Executive Function, Theory of Mind and its Relation to Preschooler's Math Achievement

Irene Y.H. Wu & Pamela E. Davis-Kean

INTRODUCTION
- Robust evidence has demonstrated the importance of children’s executive function (EF) skills and how it relates to future academic achievement.
- Similarly, theory of mind (ToM) is often associated with social-emotional and behavioral regulation, which benefits children in academic settings.
- This study takes a novel approach in examining the role that both EF and ToM may play in the prediction of children’s developing math skills.
- This brings to merge the areas of cognitive and social cognitive skills in explaining children’s academic performance.

METHOD (CONT’D)
- Executive Function: Inhibitory control was measured using the head-toe-knees-shoulder (HTKS) task

METHOD
- 40 preschool children (M age = 4.5 years) and their mothers (M education = 15.5 years)
- 26 families were European American, 8 were African-American, 1 was Hispanic and 4 were multi-racial
- Average income-to-needs ratio of the families was 3.35, with a range from 0.48 to 9.04
- EF and ToM tasks during wave 1 and math assessments during wave 2 were used for analyses

RESEARCH QUESTIONS
Q1: Do children’s performance in EF tasks correlate with their ToM and math performance?
Q2: Do children’s performance in EF tasks predict their math performance?
Q3: Do children’s performance in ToM tasks predict their math performance?

RESULTS (CONT’D)

Q: Do children’s performance in ToM tasks predict their math performance?

METHOD

RESULTS

CONCLUSION
- Primary aim was to explore how multiple EF and ToM components may affect children’s future academic performance
- Findings show that the HTKS task, which measures inhibitory control, was the strongest predictor for math achievement along with the performance of other measured constructs.
- Children who have better inhibitory control (HTKS task) may have advantages because of their ability to ignore distracting information or retain relevant information, which are essential in math problem solving
- The lack of findings from the other EF and ToM constructs could indicate young children’s inability to perform cognitively complex problems which involve a combination of working memory, attention shifting and inhibitory control.