



Center on the Developing Child
HARVARD UNIVERSITY

Using the Science of Early Childhood Development to Drive Innovation in Policy and Practice

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Center on the Developing Child at Harvard University

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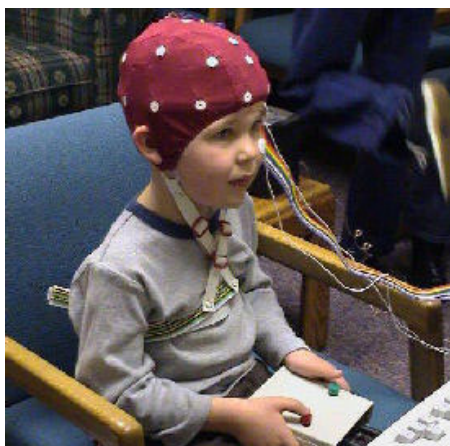
Investing in Early Childhood Is Responsible Management of Resources



When we give children today what they need to learn, develop, and thrive...

...they give back to society in the future through a lifetime of productive citizenship.

But What Do Children Need in Order to Learn, Develop, and Thrive?



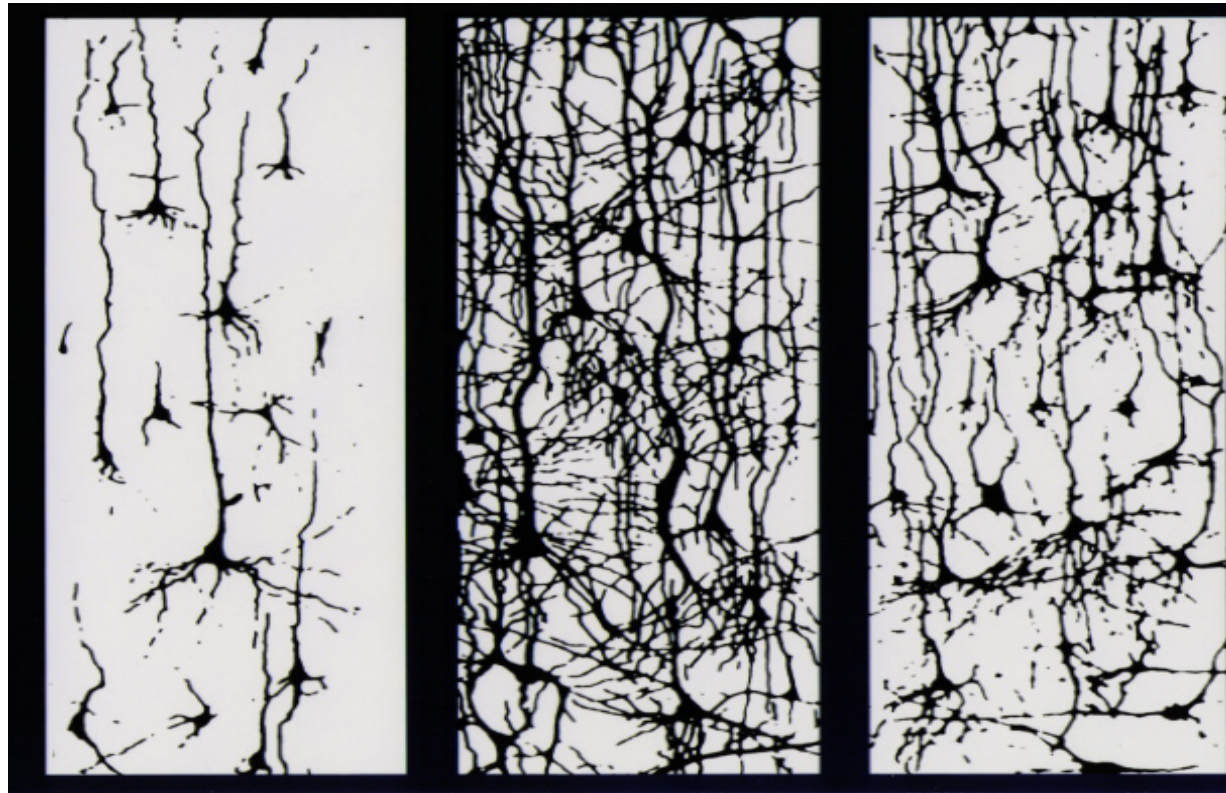
Science can help us develop more effective policies and programs for young children.

Genes and Experiences Interact to Build Brain Architecture



Experience Shapes Brain Architecture by Over-Production Followed by Pruning

(700-1000 synapses formed per second in the early years)



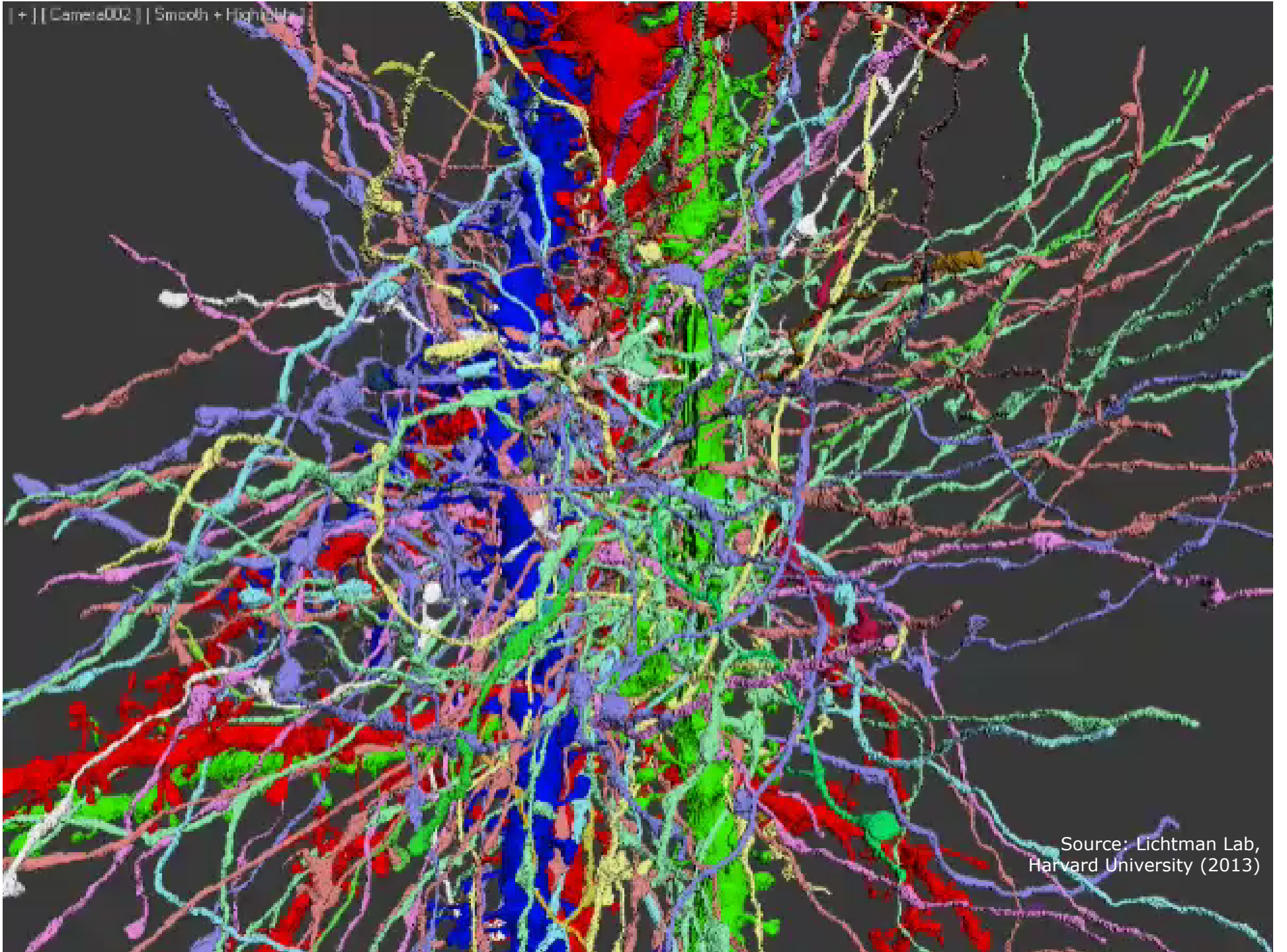
birth

6 years

14 years

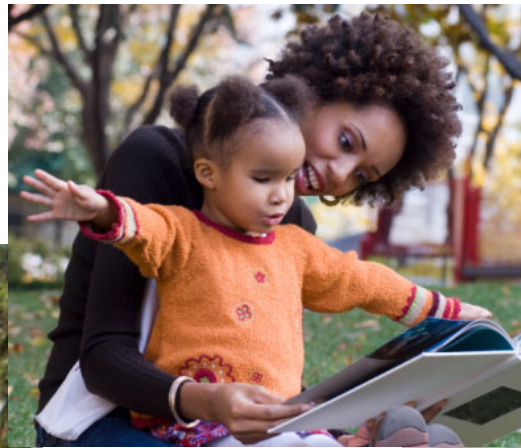
Source: Chugani, H.T. (1997)

| + || Camera002 || Smooth + HighLight ||



Source: Lichtman Lab,
Harvard University (2013)

“Serve and Return” Interaction Builds Brain Architecture



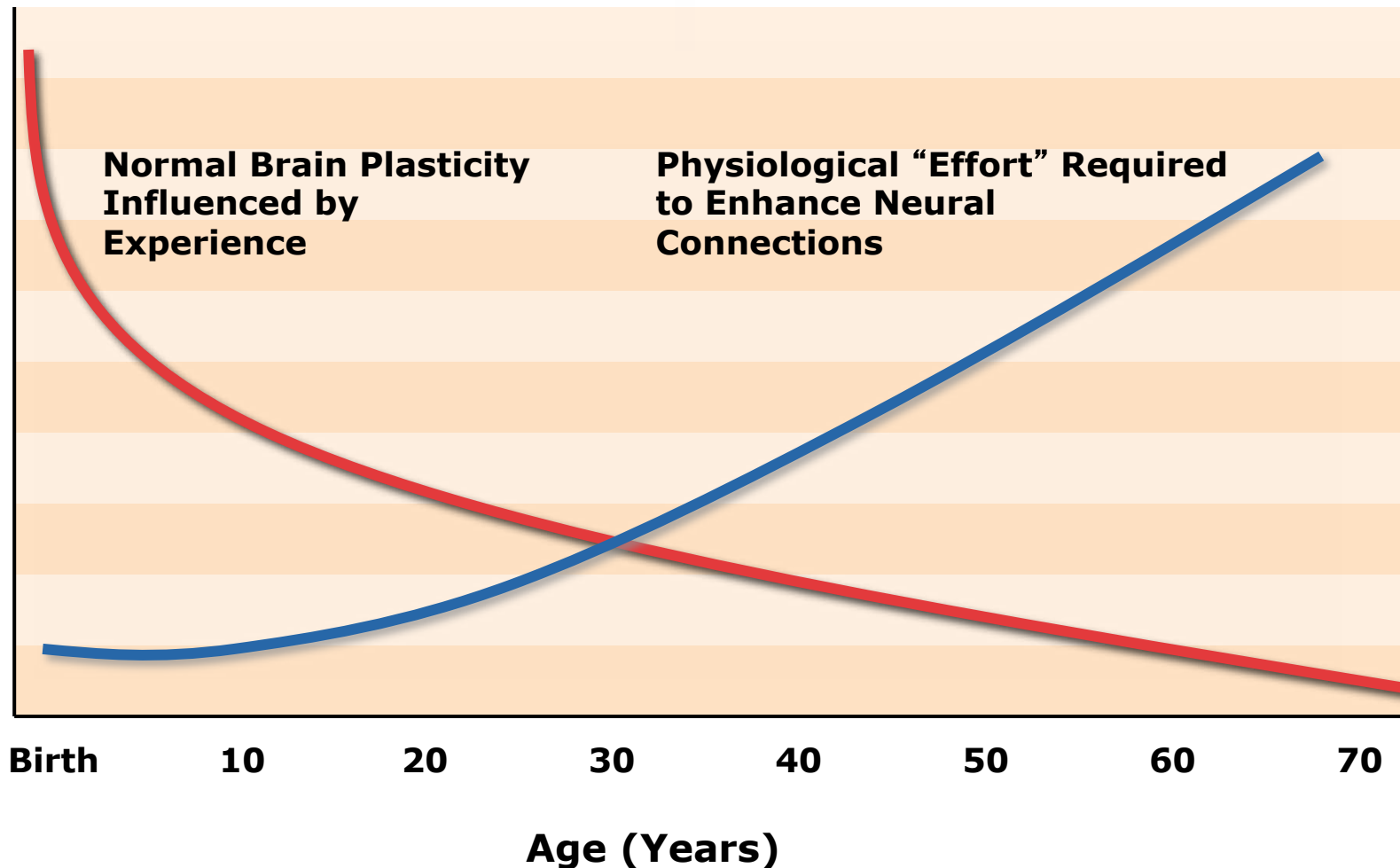
Play Scaffolds Increasingly Complex Skill Development



Let's Make Connections!

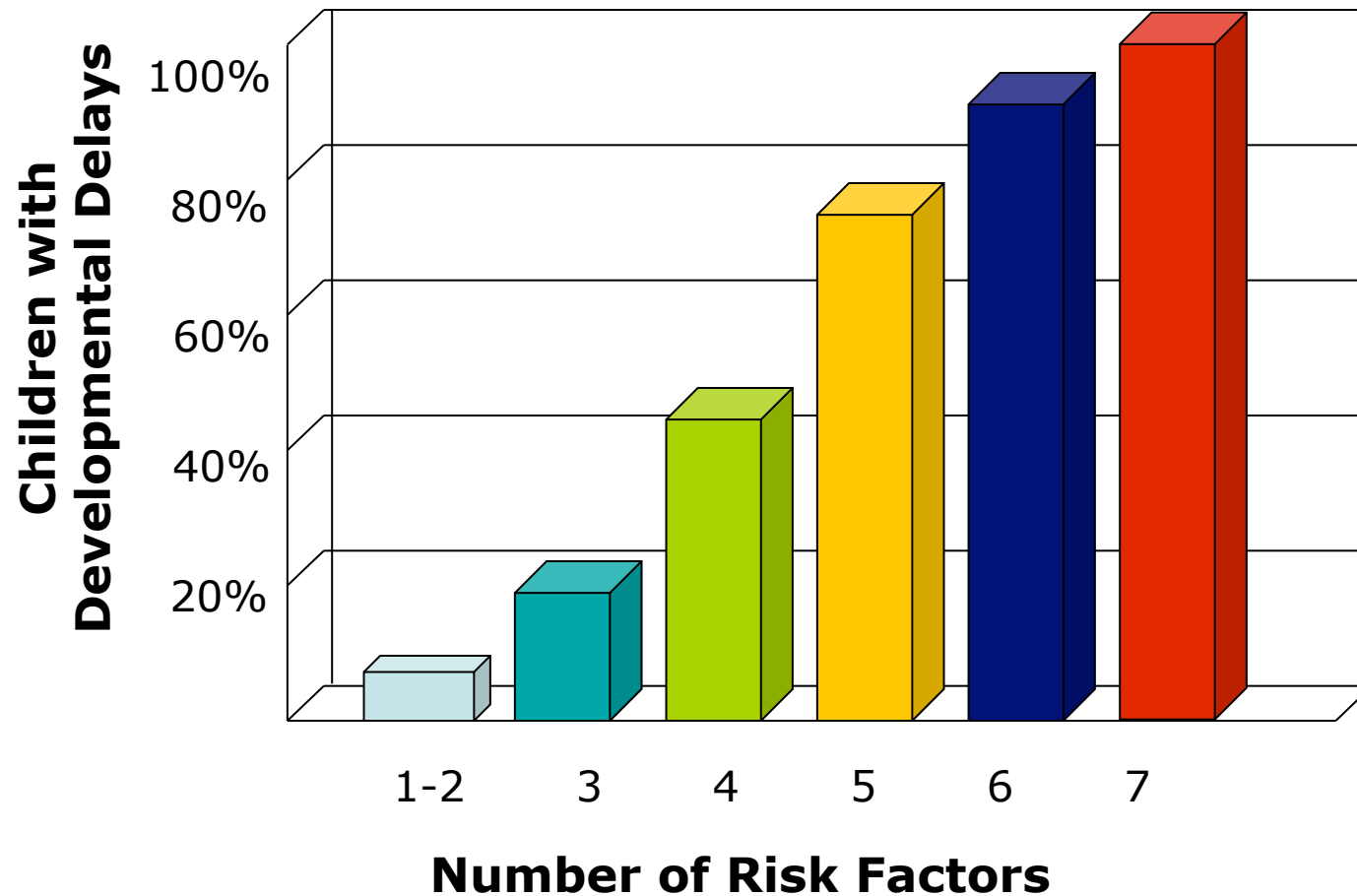


The Ability to Change Brains Decreases Over Time



Source: Levitt, P. (2009)

Significant Adversity Impairs Development in the First Three Years



Source: Barth, et al. (2008)

Toxic Stress Derails Healthy Development



The Biology of Adversity: Three Levels of Stress

Positive

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

Tolerable

Serious, temporary stress responses,
buffered by supportive relationships.

Toxic

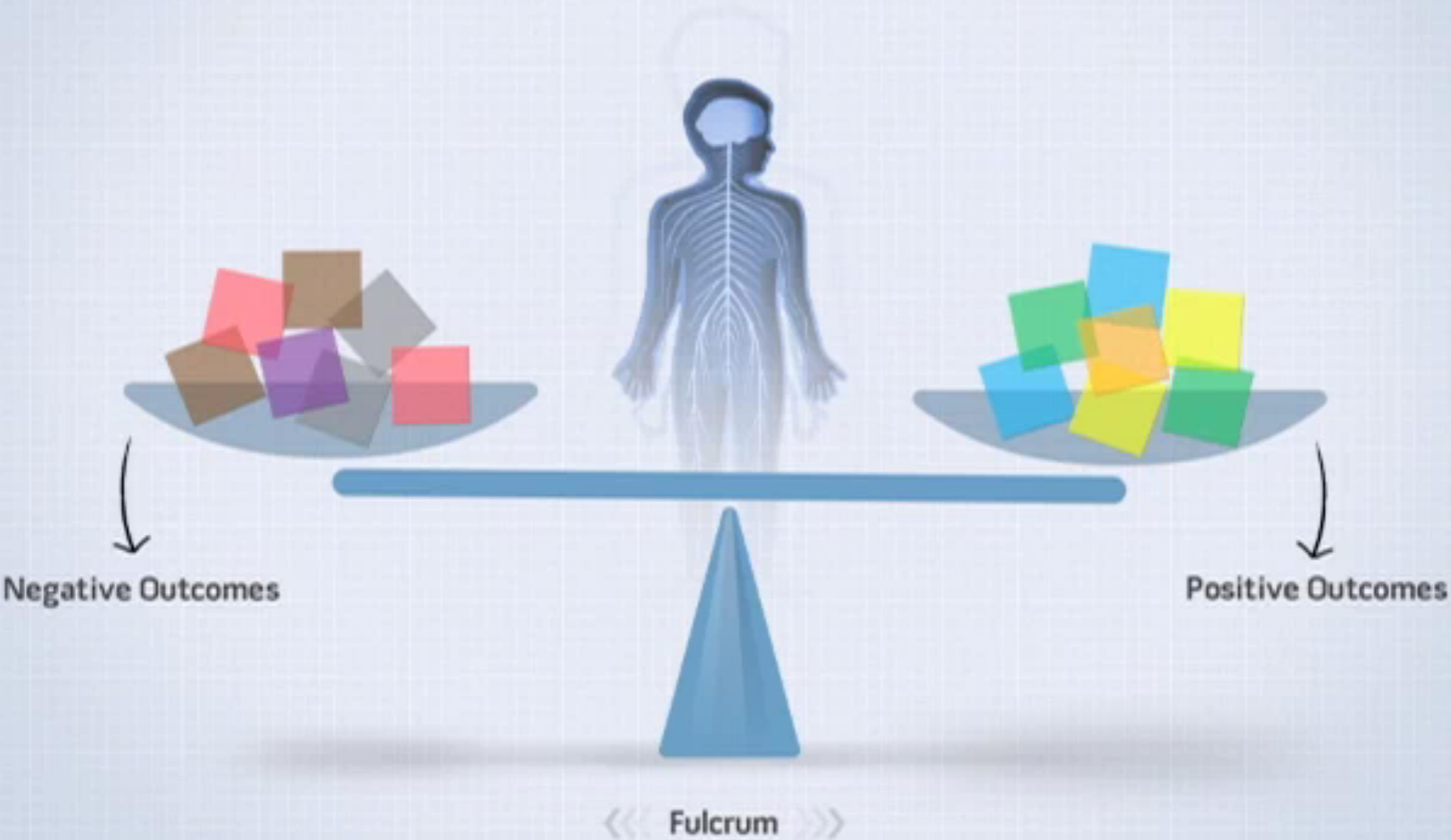
Prolonged activation of stress response systems
in the absence of protective relationships.

Building Resilience by Counterbalancing Adversity



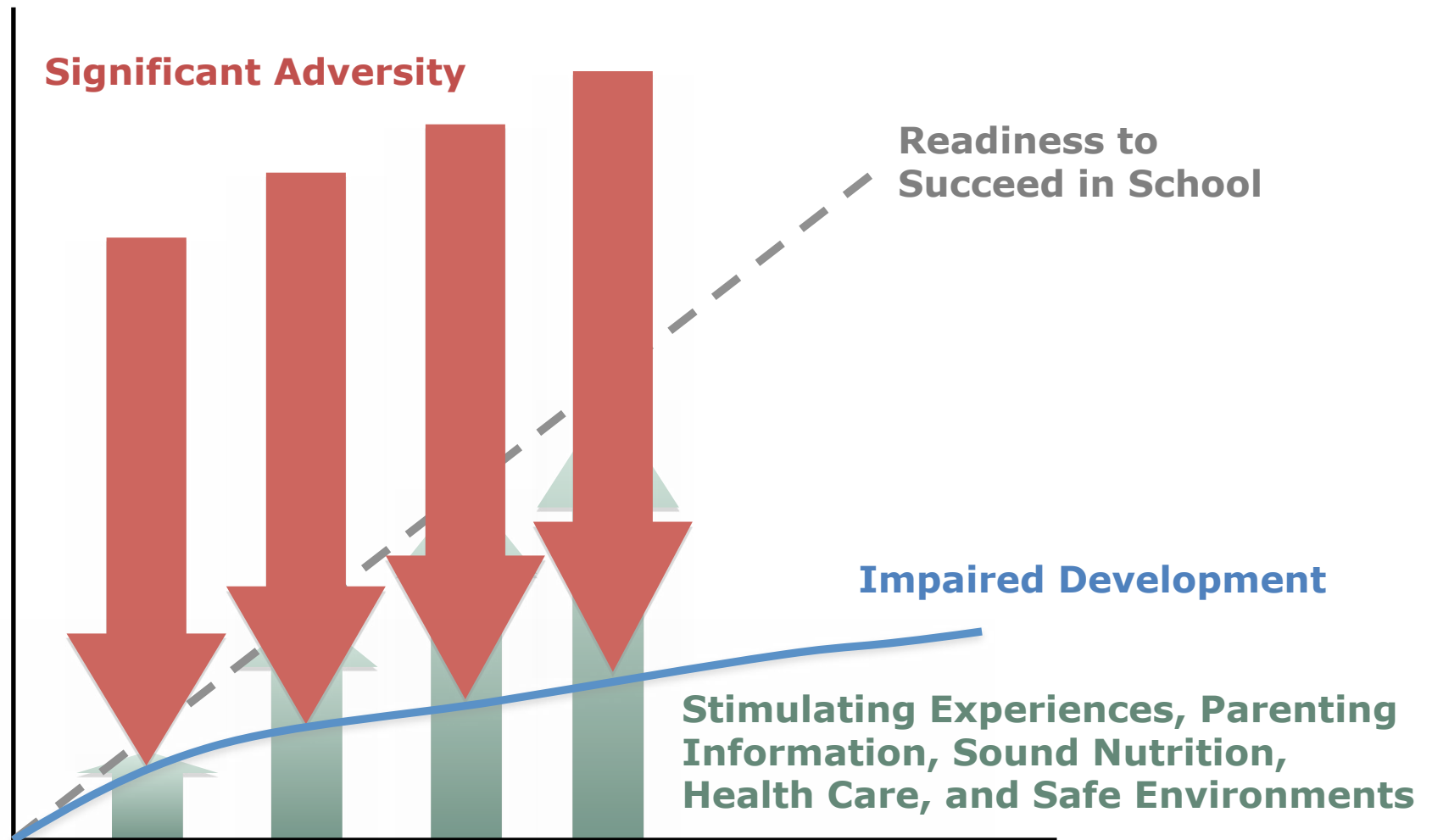


Tipping Child Outcomes to the Positive

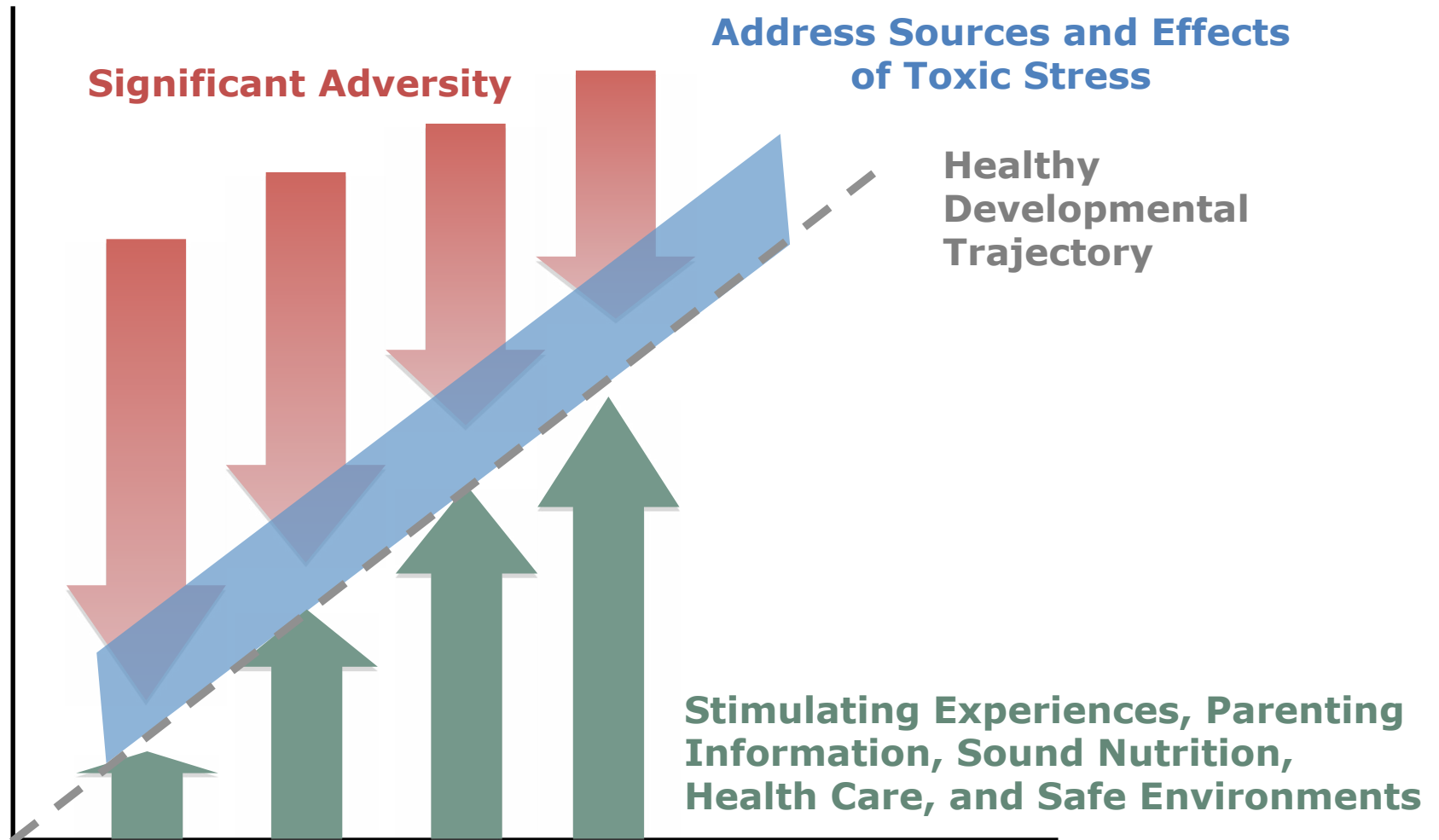


The fulcrum position is different for each individual based on genetic pre-disposition

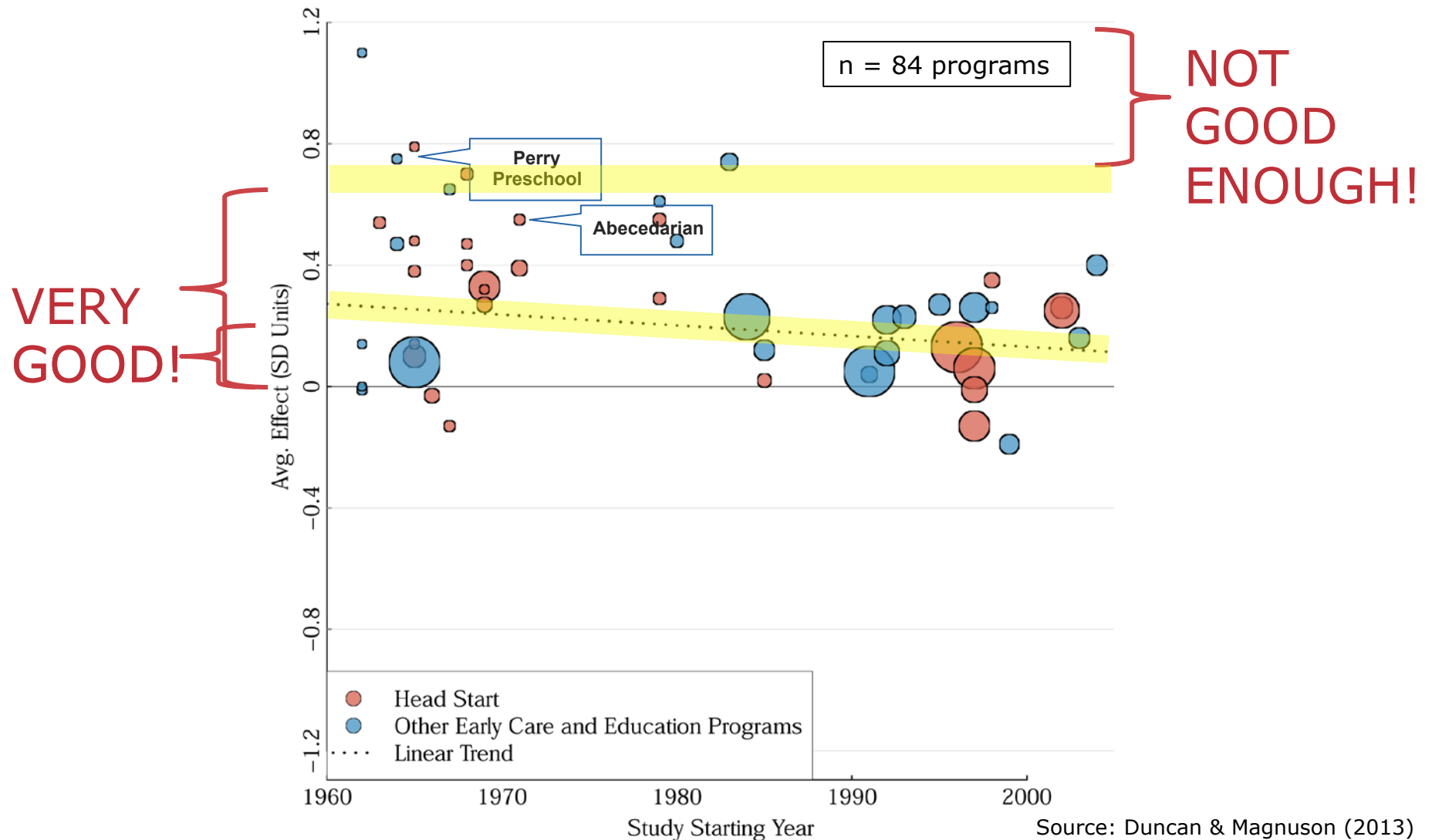
Early Childhood Policy and Practice: The Current Model

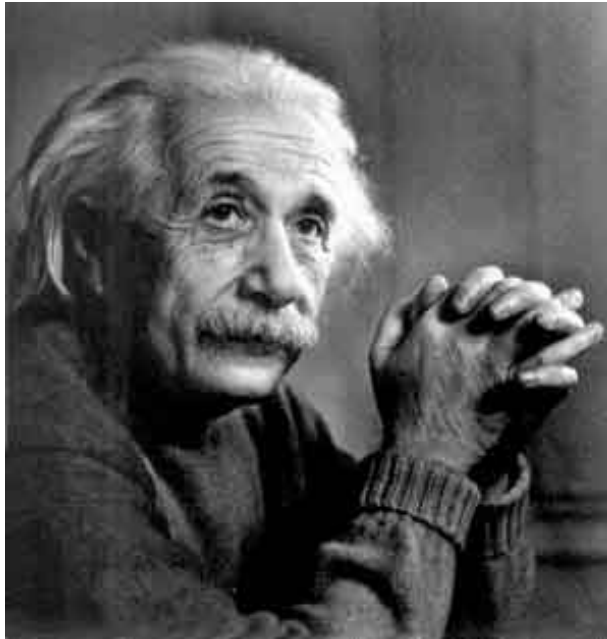


Science Points to the Need to *Balance* Enrichment, Prevention, and Protection



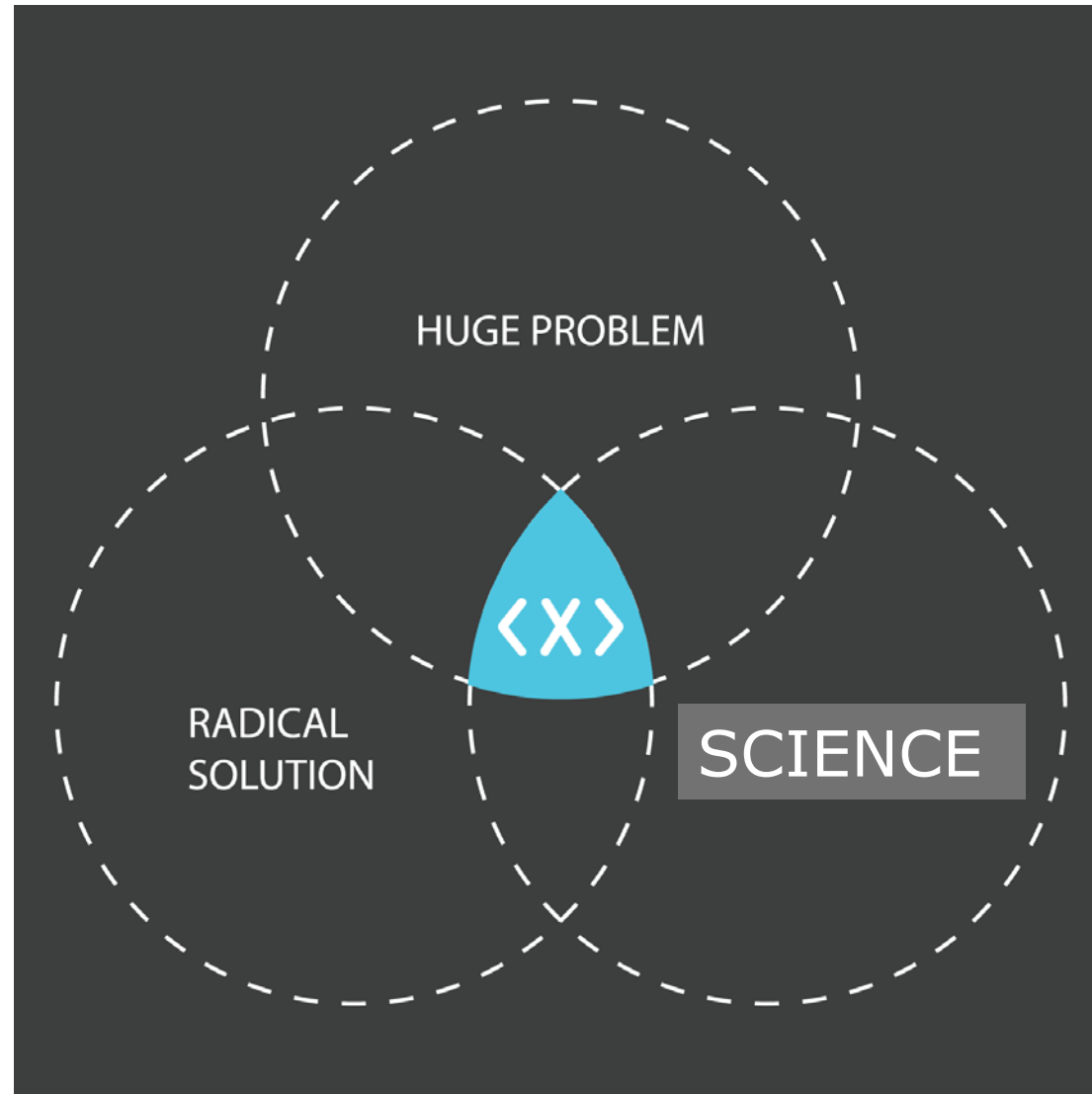
Effects of Early Education on Child Achievement and Cognition Illustrate Both Impact and Challenges



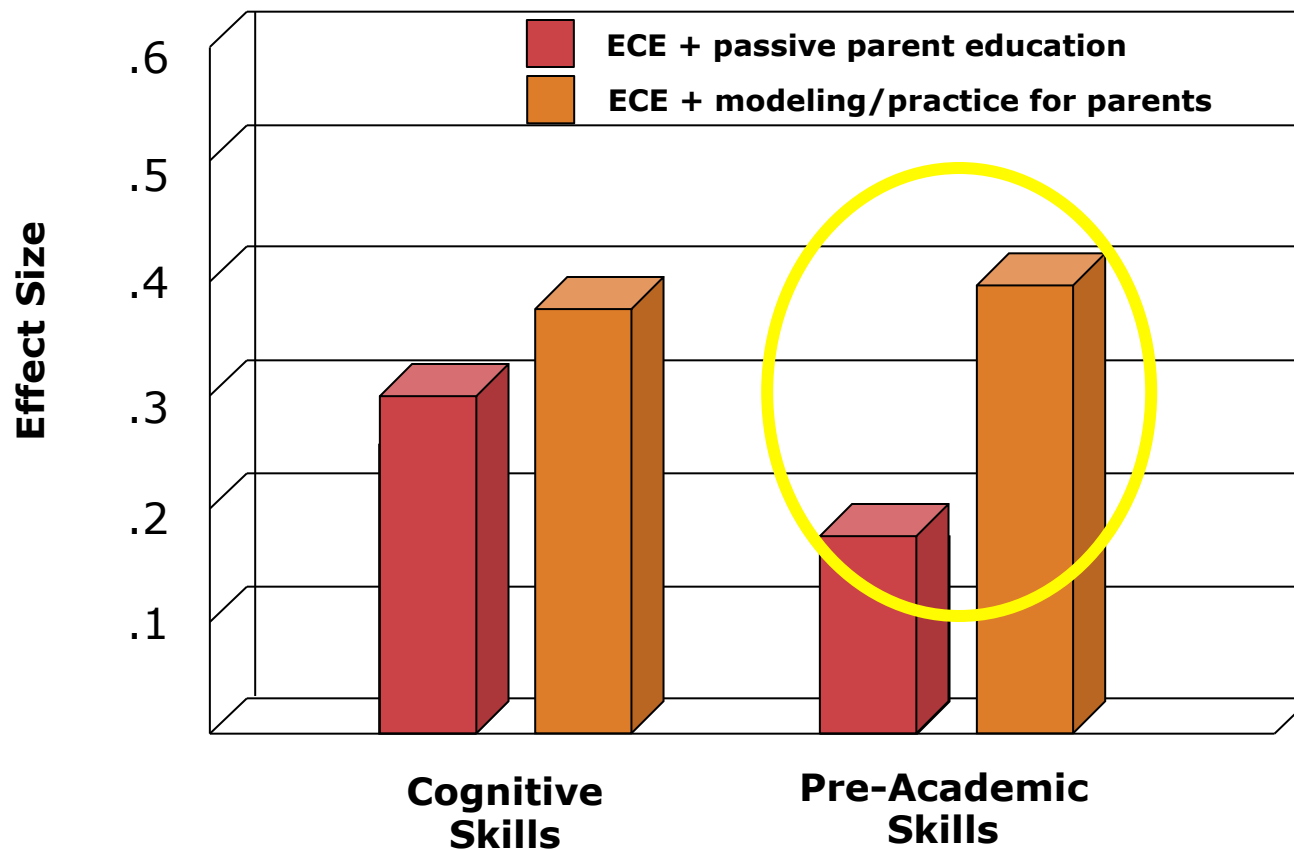


“If you always do what you always did,
you will always get what you always got.”
—Albert Einstein

Google X: The Need for R&D



Analysis of Parent Involvement in Early Childhood Programs Illustrates Challenges and Opportunities



Average Impacts of 88 Early Childhood Education Programs (1960-2007)

Source: Grindal, et al. (under review)

Theory of Change

Achieving Breakthrough Outcomes
For Children Facing Adversity
Requires Transforming the Lives
of the Adults Who Care for Them

Violence

Mental Chaos
Illness

Substance Stress
Abuse Poverty

Maltreatment



Strengthen
foundational skills
for caregiving,
employability,
and responsible
citizenship

An “Air Traffic Control System” in the Brain



A group of skills that help us to:

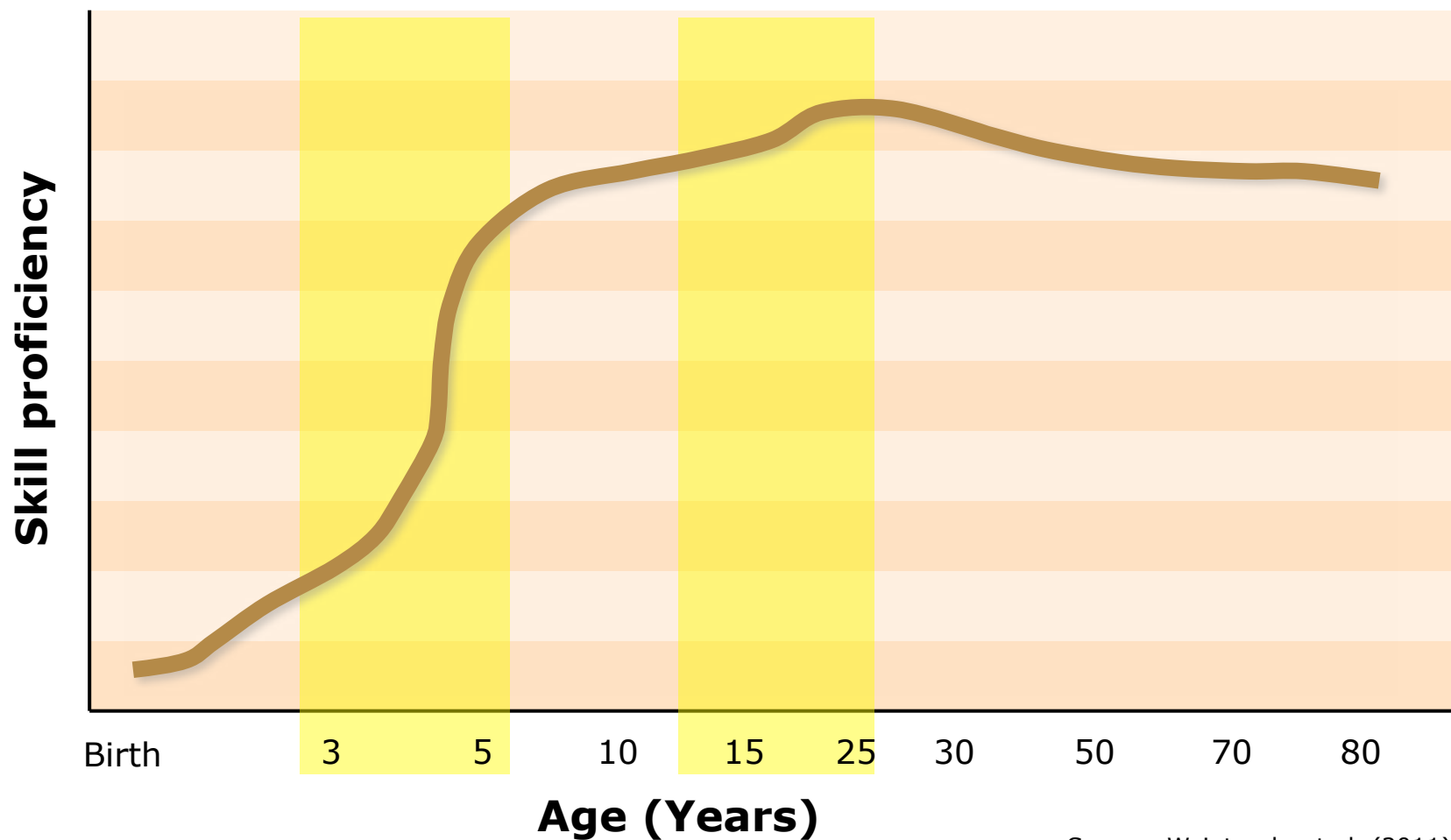
- focus,
- make decisions with available information,
- set goals
- make and execute plans
- revise and adjust
- control impulses

➤ A key biological foundation of school readiness as well as outcomes in health and employability

How Does Executive Function Develop?



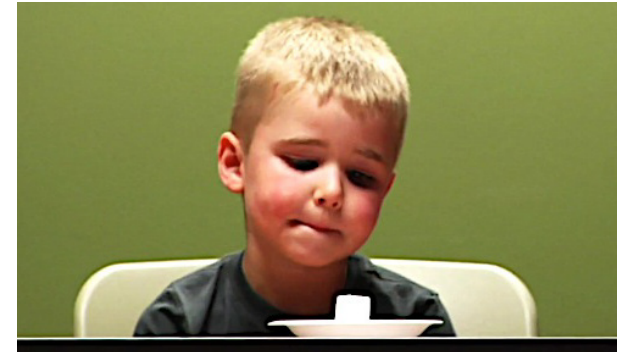
The Development of Executive Function Skills Begins in Early Childhood and Extends into the Early Adult Years



Source: Weintraub, et al. (2011)

Three Types of Executive Function Skills

Inhibitory Control — filter thoughts and impulses to resist temptations and distractions



Working Memory — hold and manipulate information in our heads over short periods of time

Mental Flexibility — adjust to changed demands, priorities, or perspectives



What Do These Skills Look Like in Adults?

Inhibitory Control — filter thoughts and impulses to resist temptations and distractions



Working Memory — hold and manipulate information in our heads over short periods of time

Mental Flexibility — adjust to changed demands, priorities, or perspectives



The Pencil Tap Test

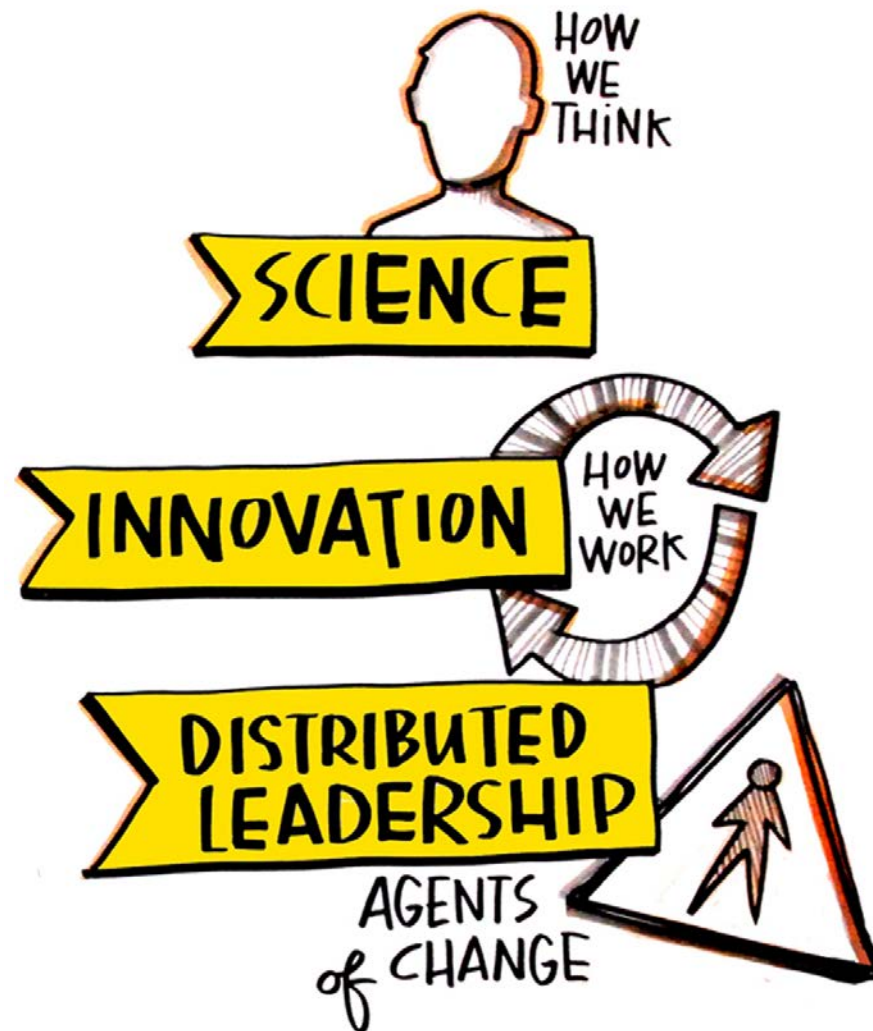


Source: Blair, C. (2012)

Building Adult Capabilities Across Sectors



To Truly Change the Field, We Must Change How We Operate





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The collage displays several key pages from the Center on the Developing Child website:

- Brain Hero:** A multimedia page featuring a video titled "Brain Hero" with the subtitle "Following a two-year collaboration with the..." and a "View all multimedia >>" link.
- InBrief: The Impact of Early Adversity on Children's Development:** A page with a video titled "Toxic Stress Changes Brain Architecture" showing a comparison between "Normal" (neuron with many connections) and "Toxic Stress" (neuron damaged by toxic stress with fewer connections). It includes a "Download PDF >>" link and a "Share this page >>" button.
- Reports & Working Papers:** A page titled "The Foundations of Lifelong Health Are Built in Early Childhood" with a "Download PDF >>" link and a "Share this page >>" button.
- Navigation and Sidebar:** A sidebar on the left contains sections for "BROWSE BY TOPIC" (Science of Early Childhood, Understanding Intervention, Innovation, Global Child Development, New Research, Foundations of Lifelong Health), "ACTIVITIES", "RESOURCES", "FACULTY & PARTNERS", "NEWS & EVENTS", and "ABOUT". It also includes "RELATED CONTENT" and a "NEWSLETTER" sign-up section.

www.developingchild.harvard.edu



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