The Importance of Early Brain Development In Adult Productivity

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Working For Kids: Building Skills
The Foundations of Lifelong Success are Built in Early Childhood
Concerns about Dwindling Productivity and Economy

The accident of birth is the greatest source of inequality.
lower reading skills

lower math skills

smaller vocabulary

antisocial behavior

lower attention
tobacco use
drug use
alcohol
teen pregnancy
school drop out rates
petty crime
serious crimes
unemployment
addiction
incarceration
mental health issues
homelessness
Who pays the bill for this gap?
Rate of Return to Investment in Human Capital

- Prenatal programs
- Programs targeted toward the earliest years
- Preschool programs
- Schooling
- Job Training

Source: Heckman (2008)
Fragmented solutions don’t work —

Learning how experiences shape brain development is a more comprehensive strategy.
Four Core Concepts of Development

1. Brain Architecture Is Established Early in Life and Supports Lifelong Learning, Behavior, and Health

2. Stable, Caring Relationships and “Serve and Return” Interaction Shape Brain Architecture

3. Toxic Stress in the Early Years of Life (ACE’s) Can Derail Healthy Development

4. Resilience can be Built through “Serve and Return” Relationships, improving Self-Regulation, and Executive Functions, and Giving Children a Sense of Mastery.

HEALTHY CHILD DEVELOPMENT
MOTHER’S SPEECH AND CHILD VOCABULARY

Experience Shapes Brain Architecture by Over-Production Followed by Pruning
Neural Circuits are Wired in a Bottom-Up Sequence
(700 synapses formed per second in the early years)

Experiences Build Brain Architecture
Stable, caring relationships play a key role in building brains.
Serve & Return Relationships Buffer the Developing Brain

Working for Kids: Building Skills™
SUPPORTIVE ENVIRONMENTS FOR BRAIN DEVELOPMENT

CARE

SUPPORT

ENCOURAGE

Engagement
Self-Confidence
Interest
SUPPORTIVE ENVIRONMENTS FOR BRAIN DEVELOPMENT

SUPPORT

ENCOURAGE

ENGAGEMENT

SELF-CONFIDENCE

ABUSE

ANGER

NEGLECT
Early Life Stress Impacts Life-long Health

Health and Development Across the Lifespan

Preconception  Prenatal  Early Childhood  Middle Childhood  Adolescence  Adulthood

Biology of Health
- Physiological Adaptations or Disruptions
  - Cumulative Over Time
  - Embedded During Sensitive Periods
Sources of Toxic Stress in Young Children

- **Maltreatment**: 75 per 1,000 (Source: Finkelhor et al. (2005))
- **Postpartum Depression**: 130 per 1,000 (Source: O-Hara & Swain (1996))
- **Parental Substance Abuse**: 136 per 1,000 (Source: SAMHSA (2009))

**NEGLIGENCE**
What are the Long-term Impacts of Toxic Stress in Early Life?
Children with Developmental Delays

Significant Adversity Impairs Development in the First Three Years

Number of Risk Factors

Source: Barth, et al. (2008)
Risk Factors for Adult Substance Abuse Are Embedded in Adverse Childhood Experiences

Source: Dube et al. (2002)

Source: Dube et al. (2003)
Risk Factors for Adult Depression are Embedded in Adverse Childhood Experiences

Source: Chapman et al. (2004)
How does neglect impact the brain?

1. **Brain Architecture** is shaped by early life stresses.

2. **Gene Expression in the Brain** changes in response to stress exposure.

3. **Hormone Secretion** changes in response to stress exposure.

4. Early stresses change the **Way You See the World**.
Adverse Early Life Experiences Change How You See the World

Source: Pollak & Kistler (2002)
Toxic Stress Derails Healthy Development

Can We *Prevent* Long-term Health Impacts of Early Life Stress and Neglect?
Current Conceptual Framework

Significant Adversity

Healthy Developmental Trajectory

Impaired Health and Development

Parenting Education, Sound Nutrition, Stimulating Experiences, and Health-Promoting Environments
Protective Interventions Can Improve Life-long Health

Significant Adversity

New Protective Interventions

Healthy Developmental Trajectory

Parenting Education, Sound Nutrition, Stimulating Experiences, and Health-Promoting Environments
Capabilities that help with stress management

- Focusing Attention
- Problem Solving
- Planning Ahead
- Behavior Regulation
- Controlling Impulses
- Adjusting to New Circumstances

*Executive Function and Self Regulation*
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