Introduction

- Improvements in children’s memory, particularly 3-6-year-olds stem from 1) increases in the ability to identify previously encountered items, 2) increases in the ability to recall contextual details associated with these items (e.g., location; e.g., Drummer & Newcombe, 2002; Riggins et al., 2009), and 3) decreases in false recognition of new items as previously encountered (e.g., committing false alarms, PA, e.g., Lindsay et al., 1995; Lloyd et al., 2009).

- Executive functioning, the ability to strategically plan and organize behavior, also shows significant development during early childhood (Diamond, 2006). Some components of executive functioning include: working memory, inhibition (conflict, delay), and cognitive flexibility.

- In developmental populations:
  - Working memory is related to recognition memory (Ruffman et al., 2001).
  - Conflict inhibition is related to memory for contextual details (Drummer & Newcombe, 2002; Cyowicz et al., 2001; Ruffman et al., 2001) and false recognition (Mellander et al., 2006; Roberts & Powell, 2005; Ruffman et al., 2001).
  - Cognitive flexibility is related to memory for contextual details (Picard et al., 2012).
  - The aim of the current study was to examine how the core components of executive function were related to memory for contextual details and false recognition taking into account general intelligence.

Methods

Participated

- Data were collected from 31 3-5-year-old children (20 boys, mean age = 3.3 ± 0.5 years, range = 3.05 - 3.57) and 25 6-8-year-old children (12 boys, mean age = 6.23 ± 0.16, range = 6.00 - 6.52). An additional 26 children were excluded because of failure to meet inclusion criteria (n = 6), incomplete behavioral data (n = 12), and noncompliance (n = 8).

Behavioral Assessments

- Memory Paradigm (Sessions 1 & 2)
- General Intellectual Ability
  - WPPSI Block Design (Session 3)
  - WPPSI Receptive Vocabulary (Session 1)
- Executive Functioning (Session 3)
  - Working Memory: Forward Digit Span
  - Conflict Inhibition: Day/Night (Gerstadt et al., 1994; Pasler et al., 1985)
  - Delay Inhibition: Delay of Gratification Task (Carlson, 2005)
- Cognitive Flexibility: Dimensional Change Card Sort (DCCS; D'Zela, 2006)

The Sessions 1 and 2 took place 1-2 days apart and Session 3 took place within a month of those sessions with most occurring within one week.

- Undergraduate research assistants coded actions performed by the children during Session 2, the Day/Night task, and the DCCS task.

Table 1
Performance by 3- and 6-year-olds on episodic memory, general intellectual ability, and executive function measures.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>M (SE)</th>
<th>M (SE)</th>
<th>MANOVA statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-year-olds</td>
<td>3.57 (0.15)</td>
<td>6.00 (0.15)</td>
<td>0.00</td>
</tr>
<tr>
<td>6-year-olds</td>
<td>6.00 (0.15)</td>
<td>3.57 (0.15)</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Significant at p < .05. MANOVA = multivariate analysis of variance

Table 2
Hierarchical multiple regression analysis predicting false recognition memory using general intellectual ability, and executive functioning measures as predictors

<table>
<thead>
<tr>
<th>Predictor</th>
<th>β</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group</td>
<td>0.51*</td>
<td>5.80*</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>General intellectual ability</td>
<td>0.38</td>
<td>3.06*</td>
<td>&lt;.01**</td>
</tr>
<tr>
<td>Executive functioning</td>
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</tr>
</tbody>
</table>

Significant at p < .05.

Results

Table 3
Hierarchical multiple regression analysis predicting memory for contextual details using age, general intellectual ability, and executive functioning measures as predictors.

<table>
<thead>
<tr>
<th>Predictor</th>
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Significant at p < .05.

Discussion

- The present study is unique because we examined all four components of executive functioning (Cyowicz et al., 2001; Drummer & Newcombe, 2002; Picard et al., 2012; Ruffman et al., 2010).
- These findings suggest that conflict inhibition is related to memory for contextual details and that cognitive flexibility is related to false recognition even when controlling for age and general intellectual ability. These findings are important because they show that particular executive functioning abilities influence memory for contextual details and 2) highlight the importance of considering individual differences in cognitive abilities.

Acknowledgements

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