Learning
Deborah Stipek
Stanford University
Incontrovertible evidence:
• of the effects of experience on the architecture of the brain as well as children’s functioning
• of the value of early intervention
• of the benefits of high quality early childhood education
What are our best leverage points?

- How early skill development enhances later skill development
- Nature of interconnections among dimensions of development
- Importance of “new” domains
  - executive functions
  - math skills
Social-Emotional Skills (+) Externalizing Behavior (-)
Executive Functions

- Working Memory
- Inhibitory Control
- Emotional Self-Regulation
- Attention Shifting
<table>
<thead>
<tr>
<th>School Entry</th>
<th>3rd Grade</th>
<th>2nd Grade</th>
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<tbody>
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<td>Math</td>
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<tr>
<td>Math</td>
<td>.23***</td>
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Young children are more capable of learning math than previously believed.

Know about the natural progression of mathematics understanding.

Fair amount known about effective strategies for teaching math to young children.

Research-based preschool mathematics programs exist.
Implications for Instruction

- Need to intervene early
- Good leverage points (?)
  - executive skills
  - math
- Teachers need to be well trained
  - educating young children is not just important, *its complicated*
Problem Solving

Number & Operations
- Numbers can be used to count, describe, order, and measure; they involve numerical relations and can be represented in various ways.
- Operations with numbers can be used to model a variety of real-world situations and to solve problems; they can be carried out in various ways.

Algebra
- Patterns can be used to recognize relationships and can be extended to make generalizations.

Geometry
- Geometry can be used to understand and to represent the objects, directions, locations in our world, and the relationships between them.
- Geometric shapes can be described, analyzed, transformed, and composed and decomposed into other shapes.

Data Analysis
- Data analysis can be used to classify, represent, and use information to ask and answer questions.

Measurement
- Comparing and measuring can be used to specify "how much" of an attribute (e.g., length) objects possess.
- Measures can be determined by repeating a unit or using a tool.

Communication

Connections

Reasoning

Representation
Number & Operations

- Numbers can be used to tell us how many, describe order, and measure; they involve numerous relations, and can be represented in various ways.
- Operations with numbers can be used to model a variety of real-world situations and to solve problems; they can be carried out in various ways.

Counting
Counting can be used to find out how many in a collection.

Adding To/Taking Away
A collection can be made larger by adding items to it and made smaller by taking some away from it.

Comparing and Ordering
Quantities can be compared or ordered, and numbers are one useful tool for doing so.

Grouping and Place Value
Items can be grouped to make a larger unit and, in a written multidigit number, the value of a digit depends on its position because different digit positions indicate different units.

Composing and Decomposing
A quantity (a whole) can consist of parts and can be "broken apart" (decomposed) into them, and the parts can be combined (composed) to form the whole.

Equal Partitioning
A quantity (whole) can be partitioned (decomposed) into equal size pieces (parts).
Implications for Research

✓ Need to understand better the interconnections among dimensions of development
✓ Need to examine how interventions focused on one domain affect others & enhance future learning
✓ Need to figure out how to prepare ECE teachers to be effective