The Core Story of Human Development

2.0

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The Foundation of a Successful Society is Built in Early Childhood

Healthy Economy
Strong Communities
Successful Parenting of Next Generation
Educational Achievement
Economic Productivity
Responsible Citizenship
Lifelong Health
HEALTHY CHILD DEVELOPMENT

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Building Healthy Brain Architecture – The Ingredients

- Takes more than having the right genes
- Takes the right, supportive experiences
- Experience literally writes on our genes, determining how well our genes work

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Early Experiences Leave Lasting Chemical “Signatures” on Genes

External Experience
Gene Regulatory Proteins
Epigenetic “Signature” Turns Gene On or Off

NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD
Experience Shapes Brain Architecture by Over-Production Followed by Pruning

(700 synapses formed per second in the early years)

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Neural Circuits are Wired in a Bottom-Up Sequence


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Human Infant is Unable to Provide Itself Adequate Stimulation for Normal Brain Development

Stimulation is Needed In Order for the Brain To Develop

The Brain Develops in the Context of Relationships

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Serve & Return Builds Brains and Skills

Young children naturally reach out for interaction through babbling, facial expressions, and gestures, and adults respond in kind.

These “serve and return” interactions are essential for the development of healthy brain circuits.

Therefore, systems that support the quality of relationships in early care settings, communities, and homes also support the development of sturdy brain architecture.

Barriers to Educational Achievement Emerge at a Very Young Age

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![Cumulative Vocabulary (Words)](Source: Hart & Risley (1995))
Poverty Affects the Development of Brain Architecture

It Takes More than Knowing Your Letters and Numbers to Be Ready For School

Hanson et al., 2013

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Higher Childhood Self-Regulation Predicts Better Adult Health

Source: Moffitt, et al. (2011)

Higher Childhood Self-Regulation Predicts Greater Adult Wealth

Source: Moffitt, et al. (2011)
Executive functioning is a group of skills that help us to focus on multiple streams of information at the same time, set goals and make plans, make decisions in light of available information, revise plans, and resist hasty actions.

- a key biological foundation of school readiness as well as outcomes in health and employability

### The “Air Traffic Control” System Develops Rapidly in Early Childhood


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<th>Birth</th>
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<td>Skill proficiency</td>
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Self-Regulation Can Be Undermined Through Experiences

- **Two pre-tasks**
  
  If you wait, I will bring you better crayons  
  If you wait, I will bring you more stickers  
  Standard Marshmallow Task  
  Half: Adult was trustworthy on the pretasks; half the adult renigged.

Kidd, Parmeri, & Aslin, 2013
The architecture of the brain is shaped by our experiences
Brain architecture develops in the context of relationships
Serve and Return provides the experiences that literally build the brain
Skills beget skills, simpler skills support later developing skills
A poor early foundation affects all that comes after
The achievement gap begins early in life
Experiences shape our abilities to regulate our own behavior

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.
Sources that can Produce Toxic Stress in Young Children

- **Risk Factors**
  - Neglect
  - Abuse
  - Exposure to Violence
  - Parental Mental Illness
  - Parental Substance Abuse
  - Homelessness/High Mobility
  - Death of parent
  - Incarceration of Parent
  - Etc.
Significant Adversity Impairs Development in the First Three Years

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

Source: Barth et al. (2008)

Source: Dong et al. (2004)
The Childhood Roots of Health Disparities: How Adversity is Built Into the Body

Conception

Adulthood

Early Childhood

Middle Childhood

Adolescence

Early Adversity

Biological Embedding during Sensitive Periods

Physiological Disruption

• Neurodevelopmental
• Immune
• Metabolic
• Neuroendocrine
• Cardiovascular

Disease/Disorder

Health-Threatening Behavior

Low Educational Achievement

Cumulative Burden over Time

Toxic Stress

Environmental Exposures

Malnutrition

Early Death

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Same Risk Factors

Different Outcomes

National Scientific Council on the Developing Child
Ann Masten’s List of Resilience Factors

- Effective Caregivers (good serve and return)
- Connections to other competent and caring adults
- Problem-Solving Skills (Air Traffic Control System)
- Positive beliefs about the self
- Spirituality, faith and religious affiliation
- Socioeconomic advantages
- Prosocial, competent peers and friends
- Effective teachers and schools
- Safe and effective communities

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How Can We Act On the Science?

Intervene Early Because the Brain Becomes Less Plastic With Development

Source: Levitt (2009)
Research Says that Remediation and Prevention ARE Possible

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Keys to Healthy Development

A balanced approach to emotional, social, cognitive, and language development, starting in the earliest years of life.

Supportive relationships and positive learning experiences that begin with parents but are strengthened by others outside the home.

Highly specialized interventions as early as possible for children and families experiencing significant adversity.
Effective Services Improve Relationships and Environments

Rigorous program evaluation research combined with improved scientific understanding of how children develop can help us make better decisions about which programs and policies are smart investments.

Low cost services that have little impact are a waste of money. Responsible investments focus on effective programs that are staffed appropriately, implemented well, and improved continuously.

Preventive Intervention is More Efficient and Produces Higher Returns than Later Remediation

Heckman, J. (2007)
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http://www.developingchild.net
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