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The Institute for Learning and Brain Sciences

University of Washington ♦ College of Arts & Sciences

Connecting the Science of Early Learning To Practice and Policy: *Why the First 2,000 Days Matter*

December 7, 2011

Gina Lebedeva, PhD, SLP
Translation, Outreach & Education (TOE)

Business Leaders

Policy-Makers

Practitioners & Families

Researchers

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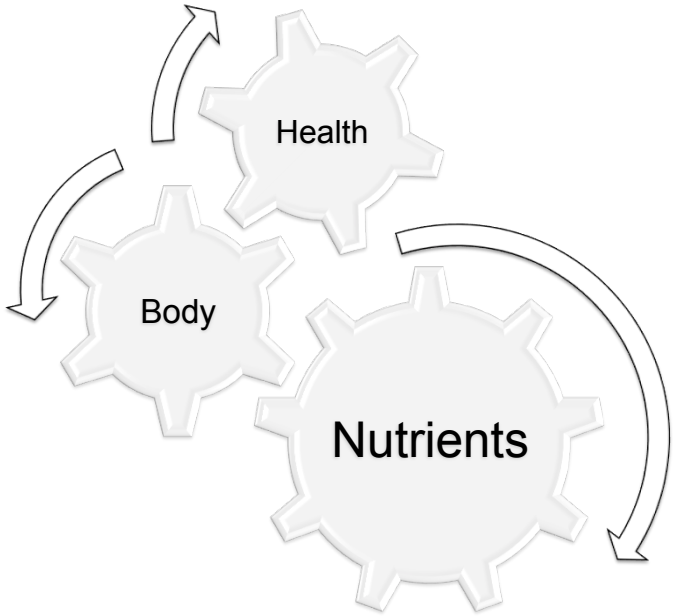
Quantifying the Connections Early in Life



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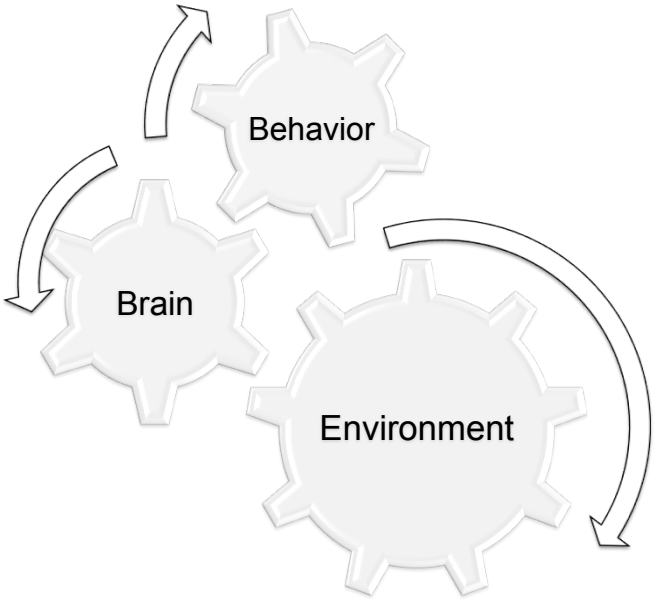
Quantifying the Connections Early in Life



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Early Learning = Early Childhood

Experience Quality → Predicts Outcomes → Funds Cognition

The brain is most plastic early in life.

+ More open to learning from enriched experience.

- More vulnerable to impoverished or highly adverse conditions.

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Cognition	Brain	Practice
• Input • Interaction	• Neural Architecture	• Key Opportunities

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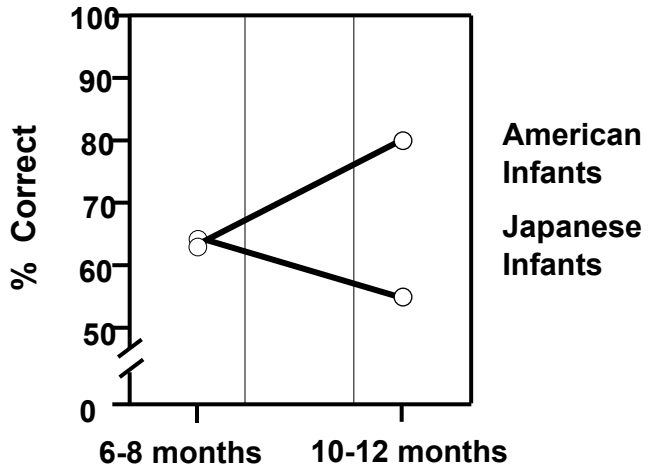
Experience shapes neural circuitry.

This is the most efficient early in development.

Infant perception of /ra/-/la/



Werker & Tees, 1984; Kuhl et al., 2006

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Early Perception Matters

Sensitivity to Speech at 7.5 months
Predicts Language Growth to 2+ Years

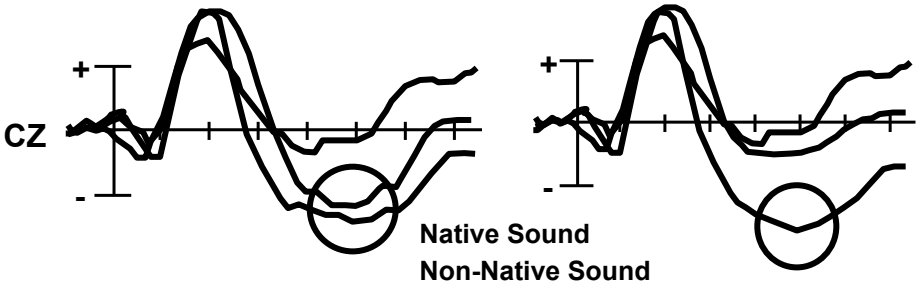
More efficient tuning early on is associated with more efficient learning later.

At 6 months:

Shows discrimination of both native and nonnative contrasts

At 11 months:

Shows increase in native and decrease in nonnative contrasts



Native Sound
Non-Native Sound
Mismatch Negativity (MMN)

Rivera-Gaxiola, Silva-Pereyra, & Kuhl, 2005; 2008

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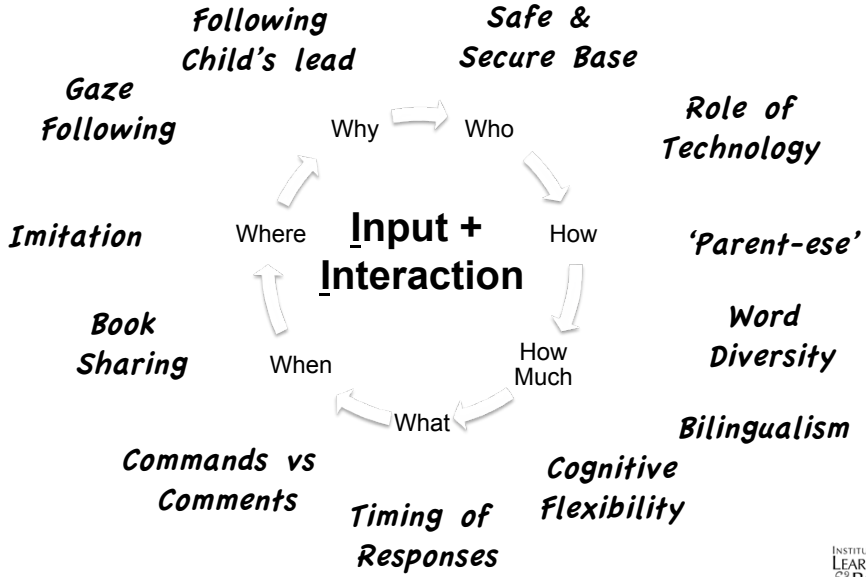
What makes good brain fertilizer?



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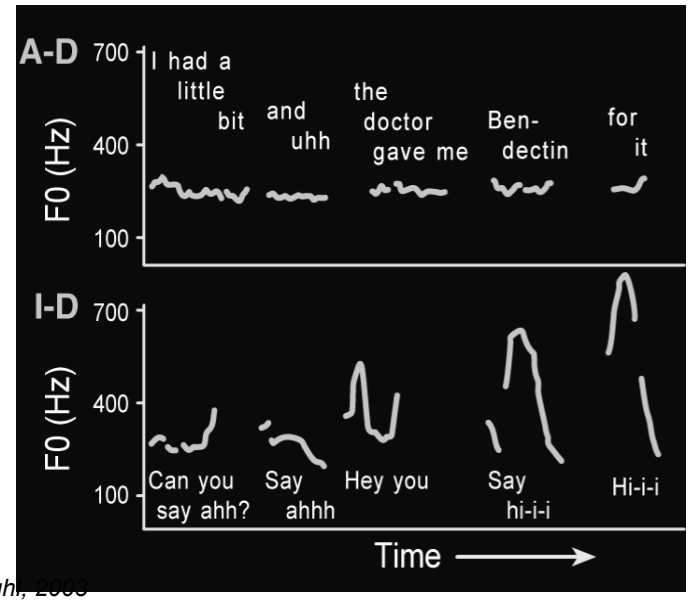
How we say it



Liu & Kuhl, 2000

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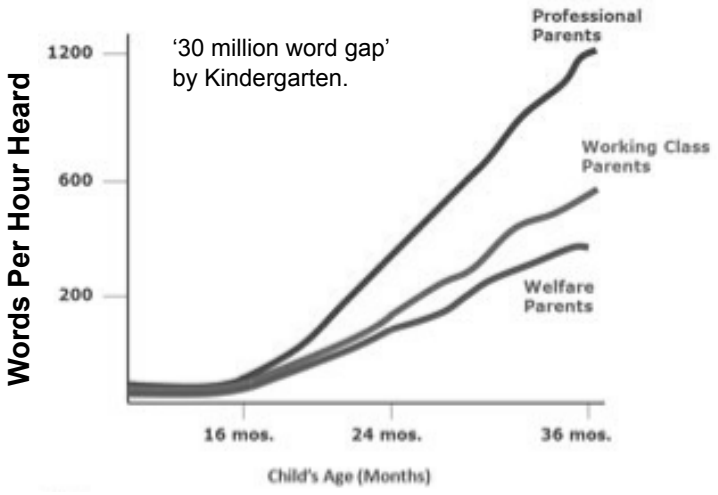
How Much We Say



'30 million word gap' by Kindergarten.

*Groups are reversed when it comes to amount of 'directives'

Hart & Risley, 1995

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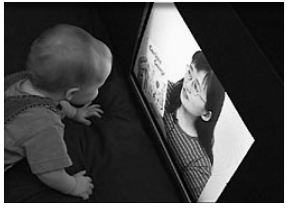
Who Says It

9-month-old Seattle infants
Naturalistic Mandarin Chinese exposure (play & books)
12 sessions, 25 minutes each. Tested on Mandarin sound.
Learning only evidenced in the **LIVE** condition.

Live Interaction

DVD Session



Audio (CD) Session

Kuhl, Liu, Tsao, 2003

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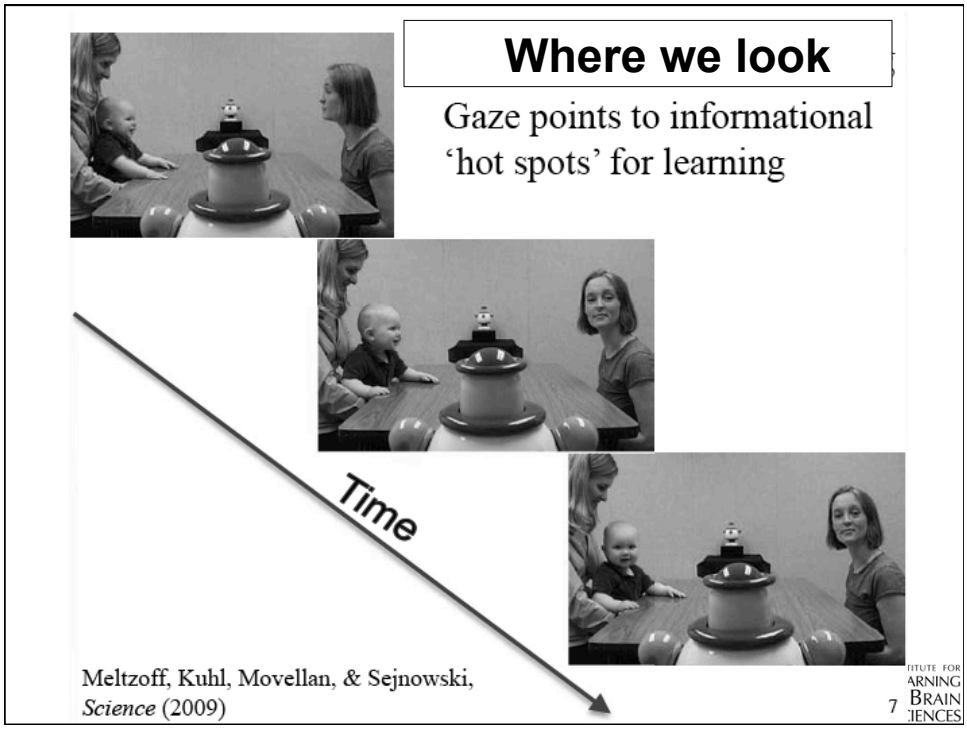
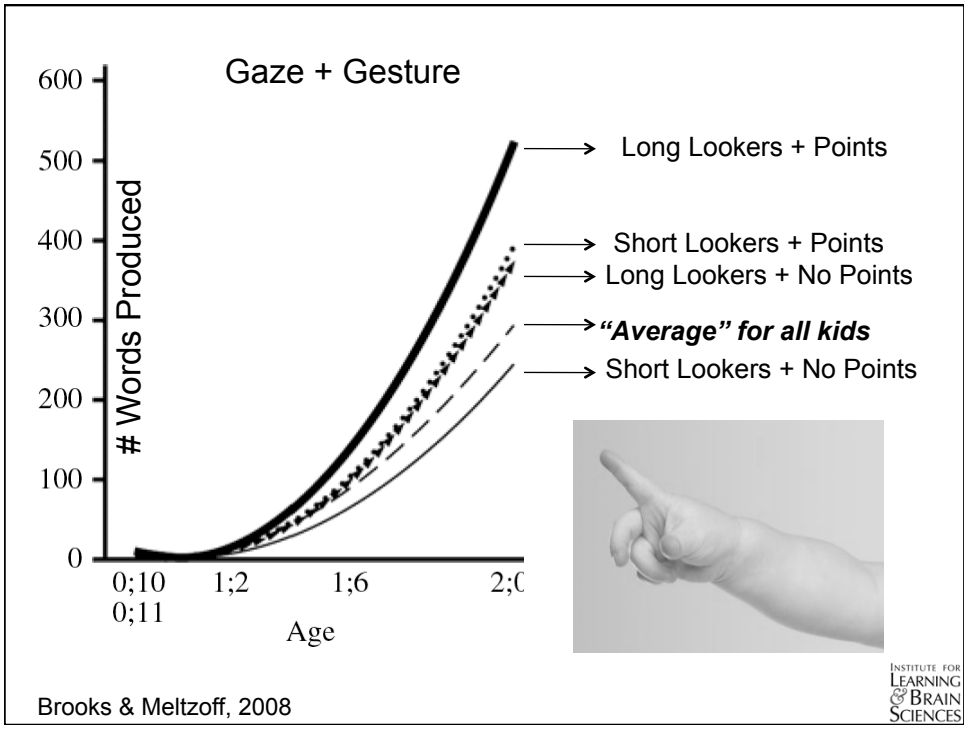
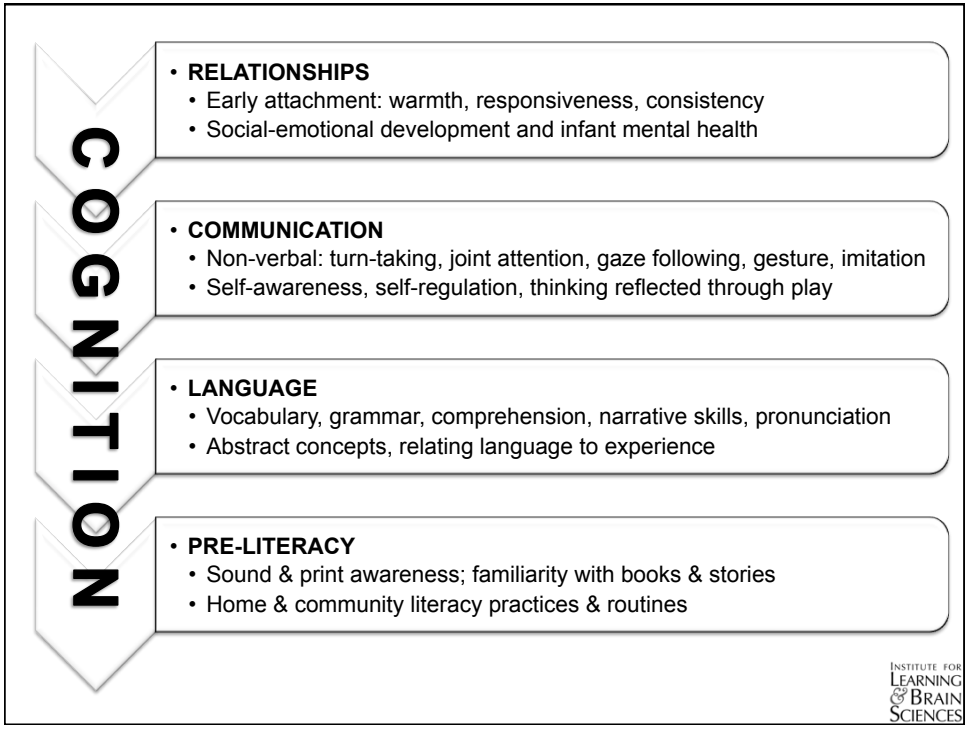

Where we look
Gaze points to informational 'hot spots' for learning
Time
Meltzoff, Kuhl, Movellan, & Sejnowski, *Science* (2009)
7


Gaze + Gesture
600
500
400
300
200
100
0
Words Produced
0;10
0;11
1;2
1;6
2;(
Age
Long Lookers + Points
Short Lookers + Points
Long Lookers + No Points
"Average" for all kids
Short Lookers + No Points
Brooks & Meltzoff, 2008


COGNITION
• RELATIONSHIPS
• Early attachment: warmth, responsiveness, consistency
• Social-emotional development and infant mental health
• COMMUNICATION
• Non-verbal: turn-taking, joint attention, gaze following, gesture, imitation
• Self-awareness, self-regulation, thinking reflected through play
• LANGUAGE
• Vocabulary, grammar, comprehension, narrative skills, pronunciation
• Abstract concepts, relating language to experience
• PRE-LITERACY
• Sound & print awareness; familiarity with books & stories
• Home & community literacy practices & routines
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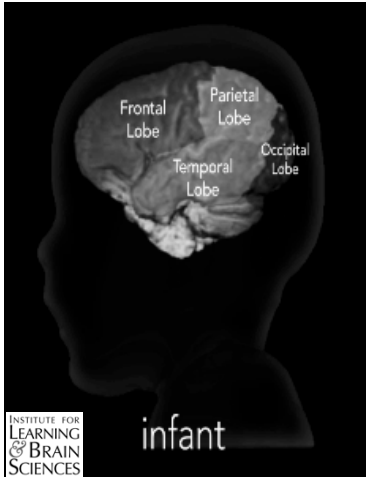


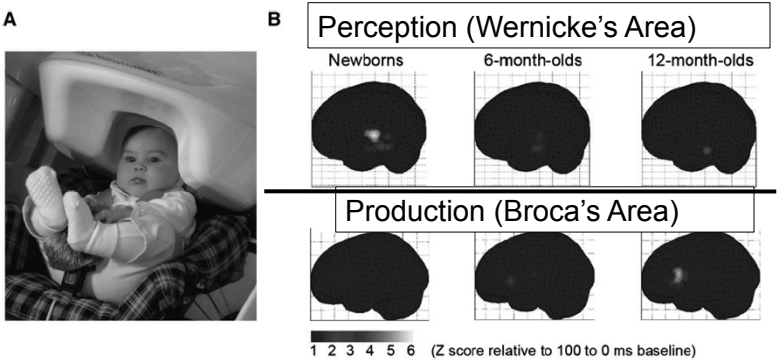
We are born with all the neurons we will ever have.

What's missing is connections.

Biology helps connections start.

Experiences sculpt areas to specialize, become more efficient and form networks between areas.

Key advances in methods are now allowing research to examine:



Real-time synchrony between brain regions, and brains.

Tools can localize and provide precise timing information about brain responses. Connections between emotion and language, speaking and listening, or experience and memory, can begin to be related to environmental factors.

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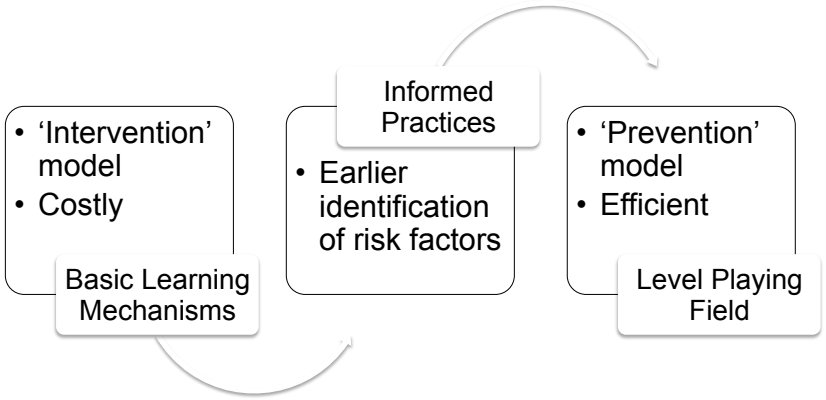
Early Learning as an Investment



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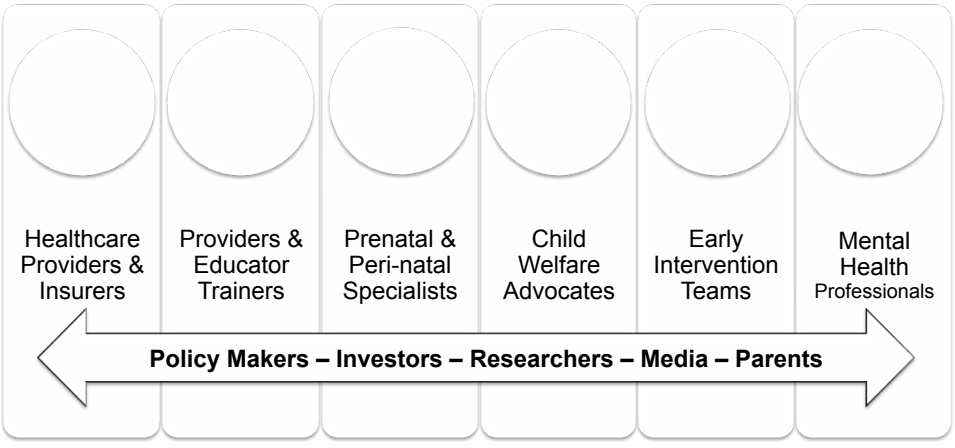
Raising Awareness to Raise Kids

Education as community, not a center



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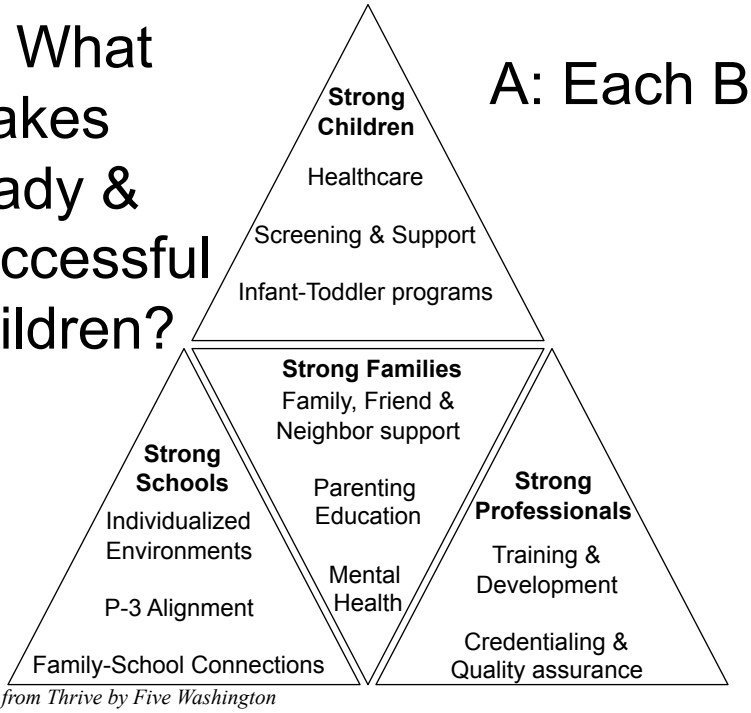
Q: What makes healthy bodies?

A: Each Bite.

Q: What makes ready & successful children?

A: Each Bit.



Compiled from Thrive by Five Washington

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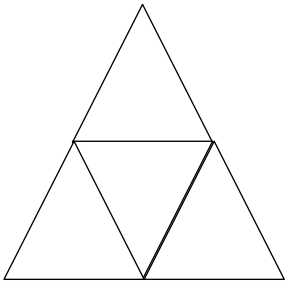
Opportunity = Knowledge + Creativity

1. What Does the State and National Picture Look Like?
2. What Does Success Look Like?
3. How Well Are We Doing?
4. How Available Is This Support?
5. What is Best Current Evidence?
6. What Infrastructure Must Be In Place?
7. What Are Some Examples of Current Models?
8. What Services and Supports Make a Difference?
9. Where Can We Connect Efforts to Build Momentum & Continuity

'…Science Curricula…Family Leave…Systematic Data Collection…'



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- Cure Autism Now

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