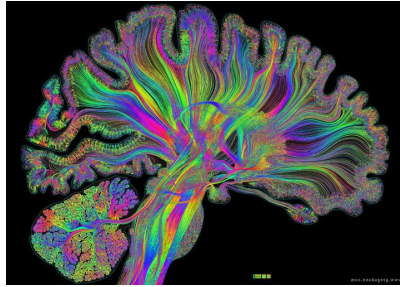


HOW TO BUILD A BRAIN

(AND THE BEST LITTLE PEOPLE!)



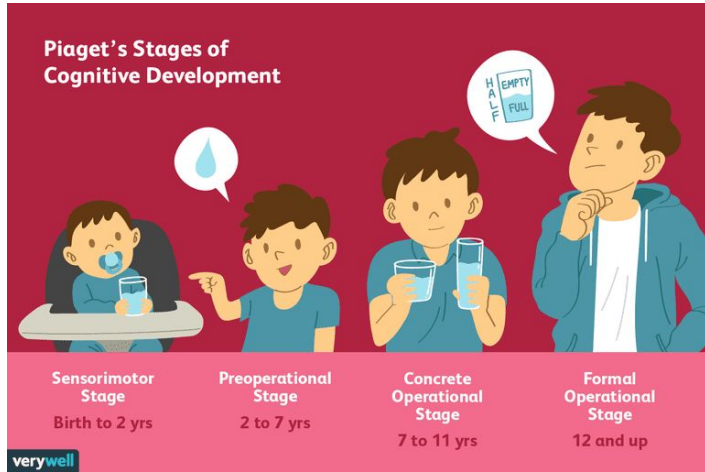
Raleigh Marmorstein, Ed.S., NCSP
School Psychologist
San Juan BOCES

OUTCOMES

1. Gain knowledge about child development principles
2. Gain knowledge about brain development and research
3. Understand the ways adults can influence children's brain development for a lifetime of learning

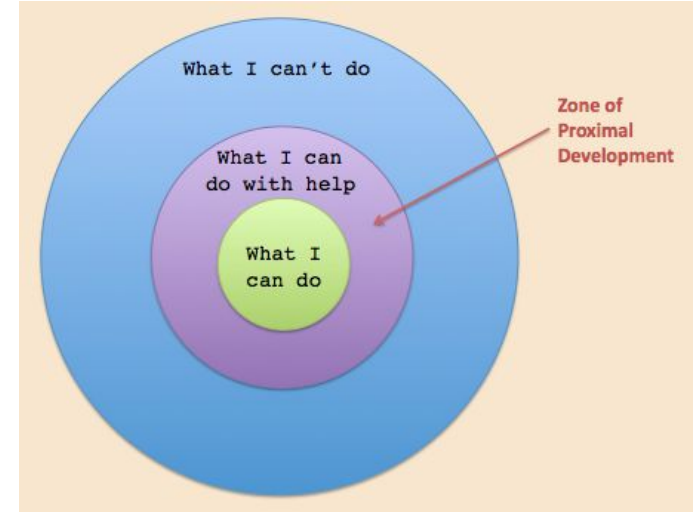
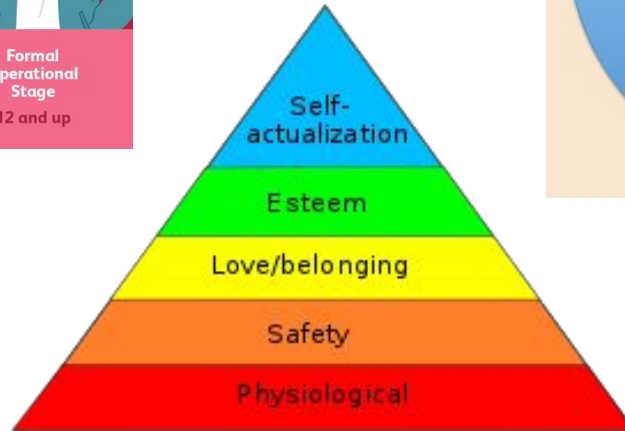
CHILD DEVELOPMENT PRINCIPLES

THERE'S LOTS OF IDEAS ABOUT DEVELOPMENT



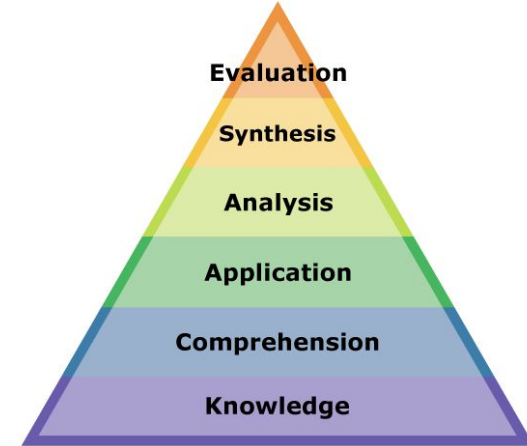
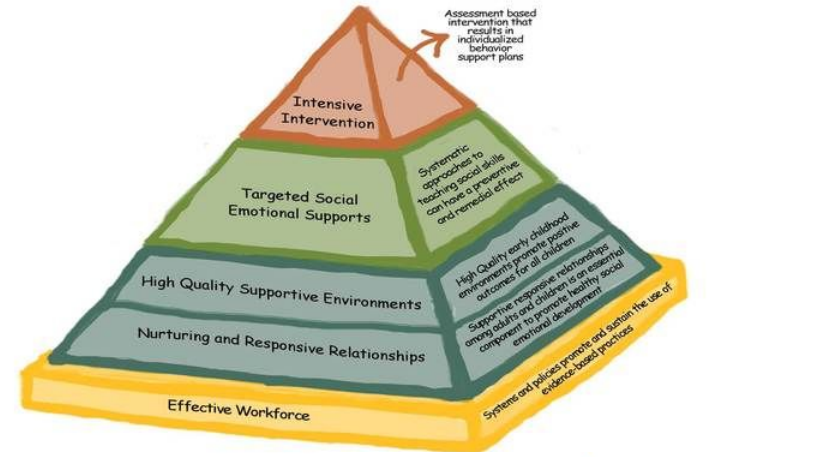
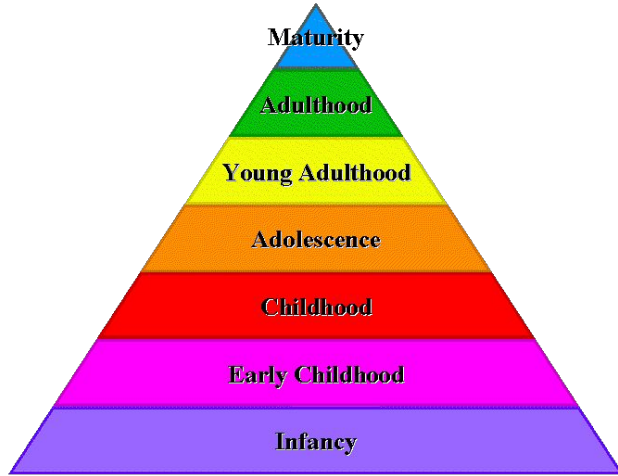
Piaget

Maslow



Vygotsky

ALL OF THE PYRAMIDS!



DEVELOPMENT HAS EVERYBODY TALKING...



Childhood is not a race to see how quickly a child can read, write, and count. Childhood is a small window of time to learn and develop at the pace which is right for each individual child.



"It is easier to build strong children than to repair broken men."

FREDERICK DOUGLAS

idob3ocv44 bild 5188818401

Understanding child development takes the emphasis away from the child's character--looking at the child as good or bad. The emphasis is put on behavior as communication. Discipline is thus seen as problem-solving. The child is helped to learn a more acceptable manner of communication.

— Ellen Galinsky —

AZ QUOTES



"WE SEE HOW EARLY CHILDHOOD EXPERIENCES ARE SO IMPORTANT TO LIFELONG OUTCOMES, HOW THE EARLY ENVIRONMENT LITERALLY BECOMES EMBEDDED IN THE BRAIN AND CHANGES ITS ARCHITECTURE."
-- Andrew S. Garner

FROM THE RESEARCH



Center on the Developing Child
HARVARD UNIVERSITY

Healthy development in the early years (particularly birth to three) provides the building blocks for educational achievement, economic productivity, responsible citizenship, lifelong health, strong communities, and successful parenting of the next generation.

Healthy development is based on 3 principles:

1. Experiences build brain architecture
2. Serve and return interaction builds brain circuitry
3. Toxic stress derails healthy development



8 THINGS TO REMEMBER ABOUT CHILD DEVELOPMENT

- **Even infants and young children are affected** adversely when significant stresses threaten their family and caregiving environments.
- Development is a **highly interactive process**, and life outcomes are not determined solely by genes.
- While attachments to their parents are primary, **young children can also benefit significantly from relationships with other responsive caregivers** both within and outside the family.
- A great deal of **brain architecture** is shaped during the first three years **after birth**, but the window of opportunity for its development does not close on a child's third birthday.



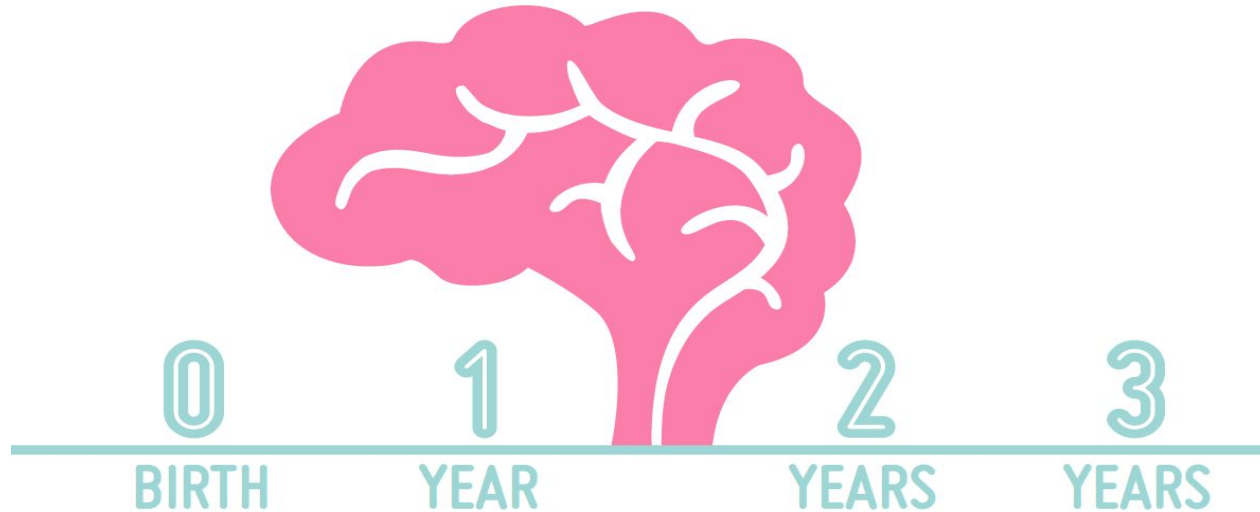
8 THINGS TO REMEMBER ABOUT CHILD DEVELOPMENT

- **Severe neglect appears to be at least as great a threat to health and development as physical abuse—possibly even greater.**
- Young children who have been **exposed to adversity or violence do not invariably develop stress-related disorders** or grow up to be violent adults.
- **Simply removing a child from a dangerous environment** will not automatically reverse the negative impacts of that experience.
- **Resilience requires relationships**, not rugged individualism.

BRAIN
DEVELOPMENT

WHY FOCUS ON BABIES' BRAINS?

A BABY'S BRAIN GROWS **80%**
IN THE FIRST 18 MONTHS



Brains Are Built Through Experiences

700 to 1,000 new neural connections are formed each second in the infant brain

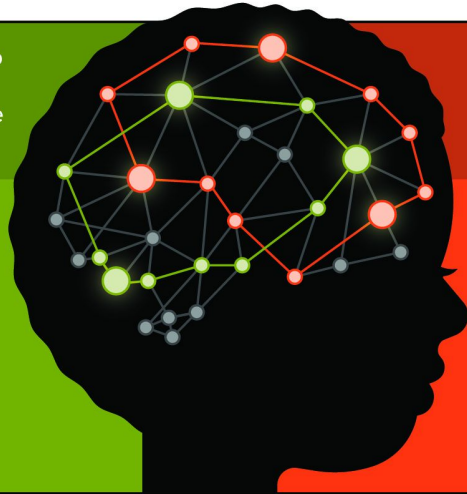
Caregivers who are responsive to a child's signals through **"serve and return"** interactions facilitate healthy brain architecture

CHILD SIGNALS:

- Cries
- Gestures
- Babbles

CAREGIVER RESPONSES:

- Hugs
- Words
- Eye contact



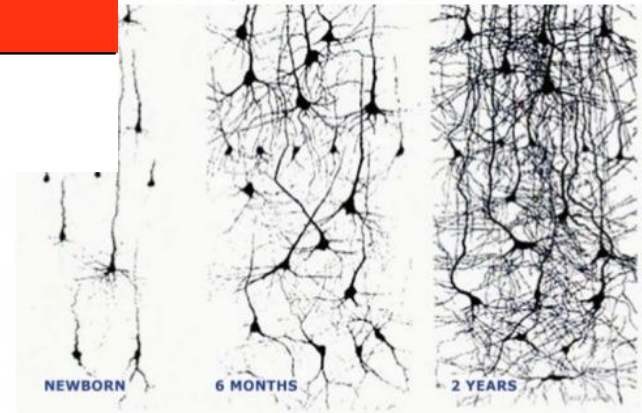
A child without supportive adults who experiences **"toxic stress"** can develop weakened brain architecture

TOXIC STRESSORS INCLUDE:

- Chronic neglect
- Exposure to violence
- Physical or verbal abuse
- Caregiver mental illness or drug abuse

New Neural Connections Every Second

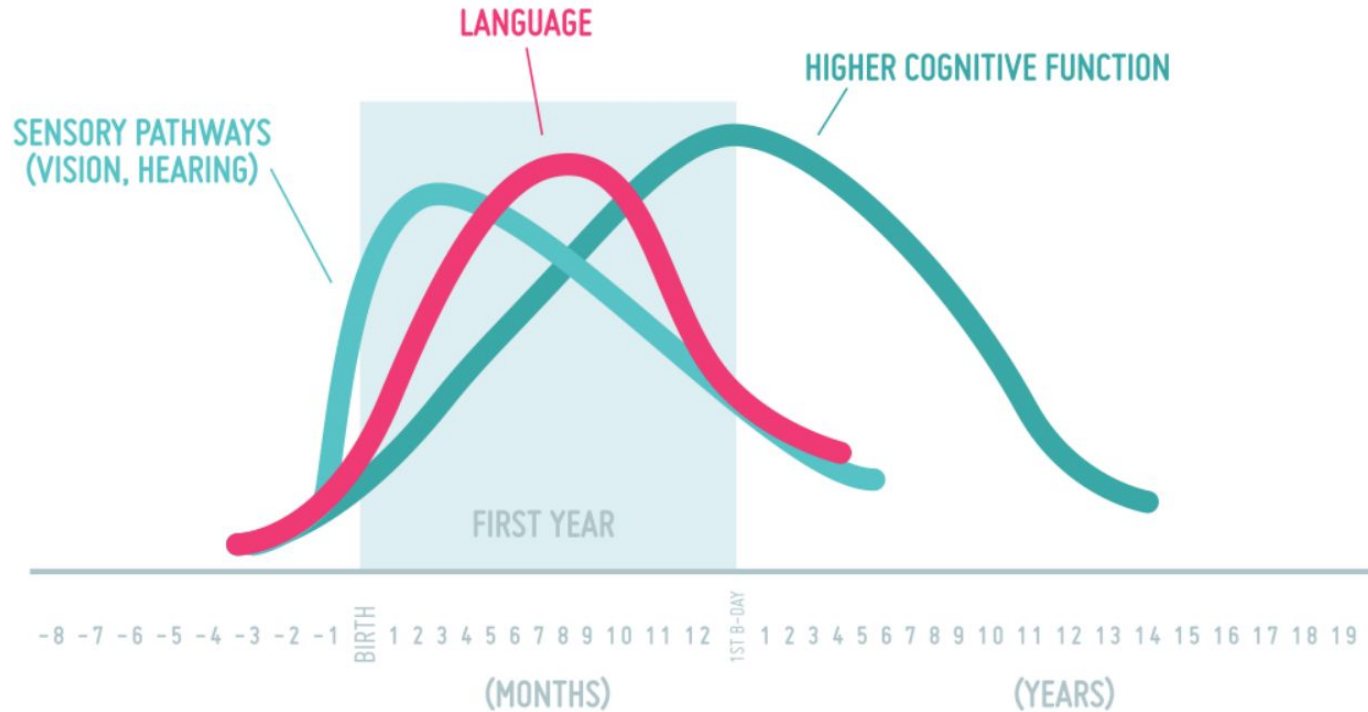
Source: Conel, J.L. *The postnatal development of the human cerebral cortex.* Cambridge, Mass: Harvard University Press, 1959



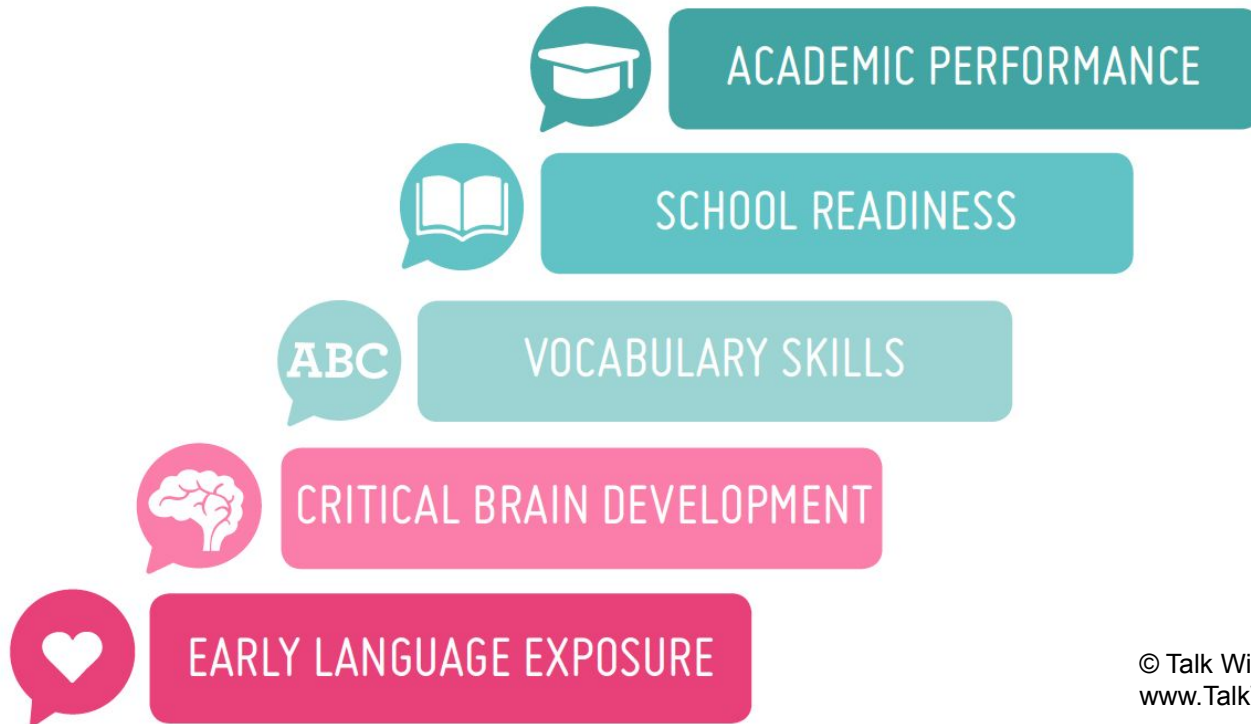
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For citations of the studies that support the key messages depicted in this image, visit minneapolisfed.org/2017FRSConference.

Brain Development Over Time



EARLY LANGUAGE EXPOSURE ENHANCES VOCABULARY AND ACADEMIC PERFORMANCE



BUILDING BLOCKS MODEL (HOORAY FOR MORE PYRAMIDS!)



CO Brain Injury Steering Committee: Adapted from Miller, 2007; Reitan and Wolfson, 2004; Hale and Fiorello, 2004

ADULTS CAN INFLUENCE
CHILDREN'S BRAIN
DEVELOPMENT FOR A
LIFETIME OF LEARNING

HOW ON EARTH CAN I DO ALL THAT???

Did you know that the most important interactions you have with a child can happen through play?

<https://youtu.be/fpiYNkkNmEo>

Play in early childhood is an effective way of supporting all three of these principles:

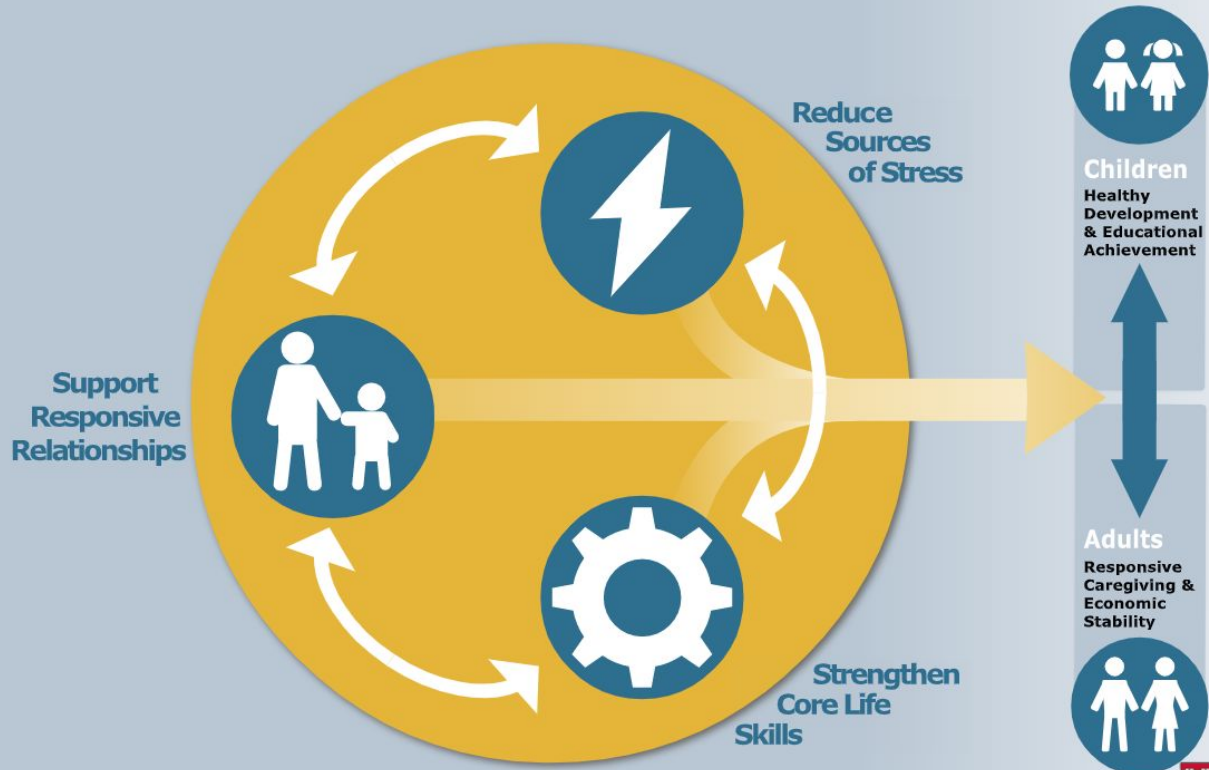
1. Supporting responsive relationships
2. Strengthening core life skills
3. Reducing sources of stress



Science to Policy and Practice

Three Principles to Improve Outcomes for Children and Families

These principles, grounded in science, can guide policymakers and program developers as they design and adapt policies and programs to improve outcomes for children and families.

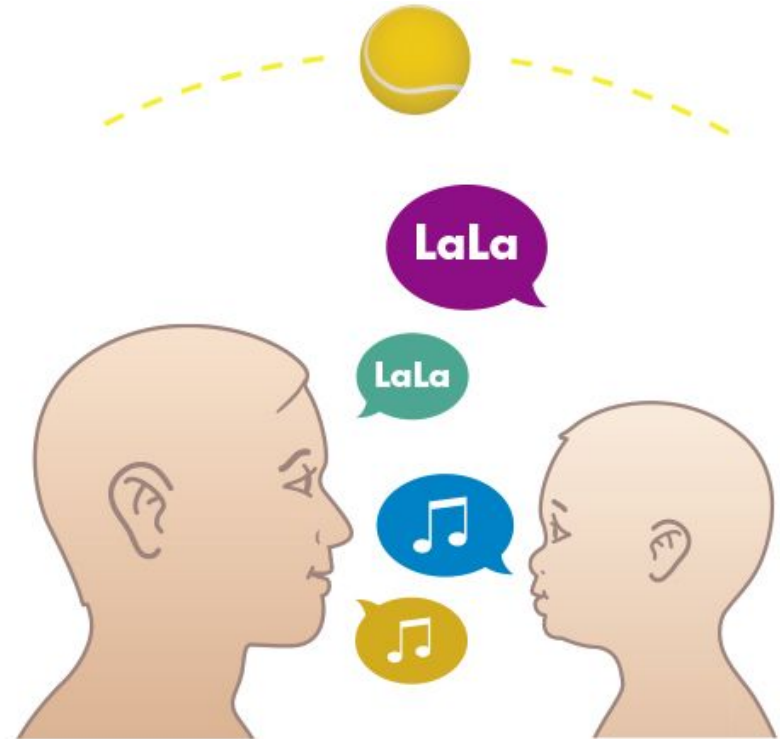


SUPPORT RESPONSIVE RELATIONSHIPS

A major active ingredient in this developmental process is the **serve-and-return interaction** between children and their parents and with other caregivers in the family or community.

When an infant or young child babbles, gestures, or cries, and an adult responds appropriately with eye contact, words, or a hug, neural connections are built and strengthened in the child's brain.

These relationships provide the personalized responsiveness and protection that buffer children from developmental disruption and model the capabilities—such as the ability to plan, monitor, adjust, and regulate behavior—that enable individuals to respond adaptively to adversity and thrive.



Research demonstrates that the single strongest predictor of a child's academic success is not socioeconomic status, level of parental education, income, or ethnicity, but rather **the quality and quantity of words spoken to the baby in the first three years of life.**



Early talk matters.

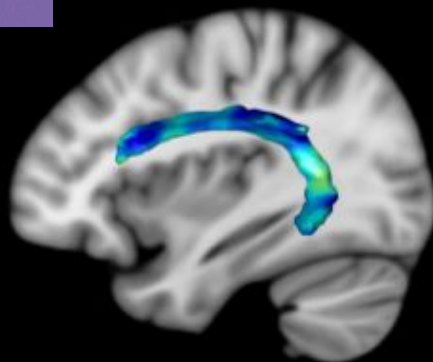
LENA™

Building brains through early talk

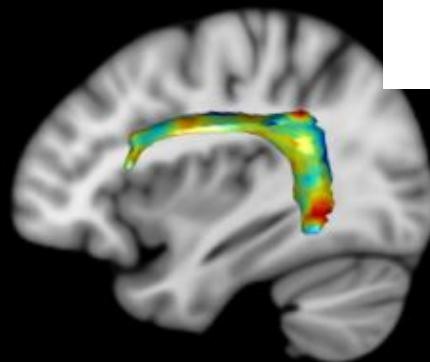
Higher
Connectivity



Lower
Connectivity



95 conversational
turns per hour



210 conversational
turns per hour

EXCITING NEW RESEARCH FROM LENA



A 10-year study by LENA researchers confirms that the amount of talk with adults that babies experience in the first three years of life is related to their verbal abilities and IQ in adolescence. The paper, [“Language Experience in the Second Year of Life and Language Outcomes in Late Childhood,”](#) was released for the first time today through advanced online publication in *Pediatrics*.



The results: the adult words and especially the conversations the children experienced between 18 and 24 months correlated 10 years later with their IQ, verbal comprehension, vocabulary, and other language skills. The amount their parents talked to them was important, but the amount they talked with them (“conversational turns”) was even more important.



STRENGTHEN CORE LIFE SKILLS

These core capabilities support our ability to focus, plan for and achieve goals, adapt to changing situations, and resist impulsive behaviors. No one is born with these skills; they are developed over time through coaching and practice.

Scientists call these capabilities [executive function and self-regulation skills](#). Just as an air traffic control system at a busy airport safely manages the arrivals and departures of many aircraft on multiple runways, the brain needs this skill set to filter distractions, prioritize tasks, remember rules and goals, and control impulses. These skills are crucial for learning and development.

In the first three years of life, we start learning to use these core capabilities in basic ways—like focusing attention, responding to limit-setting, and following simple rules.



LIFE SKILLS?



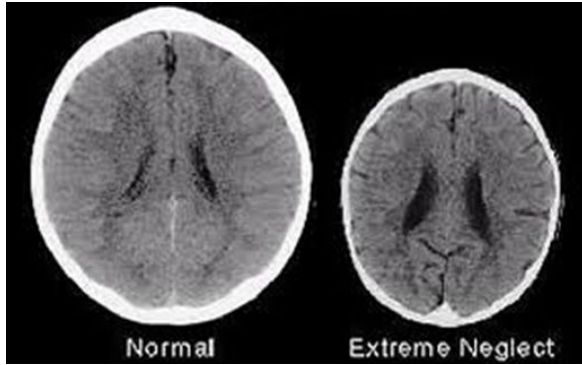
REDUCE SOURCES OF STRESS

Reducing the pile-up of potential sources of stress will protect children directly (i.e., their stress response is triggered less frequently and powerfully) **and indirectly** (i.e., the adults they depend upon are better able to protect and support them, thereby preventing lasting harm).

Excessive activation of stress response systems affects the brain and other organ systems in many ways. When we feel threatened, our body prepares us to respond by increasing our heart rate, blood pressure, and stress hormones, such as cortisol.

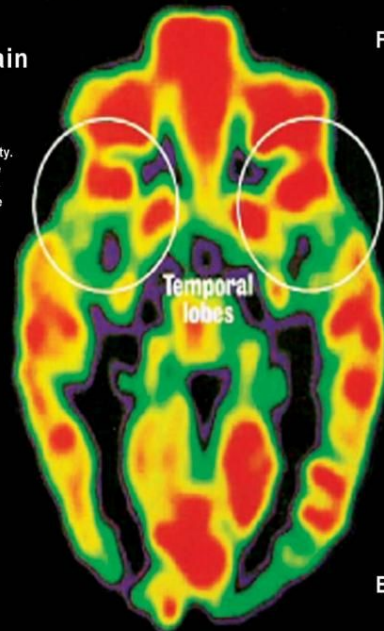
Chaotic, threatening, and unpredictable situations and environments that activate the “fight or flight” response repeatedly or excessively can make it difficult to engage executive function skills—the underlying skills we all need to plan, focus, adjust, and resist impulsive behaviors. **People who have experienced serious early adversity are more likely to perceive and focus attention on potential threats throughout life.** While brain development and adaptation continue across the life course, it’s always harder and more costly to remediate than to prevent problems.

A TALE OF TWO BRAINS



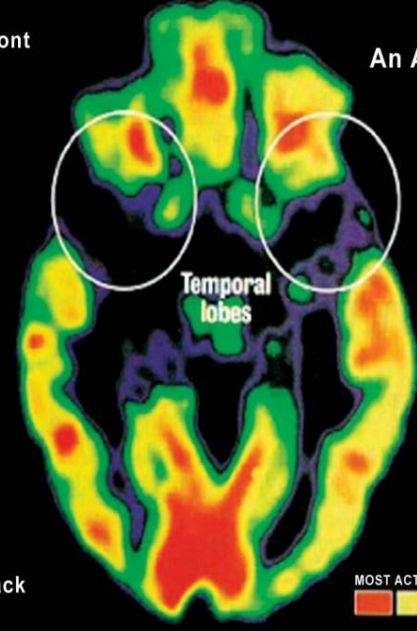
Healthy Brain

This PET scan of the brain of a normal child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), early childhood experiences wire the circuits.



An Abused Brain

This PET scan of the brain of a Romanian Orphan, who was institutionalized shortly after birth, shows the effect of extreme deprivation in infancy. The temporal lobes (top), which regulate emotions and receive input from the senses, are nearly quiescent. Such children suffer emotional and cognitive problems.



MOST ACTIVE LEAST ACTIVE

BRINGING IT HOME... KEEP IT SIMPLE TO BUILD BIG BRAINS

Talk, talk, talk



Read books



Sing songs



Play, play, play

Experiences - **go** places,

meet people, **try** new things



POST-EVALUATION - DID YOU...

1. Gain knowledge about child development principles?

None ---- a little ---- a lot ---- too much

2. Gain knowledge about brain development and research?

None ---- a little ---- a lot ---- too much

3. Understand the ways adults can influence children's brain development for a lifetime of learning?

None ---- a little ---- a lot ---- too much

RESOURCES

<https://developingchild.harvard.edu/science/>

<https://www.lena.org/>

<https://talkwithmehbaby.org>

<https://www.cde.state.co.us/healthandwellness/braininjury>

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