Disparities in School Readiness:  
The Dallas Preschool Readiness Project  

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Disparities in School Readiness

• 34% of African American and 42% of Latino kindergarteners are in the lowest quartile of reading skills
• Early academic achievement is a strong predictor of graduation rates
• Achievement disparities a strong predictor of health disparities in adulthood
Self Regulation and School Readiness

• Greater capacity for self-regulation at school entry associated with better academic performance and behavioral adjustment in kindergarten and early elementary school (Cameron et al., 2012; Denham et al., 2012; Dilworth-Bart, 2012; Lan et al., 2011; McClelland, et al., 2007; Ponitz et al., 2009; Rimm-Kaufman, et al., 2009; Sektnan et al., 2010; Valiente et al., 2010)

• Associations hold after controlling for verbal IQ, temperament, and family SES (Ponitz et al., 2009; Valiente, et al., 2010)
What is self regulation?

“What primarily volitional cognitive and behavioral processes through which an individual maintains levels of emotional, motivational, and cognitive arousal that are conducive to positive adjustment and adaptation, as reflected in positive social relationships, productivity, achievement, and a positive sense of self.”

Table 2. Percentage of Teachers (Means and Standard Errors) Who Said that *About Half of the Class or More* Enter Kindergarten with Specific Problems *(N = 3,595)*

<table>
<thead>
<tr>
<th>Type of Problem</th>
<th>Percentage of Teachers (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty following directions</td>
<td>46.16 (1.07)</td>
</tr>
<tr>
<td>Lack of academic skills</td>
<td>36.26 (0.98)</td>
</tr>
<tr>
<td>Disorganized home environment</td>
<td>34.54 (1.00)</td>
</tr>
<tr>
<td>Difficulty working independently</td>
<td>34.39 (1.02)</td>
</tr>
<tr>
<td>Lack of any formal preschool experience</td>
<td>30.79 (0.99)</td>
</tr>
<tr>
<td>Difficulty working as part of a group</td>
<td>30.45 (0.99)</td>
</tr>
<tr>
<td>Problems with social skills</td>
<td>20.39 (0.88)</td>
</tr>
<tr>
<td>Immaturity</td>
<td>19.87 (0.87)</td>
</tr>
<tr>
<td>Difficulty communicating/language problems</td>
<td>13.50 (0.72)</td>
</tr>
</tbody>
</table>

Another definition of self regulation

“Emotion regulation and executive function are both control processes that are linked in fundamental ways to more basic physiological and attentional processes and have consequences for later-developing and more sophisticated social and cognitive skills”

Another definition of self regulation

“We … embed these processes within the larger construct of self regulation. So, one way to conceptualize the self-regulatory system is to describe it as adaptive control that may be observed at the level of physiological, attentional, emotional, behavioral, cognitive, and interpersonal or social processes.”

Inhibition

- The ability to ignore distraction and stay focused, and to resist making one response and instead make another

Cognitive flexibility

- The ability to flexibility switch perspectives or focus of attention

Working memory

Developmental course of self regulation

- PFC and ACC - control higher order processes including planning, monitoring and goal setting; effortful
- Amygdala, hypothalamus - responsive to emotional cues; more automatic
- Connected in a feedback loop
What do we know about development trajectories for EF?
Dallas Preschool Readiness Project
Funded by the Eunice Kennedy Shriver National Institute of Child Health and Development

- 407 preschoolers enrolled at age 2½ years
  - 183 African American, 224 Latino
  - Average family income: 82% FPL (54.5% of African American and 14.8% of Latino families < 50% FPL)
  - 14.8% of African American and 42.8% of Latino caregivers had less than a high school education
  - 73% of Latino caregivers foreign-born; 75% Spanish-speaking

- 366 followed up at age 3½ years (90% follow-up rate)
  - 86% follow up rate for African American families
  - 93% follow up rate for Latino families
Dallas Preschool Readiness Project

Funded by the Eunice Kennedy Shriver National Institute of Child Health and Development

• Two home visits
• Measures
  – Self regulation/executive function
  – Parent-child interaction (mother-child and father-child)
  – Family/household characteristics
  – School readiness
    • Child behavior problems (T1 and T2)
    • Child language (T2)
    • Pre-academic skills (T2)
<table>
<thead>
<tr>
<th>Time 1 – 2½ years</th>
<th>Time 2 – 3½ years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Delay</td>
<td>Snack Delay</td>
</tr>
<tr>
<td>Wrapped Gift</td>
<td>Wrapped Gift</td>
</tr>
<tr>
<td>Forbidden Toy</td>
<td>Mommy &amp; Me</td>
</tr>
<tr>
<td>Mommy &amp; Me</td>
<td>Heads &amp; Toes</td>
</tr>
<tr>
<td>Shape Stroop</td>
<td>Dimensional Change Card Sort</td>
</tr>
<tr>
<td></td>
<td>Memory Task</td>
</tr>
</tbody>
</table>
Snack Delay
Wrapped Gift
Forbidden Toy
Shape Stroop and Mommy & Me

“Show me the baby grapes”
Heads, Toes, Knees & Shoulders


Photo credit: https://my.vanderbilt.edu/toolsofthemindevaluation/files/2012/01/HTKS-adapted-for-web.pdf
Memory Chocolates (working memory)
DPReP Findings Overview

- Patterns of school readiness
- Patterns of self regulation skill development
- Determinants of self regulation and school readiness
Patterns of School Readiness

DPReP Findings Overview:

Bar chart showing patterns of school readiness for African American and Latino groups in Bracken (T2) and PPVT/TVIP (T2) tests. The Latino group shows a significant difference in PPVT/TVIP (T2).
DPReP Findings Overview:
Externalizing Behavior Problems

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>African American</td>
<td>19.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Latino</td>
<td>16.1</td>
<td>11.5</td>
</tr>
<tr>
<td>Total</td>
<td>17.7</td>
<td>13.9</td>
</tr>
</tbody>
</table>

% > 60
DPReP Findings Overview:
Patterns of Self Regulation Development

Proportion of Time Waited

<table>
<thead>
<tr>
<th>Condition</th>
<th>Time 1</th>
<th>Time 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snack Delay</td>
<td>0.30</td>
<td>0.70</td>
</tr>
<tr>
<td>Wrapped Gift</td>
<td>0.10</td>
<td>0.30</td>
</tr>
<tr>
<td>Wait for Bow</td>
<td>0.60</td>
<td>0.90</td>
</tr>
<tr>
<td>Forbidden Toy</td>
<td>0.20</td>
<td>0.40</td>
</tr>
</tbody>
</table>
Cross-sample comparison

<table>
<thead>
<tr>
<th>“Touch” score</th>
<th>Snack Delay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waits until end of trial</td>
<td>4</td>
</tr>
<tr>
<td>Touch after bell lift</td>
<td>3</td>
</tr>
<tr>
<td>Touch before bell lift</td>
<td>2</td>
</tr>
<tr>
<td>Eats after bell lift</td>
<td>1</td>
</tr>
<tr>
<td>Eats before bell lift</td>
<td>0</td>
</tr>
</tbody>
</table>

Kochanska et al., (1996). Age: 26-41m (mean 32m)
Cross-sample comparison

Carlson, Mandell, & Williams, 2004
Age: 24m

Shape stroop

Average score

Correct

Self Correct

Incorrect

0.76  91%

1.53  31%
Self Regulation Factor Model

• Inhibitory control (T1 and T2)
  – Snack Delay
  – Wrapped Gift/Wait For Bow
  – Forbidden Toy
• Complex response inhibition (T2 only)
  – Mommy & Me
  – Heads & Toes
• Set Shifting (T2 only)
  – DCCS
• Working Memory (T2 only)
  – Memory Span

Caughy, Mills, Owen, & Hurst (2013). JECP, in press
DPReP Findings Overview:
Self Regulation and School Readiness

<table>
<thead>
<tr>
<th></th>
<th>IC1</th>
<th>IC2</th>
<th>CRI</th>
<th>SS</th>
<th>WM</th>
<th>BR</th>
<th>PPVT</th>
<th>CBCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhibitory control (T1)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inhibitory control (T2)</td>
<td>.30</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complex response inhibition</td>
<td>.08</td>
<td>.11</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set shifting</td>
<td>.05</td>
<td>.08</td>
<td>.10</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Working memory</td>
<td>.11</td>
<td>.18</td>
<td>-.02</td>
<td>.00</td>
<td>.00</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bracken</td>
<td>.25</td>
<td>.22</td>
<td>.15</td>
<td>.16</td>
<td>.22</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPVT/TVIP</td>
<td>.16</td>
<td>.29</td>
<td>.03</td>
<td>.07</td>
<td>.27</td>
<td>.44</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>CBCL</td>
<td>-.05</td>
<td>-.16</td>
<td>-.01</td>
<td>-.09</td>
<td>-.11</td>
<td>-.16</td>
<td>-.09</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Bold font indicates \( p < .05 \)
DPReP Findings Overview: Determinants of Self Regulation

- Inh Ctrl (1)
- Inh Ctrl (2)
- CRI
- Set shifting
- Working memory

African American vs. Latino

Caughy, Owen, & Mills (under review)
DPReP Findings Overview:
Determinants of Self Regulation

Household risk factors: PCG < HS education; below 50% FPL, single parent, child:adult ratio 3+; change in PCG; change in PCG partner; household move; neighborhood/household safety concerns; PCG depression; PCG harsh during interaction
### DPReP Findings Overview: Determinants of Self Regulation

<table>
<thead>
<tr>
<th></th>
<th>Parenting Sensitivity Composite</th>
<th>Parent Intrusiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(sensitivity, cognitive stimulation, positive regard, negative regard, detachment)</td>
<td></td>
</tr>
<tr>
<td>Inhibitory control (T1)</td>
<td>.21**</td>
<td>-.21**</td>
</tr>
<tr>
<td>Inhibitory control (T2)</td>
<td>.15**</td>
<td>-.16**</td>
</tr>
<tr>
<td>Complex response inhibition</td>
<td>-.02</td>
<td>-.08</td>
</tr>
<tr>
<td>Set shifting</td>
<td>-.00</td>
<td>-.11</td>
</tr>
<tr>
<td>Working memory</td>
<td>.13*</td>
<td>-.07</td>
</tr>
</tbody>
</table>

*p < .05; **p < .01
DPReP Findings Overview:
Direct and indirect effects of parenting

• Caregiver sensitivity
  – Directly associated with higher PPVT scores for all
  – Indirectly associated with higher PPVT scores (via IC and WM) for Latinos in higher risk households

• Caregiver intrusiveness
  – Directly associated with lower IC for all
  – Indirectly associated with lower Bracken scores (via IC) for African Americans living in higher risk households
  – Indirectly associated with lower PPVT scores (via IC) for Latinos living in higher risk households

Caughy, Owen, & Mills (under review)
DPReP Findings Overview: Fathering and Self Regulation Development

Model adjusted for family income and mother sensitivity composite

Adapted from Owen et al. 2013
Dallas Preschool Readiness Project: Next Steps

• Finalizing coding of T2 parent-child interaction data
• How to model joint influence of mothering and fathering?
• Spin-off analyses
  – Racial socialization practices and school readiness
  – Gender differences in the relation between parenting and change in behavior problems among Latinos
  – Spatial analyses
  – Changes in profiles of mothering (Hasanizadeh dissertation)
  – Maternal behavior, child language, and self regulation among Spanish-speakers (Peredo thesis)
  – Partner relationship quality, maternal depression, and child adjustment (Thomas dissertation)
  – Bilingualism and DCCS performance (N’ganga thesis)
Dallas Preschool Readiness Project: Next Steps

• Phase 2 data collection (Kindergarten and first grade follow-ups) starting this fall
  – Will include teacher-reported data

• Related projects
  – Language development and self regulation development in ELLs (with Raul Rojas)
  – *Juega Conmigo* evaluation (Owen as part of Center for Children and Families)
  – Exploratory data collection/analysis of child BMI
Dallas Preschool Readiness Project

Funded by the Eunice Kennedy Shriver National Institute of Child Health and Development

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