

How Early Experiences Shape Brain Architecture

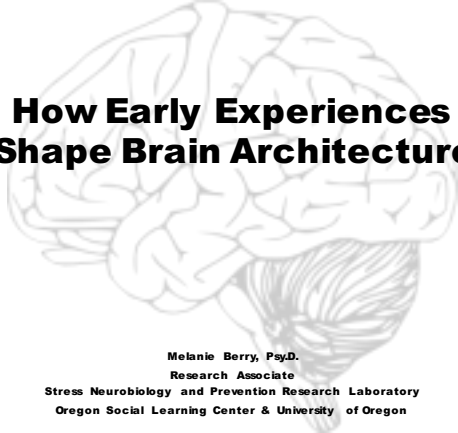
Melanie Berry, Psy.D.

Research Associate

Stress Neurobiology and Prevention Research Laboratory

Oregon Social Learning Center & University of Oregon

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Acknowledgements




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THREE CORE CONCEPTS IN EARLY DEVELOPMENT


Core Concept #1

Early experience builds brain architecture.

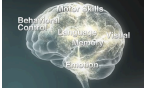
Early Experience Builds Brain Architecture

Three Core Concepts in Early Development



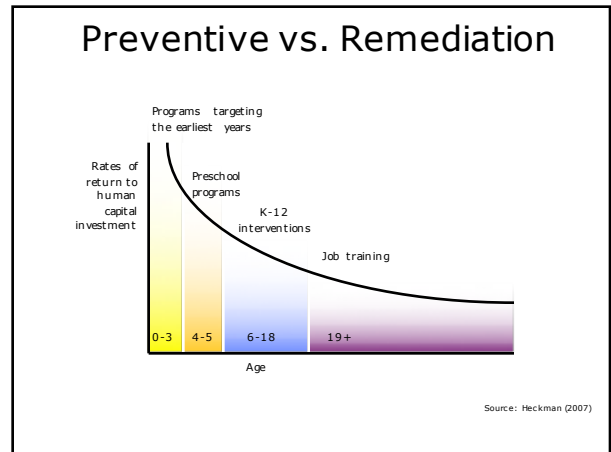
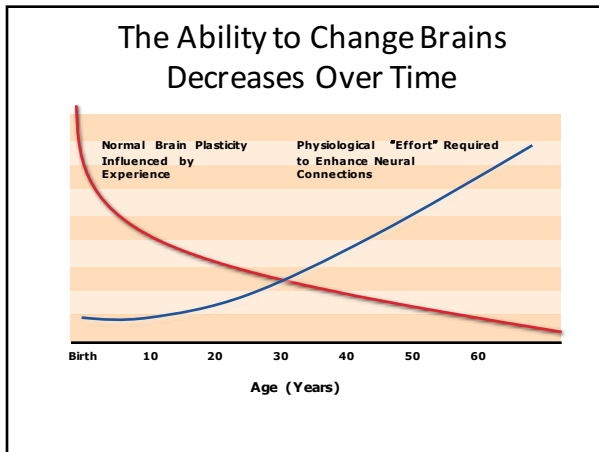
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Early experience builds brain architecture



- Genes are the blueprint but experience is like the carpenter
- Together, they establish a weak or sturdy foundation

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Reflection

- How does the idea that early experience builds brain architecture relevant to your work?
- Why is this important? What are the implications for kids, parents, service providers, researchers and legislators?

Core concept #2

Caregiver-child interaction shapes brain circuitry.

Caregiver-child Interaction Shapes Brain Circuitry

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2 Serve & Return Interaction Shapes Brain Circuitry

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Serve & Return interaction shapes brain circuitry

- Children *serve*
- Caregivers *return* their serves
- This back and forth is key to wiring the brain
- Works best within a trusting relationship
- Occurs inside and outside the home

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Reflection

- Think an examples of serve and return interaction.
- Think of a child who experiences plenty of Serve & Return.
- Think of a child who does not.

Core Concept #3

Toxic stress derails healthy brain development.


Toxic Stress Can Derail Healthy Brain Development

Three Core Concepts in Early Development

3 Toxic Stress Derails Healthy Development

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Toxic stress derails healthy development



- When we are stressed, our bodies activate physiological response
- Short lived stress can promote growth
- Toxic stress can weaken the architecture of the developing brain

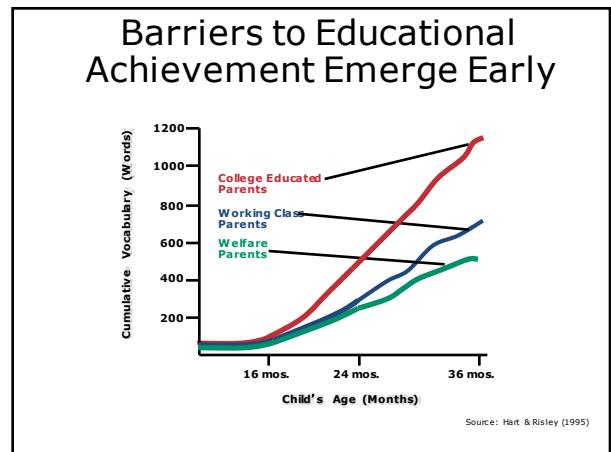
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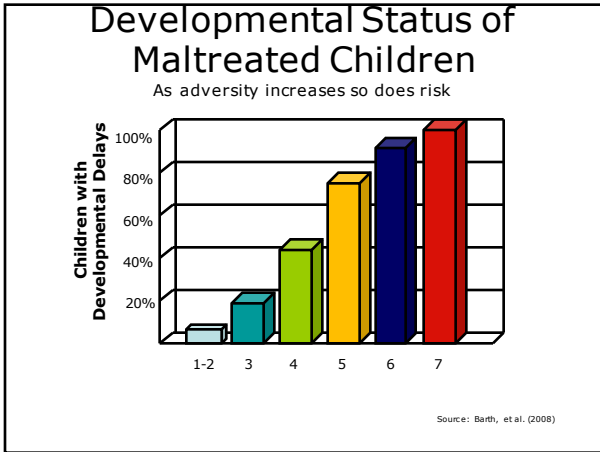
The Biology of Adversity: Three Levels of Stress

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.





Executive Functioning

- EF is an important group of skills that children need to succeed
- Include inhibitory control, working memory and cognitive flexibility
- EF skills are built over time
- EF skills are linked to important outcomes
- Critical factors that shape children's EF skills include relationships, activities and places
- Toxic stress can negatively impact EF skills development

Reflection

- Do you serve families who experience toxic stress? What does toxic stress look like for them?
- In your experience, how does adversity and toxic stress impact development?

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.

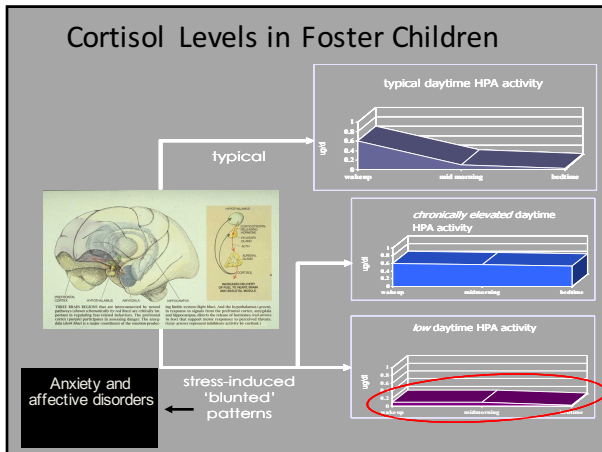
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SNAP Lab Research

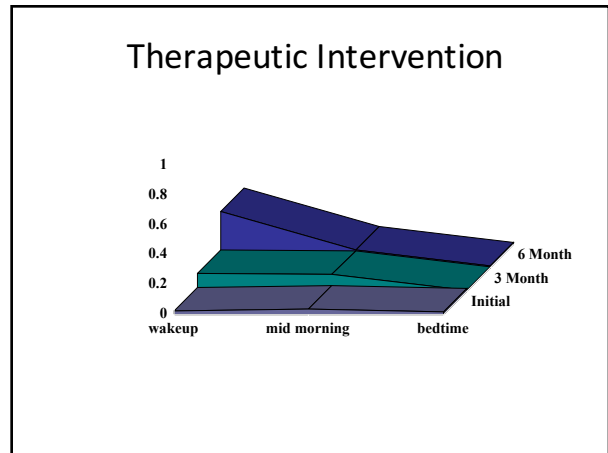
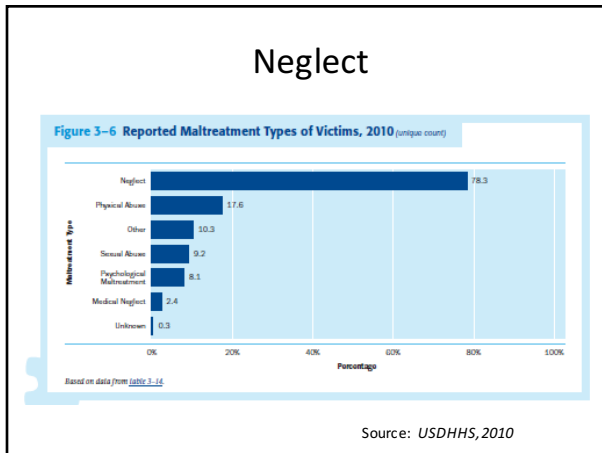
- Specific effects of toxic stress
- Brain plasticity

The HPA Axis

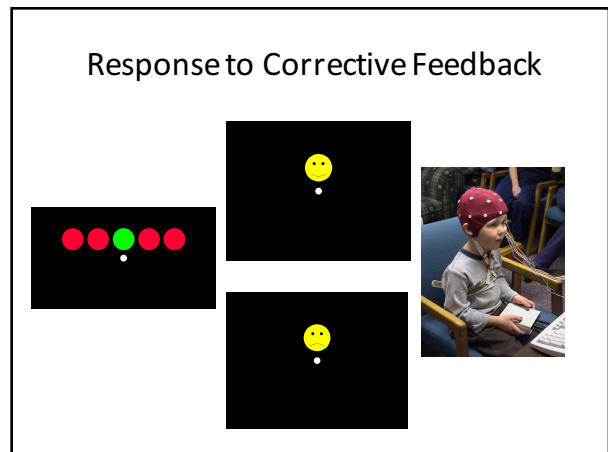
- Hypothalamic-pituitary-adrenal axis
- Part of the neuroendocrine system
- Involved in stress regulation and other bodily processes (digestion, immune system, mood)
- Cortisol plays an important role

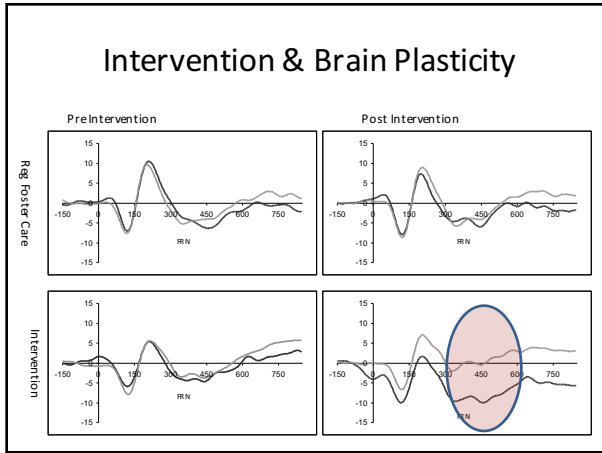
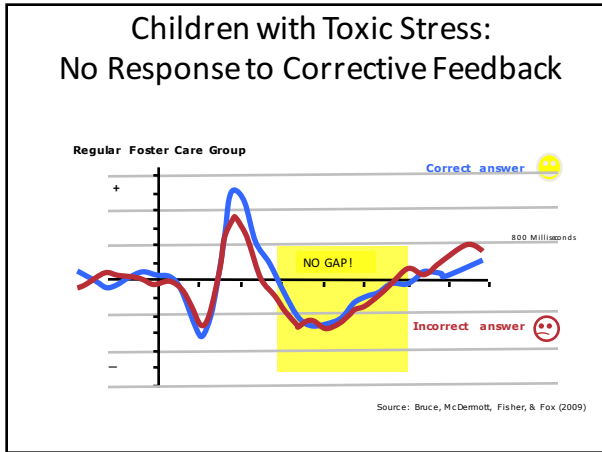
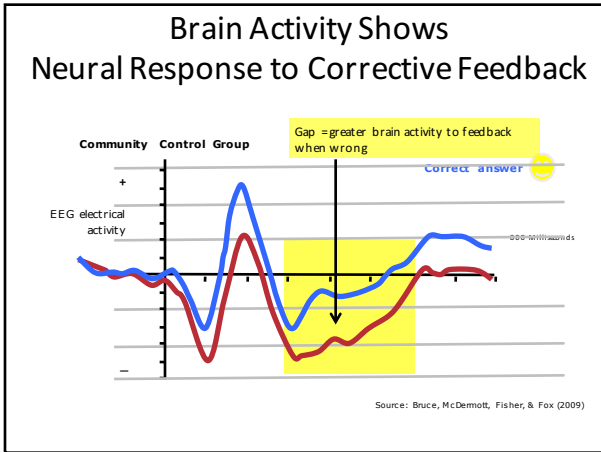


- ### Low Cortisol in Foster Children
- Is associated with neglect (i.e. the failure of *Serve & Return*)
 - The same pattern of cortisol activity has been observed in other studies of foster children and in internationally adopted children
 - Important: Low cortisol levels are NOT the result of physical or sexual abuse



- ### Reflection
- Does it surprise you that kids in foster care showed an atypical pattern of cortisol levels?
 - Is it surprising that those patterns normalized after six months of treatment?
 - What are the implications?





The Good News

Some Toxic stress effects can be overcome with systematic and well-timed family based interventions

Reflection

- Based on your experience working with kids and families, what do you think of these findings?



In Conclusion



- Early experience shapes brain architecture
- Especially, early caregiver-child interaction
- Toxic stress can derail brain development
- But these effects can be overcome by well timed, family based intervention.

Online Resources

- Harvard Center on the Developing Child
– <http://developingchild.harvard.edu/>
- Stress Neurobiology and Prevention Lab
– <http://pages.uoregon.edu/snaplab/SNAP/Welcome.html>



Thank You

melanieb@oslc.org