INTRODUCTION
• Young children’s math learning undergirds their cognitive development
• Early math skills build a foundation for later math, science, engineering, and problem-solving skills (Claessens & Engel, 2013)
• Early learning environments (e.g., school and home) are critical targets for math interventions
• Many early education teachers and families are not trained in evidence-based methods to facilitate meaningful math experiences

PURPOSE
Create a cross-context (school-home) intervention using innovative strategies to transform the math learning environments of preschoolers from under-resourced communities

PRIOR EXPLORATORY RESEARCH
• EDC partnered with eight New England Head Start programs to develop and test the first Young Mathematicians (YM) program
• A 2016-17 study found significant positive effects of one condition of YM on (1) Head Start preschoolers’ math learning, (2) teachers’ instructional practices, and (3) family attitudes toward math (Young, Reed, Rosenberg, & Kook, 2019)
• More research is needed to fully develop and test YM for broad implementation and to maximize program effect for younger and older children and dual-language learners

Connecting school and home mathematics provides preschoolers with a web of opportunity that promotes school success

Game: Same? One More, One Less?
Teacher card
Cards on table for children to choose from
Can you find a card with the same number of dots as mine?
Can you find a card with one more dot than mine?
Can you find a card with one less dot than mine?

Y2 Implementation Study
• 5 Head Start classrooms; 10 teachers, 1 coach
• Math learning games, materials, and storybooks for classroom and virtual learning
• Bi-weekly teacher professional learning sessions
• Video observations of children playing games

RESEARCH DESIGN
Year 1: materials design and development in five Head Start classrooms
Year 2: implementation study with five Head Start classrooms to ensure materials are engaging and comprehensible
Year 3: RCT field study with 40 Head Start classrooms to measure the impact of YM on preschoolers’ math learning
Year 4: data analysis and dissemination of finalized materials for school and home

MEASURES
• Weekly surveys to probe teachers’ math learning and knowledge, program implementation, and ease of materials use
• Lessons Learned
  • Intentional supports are needed to create equitable learning opportunities
  • Visual guides/Instructional tips to support math game play with simple, less formal voice
  • Teachers and families want scaffolded exposure to math vocabulary and concepts
  • Pandemic highlighted the critical relationship of teachers and families as partners in children’s learning
  • Math materials can bridge home and school

This project is funded by the National Science Foundation under Grant DRL-1907904 and supported by the Heising-Simons and Overdeck Foundations #2015-1396, the Heising-Simons Foundation Grants 2016-133 and 2015-023, and National Science Foundation under DUE-1348564.