Three Science Principles That Can Help Us Think Differently About How to Improve Outcomes for Children and Families

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Why We Do What We Do
More Than 1 Million New Neural Connections Form Every Second in the First Few Years of Life

3 Key Science Concepts

1. Responsive relationships and positive experiences build strong brain architecture starting in the earliest years of life.
Experiences and Relationships Shape Brain Architecture

“Serve and Return” Interaction Builds Brain Architecture
The Ability of Brains to Change in Response to Experiences Decreases Over Time

Source: Levitt, P. (2009)

3 Key Science Concepts

1. Responsive relationships and positive experiences build strong brain architecture.

   The core capabilities we all use to thrive in school, at work, and in the home are built over time through practice and modeling.

2. Normal Brain Plasticity Influenced by Experience

   Physiological "Effort" Required to Enhance Neural Connections

Source: Center on the Developing Child, Harvard University
What Kinds of Skills?
An “Air Traffic Control System” in the Brain

Executive function and self-regulation are foundational set of capacities that help us
- focus,
- make decisions with available information,
- set goals
- make and execute plans
- revise and adjust
- control impulses

- Foundation laid in infancy, with two major spurts in skill development:
  ages 3-5 and approximately 15-25

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Three Types of Executive Function Skills

Inhibitory Control — filter thoughts and impulses to resist temptations and distractions

Working Memory — hold and manipulate information in our heads over short periods of time

Mental flexibility — adjust to changed demands, priorities, or perspectives
The Pencil Tap Test
(Cognitive Flexibility and Inhibitory Control)

Age 3不对
Age 5对

Source: Blair, C. (2012)

3 Key Science Concepts

1. Responsive relationships and positive experiences build strong brain architecture.

2. The core capabilities we all use to thrive in school, at work, and in the home are built over time through practice and modeling.

3. Serious adversity disrupts the development process and our ability to use these core capabilities.
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.

Toxic Stress Disrupts Brain Architecture and Other Biological Systems
How Excessive Stress Affects the Development and Use of Core Capabilities

Early Childhood

A Test of Working Memory Under Stress

Center on the Developing Child, Harvard University
Let’s De-Stress

3 Principles: A Lens on How to Improve Outcomes for Children and Families

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

Children
Healthy Development & Educational Achievement

Adults
Responsive Caregiving & Economic Stability
Using the Science Principles as a New Lens for Children’s Museum Activities

Build Responsive Relationships
e.g., by sharing focus and returning serves...

Strengthen Core Life Skills
e.g., by giving opportunities to practice core executive function skills like memory, self-control, and trying on new roles...
Using the Science Principles as a New Lens for Children’s Museum Activities

Reduce Sources of Stress

e.g., by teaching mindfulness, bringing museum activities into the community, providing quiet spaces, including exercise...

Becoming More Precise About Impact

Rather than asking if a program works on average, we need to be asking a different set of questions:

- What about it works?
- How does it work?
- For whom does it work, and for whom does it not work?
- In what contexts does it work?
Becoming More Precise About Impact:
The IDEAS Impact Framework™

A set of steps and method to help innovators:

• Go from idea to implementation to measurement.
• Be clear about the root causes they want to change and the outcomes they are aiming for.
• Determine how an intervention works, for whom, and in what contexts.
• Generate usable knowledge quickly.

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ARE YOU READY TO SING?

He’s a good dad,
loves his babies
loves reading
them Good Night Moon
She’s a good mom,
puts bread on the table
works three jobs
and builds castles too
It’s a long day
workin’ for the family
They miss time,
just playin’ in the yard

But they make time
after the work’s done
For play time
‘cause that’s the best part

And it’s brain...
brain buildin’

yeah it’s brain...
brain buildin’
all the children
playin’ in the schoolyard
play games and
they make up the rules

all the children
playin’ in museums
they’re learnin’
as much as in school

‘Cause it’s brain...
brain buildin’
yeah it’s brain...
brain buildin’
[wait for the guitar riff!]

...brain building, yeah it’s brain buildin’,
yeah it’s brain building, yeah it’s brain buildin’,
yeah it’s brain building, yeah it’s brain buildin’
You wanna build kids’ executive function
Better let them play Simon Says

I wanna shout out that play is for learnin’
And learning through play is the BEST

‘Cause it’s brain...
brain buildin’
yeah it’s brain...
brain buildin’
[guitar riff]
‘Cause it’s brain...
brain buildin’
yeah it’s brain...
brain buildin’
...it’s brain building, yeah it’s brain buildin’

Said it’s brain building, yeah it’s brain buildin’