Center on the Developing Child
HARVARD UNIVERSITY

The Science of Early Childhood Development: Lessons for Policy and Practice

TODD GRINDAL ED. D
Abt Associates
Julius B. Richmond Dissertation Fellow, Center on the Developing Child at Harvard University

Todd_Grindal@abtassoc.com

The Foundation of a Successful Society is Built in Early Childhood

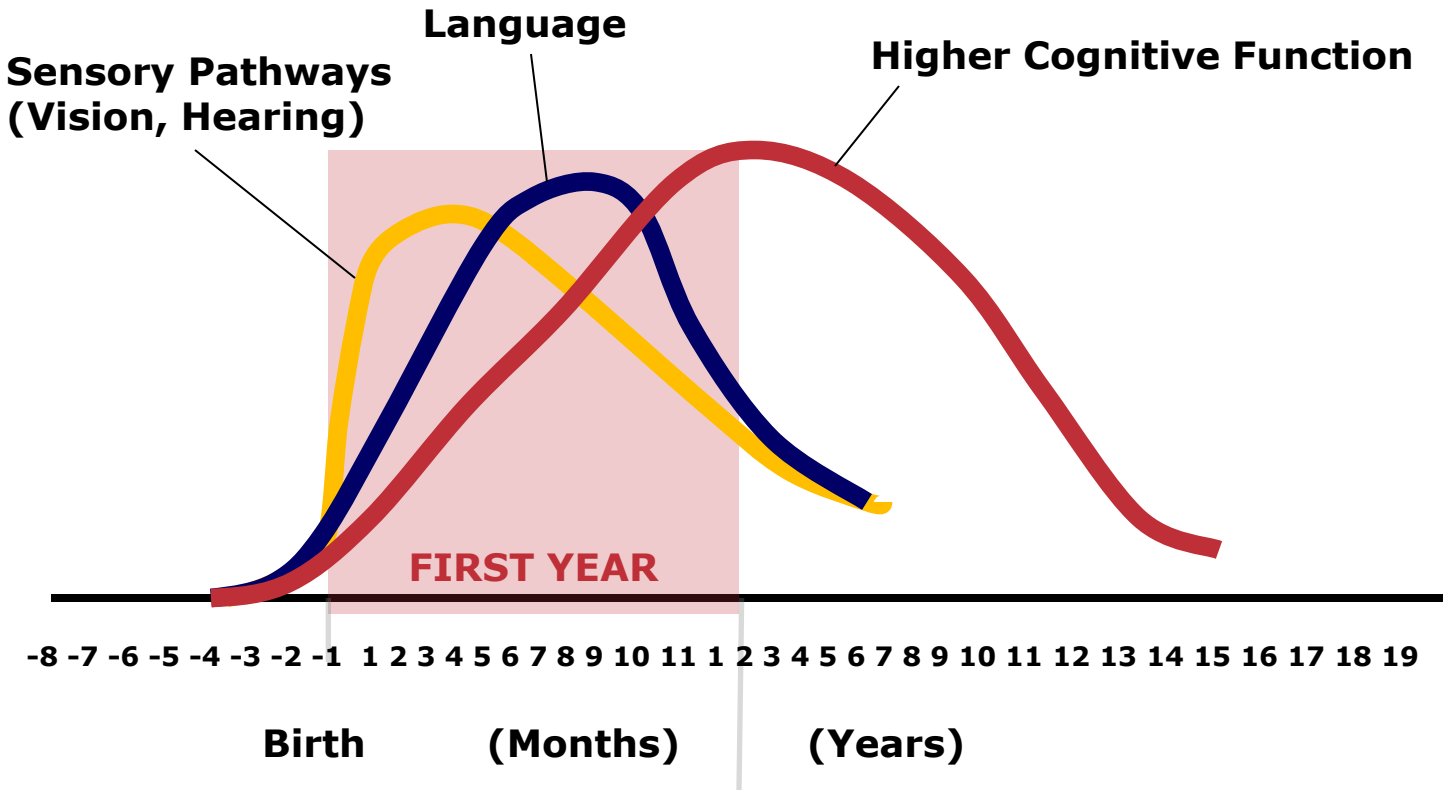
Experiences Build Brain Architecture

Experience Shapes Brain Architecture by Over-Production Followed by Pruning

(700 synapses formed per second in the early years)

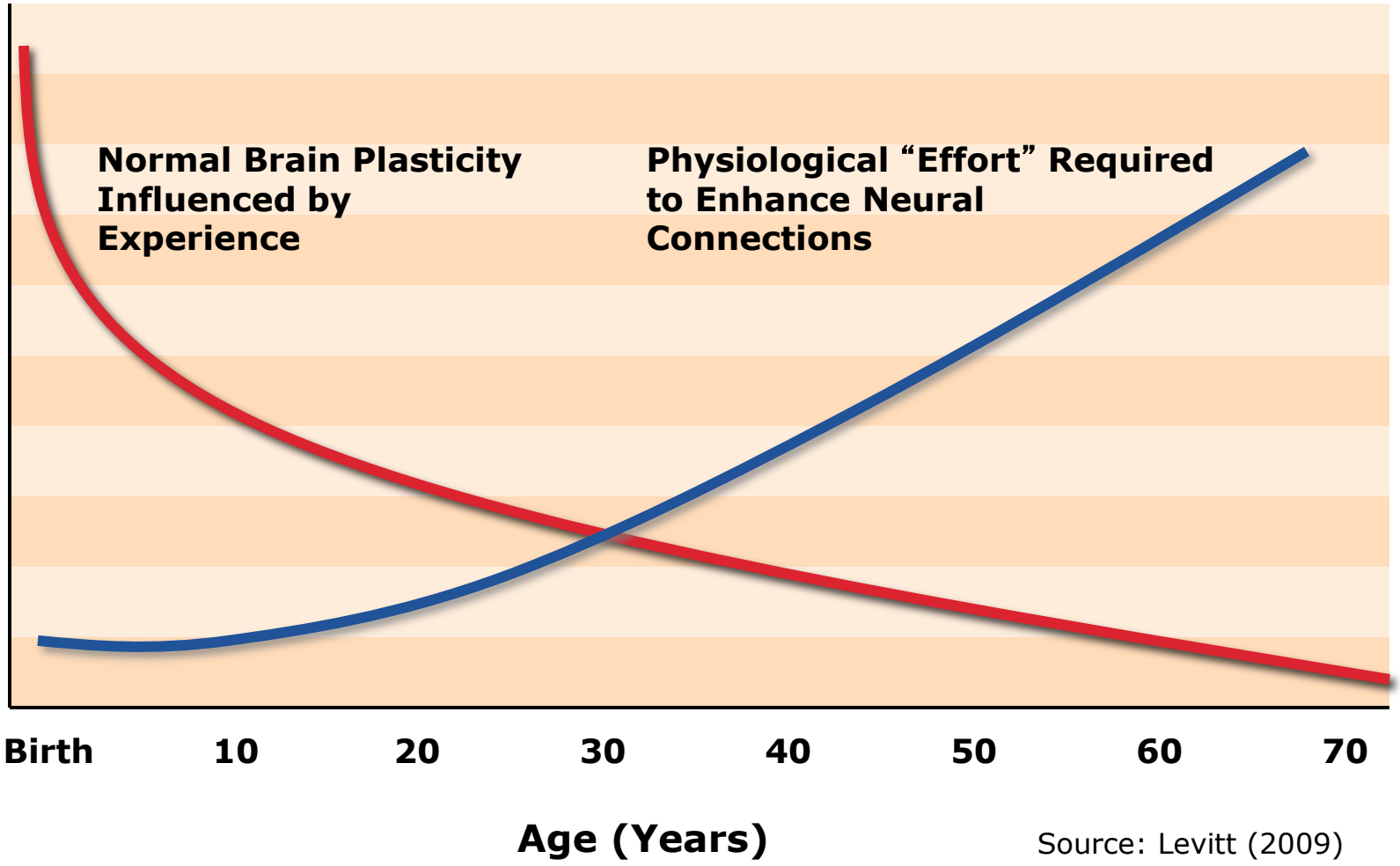
birth 6 years 14 years

Neural Circuits are Wired in a Bottom-Up Sequence



Source: Nelson (2000)

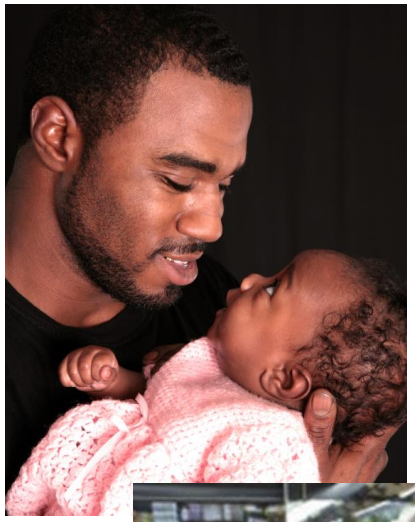
The Ability to Change Brains Decreases Over Time

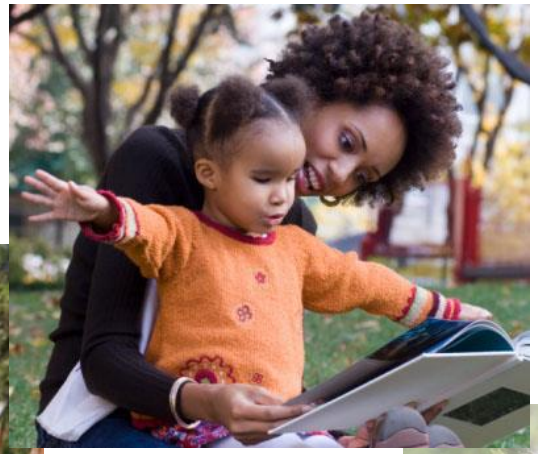


Source: Levitt (2009)

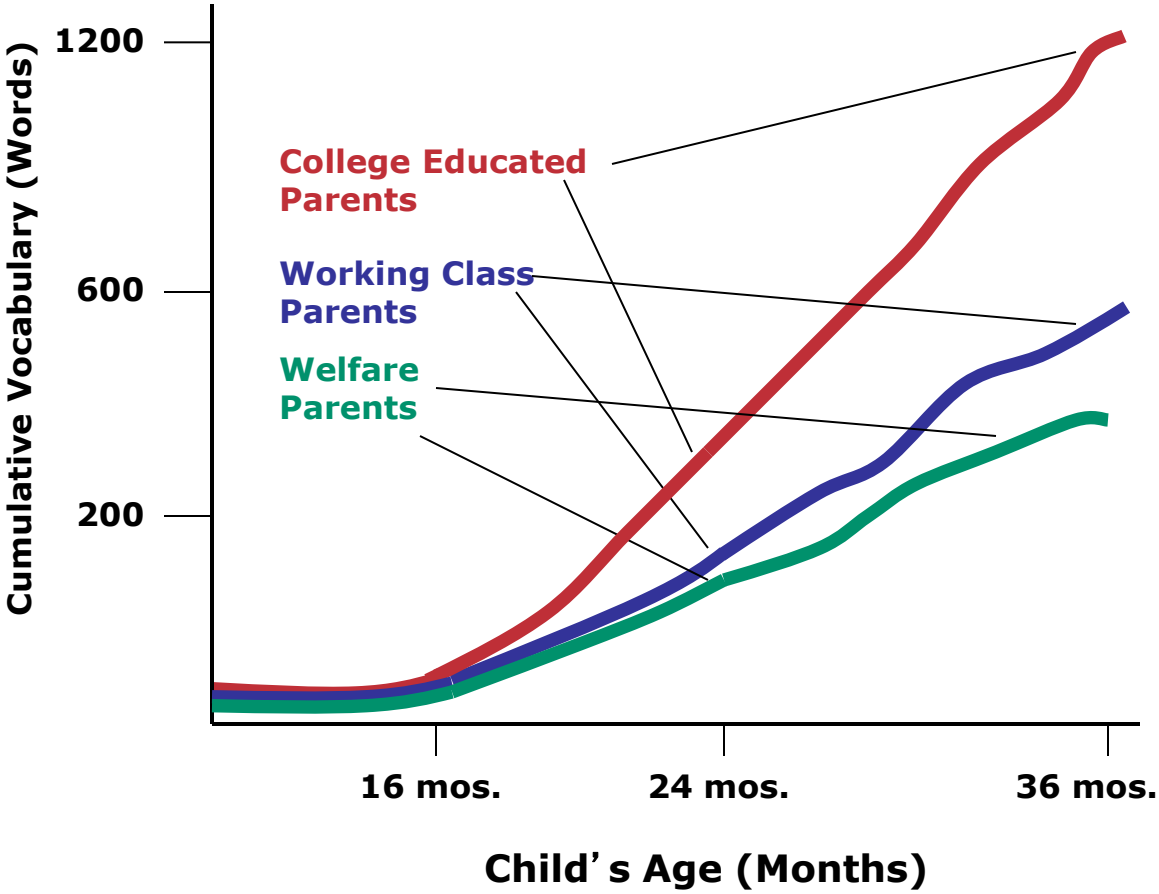
Interactions Shape Brain Circuitry

Brains and Skills are Shaped by the "Serve and Return" Nature of Human Interaction



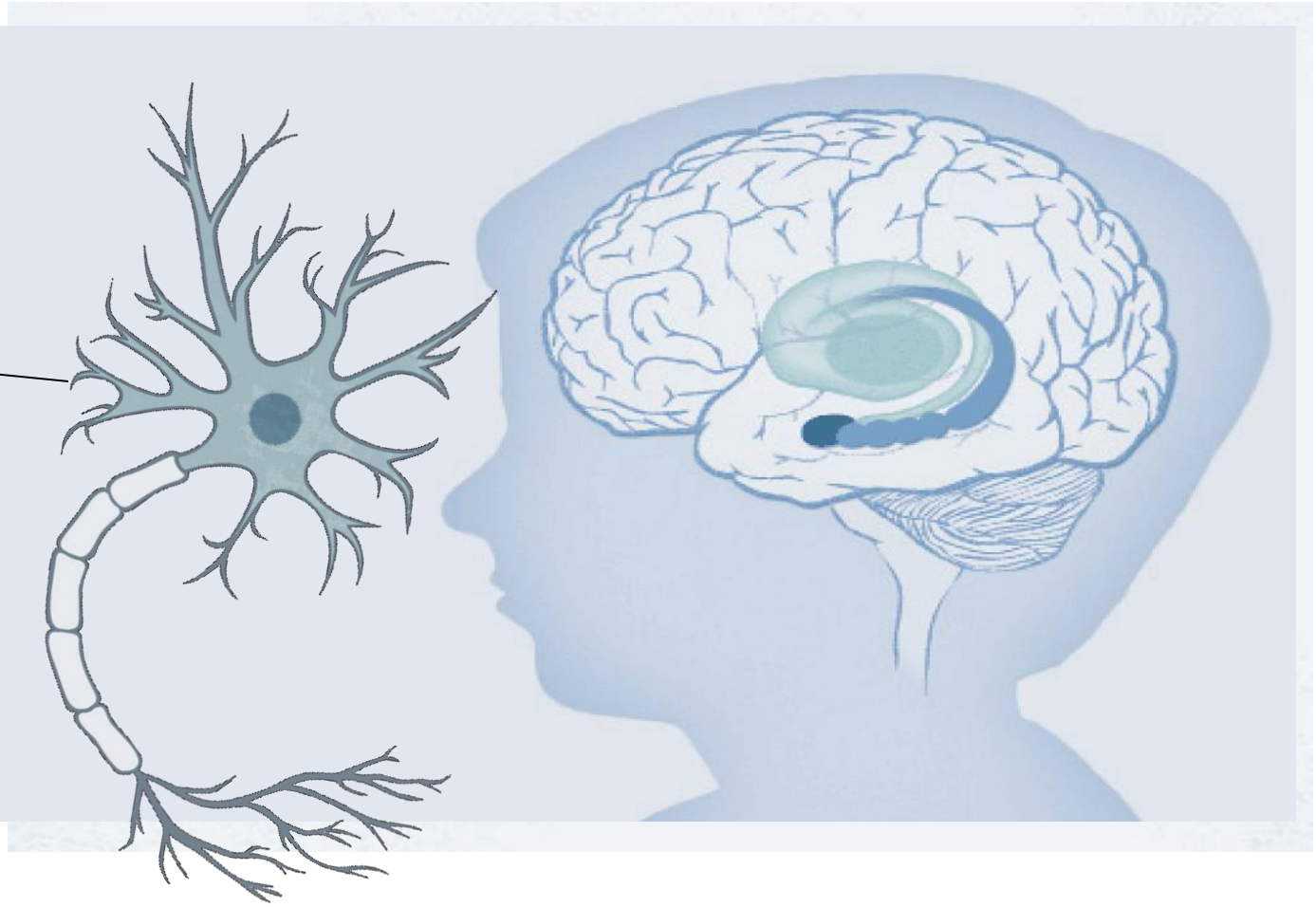


Language environment impacts children's language development

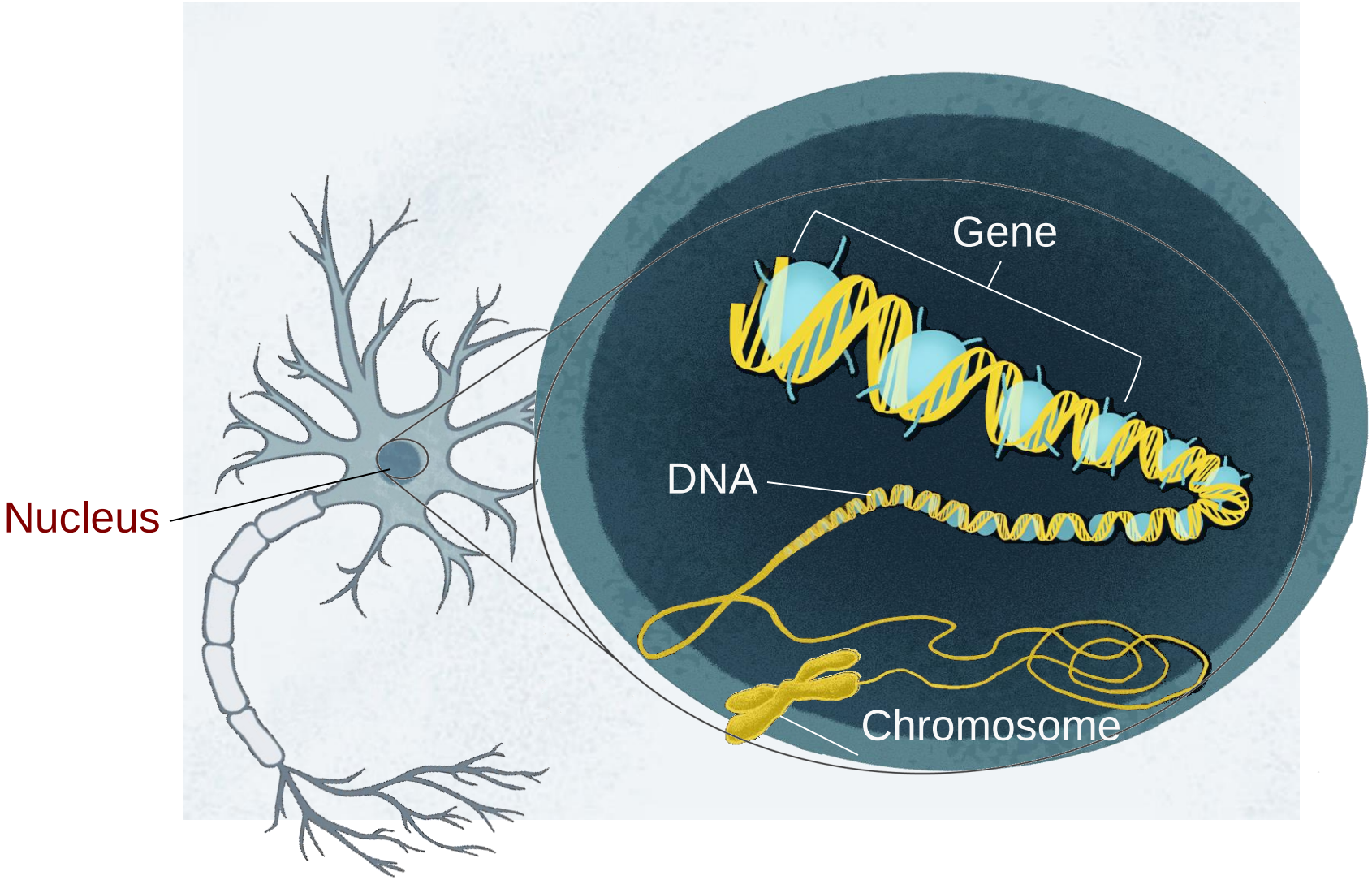


Source: Hart & Risley (1995)

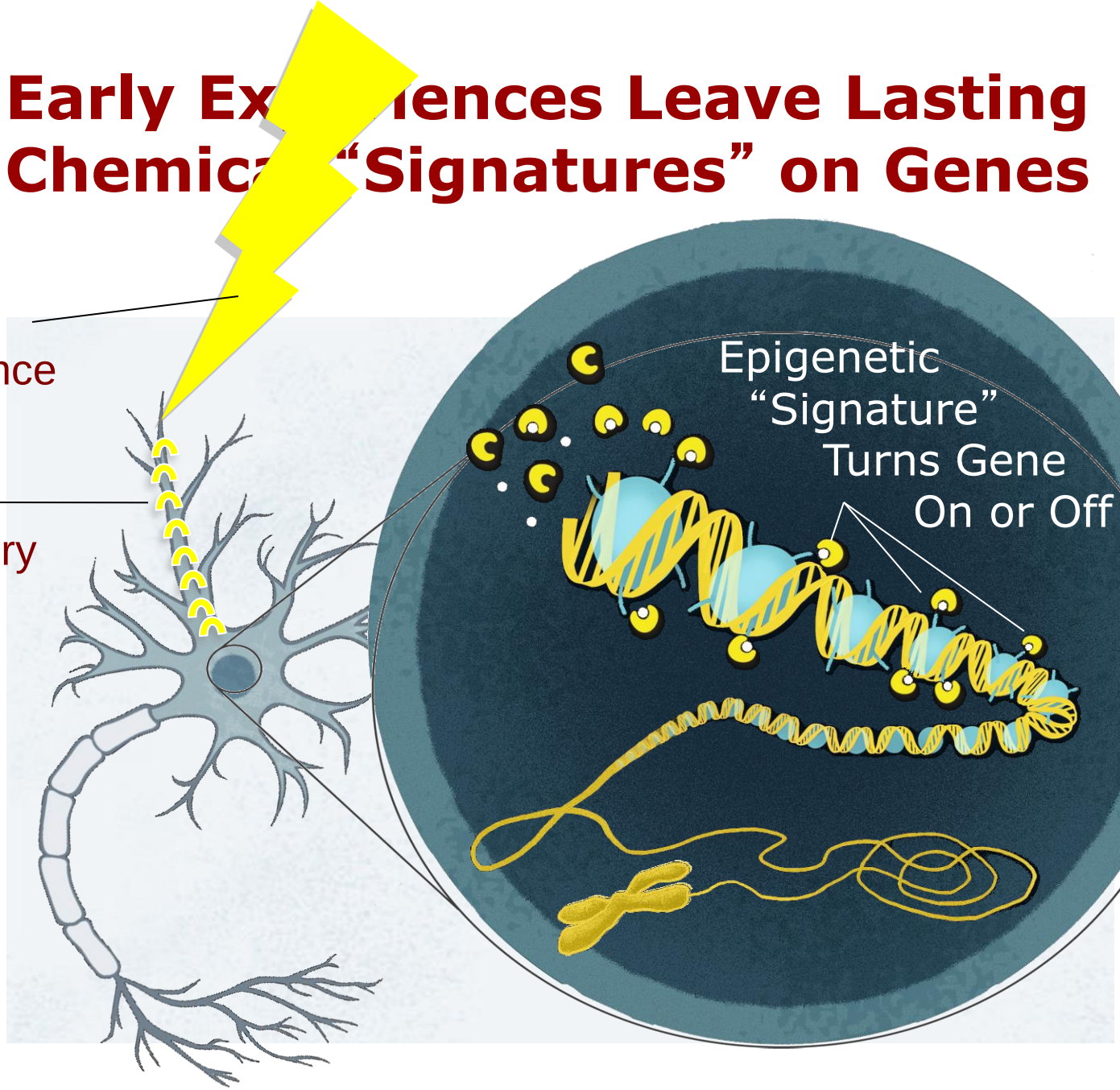
Early Experiences Alter Gene Expression and Shape Development



Genes Carry Instructions that Tell Our Bodies How to Work

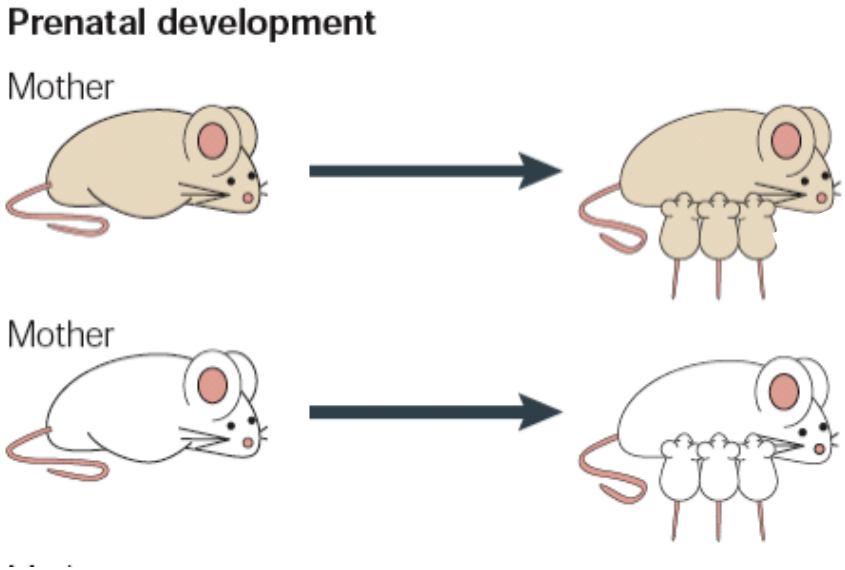


Early Ex[illegible]iences Leave Lasting Chemica[illegible]"Signatures" on Genes



Example 1:

Early Experience Affects Differences in Adult Anxiety in Mice



High care → Low

Low care → High

Source: Gross & Hen, 2004

Early Life Experiences Are Built Into Our Bodies (For Better or For Worse)

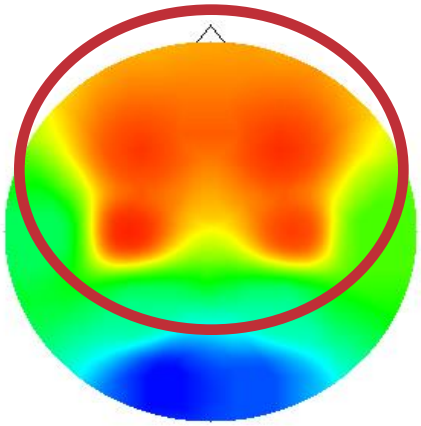
Three Levels of Stress Response

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

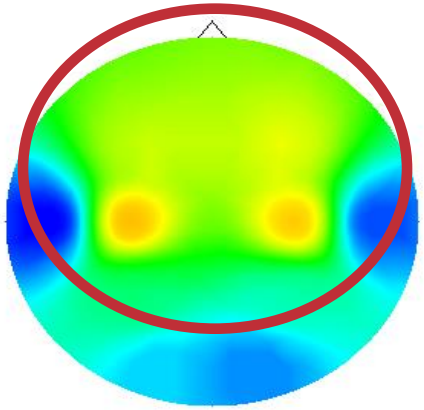
Tolerable
Serious, temporary stress responses,
buffered by supportive relationships.

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

Severe Neglect Affects Brain Power



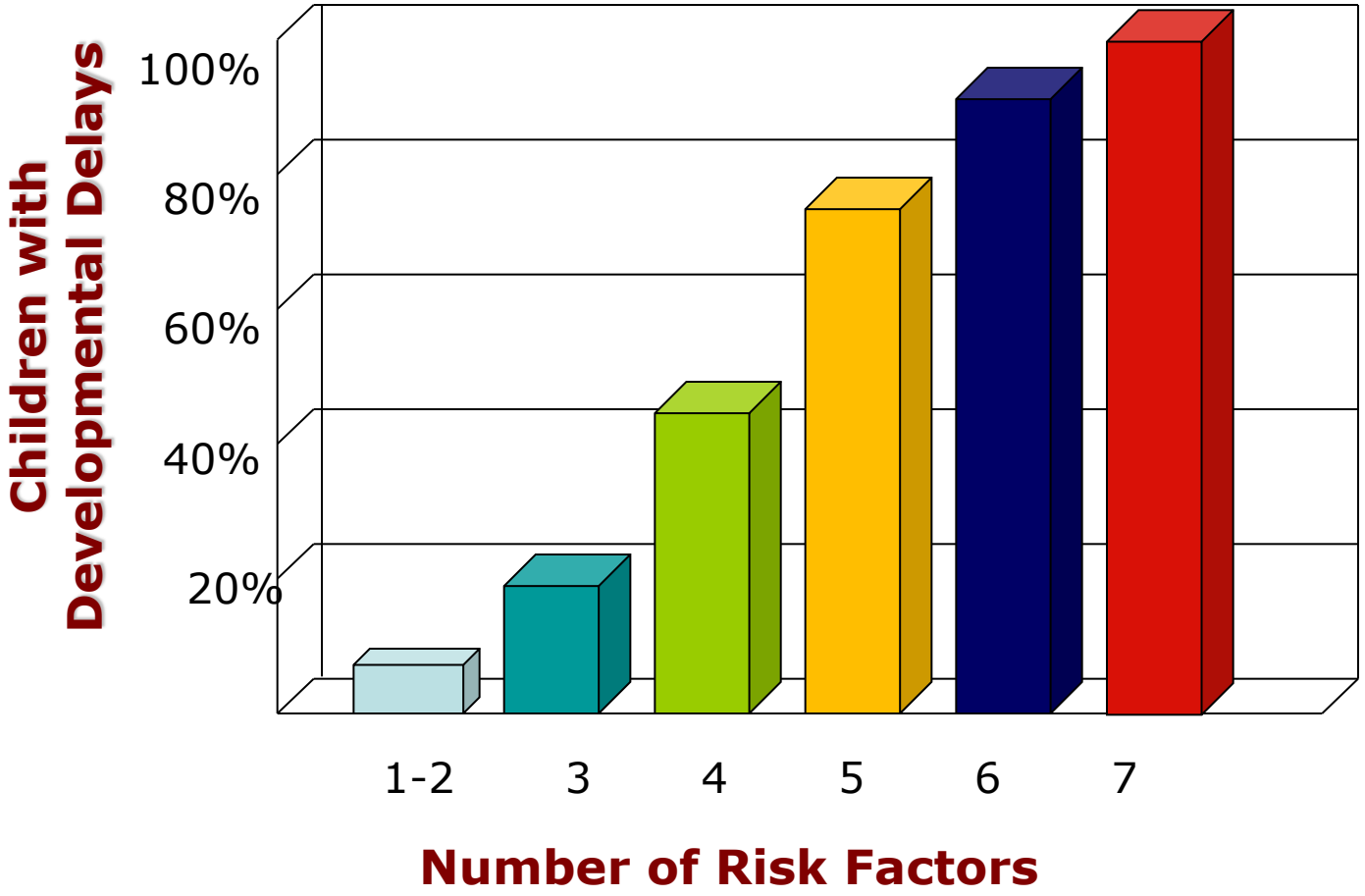
Positive Relationships



Extreme Neglect

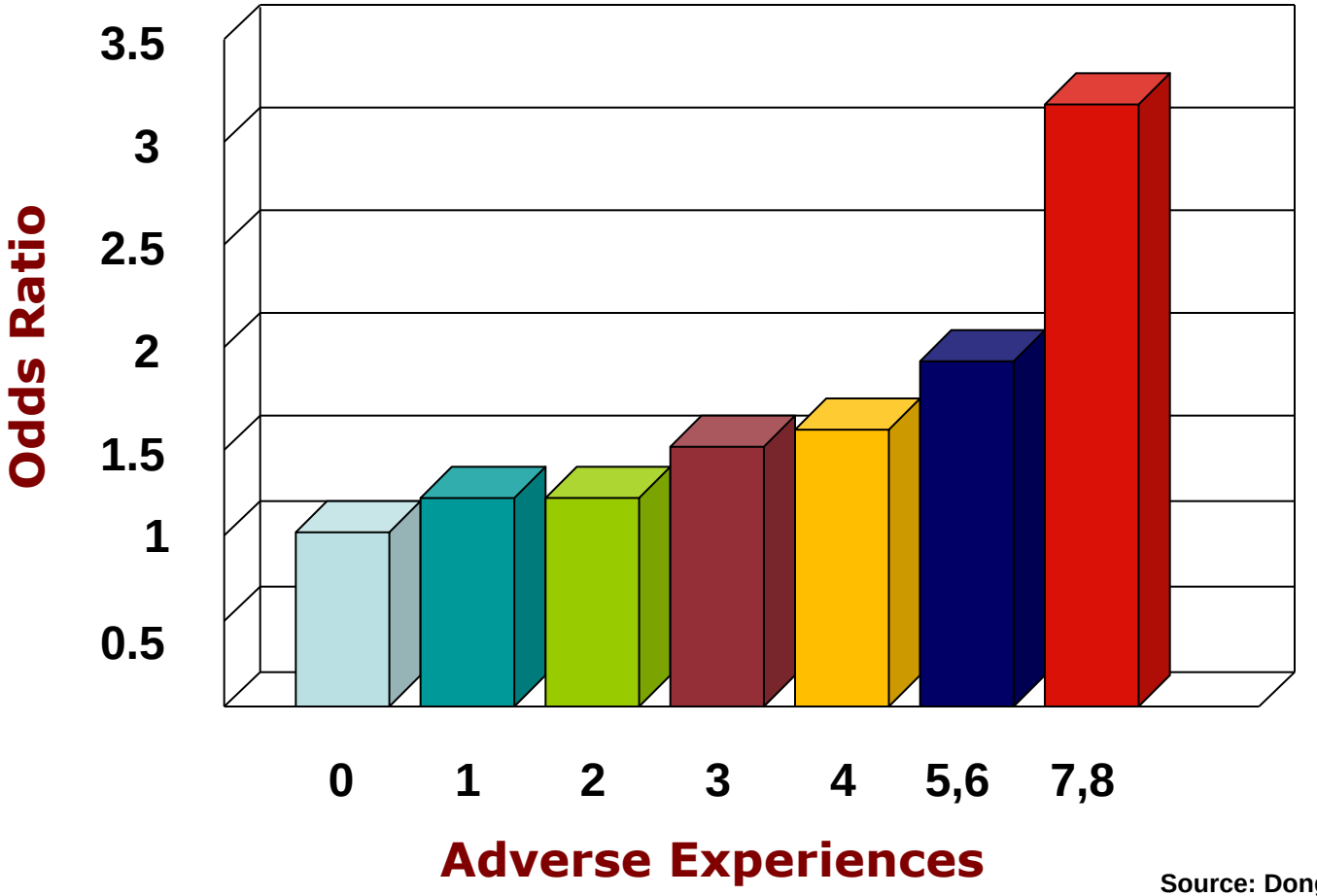
Source: C.A. Nelson (2008); Marshall, Fox & BEIP (2004)

Significant Adversity Impairs Development in the First Three Years



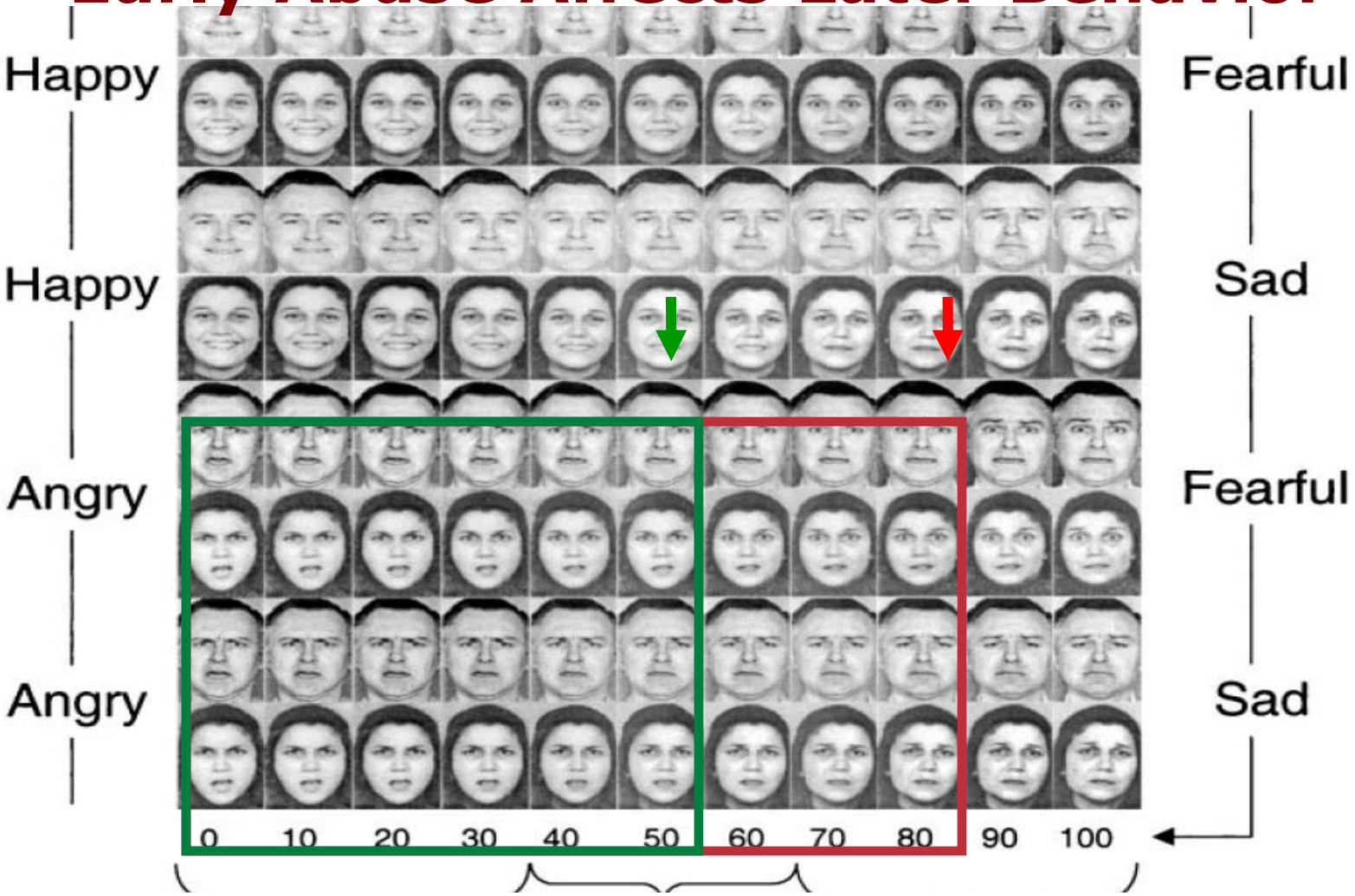
Source: Barth, et al. (2008)

Example 1:
Risk Factors for Adult Heart Disease are Embedded in Adverse Childhood Experiences



Source: Dong, et al. (2004)

Example 3:
Early Abuse Affects Later Behavior



Source: Pollak & Kistler (2002)

Profound Neglect Impairs Physical Growth

Source: Johnson et al. (2000)

What does this tell of us about early childhood policy and programs?

Bucharest Early Intervention Project

Children randomly assigned to leave the institution and be placed and high quality foster care environment

- Children placed in foster care before age 2 appear to catch up with typical children on measures of cognitive development
- These children had lower rates of ADHD, disruptive behaviors, and depression when compared to children who stayed in the institution

As a result of this study,

- The Romanian government passed a law forbidding the institutionalization of non-handicapped children under age 2.
- Over 27,000 foster homes have been created.

Long-term effects of Head Start

- Head Start closes one-third of the gap between median and low income 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

Chicago Child-Parent Center (2004)

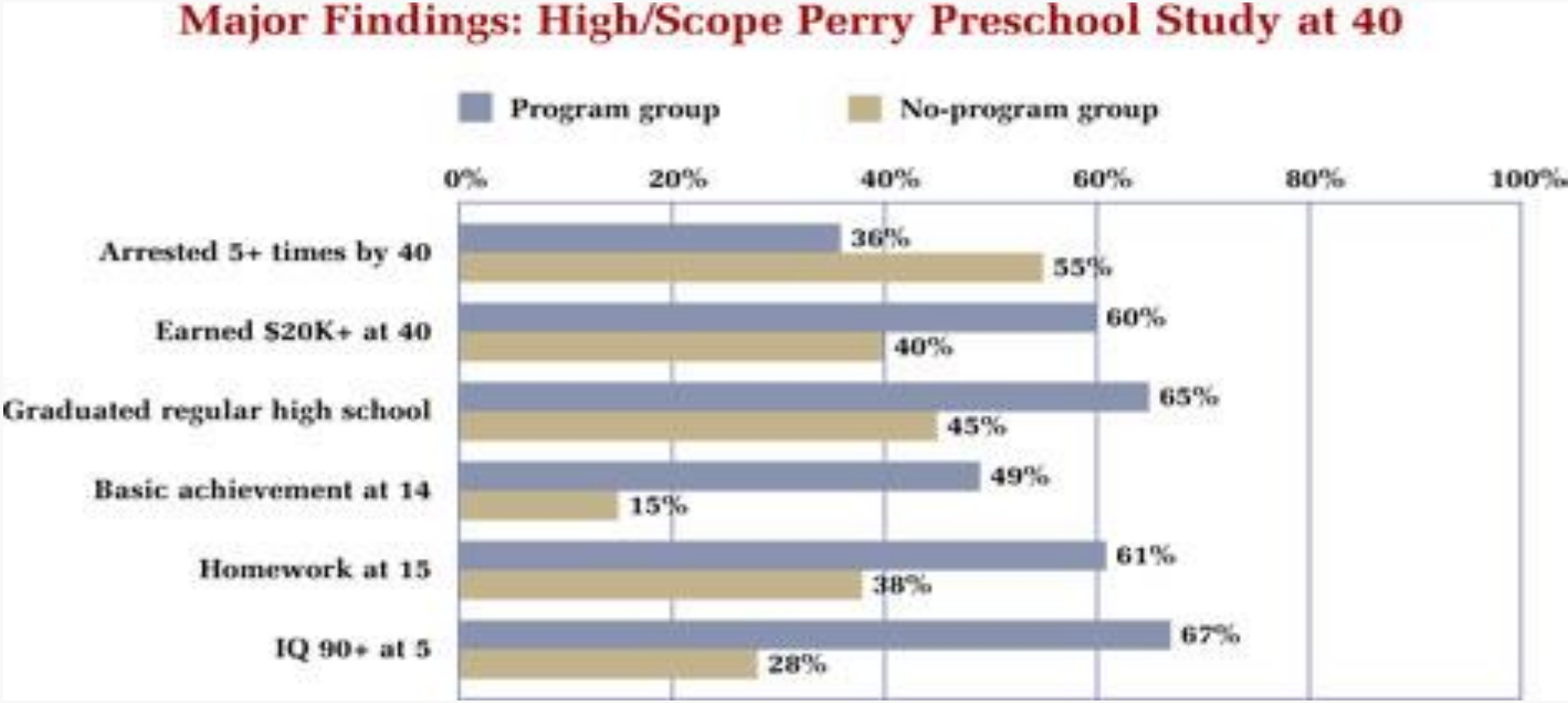
- Children who did not receive a strong education from PK through 3rd grade were three times more likely to be held back and more likely to be placed in special education than those who had a strong PK-3 foundation.

Preparing to Succeed-Boston (2011)

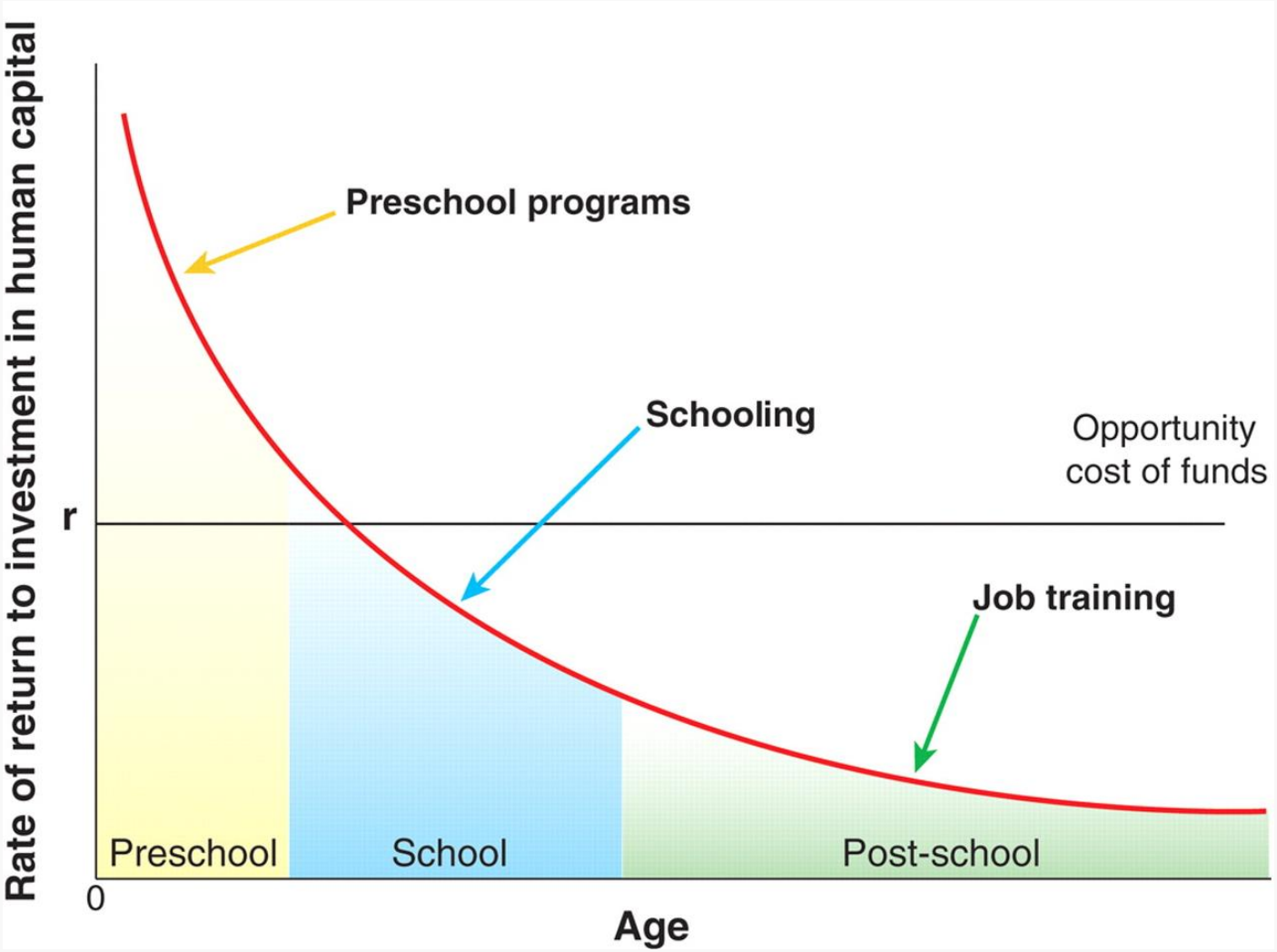
- Attending preschool erased the Latino/white test score gap and significant reduced the African American/White test score gap

Source: Reynolds, et al., 2004

The impact of attending high quality early childhood education can be observed nearly four decades later

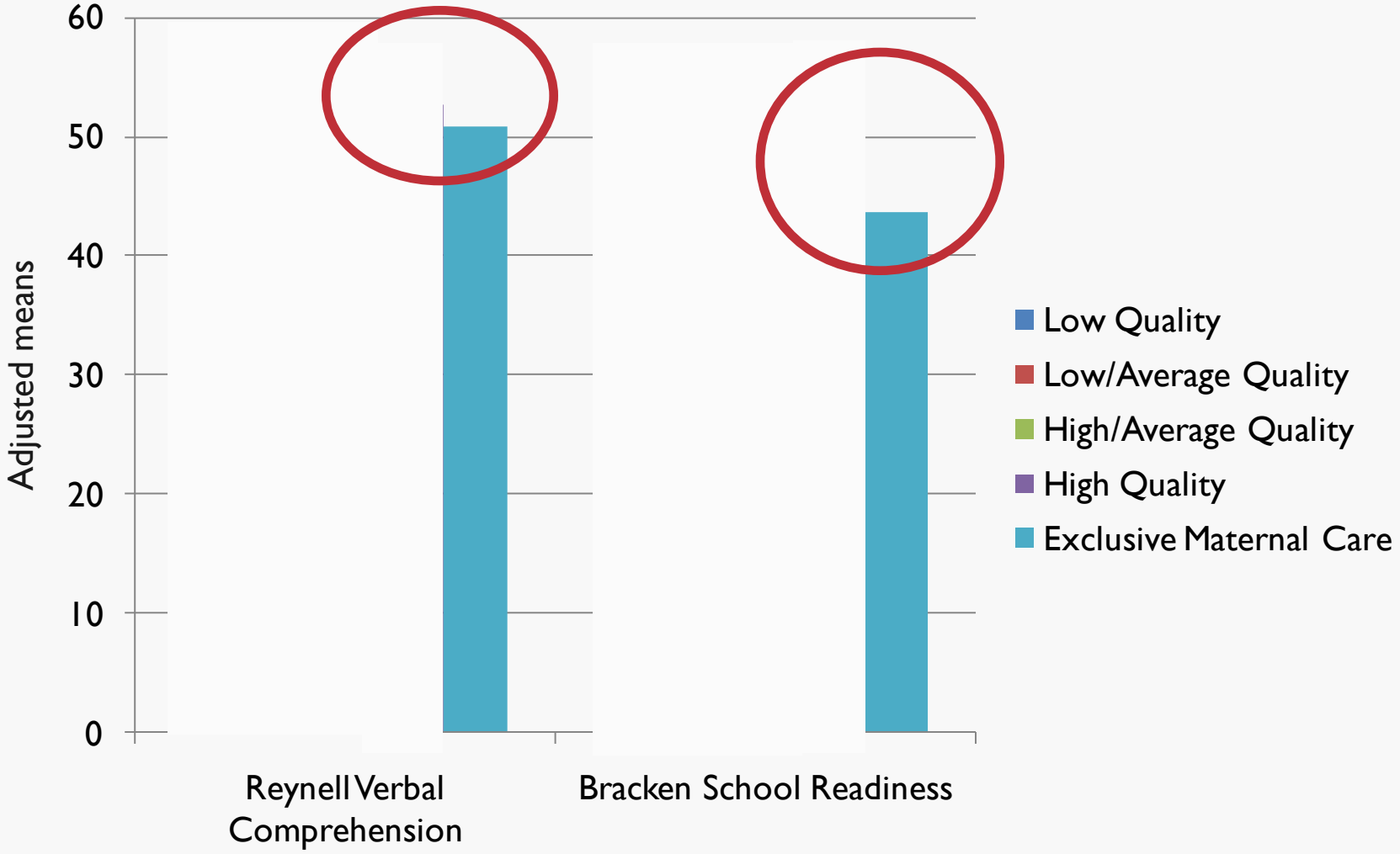


Rates of return to human capital investment



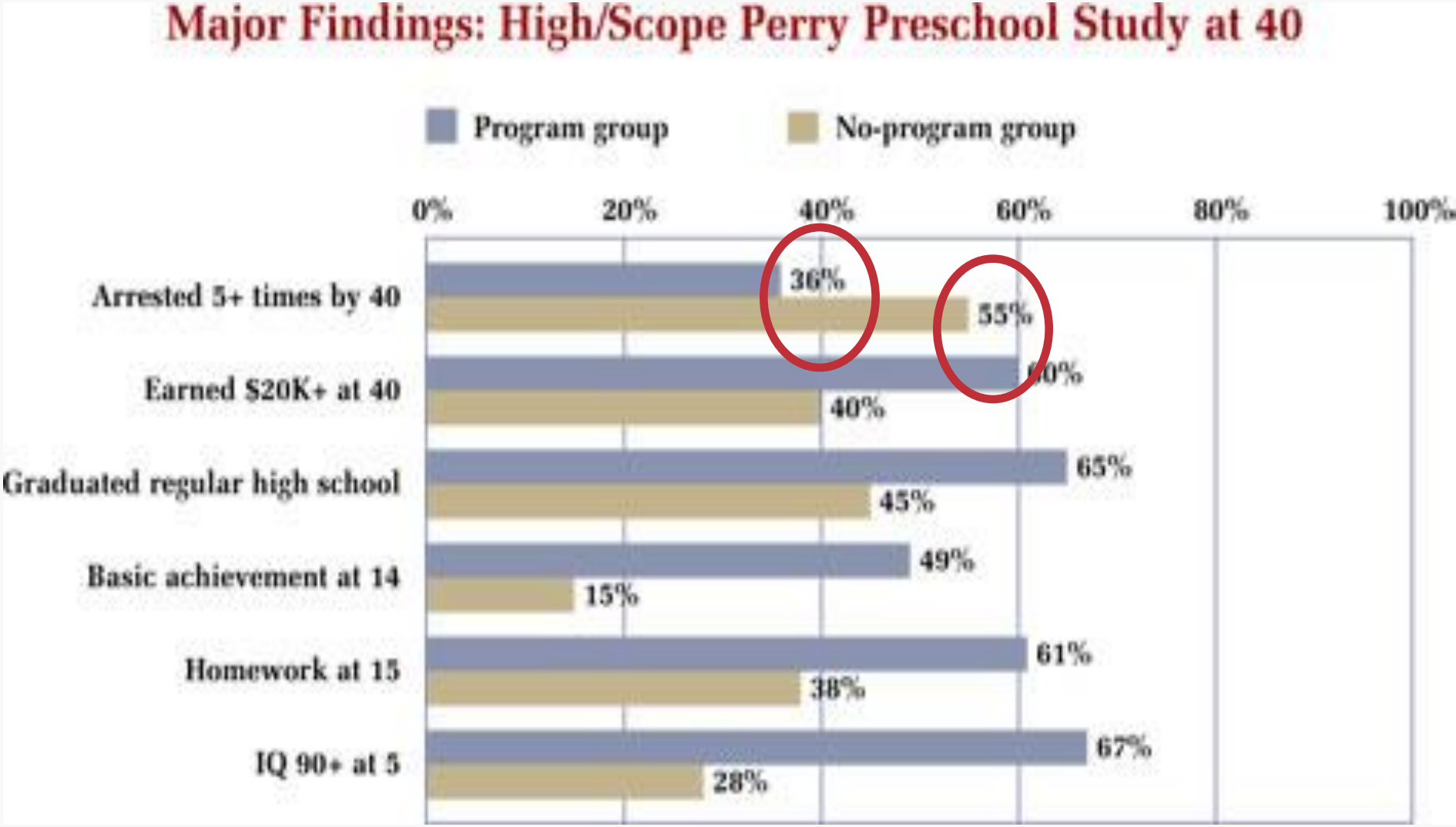
Source: Heckman, 2006 p.1902

36 months: Adjusted means for child outcome by quality

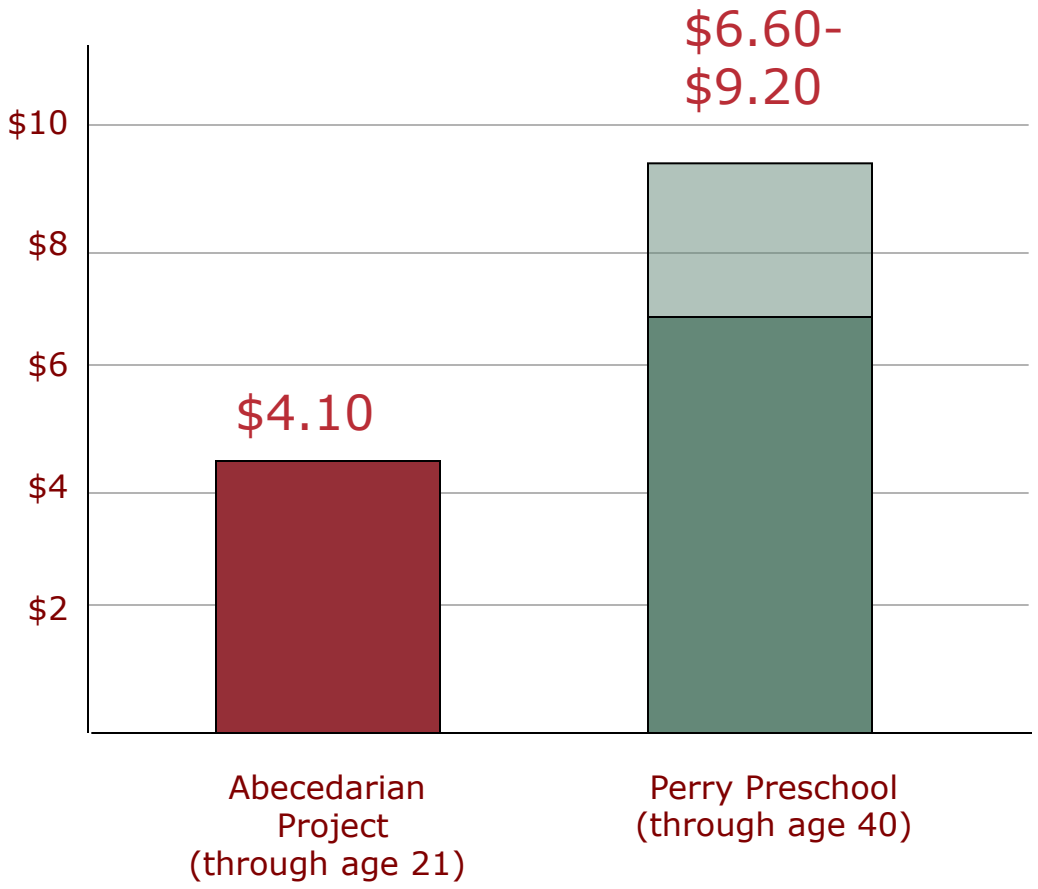


Source: NICHD ECCRN, 2000

The best of what we do is still not good enough



The economic impact of attending a high quality early childhood education program



Total Return per $1 Invested

To Individuals

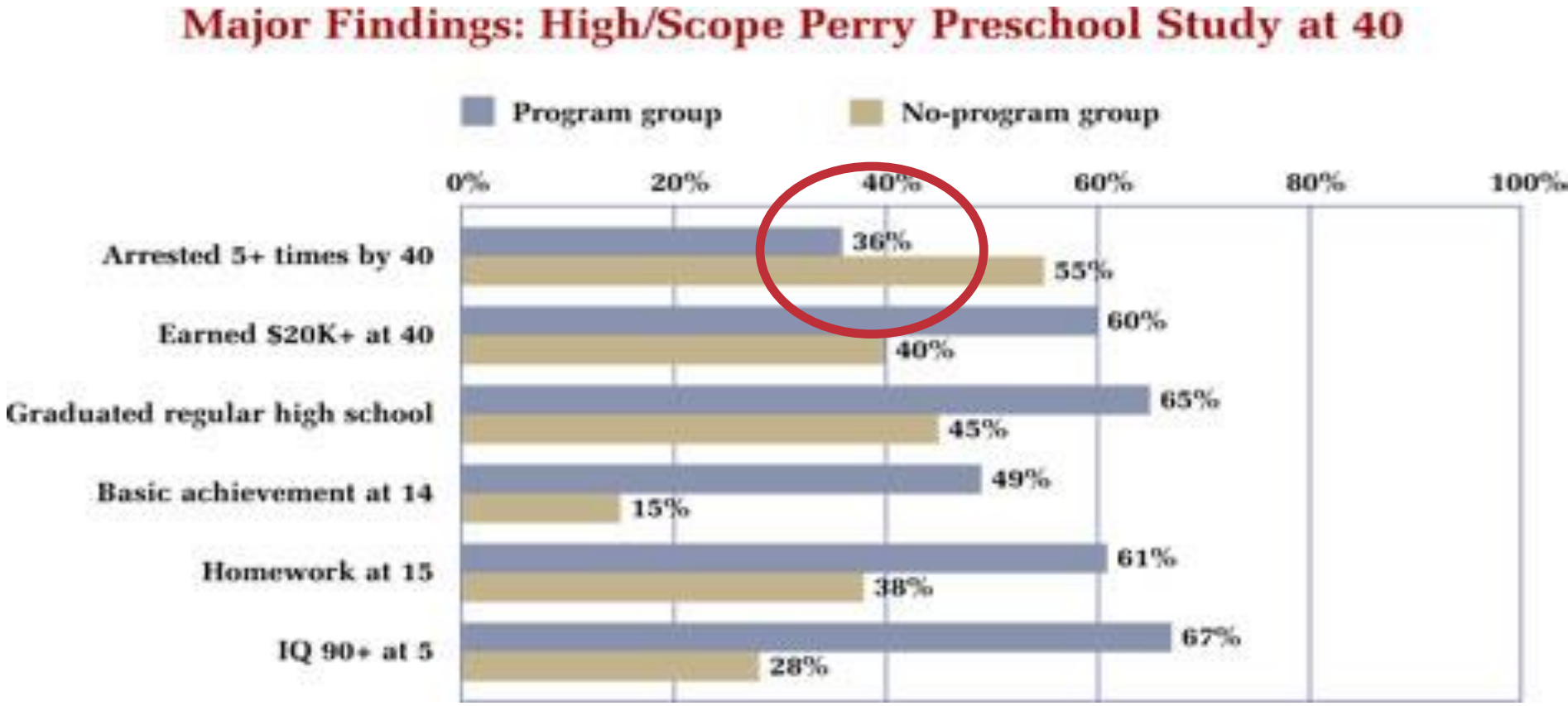
Increased earnings

To Society

Crime costs, special education and welfare savings, increased income taxes paid

Sources: Masse & Barnett (2002) Heckman et al. (2009)

The best of what we do, is not yet good enough.



Program Evaluation Research Helps Identify Effectiveness Factors

Not all programs are effective.

Effectiveness factors are key to distinguishing those programs that work from those that do not.

Our goal: to provide clearer guidance than the usual calls for "quality."

Source: Center on the Developing Child at Harvard University (2007)

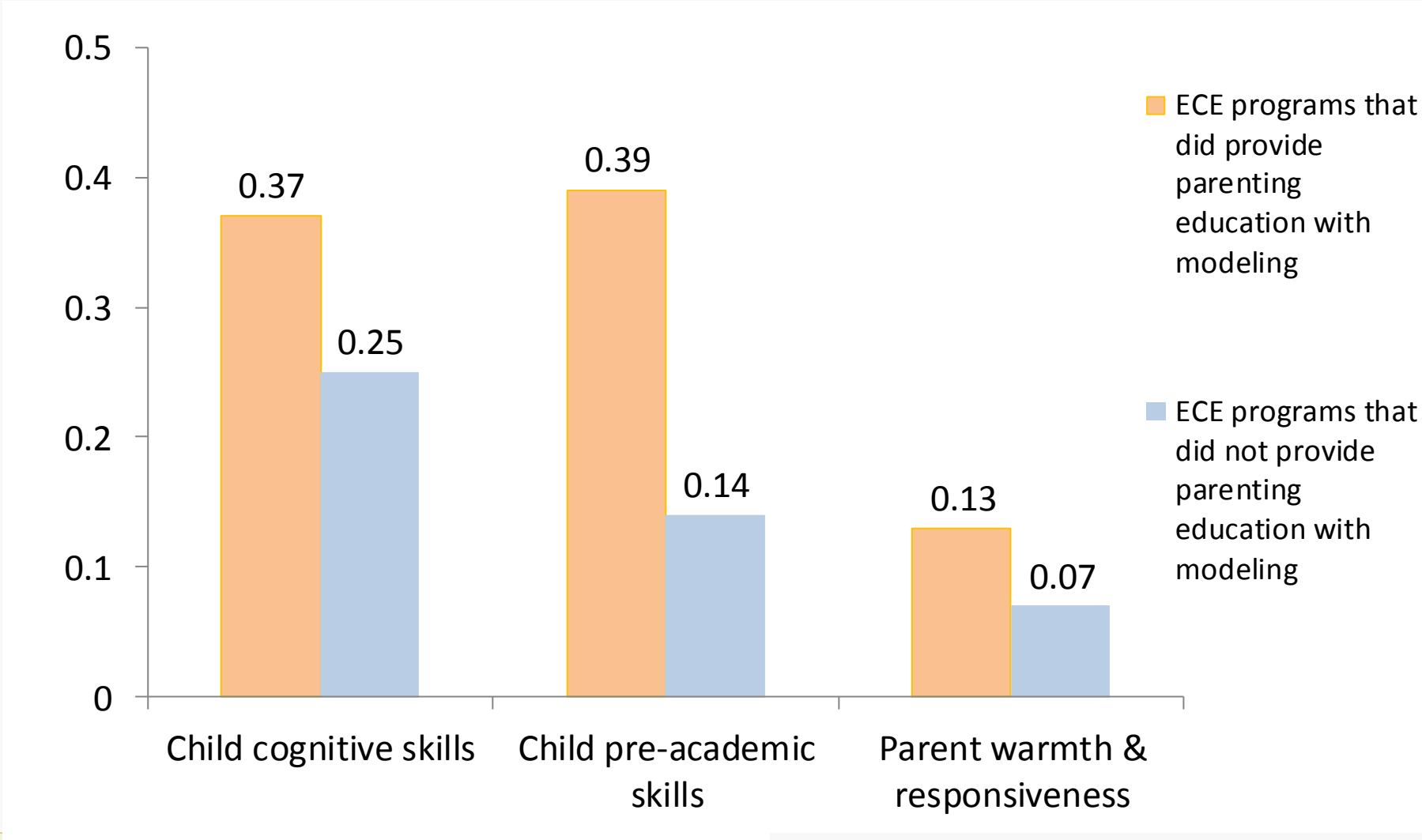
Effectiveness Factors for Early Care and Education Programs

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

Source: Center on the Developing Child at Harvard University (2007)

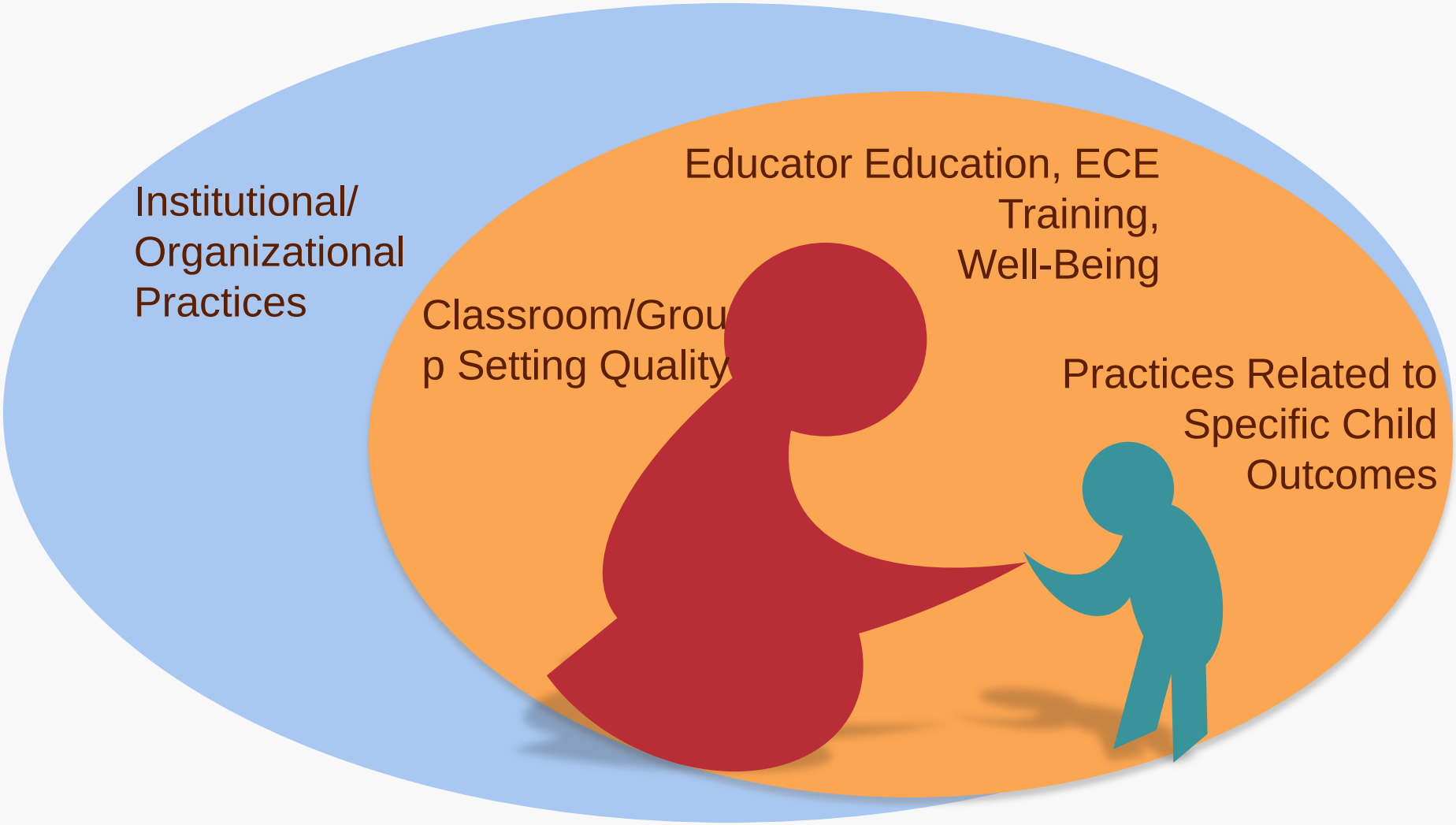
Effectiveness Factors for Parenting Education Programs:

Parenting education with modeling and/or opportunities for practice



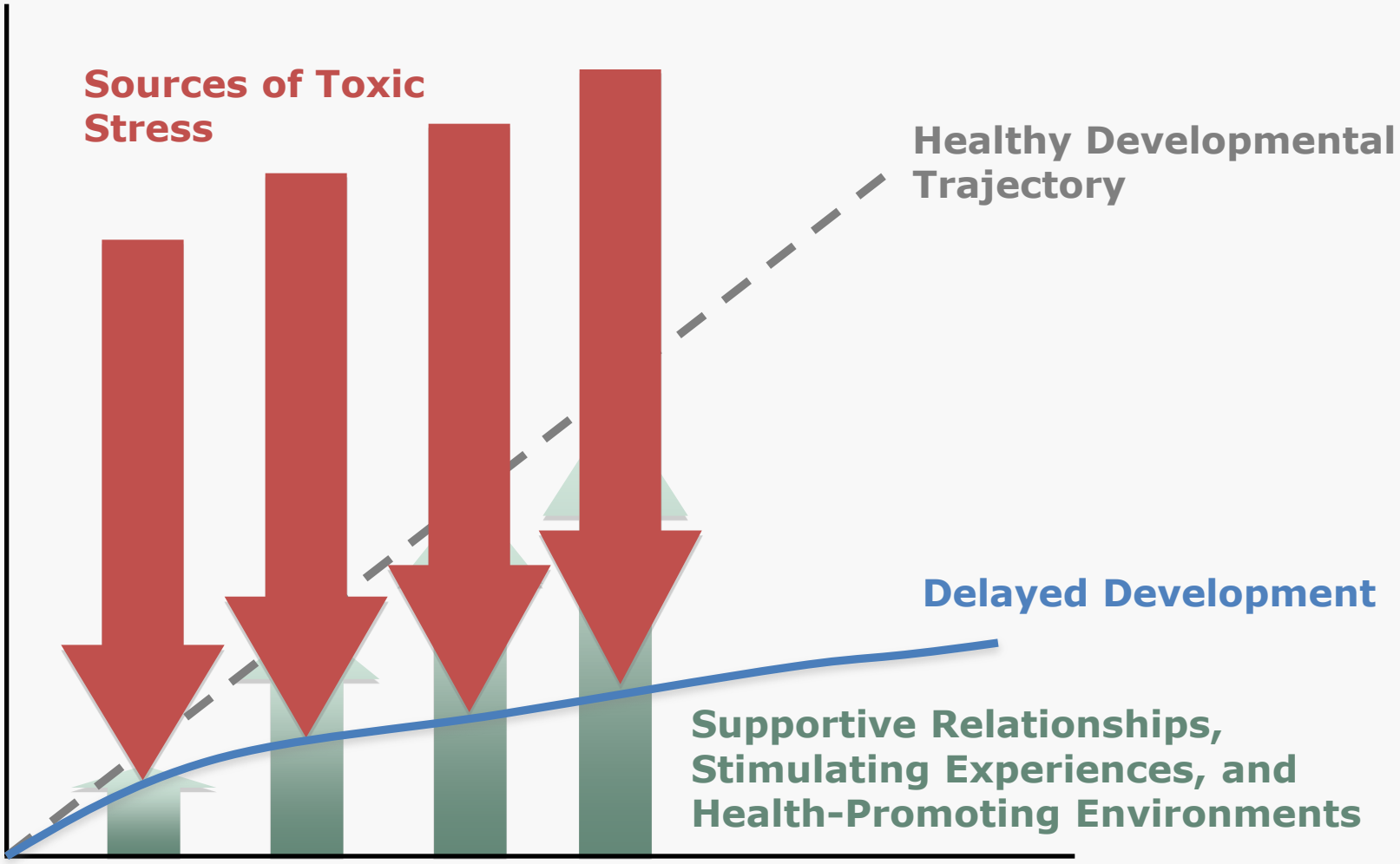
Grindal et. al. (under review)

Four Targets for Professional Development

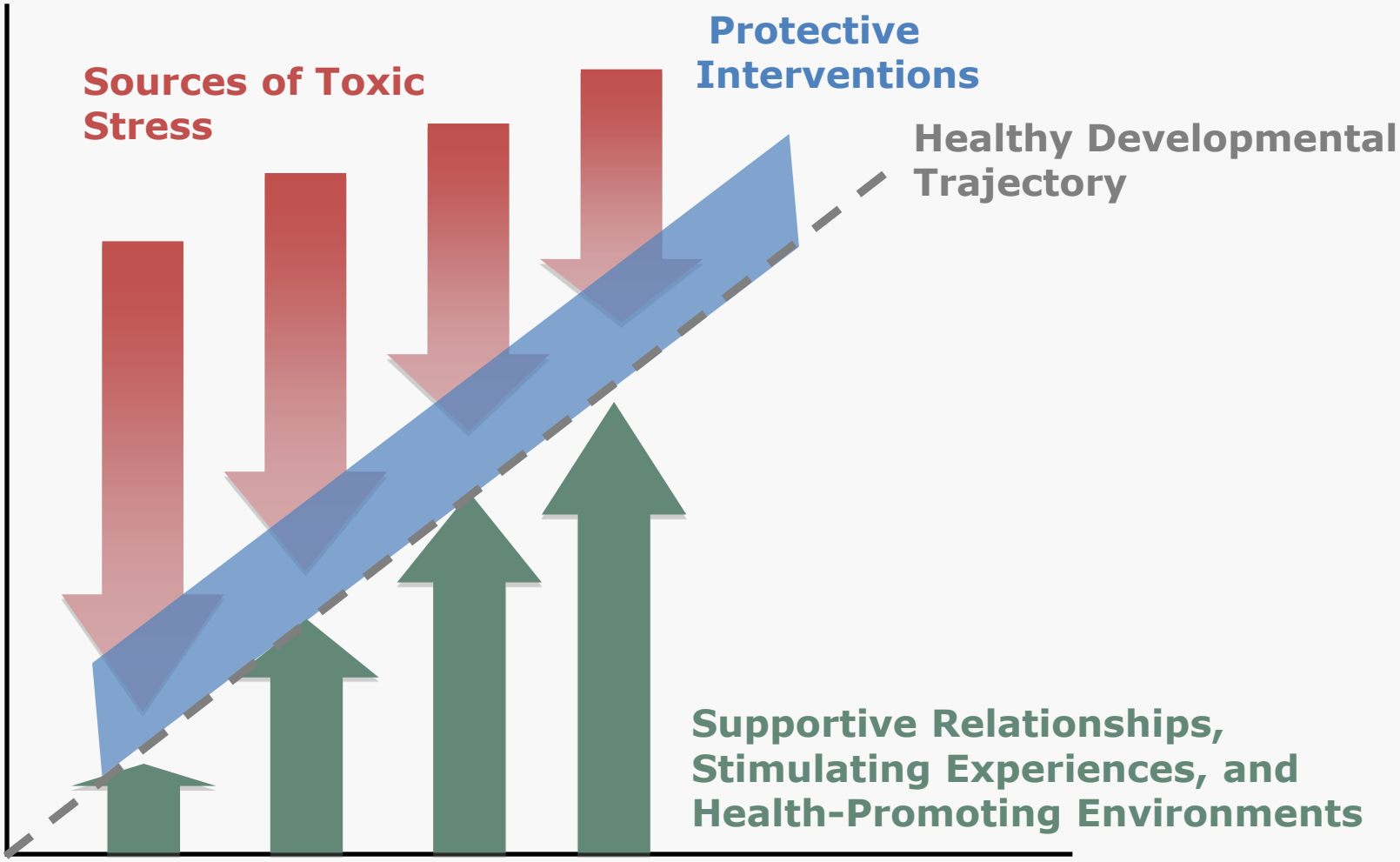


Source: U.S. Department of Education (2010)

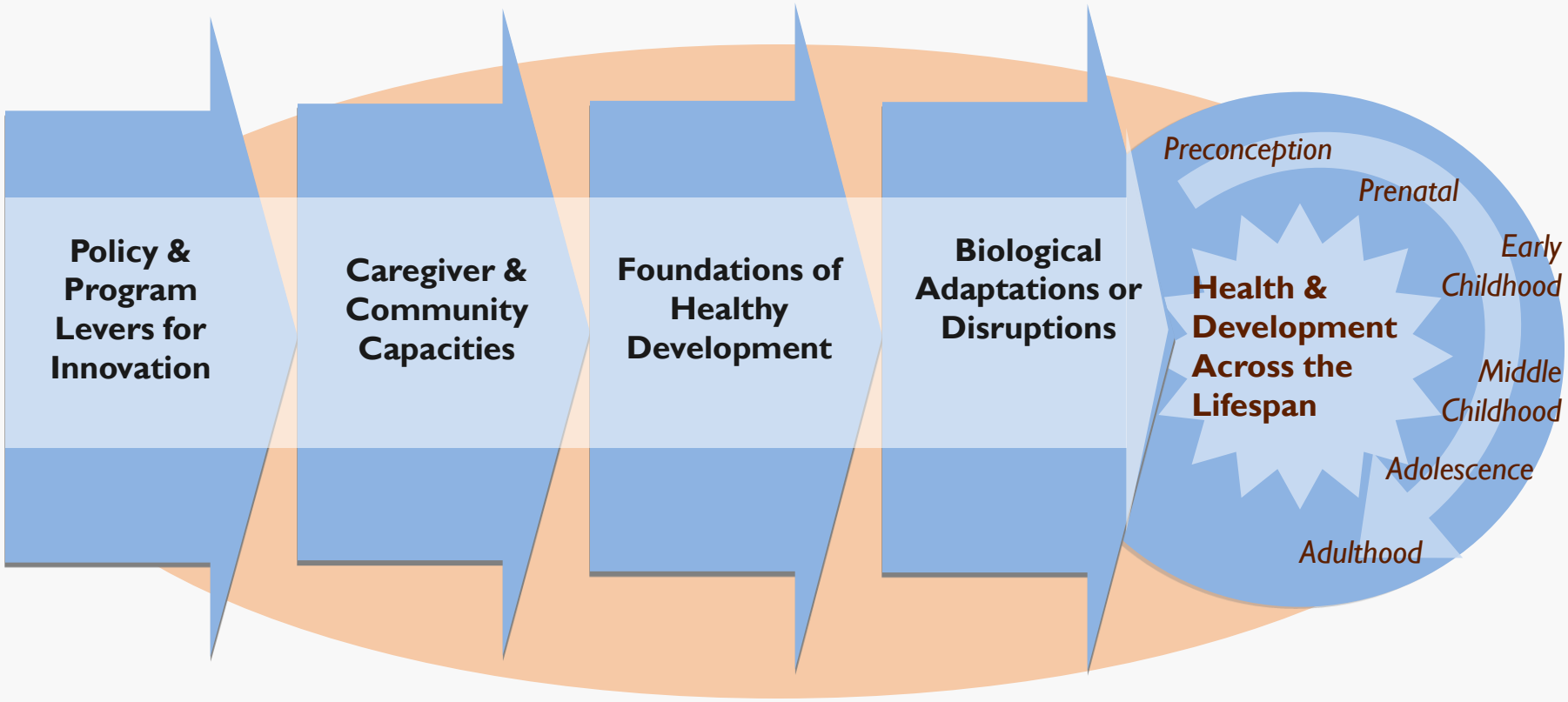
Current Conceptual Framework for Early Childhood Policy and Practice



Designing an Enhanced Framework that Balances Enrichment and Protection

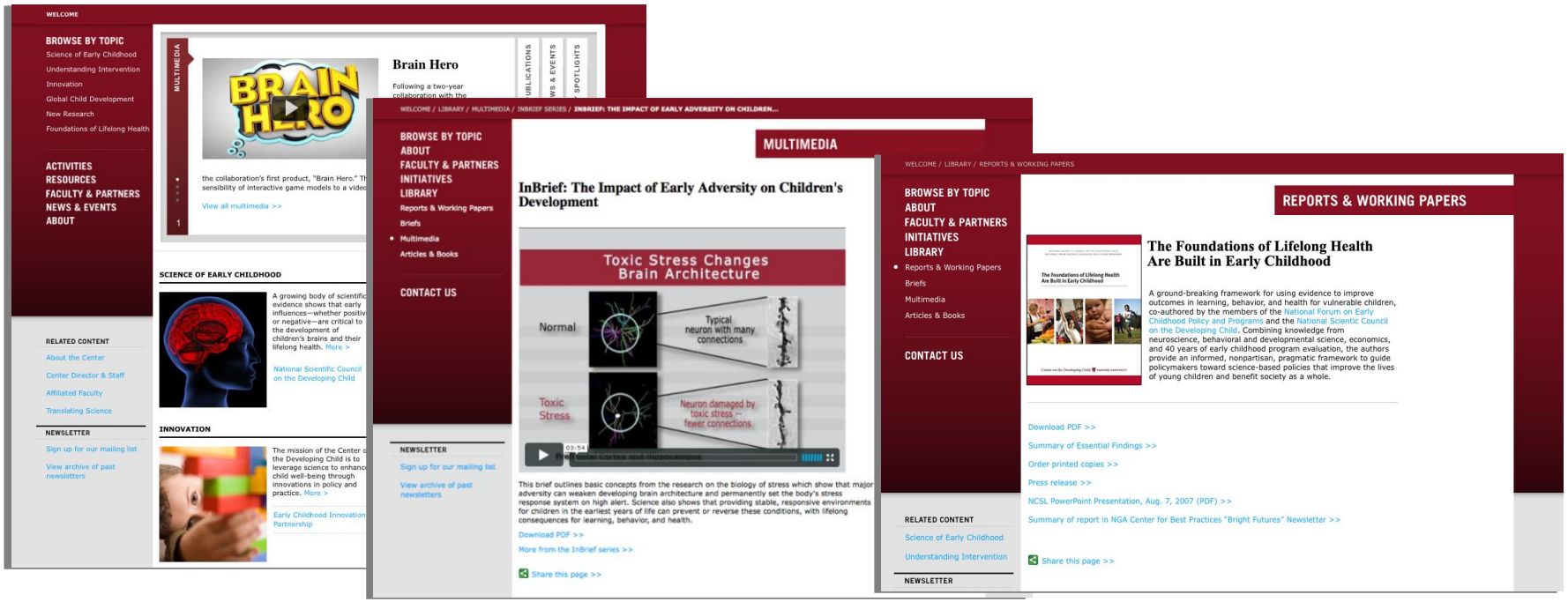


An Integrated, Science-Based Logic Model Could Inform More Effective Early Childhood Policies and Programs



Source: Center on the Developing Child (2010)

Center on the Developing Child
HARVARD UNIVERSITY



www.developingchild.harvard.edu