Pre–K 3
A Question of Continuity
Tools of the Mind as a Case Study

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Continuity in what?

In

- Underlying cognitive skills, like self-regulation, as well as content
- Instructional methods and assessments
- Teacher knowledge of child development and developmental trajectories
Tools of the Mind

- Learning leads development
- Learning is fundamentally a social act—learning involves the mind of another person
- Self-regulation is a core process in development and is learned
- Content is a vehicle for teaching underlying cognitive skills
- There are ‘leading activities’ at different ages and a set of critical underlying skills to be mastered within each
Is EF the New IQ?

Why the ability to resist distraction, a skill scientists call "executive function," may be more important to academic success than traditional measures of intelligence.
Self–regulation predicts academic performance in first grade, over and above cognitive skills and family backgrounds

(e.g., Blair, 2002; Farran, 2010; McClelland, M. M., Piccinin, A., & Stallings, M. C 2010; Raver & Knitzer, 2002)
Components of Self–Regulation/EF

- Inhibitory, effortful or self–control
- Working Memory
- Cognitive Flexibility
Inhibitory, Effortful, or Self–Control

- Controlling anxiety when you make mistakes
- Controlling your temper when you don’t get your way or what you want
- Being able to stop and think before you act
- Acting appropriately when tempted to do otherwise
- Paying attention despite distractions
- Staying on task even when bored or delaying gratification
- Stopping yourself from using the first strategy that comes to mind in favor of a second
Being able to act appropriately when tempted to do otherwise

Controlling your temper when you don’t get your way or what you want
Being able to delay gratification
Working Memory

- Holding information in mind and being able to work with it
- Being able to reflect on one’s thinking
- Weighing two different strategies so you consider which is the better one
- Taking more than one perspective at a time
Consider reading the following two sentences:

I love to read books.

I read two books before I came to class.
Cognitive Flexibility

- Flexibly adjusting thinking, actions, and mental effort to changing demands of the situation
- Intentionally investing more mental effort in tasks that are difficult
- Multi-tasking (given two or three assignments for homework)
Self–Regulation/EF skills are necessary when you need to be intentional, to learn something new—on–purpose—when you are not functioning on autopilot.
Our pilot evaluation of Tools with an at-risk population

100 preschoolers
100 Kindergarteners

Children had received 0, 1, or 2 years of Tools.

Academic outcomes were obtained independently by NIEER (Steve Barnett).
Hearts - Congruent

Push Left

Push Right

Flowers - Incongruent

Push Right

Push Left
Requires holding 2 higher order rules in mind (hearts - same side; flowers - opposite side) and on incongruent trials inhibiting the prepotent tendency to respond on the same side as the stimulus.
Hearts/Flowers Conditions: Accuracy

Stimuli presented for 2500 ms
Stimuli presented for 750 ms

Age in Years

Percent Correct

Congruent
Incongruent
Mixed
Four-year-olds would often call out the correct higher-order answer on each trial of hearts/flowers-MIXED (“same,” “opposite,” “opposite,” “same”), even as they are making many errors. It is NOT that they have forgotten the rules.
Flowers Task – Block 2 (Incongruent)
Percentage of Correct Responses
Pre-K Children

<table>
<thead>
<tr>
<th>Percentage of Correct Responses</th>
<th>Pre-K Children</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Tools</td>
<td></td>
</tr>
<tr>
<td>1 Year of Tools</td>
<td></td>
</tr>
<tr>
<td>2 Years of Tools</td>
<td></td>
</tr>
</tbody>
</table>

- No Tools
- 1 Year of Tools
- 2 Years of Tools
Hearts/Flowers Task - Mixed Block
Percent of Children Who Passed Practice

<table>
<thead>
<tr>
<th>No Tools</th>
<th>Tools</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>

Percent Passing

No Tools: 
- 30%

Tools: 
- 60%

Star indicates significant difference.
## Correlation of Percentage of Correct Responses on the Hearts/Flowers Task and Academic Performance Measures

<table>
<thead>
<tr>
<th></th>
<th>Congruent</th>
<th>Incongruent</th>
<th>Mixed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRSS (Social Skills Rating Scale) External subscale</td>
<td>-0.178</td>
<td>-0.456**</td>
<td>-0.177</td>
</tr>
<tr>
<td>SSRS Internal subscale</td>
<td>-0.161</td>
<td>-0.149</td>
<td>0.023</td>
</tr>
<tr>
<td>PPVT (Peabody Picture Vocabulary) raw score</td>
<td>0.036</td>
<td>0.290*</td>
<td>0.464**</td>
</tr>
<tr>
<td>IDEA Oral Language proficiency raw score</td>
<td>0.165</td>
<td>0.183</td>
<td>0.390*</td>
</tr>
<tr>
<td>Expressive (EOWPVT) raw score</td>
<td>-0.037</td>
<td>0.272*</td>
<td>0.383**</td>
</tr>
<tr>
<td>WIPPSI raw score</td>
<td>0.012</td>
<td>0.125</td>
<td>0.03</td>
</tr>
<tr>
<td>WCJ (Woodcock Johnson) letter word raw score</td>
<td>0.091</td>
<td>0.166</td>
<td>0.068</td>
</tr>
<tr>
<td>WCJ applied problems raw score</td>
<td>-0.027</td>
<td>0.264*</td>
<td>0.392**</td>
</tr>
<tr>
<td>Get Ready To Read raw score</td>
<td>0.05</td>
<td>0.315*</td>
<td>0.423**</td>
</tr>
<tr>
<td>PPVT standard score</td>
<td>0.034</td>
<td>0.275*</td>
<td>0.444**</td>
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<tr>
<td>Expressive (EOWPVT) standard score</td>
<td>-0.117</td>
<td>0.207</td>
<td>0.289*</td>
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<tr>
<td>Expressive standard score new (accounts for floor effect)</td>
<td>-0.086</td>
<td>0.242</td>
<td>0.329**</td>
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<tr>
<td>WCJ (Woodcock Johnson) letter word standard score</td>
<td>0.08</td>
<td>0.167</td>
<td>0.12</td>
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<tr>
<td>WCJ applied problems standard score</td>
<td>-0.071</td>
<td>0.218</td>
<td>0.359**</td>
</tr>
</tbody>
</table>
Continuity in Self–Regulation

- In deliberate self–regulation practice
- In embedding self–regulation in content activities
- In eliminating practices that encourage unregulated behavior
  - Boredom (too easy or too hard)
  - Long large group activities
Continuity in Self-Regulation
Continuity in Self-Regulation

Jason
Science

Errin

<table>
<thead>
<tr>
<th>Name: Gregory</th>
<th>Date: 5/23-5/29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study Buddy: Maxine</td>
<td></td>
</tr>
</tbody>
</table>

- Listening Center
- Stories and Charts
- Alexander and the Very Big Day
- Humpty Dumpty
- Fur
- Sentences
- Word Puzzles
- Make a Book
- Sound Puzzles
- Our Deser Home
- Books
- Suck

My Learning Goal is...
Continuity in Content

- Sequential
- Systematic
- Individualized

- Should follow developmental trajectories as well as content standards, taking into consideration the qualitative differences in children’s abilities at different ages
- Should have developmental breadth—there is built in support for children who need it, but enough challenge for children who are at a higher level
- Should motivate children to become deeply engaged, to want to learn
Oral Plan
Picture Message Concept of Word
Initial Sound Ending Sound Medial Sounds Alphabetic Principle Patterns

Ryan: I am going to play with my toys.

Jessica: I am going to eat some candy.

Saul: I am going to meet Kassel.

Brenda: I am going to be super cute and go to school.
How Many Fish in the Sea?
A Book about Oceans

First Facts
by Linda Tagliferro

Midnight on the Moon
Mary Pope Osborne

Sand makes pots. Oysters are gast, all. Oysters are pretty on the inside. And ugly on the outside. Oysters are gray. Oysters are nice. Feet are pink, tails are white. Oysters can be big. Oysters can be small. Oysters are very very tall. On the outside. My oyster is as long as one pencil and as small as a baby.
Instructional practices should maximize the child’s mental action taking into account the child’s level of development and level of acquisition of the content.
The right answer should be the by-product of the right process. Instruction should help children learn the right process as well as the right answer.
Weekly Learning Conferences

<table>
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<tr>
<td>Gregory</td>
<td>Maxine</td>
<td>5/22-5/26</td>
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<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Listening Center</td>
</tr>
<tr>
<td>1</td>
<td>Stories and Charts</td>
</tr>
<tr>
<td>2</td>
<td>Investigations</td>
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<tr>
<td>2</td>
<td>Penmanship Center</td>
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<tr>
<td>1</td>
<td>Word Puzzles</td>
</tr>
<tr>
<td>1</td>
<td>Make a Book</td>
</tr>
<tr>
<td>2</td>
<td>Sound Puzzles</td>
</tr>
<tr>
<td>2</td>
<td>Our Desert</td>
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<tr>
<td>2</td>
<td>Literacy Games</td>
</tr>
<tr>
<td>2</td>
<td>Books</td>
</tr>
<tr>
<td>2</td>
<td>Sound Center</td>
</tr>
</tbody>
</table>

My Learning Goal is: Tanwood In Sound Center
Supported Practice
Dynamic Assessments—designed to reveal the way children think
- Should ask child about correct and incorrect answers
- Should reveal if child understands errors in the process
- Should include hints and prompts that the child might use on the next problem
Continuity in teacher knowledge

- Teachers use developmental trajectories that span skill/concept development across the Pre–K to 3rd grade range.
- Teachers understand how to access skills taught at lower grades and how to build on them.
- Teachers understand how teachers in later grades build upon the skills that they have taught.
Continuity in what?

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- Instructional methods and assessments
- Teacher knowledge of child development and developmental trajectories
Tools of the Mind
The Vygotskian Approach to Early Childhood Education

Elena Bodrova • Deborah J. Leong
Foreword by Michael Cole

Second Edition

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www.toolsofthemind.org