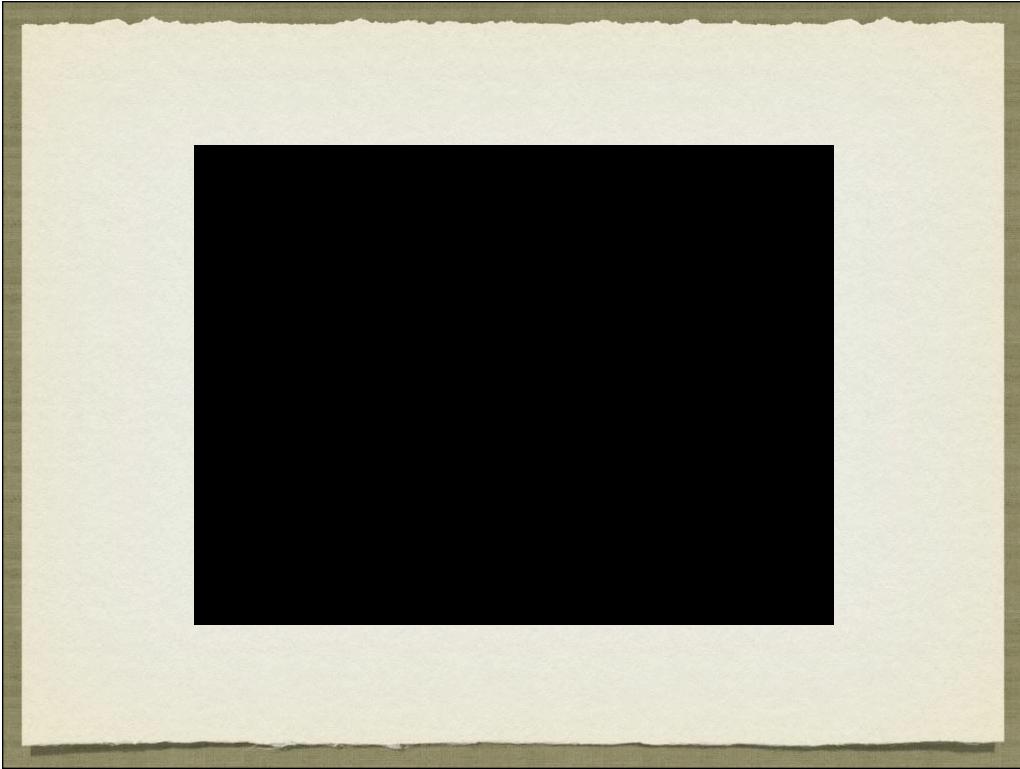
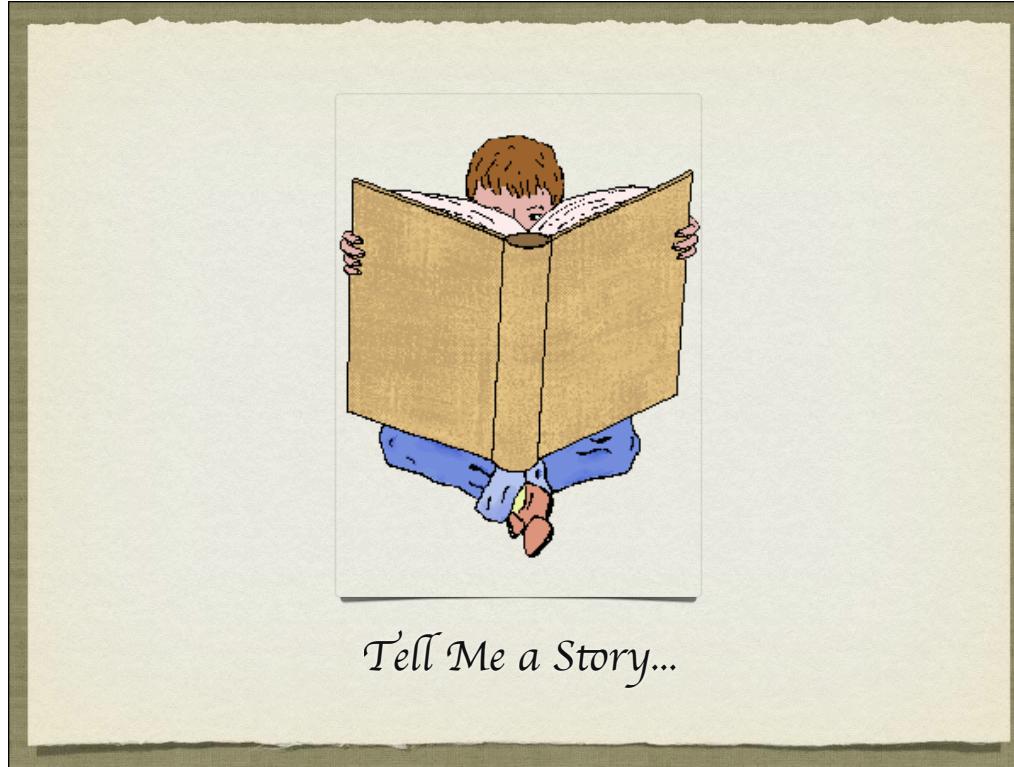




BRAIN DEVELOPMENT

The Core Story





When a decision making heuristic - or rule of thumb - is presented to us without a context, we cannot decide the validity of the rule we have heard, nor do we know where to store this rule in our memories. Thus, what we are presented with is both difficult to evaluate and difficult to remember, making it virtually useless. People who fail to couch what they have to say in memorable stories will have their rules fall on deaf ears despite their best intentions and despite the best intentions of their listeners. Roger Shank

What is brain development? How does it happen? What can derail healthy brain development? What does it mean? Recommendations, ideas & strategies fall on deaf ears if the core story hasn't been told. So, no matter who you are or what you do - if you want to change minds or change behavior, begin with learning to tell the core story well.

*BRAINS NEED A
STURDY
FOUNDATION*



The brain is built from the bottom up – first basic circuits are built for basic skills like sensory and motor skills. Then more complex circuits are built on top of those basic circuits – for things like language and higher order cognition. Skills beget skills. Brain development is like building a house, you have to have a sturdy foundation before the plumbing and wiring etc. If that doesn't happen, it doesn't mean there is nothing we can do – it just means it will be harder and more expensive to fix later on.

Early Experience Matters

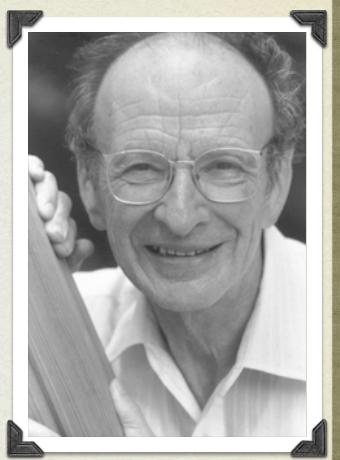


The core story of healthy brain development really is the story of love. It is the story of how caring relationships have a central role in all aspects of development including brain development. You cannot tell the core story without talking about relationships. Human infants have literally been bred to form powerful emotional ties to caring adults. It is a survival strategy shared by most mammals because evolution has favored animals that protect their young. We are herding animals. We are hard wired to seek out relationships and form very powerful emotional ties from the first minutes and hours of existence.

RELATIONSHIPS ARE THE 'SECRET SAUCE'

*“Somebody’s got to be crazy
about that kid. That’s
number one. First, last, and
always.”*

Urie Bronfenbrenner



in order to develop normally, a child requires progressively more complex joint activity with one or more adults who have an irrational emotional relationship with the child. Somebody's got to be crazy about that kid. That's number one. First, last, and always.

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THE POWER OF RELATIONSHIPS



U.S. School for Indians at Pine Ridge, S.D.

WHAT IS THE BABY'S JOB?



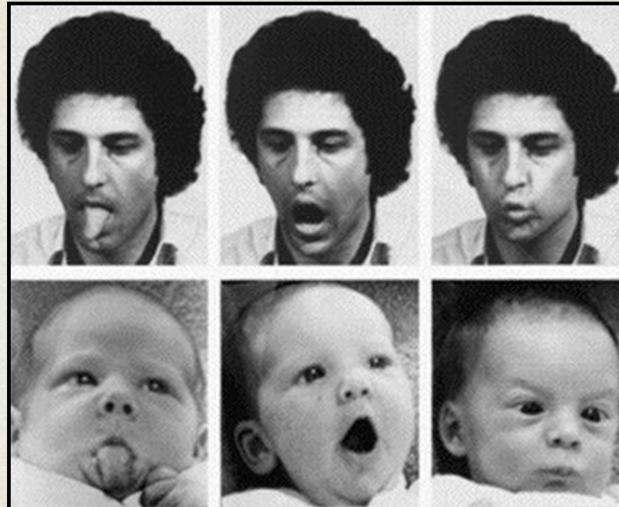
Child development can be thought of as the baby's job. All infants have an important job to do and not much time to do it. Their job comes in three parts: as we talked about already, job one is to forge strong emotional ties, infants cannot survive 10 minutes without a relationship with at least one committed adult. Two – babies must learn about and explore their environment – basic cognitive and motor skills. But there is a third task babies must learn to accomplish – infants must learn how to regulate their emotions, attention and behavior. This part is often overlooked, but it is just as essential as learning to walk. Most parents can remember their child's first steps, or first words, but how many of us remember when our child learned to share, or take turns, or suppress an impulse?

Two Sides of the Same Coin



Brain development is integrated, you can't do one part well if the other parts are ignored. No matter how intellectually gifted a child might be, he cannot reach his full potential if his emotional needs are not met. So really, children's mental health and healthy child development are really two sides of the same coin. If you work in child development, you work in children's mental health, and vice versa.

BRAIN DEVELOPMENT DEPENDS ON EXPERIENCE



So we know what healthy development is – it is the baby's job. And we know that healthy brain development is integrated, you can't do one part well if the other parts are ignored. So how does it happen? It is the tiny, minute and seemingly inconsequential interactions between parents and children that shape and sculpt the developing brain.



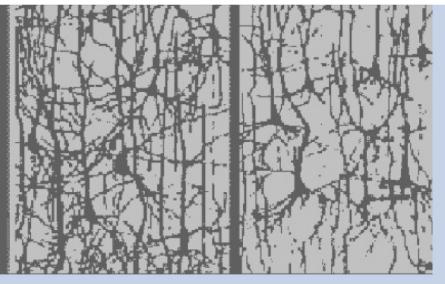
about 3/4 of brain development is occurring somewhere between the third trimester of pregnancy and the 3 or 4th birthday, although the brain isn't fully mature until much later – even into early adulthood. Between birth and adulthood the brain triples in size. It is not so much new neurons or brain cells that are forming but the tiny intricate connections between the brain cells – called synapses that are forming at a fantastic rate – 700 new synapses every second

Synapse Formation and Pruning

BIRTH



6 YEARS OLD



14 YEARS OLD



Photo: H. Chugani, from Shore, 1997, *Rethinking the Brain*

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Then the process of pruning occurs – based on experiences.





Every Story Has a Villain

THE STRESS RESPONSE

*The Amygdala is like
the baby's 911
operator*

Mom is on speed dial



The amygdala are almond shaped structures that lie deep in the part of the brain called the limbic system – and have a role in formation and storage of emotional memories – particularly fear. It triggers a whole host of reactions in the body – heart rate, respiration, stress hormones, etc.

TOXIC STRESS

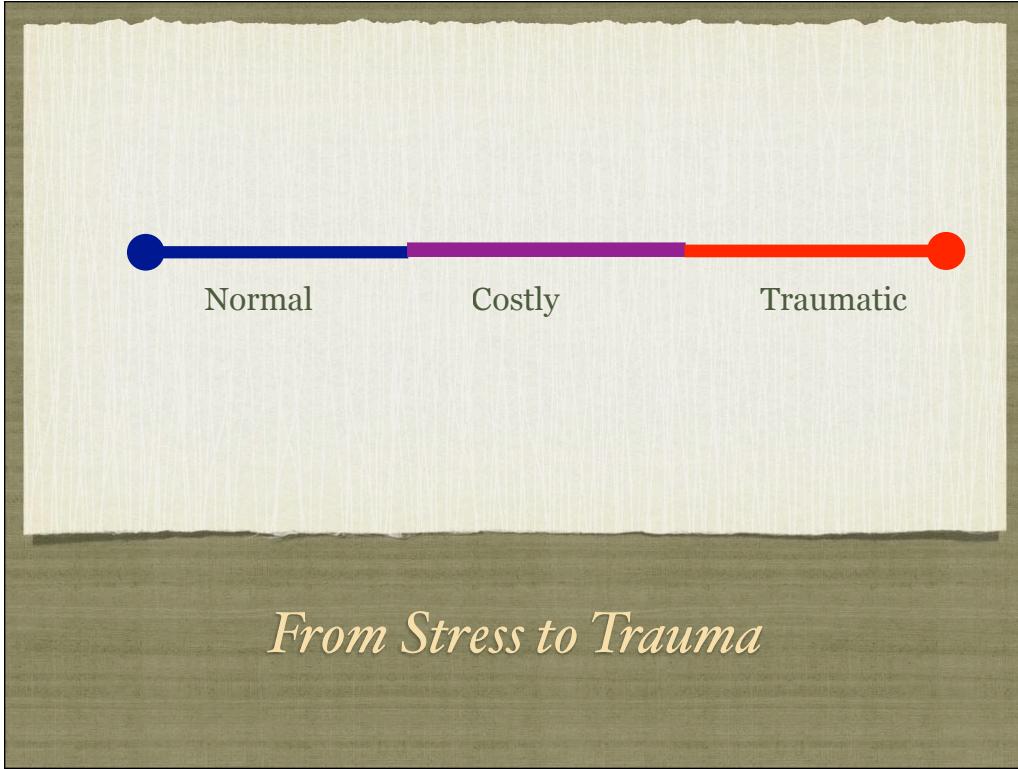
Uncontrollable

Unpredictable

Pervasive



See lecture by Dr. Matthew Hill, Postdoctoral Fellow Laboratory of Neuroendocrinology at The Rockefeller University – Alberta Family Wellness



Stress and the Body



Hobbs et al, Child Abuse and Neglect: Clinician's Handbook, 1999

Chapter Index



Chapter 1



Chapter 2



Chapter 3



Chapter 4: Milk Taste Experiment

Main Menu

Chapters 5 - 10

THE UPSTAIRS
BRAIN
&
THE
DOWNSTAIRS
BRAIN



The Upstairs Brain: Executive Functioning

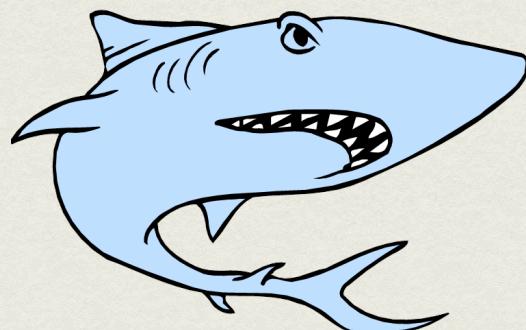
Working Memory
Cognitive Flexibility
Inhibitory Control



Stress and Executive Functioning



The Downstairs Brain: Shark Music





TARGETING THREE CRITICAL NEEDS



Children who have been traumatized have 3 critical needs

- 1 They do not have the neural pathways to regulate their emotions attention or behaviour the way we expect them to
- 2 They give puzzling cues – they look angry when they are frightened, they look contented when they are stressed, they look independent when they are needy
- 3 They provoke a negative reaction from peers, teachers and caregivers – reinforcing cycle

HOW TO BUILD A BETTER BRAIN: RELATIONSHIPS ARE THE KEY

Who is crazy about that kid?

Who is that kid crazy about?

Can we support that
relationship?

Can we protect the developing
brain from toxic stress?





SYMPOSIA SIGN-IN ABOUT CONTACT

For Researchers & Faculty | For Healthcare Professionals | For Front-Line Professionals | For Policy Makers | For P

THE INITIATIVE ▾

BRAIN DEVELOPMENT & ADDICTION ▾

PROGRAMS ▾

NEWS & EVENTS ▾

R

Welcome to the Alberta Family Wellness Initiative

Where Science Meets Real Life.

FEATURED RESOURCES AND VIDEOS



Leveraging Science to Shape



2011 Early Brain & Biological



2010 Recovery from Addiction



Organizational

WELCOME

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Science of Early Childhood

Understanding Intervention

Innovation

Global Child Development

Foundations of Lifelong Health

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MULTIMEDIA

NEW VIDEO SERIES

Three Core Concepts in Early Development



1. Experiences Build Brain Architecture
2. Serve & Return Interaction Shapes Brain Circuitry
3. Toxic Stress Derails Healthy Development

This new, three-part video series from the Center and the [National Scientific Council on the Developing Child](#)

SCIENCE OF EARLY CHILDHOOD



A growing body of scientific evidence shows that early influences—whether positive or negative—are critical to the

UNDERSTANDING INTERVENTION



Early childhood program evaluation studies indicate that it is possible to improve outcomes for vulnerable

THANK
YOU!

