

NATIONAL SCIENTIFIC COUNCIL ON THE DEVELOPING CHILD

The Impact of Toxic Stress on Brain Development and Health

Megan R. Gunnar, Ph.D.
Regents Professor and Distinguished McKnight University Professor
Institute of Child Development
University of Minnesota

USC School of Cinematic Arts
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The Foundations of Prosperity and Sustainability Begin in Early Childhood

The healthy development of young children provides a strong foundation for a healthy and competent adulthood:

- responsible citizenship,
- economic productivity,
- competent parenting of the next generation

By extension, ensuring the healthy development of children, supports strong communities, and a just and fair society.

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Building Healthy Brain Architecture – The Ingredients

Our genes, and ultimately our developing brain architecture, are influenced powerfully by positive early experiences—and negative ones, too.

Genes provide the hardware, but early experience is the software that drives the system.

Four Numbers to Remember

700 per second

18 months

90-100 percent

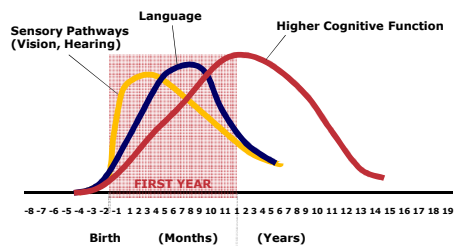
3:1 odds

Experience Shapes Brain Architecture by Over-Production Followed by Pruning (700 synapses formed per second in the early years)



birth

Neural Circuits are Wired in a Bottom-Up Sequence



Interaction as Serve and Return

Healthy development of brain architecture depends on interaction experts call **Serve and Return**, based on games like tennis and volleyball.

Young children instinctively reach out for interaction, through babbling, facial expressions, words, gestures, cries, etc. and adults respond by getting in sync and doing the same.

Serve and Return works best with adults who are familiar to the child, like familiar partners. It affects everything in the brain from the chemicals to physical structures and connections.

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



Four Numbers to Remember

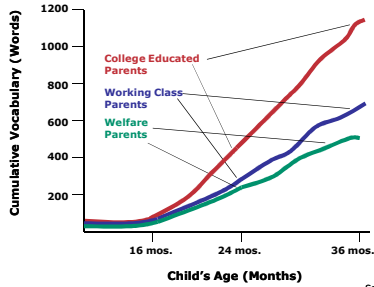
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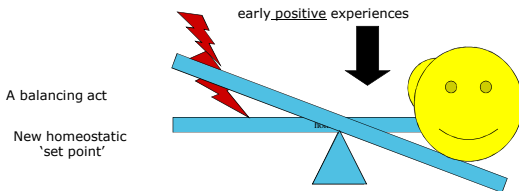
3:1 odds

Barriers to Educational Achievement Emerge at a Very Young Age



Source: Hart & Risley (1995)

Experiences in childhood have a lasting impact on how our fear and anxiety systems work



Early Childhood Adversity Can Influence a Range of Lifelong Outcomes

Research on the biology of stress helps explain some of the underlying reasons for differences in learning, behavior, and high risk for physical (cardiovascular disease, diabetes), and mental health disorders.

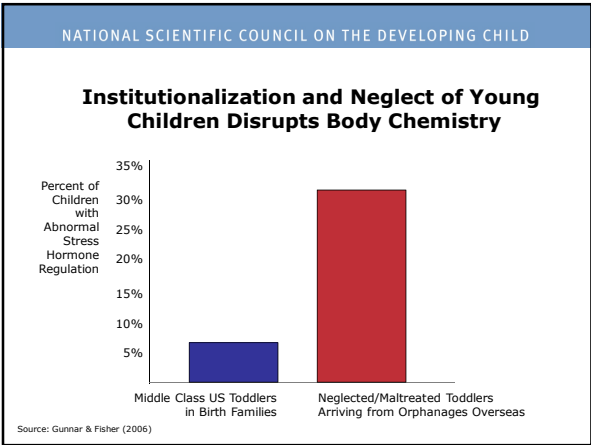
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Experiences in childhood have a lasting impact on how our fear and anxiety systems work

A balancing act

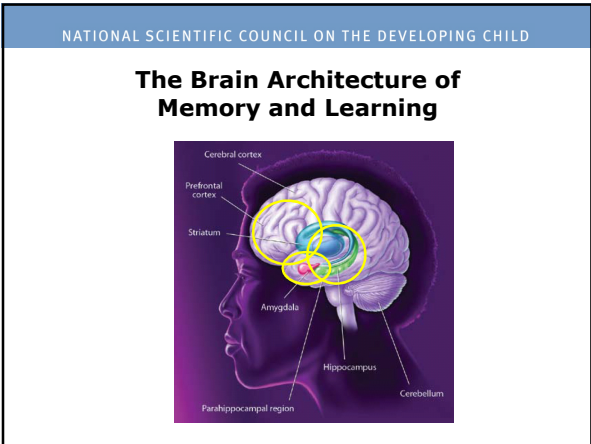
New homeostatic 'set point'

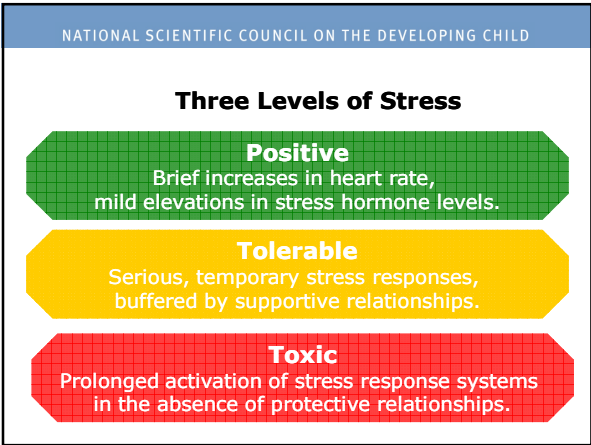
early negative experiences

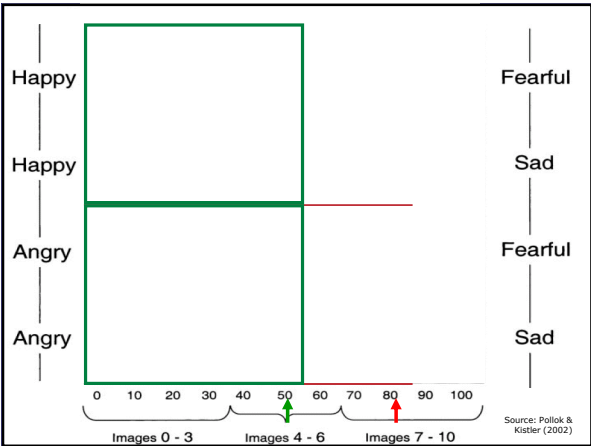


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The Brain Architecture of Anxiety and Fear









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Sources of Toxic Stress in Young Children

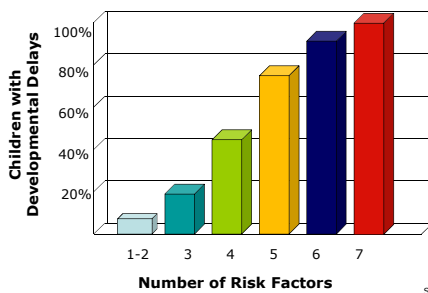
- **Risk Factors**

Neglect
Abuse
Exposure to Violence
Parental Mental Illness
Parental Substance Abuse
Homelessness/High Mobility
Death of parent
Incarceration of Parent
Etc.



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Significant Adversity Impairs Development in the First Three Years





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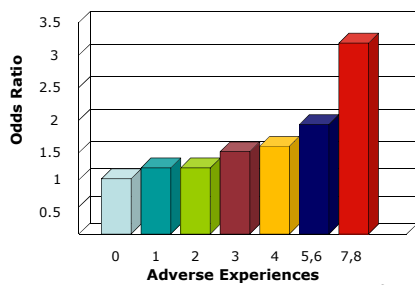
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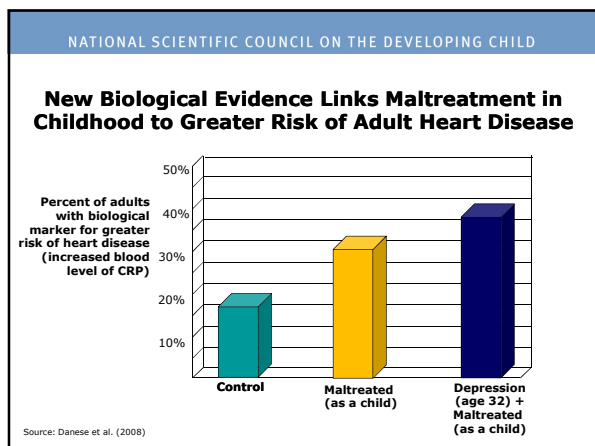
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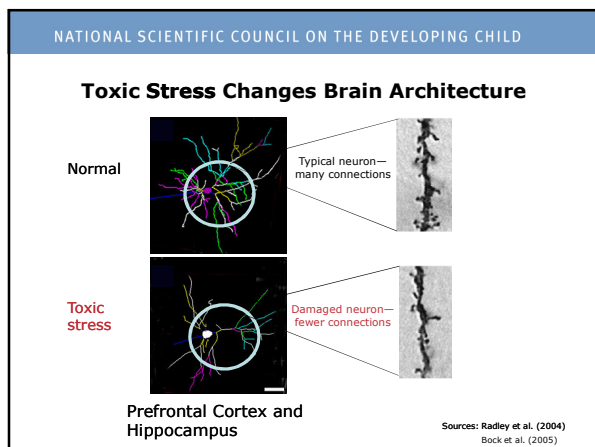
Adverse Childhood Experiences (ACEs)
early in life contribute directly to the risk
for long-term physical and mental health.

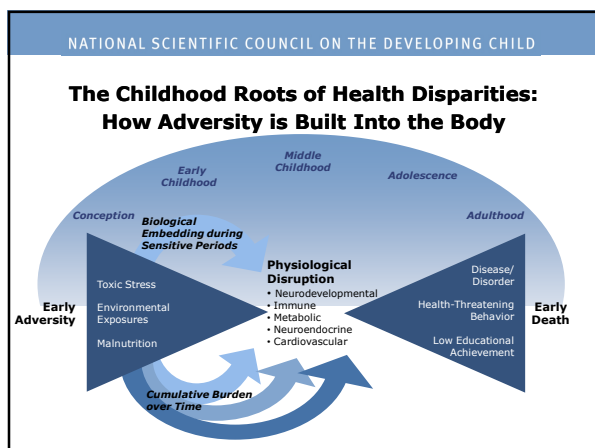
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Risk Factors for Adult Heart Disease are Embedded in Adverse Childhood Experiences



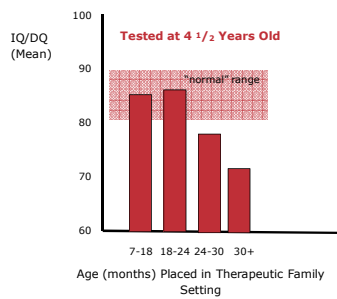






**Research Says that
Remediation and Prevention
ARE Possible**

**Delayed Intervention Harms Development
Bucharest Early Intervention Program**



**How Should We Act
On the Science?**

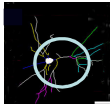
Keys to Healthy Brain Development

Supportive relationships and positive learning experiences that begin in the home but can be strengthened by outside assistance when families need help.

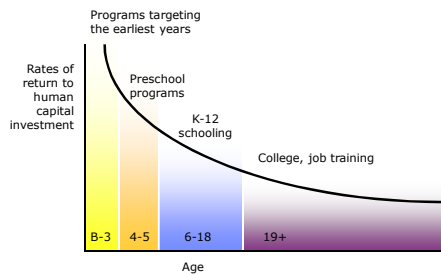


A balanced approach to emotional, social, cognitive, and language development.

Highly specialized interventions as early as possible for children and families experiencing significant adversity.



Preventive Intervention is More Efficient and Produces More Favorable Outcomes Than Later Remediation



Heckman, J. (2007)

Building a New Science-Based Approach to Promoting Health and Preventing Disease

A healthier population begins with reducing toxic stress in early childhood, not just trying to change adult behavior.

Early childhood intervention programs can be a vehicle for enhancing lifelong health, not just preparing children to succeed in school.

A redesigned child welfare system could improve health outcomes by promoting positive relationships and adaptive development, not simply focusing on physical safety and custody.

Maximizing Return on Investment

The basic principles of neuroscience indicate that later remediation will be more costly than preventive intervention in the first years of life.

Brains: more physiological energy needed to compensate for poorly formed neural circuits.

Society: higher cost of remedial education, clinical treatment, crime.

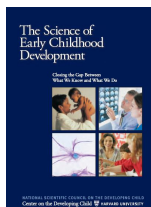
Think Broadly About Children's Environment of Relationships

Plan from pregnancy to kindergarten, and look beyond education and health care.

Invest in the development and retention of a skilled early childhood workforce.

Make sure vulnerable children have access to stable, supportive relationships with adults—as early and as consistently as possible.

PRESENTED BY MEGAN R. GUNNAR
Regents Professor and Distinguished McKnight
University Professor
Institute of Child Development
University of Minnesota
gunnar@umn.edu



<http://www.developingchild.net>
<http://www.developingchild.harvard.edu>

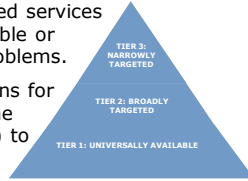
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NATIONAL FORUM ON EARLY CHILDHOOD PROGRAM EVALUATION

Science Points Toward a 3-Tiered Approach to Ensuring Healthy Development

3: Narrowly targeted, specialized services for children experiencing tolerable or toxic stress to prevent later problems.

2: Broadly targeted interventions for children in poverty (e.g., income supports and early enrichment) to give all the chance to succeed.

1: Basic health services and early care and education available to all children to help build and sustain strong brains and bodies.



Sources of Toxic Stress in Young Children

