Introduction

- Numeracy skills including magnitude comparison vary substantially at school entry, and these skills predict later academic achievement (Rittle-Johnson et al., 2017).
- Parents’ engagement in numeracy with their children is related to children’s early numeracy skills (Ramani et al., 2015).
- Further, frequent parent-child engagement with advanced early number concepts including magnitude comparison predicts children’s early numeracy skills (Skwarchuk et al., 2014).
- However, this engagement tends to be infrequent (Vandermaas-Peeler, 2012) and may be related to parents’ beliefs about math (Skwarchuk et al., 2014) and the type(s) of activity in which they engage (Dauber et al., 2018).
- Parents reportedly prefer informal math activities rather than formal ones (Cannon & Ginsburg, 2008). Card games might be a particularly good informal context for parent-child engagement in numeracy since card games usually require attention to numbers and parents likely have cards at home.
- However, little is known about whether specific card games inherently encourage parent-child engagement with advanced early number concepts.

Questions

- How does the type of informal activity (card game) in which parent-child dyads are engaged relate to how frequently they engage in magnitude comparison while playing with cards?
- How do parents’ math-related beliefs and children’s math and verbal skills relate to the frequency of parent-child engagement in magnitude comparison?

Participants

- Forty-six preschoolers (M=4.56 years, SD=2.9) and a parent were recruited from 6 preschools in a Southeastern U.S. city.
- Preschoolers were 54% girls, were 46% White, 39% Black, 4% Biracial, 2% Asian, and 4% Hispanic, and 37% received financial assistance for tuition.
- Most of the parents were mothers (80%), about half identified as White (49%), and 87% of mothers and 62% of fathers reported having at least an Associate’s degrees.

Method

- Parent-child dyads played a card game of their choice at the children’s preschool (after receiving two suggested card games: War and Order Up).
- The play sessions (M=7.5 minutes, SD=2.9) were coded for frequency of parent-child dyads that played and were interval-coded every ten-seconds for parents’ and children’s magnitude comparison.
- Parents reported their math-related beliefs via a survey (Zippert & Rittle-Johnson, 2018).
- Children’s math and verbal abilities were assessed using the Research-based Early Mathematics Assessment Short-Form (Weintraub et al., 2012) and the Picture Vocabulary Test (Weschtaub et al., 2013) respectively during a separate session.

Results

<table>
<thead>
<tr>
<th>Card Game Played</th>
<th>Percentage of Participants</th>
<th>Frequency of Magnitude Comparison M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>War</td>
<td>56.5</td>
<td>35.5(16.3)</td>
</tr>
<tr>
<td>Order Up</td>
<td>19.6</td>
<td>12.0(21.1)</td>
</tr>
<tr>
<td>Matching Numbers</td>
<td>10.9</td>
<td>3.6(5.0)</td>
</tr>
<tr>
<td>Go Fish</td>
<td>6.5</td>
<td>5.2(5.9)</td>
</tr>
<tr>
<td>Free Play</td>
<td>4.3</td>
<td>0.0(0.0)</td>
</tr>
<tr>
<td>Number Identification</td>
<td>2.2</td>
<td>0.0(0.0)</td>
</tr>
</tbody>
</table>

Notes: Eight dyads chose to play multiple card games however the analyses only include the first card game that they played. Participants who played card games other than War were collapsed into one group (“Other Card Game”) for analyses. Across all card games, parents compared magnitudes for 23% of the play session (SD=21.0) and children compared magnitudes for 15% of the session (SD=14.0).

Hierarchical Regression Predicting Frequency of Parent Magnitude Comparison

<table>
<thead>
<tr>
<th>Model Variables</th>
<th>β</th>
<th>t</th>
<th>R²</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 Child Magnitude Comparison</td>
<td>.53</td>
<td>4.18***</td>
<td>.28*</td>
<td></td>
</tr>
<tr>
<td>Step 2 Child Magnitude Comparison</td>
<td>.27</td>
<td>2.23*</td>
<td>.51*</td>
<td></td>
</tr>
<tr>
<td>Type of Card Game Played</td>
<td>.56</td>
<td>4.49***</td>
<td>.23</td>
<td></td>
</tr>
</tbody>
</table>

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Supporting Early Numeracy Development with Card Games: War Tops The Deck
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References