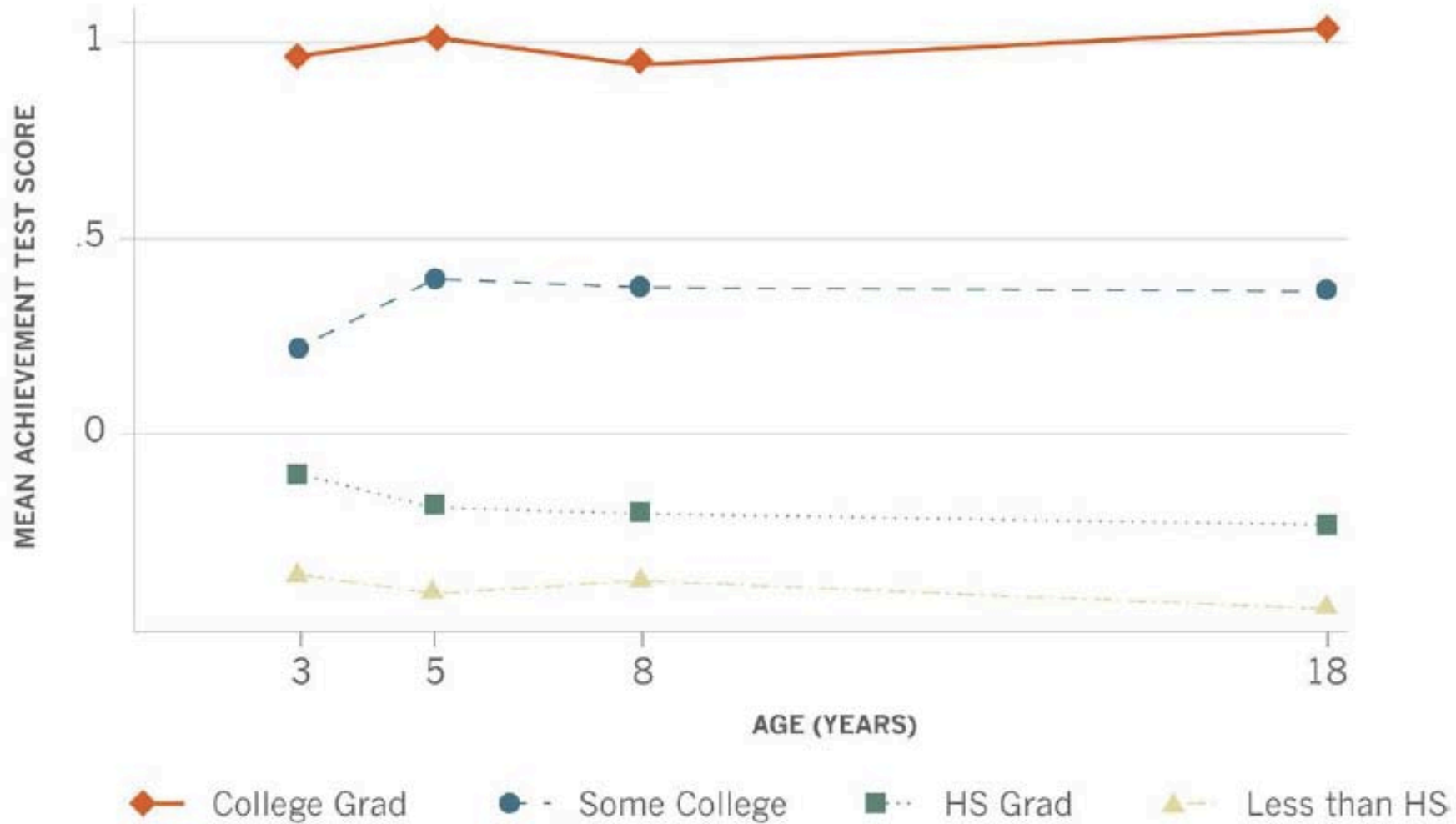
Self-control (executive functioning)

Poverty (socio-economic status)

Maltreatment/Neglect

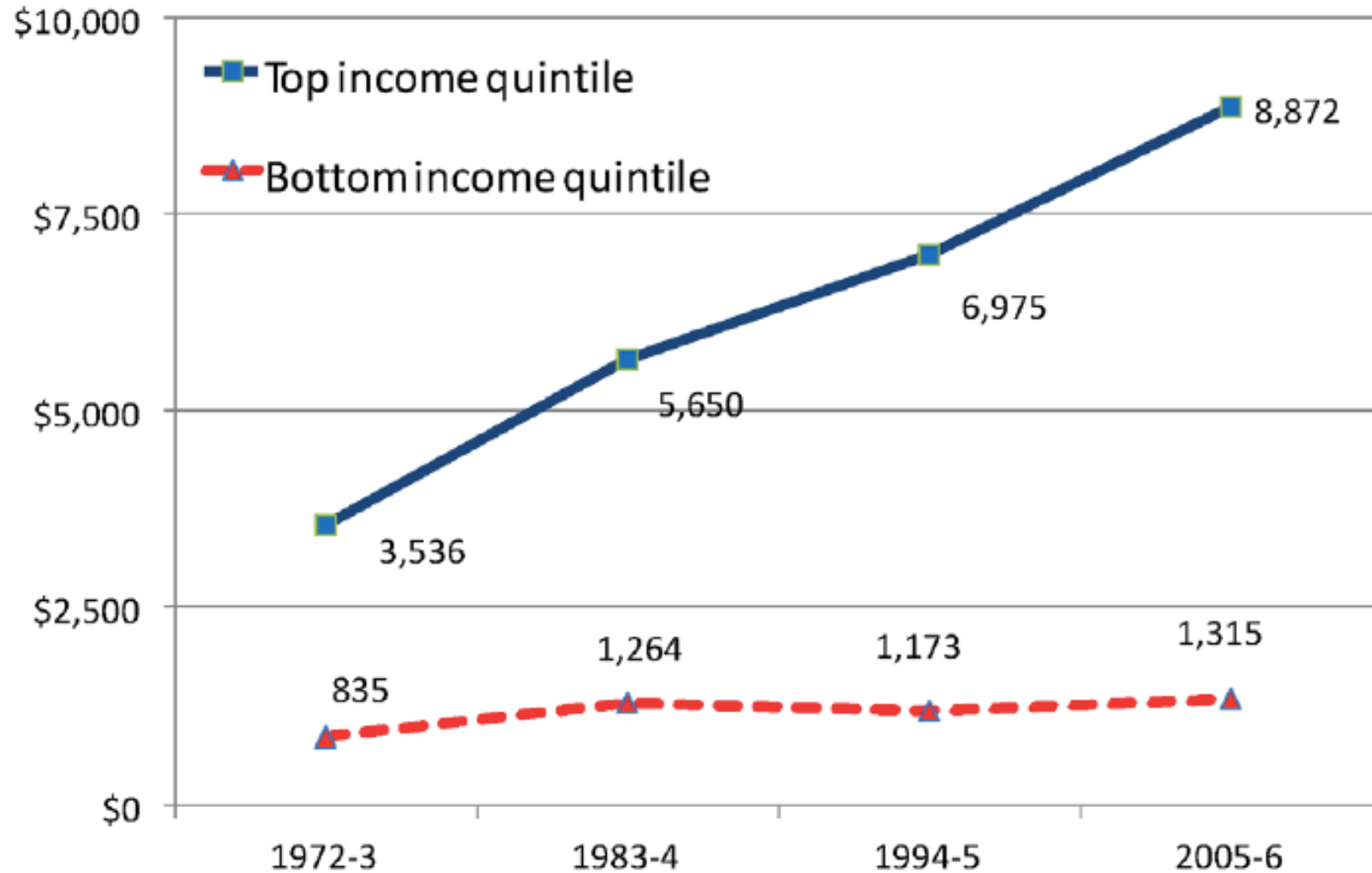
<http://gcsel.education.olemiss.edu/wp-content/uploads/sites/21/2018/02/HeckmanPres.pdf>

Mean Achievement Test Scores by Age by Maternal Education



Each score standardized within observed sample. Using all observations and assuming data missing at random. Source: Brook-Gunn et al. (2006).

Per Capita Enrichment Expenditures on Children (\$2008) Top Versus Bottom Quintile of Households



Source: Duncan and Murnane (2011)

[About the Project](#)

[The Design and the Innovative Curriculum](#)

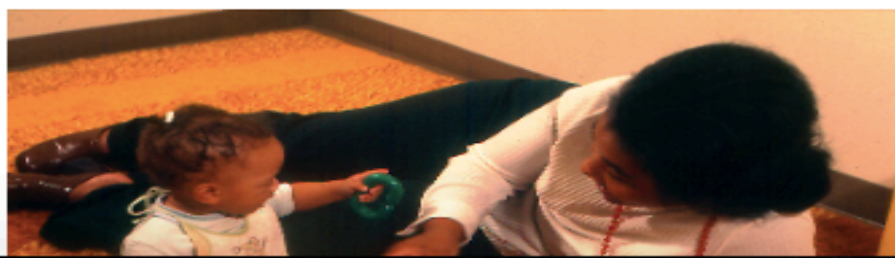
[Groundbreaking Follow-Up Studies](#)

[International Initiatives](#)

The Abecedarian Project

FPG's Abecedarian Project, one of the world's oldest and **most oft-cited early childhood education programs**, marked its 42nd anniversary last year with groundbreaking findings from principal investigator **Frances A. Campbell**, Nobel laureate James J. Heckman, and their colleagues—as well as several **new international initiatives** that showcase adaptations of the curriculum that the project first developed four decades ago.

Since its inception and **early leadership from Craig Ramey, Joseph Sparling, and others**, the Abecedarian Project has become synonymous with **positive, long-term effects of high-quality early care and education**, particularly with regard to the power of early intervention to surmount some of the disadvantages of poverty. Children born between 1972 and 1977 were randomly assigned as infants to either the early educational intervention group or the control group.



Children in the experimental group received **full-time, high-quality educational intervention in a childcare setting from infancy through age 5**. Each child had an individualized prescription of educational "games" incorporated into the day. These activities focused on social, emotional, and cognitive areas of development.



SINCE 1828

¹ abecedarian

noun | abe·ce·dar·i·an | \,ā-bē-(,)sē-'der-ē-ən\
ˌā-bē-(,)sē-'der-ē-ən

Definition of ABECEDARIAN

: one learning the rudiments of something (such as the alphabet)

The Abecedarian Project

Craig Ramey, the principal investigator of the original study, established a randomized trial to examine the extent to which intensive early childhood education could overcome the odds of developmental delays and academic failure for children born into low-income families. Following an experimental design, researchers recruited 111 at-risk children from families in Orange County, North Carolina.

- Randomized Control Trial
- Both groups were provided with nutritional supplements, social services, and health care.
- 5 years, 5 days a week, year round (average entrance age: 4 months)
 - Language priority,
 - Conversational reading
 - Enriched caregiving
 - Learning games curriculum: Activities focused on social, emotional, and cognitive areas of development but gave particular emphasis to language.

According to Professor Heckman:
Rate of Return on The Abecedarian Project
Overall - 13.7% per annum

Males - 14% per annum

Females - 10% per annum

The enhanced income of mothers from providing childcare by itself pays for program costs.

What returns?

At age 15

- Higher IQ
- Higher achievement scores in Math & Reading
- Lower grade retention
- Fewer placements in special education

At age 21

- Higher IQ
- Higher on tests of Math & Reading
- More years of education
- More likely to attend college
- Less likely to be teen parents
- More likely to have a skilled job

At age 30

- More likely to have a bachelor's degree
- More likely to have a job
- Less likely to be incarcerated
- Less likely to need government support

Abecedarian Project, Health Effects at Age 35 (Males)

	Treatment Mean	Control Mean	Treatment p-value
Systolic Blood Pressure	125.79	143.33	0.018
Diastolic Blood Pressure	78.53	92.00	0.024
Pre-Hypertension	0.68	0.78	0.235
Hypertension	0.10	0.44	0.011
HDL Cholesterol	53.21	42.00	0.067
Cholesterol/HDL-C	3.89	4.69	0.057
Abdominal Obesity	0.65	0.87	0.136
Metabolic Syndrome	0.00	0.25	0.009

Source: Campbell, Conti, Heckman, Moon, Pinto, Pungello and Pan (2014).

The Importance of the Early Years: Skills Beget Skills

Social-emotional Skills



Cognitive Skills, Health

(sit still; pay attention; engage in learning; open to experience)

Health



Cognitive Skills, Social-Emotional Skills

(fewer lost school days; ability to concentrate)

Cognitive Skills



**Produce better health practices;
produce more motivation; greater
perception of rewards, social-emotional
skills**

(child better understands and controls its environment)

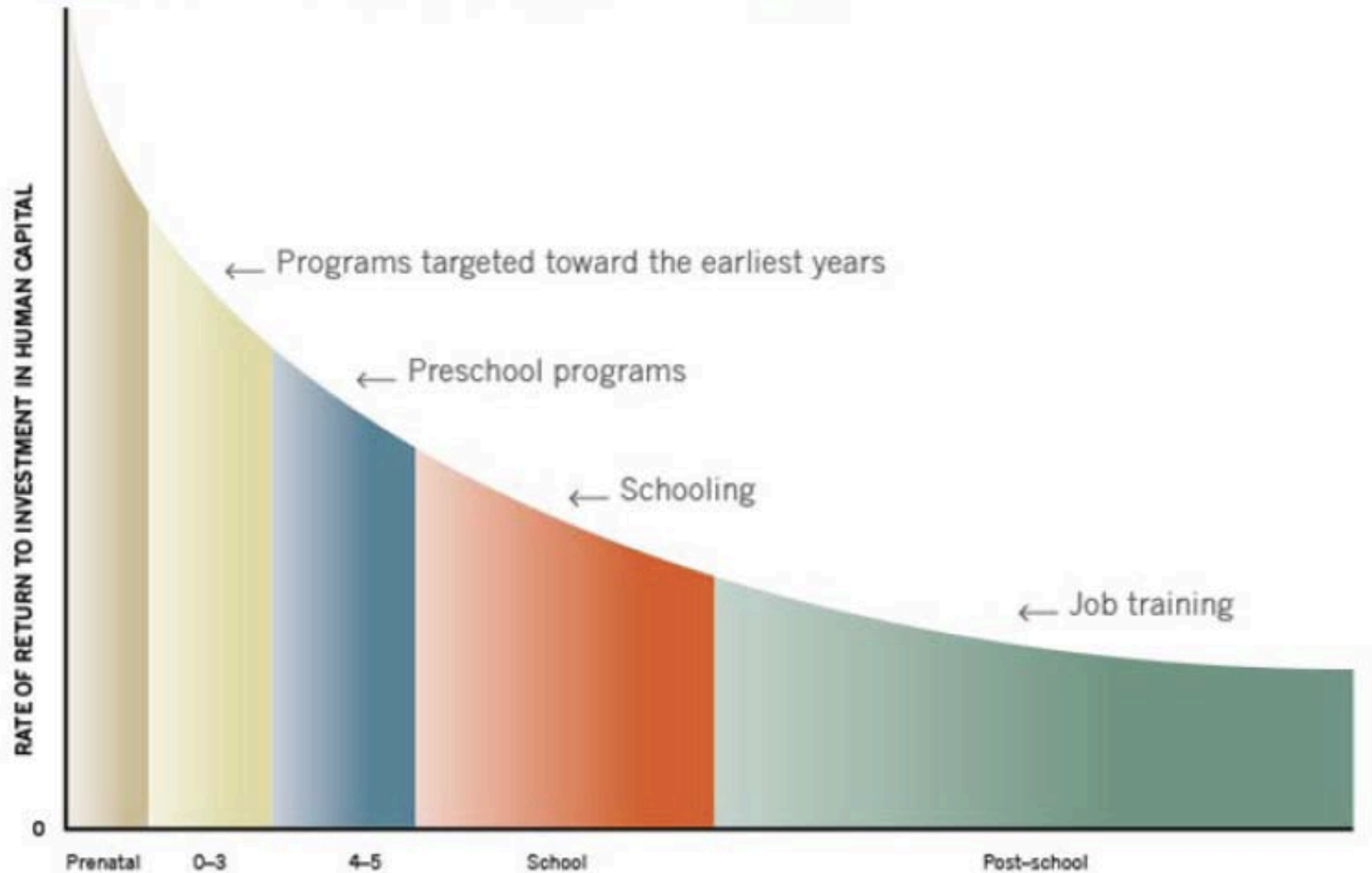
Outcomes: increased productivity, higher income, better health, more family investment, enhanced social mobility, reduced social costs.

Prioritizing Spending

- Later remediation is costly and as currently configured is generally ineffective.
- Effective adolescent remediation targets social and emotional skills (not cognitive skills).

<http://gcsel.education.olemiss.edu/wp-content/uploads/sites/21/2018/02/HeckmanPres.pdf>

Returns to a Unit Dollar Invested



Source: Heckman (2008)

<http://gcsel.education.olemiss.edu/wp-content/uploads/sites/21/2018/02/HeckmanPres.pdf>

Components of Effective Early Childhood Programs

- Returns on high quality programs for *disadvantaged* children
- Successful early childhood programs:
 - Help parents grow their parenting skills
 - Foster the skills and aspirations of their children, and
 - Make for engaged and inclusive communities, a more skilled workforce, and a healthier society.

Heckman Recommendations

- Success depends on having the right skills and abilities.
- The challenges facing families impair their ability to foster the skills of their children.
- Character and cognition are skills that can be developed, *not* traits fixed at birth.
- Developing skills and abilities is the best way to solve the problems of economic and social inequality.
- A skilled workforce is a flexible, adaptable, and productive workforce.
- Supporting families in engaging and nurturing their children is key to success in education and learning at all stages of a child's life.
- Invest more in prevention and less in remediation. Invest in flourishing lives, not in correcting problems after they appear.

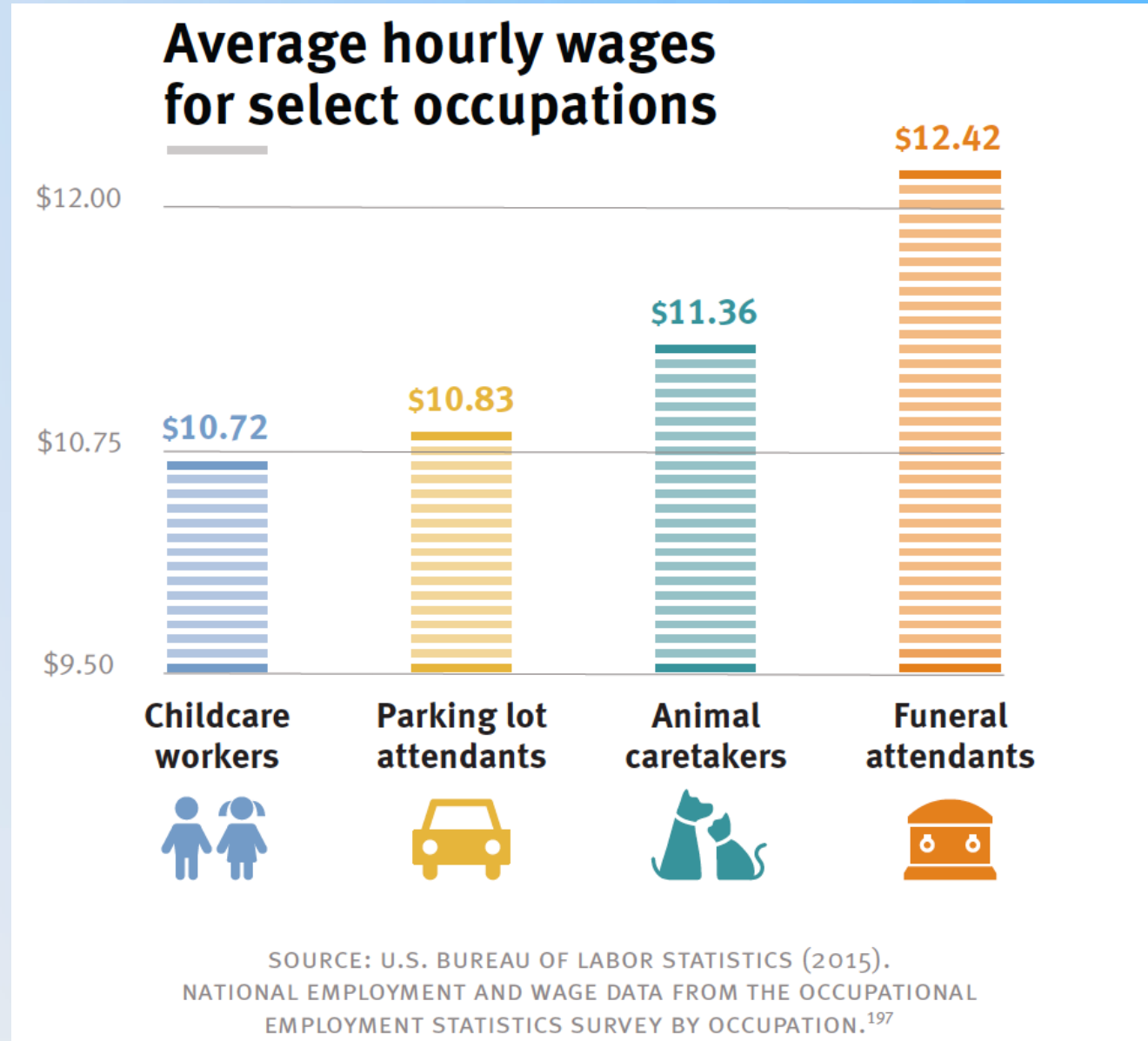
Experiences matter...a lot.

While attachments to their parents are primary, young children can also benefit significantly from relationships with other responsive caregivers both within and outside the family.

Again, Serve & Return builds brain architecture.

Building the capabilities of adult caregivers can help strengthen the environment of relationships essential to children's lifelong learning, health, and behavior.

Center on the Developing Child at Harvard University (2016). *From Best Practices to Breakthrough Impacts: A Science-Based Approach to Building a More Promising Future for Young Children and Families*. Retrieved from www.developingchild.harvard.edu.



Post Truth?

[Agnotology](#): The study of culturally induced ignorance or doubt; derived from *agnosis*, the Greek word for ignorance or “not knowing”.

Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing had happened.

Winston Churchill

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