Assessing development trajectories of executive functions in low income ethnic minority preschoolers: Challenges and opportunities

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Why is it important?

• Race/ethnic disparities in school readiness
  – 34% of African American and 42% of Hispanic kindergarteners are in the lowest quartile of reading skills
• Self regulation skills are emerging as an important foundation of school readiness
• Earlier intervention is more effective
What do we know about development trajectories for EF?
Ethnic composition of longitudinal studies of executive functioning

% ethnic minority

- Not specified
- African American
- Hispanic
- Asian
- Am Indian
- Multiracial/other

Bierman, Blair, Brewis, Carlson, Dennis, Eisenberg, Kochanska, Lengua, Li-Grining, Raikes, Spinrad
Dallas Preschool Readiness Project
Funded by the Eunice Kennedy Shriver National Institute of Child Health and Development

• 400 preschoolers to be assessed annually starting at age 2½ years
  – All either African American or Hispanic
  – All with family incomes <200% poverty

• Measures of executive functions
  – Delay of gratification: snack delay, wrapped gift, forbidden toy
  – Effortful attention: Fruit Stroop, Mommy & Me, Heads & Toes, Walk-the-line

• Other measures
  – Video of mother-child and father-child interaction
  – Parenting attitudes and beliefs about school readiness
  – Racial socialization practices
  – School readiness
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As of May 17, 2010

Recruited
N = 348

Enrolled
N = 160

African American
N = 52
  Fathers Eligible
  N = 29
  Fathers Enrolled
  N = 29

Hispanic
N = 108
  Fathers Eligible
  N = 87
  Fathers Enrolled
  N = 42

Child Language
English
N = 15
Spanish
N = 93

Caregiver Language
English
N = 18
Spanish
N = 90

Pending
N = 188

African American
N = 83

Hispanic
N = 105

Fathers Eligible
N = 87

Fathers Enrolled
N = 29
Cross-sample comparison: Delay of gratification tasks

- Snack delay: 21, 49
- Wrapped gift (bow): 43, 71

Carlson, 2005
Snack delay: 
Behavior across trials

<table>
<thead>
<tr>
<th>% children</th>
<th>Never waits</th>
<th>Improves across trials</th>
<th>Always waits</th>
<th>Mixed behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>38</td>
<td>12</td>
<td>12</td>
<td>34</td>
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Never waits: 38% of children
Improves across trials: 12% of children
Always waits: 12% of children
Mixed behavior: 34% of children
Cross-sample comparison: Delay of gratification tasks

Kochanska, Murray, & Harlan, 2000
Cross-sample comparison: Effortful attention tasks

Carlson, Mandell, & Williams, 2004
Effortful attention tasks:
Fruit Stroop

“Show me the baby grapes”
Cross-sample comparison: Effortful attention tasks

Fruit Stroop

Bell, Hubble, & Morasch, 2010
Effortful attention tasks:
Mommy & Me
Cross-sample comparison: Effortful attention tasks

Mommy & Me

Bell, Hubble, & Morasch, 2010
Effortful attention tasks:
Confidence in child comprehension

![Bar chart showing confidence in child comprehension for different tasks.
- Not at all confident
- Somewhat not confident
- Neutral
- Somewhat confident
- Very confident

Tasks:
- Fruit Stroop
- Mommy & Me

% children on the y-axis.
Fruit Stroop and Mommy & Me categories on the x-axis.
How is the development of EF shaped by the unique ecological niches of minority children?

• Acculturation and the development of effortful attention
  – Carlson & Meltzoff (2008): Bilingual kindergarteners perform better on attention conflict tasks

• Racial socialization
  – A home environment rich in Africentric culture is associated with better cognitive skills in African American preschoolers (Caughy et al., 2002) and first graders (Caughy et al., 2006)
How is the development of EF shaped by the unique ecological niches of minority children?

- **Importance of fathers**
  - Fathers very engaged

- **Unique family/household characteristics**
  - Instability of household residents
  - Non-traditional family structures
  - Instability of non-maternal care providers
  - Multiple family households

- A number of families in this population will already be involved in some sort of intervention project.

- Is the association between proximal factors and EF development moderated by contextual factors?
Conclusions and questions

• How well can we generalize what we know about development trajectories of EF to those children most at risk for school failure?
  – Standard EF tasks show variability in low income minority children.
  – How do we best capture subtle individual differences in self regulation skills?
Conclusions and questions

• In what ways should we broaden our consideration of factors important for the development of executive functions in low income, ethnic minority children?
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