The Essential Ingredient for Success of Our Children and the Local Economy: Early Brain Development

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The Foundations of Prosperity and Sustainability Begin in Early Childhood

The healthy development of young children provides THE strong foundation for healthy and competent adulthood, responsible citizenship, economic productivity, strong communities, and a just and fair society.
States (and countries) with low child achievement are falling off the economic cliff
Policy Changes - What Can They Mean?

Reduce special needs populations; increase emotionally sound, learning-ready children with sound Executive Function

Invest Early

Major increase in human capital via ready workforce

It’s

Patriotic
The Core Story

#1 - Child development is the foundation of prosperous communities

#2 - Brains are built over time, from the bottom up (*simple skills beget more complex skills*)

#3 - Genes and experiences together build brains (*serve and return* relationships)

#4 - Cognitive, social and emotion development are inextricably intertwined - *skill ropes*

#5 - *Toxic stress* damages *brain architecture*

#6 - *Resilience* is not an internal character strength, but rather is built through combined impact of genes and experiences of a child
#7 - For many functions, the brain’s capacity for change decreases over time (cost-effective factor) - **but not all functions are impacted equally**

Source: Levitt (2009)
Dramatic Growth of Neuronal Architecture - Birth - 2 yrs

(1-2 million synapses formed per second in the early years)

Courchesne et al, Neuron 56, 2007
Experience Shapes Brain Architecture by Over-Production Followed by Pruning Through Childhood
Interaction as Serve and Return
The Word Gap - Ingredients of Learning Language

“serve and return”

“attention”

“high motivation”

Cumulative Vocabulary (Words)

Child’s Age (Months)

College Educated Parents
Working Class Parents
Public Assistance Parents

16 mos. 24 mos. 36 mos.
Powerful experiences, no matter what kind (+/-), matter
Neglect is the Most Prevalent Form of Child Maltreatment

- Neglect
- Physical Abuse
- Other
- Sexual Abuse
- Psychological Maltreatment
- Medical Neglect

U.S. Dept. Health and Human Services, 2010
Early Executive Function Disruption - Long Term Impact

The Dunedin Study (New Zealand)

Poor Health Outcomes
(cvd, cancer, diabetes, immune, mental illness)

low ‘EF’       high ‘EF’

Moffitt et al PNAS 2011
Early Executive Function Disruption - Long Term Impact

The Dunedin Study (New Zealand)

Credit Rating Score

low ‘EF’

high ‘EF’

Moffitt et al PNAS 2011
A Major Challenge:

ELS Can Have an Impact Across Generations
DNA Methylation

Active Gene

Silenced Gene
Multiple phenotypes from a common genotype

Every cell in your body has the same nuclear genes, but...?
Genes involved in activation of stress responses
Children need to grow up in an environment of relationships that promote critical skill-building.
Early Disruption of Executive Function = Long term, Expensive Problems
Executive Function

The weaving of skill ropes - social, emotional and cognitive development

- Inhibitory control
- Working memory
- Mental flexibility
Who wants to hire him, or any of the children in that preschool class?
Let’s Test Your Executive Function

“Say the name of the color that the word is printed in”
Red
Green
Black
Blue
You do EF Tasks Everyday
The 3 Principle Ingredients to Improve Outcomes

- Support Responsive Relationships
- Strengthen Core Life Skills
- Reduce Sources of Stress

Children
- Healthy Development & Educational Achievement

Adults
- Responsive Caregiving & Economic Stability
Albert Einstein Got It Right

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

Shonkoff, Center for the Developing Child, Harvard
Investment Strategies That Work

• Plan from pregnancy and look beyond education and health care

• Invest in the training and retention of a skilled workforce in early childhood programs

• Make sure that vulnerable children have access to stable, supportive relationships with adults - as early and consistently as possible

• Targeting Executive Function in children AND caregivers - BIG bang for the buck
Thank You!

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