Young Mathematicians (YM): Expanding an Innovative and Promising Model Across Learning Environments to Promote Preschoolers' Mathematics Knowledge

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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

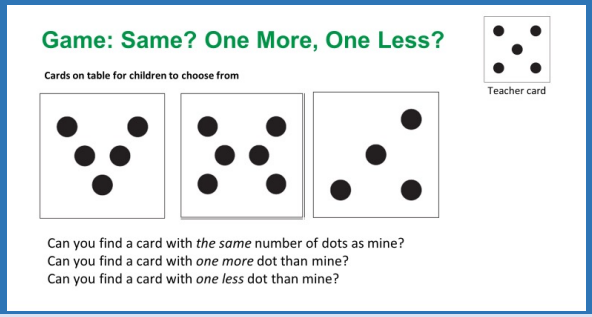
PURPOSE

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



This project is funded by the National Science Foundation under Grant DRL-1907904 and supported by the Heising-Simons and Overdeck Foundations #2019-1396, the Heising-Simons Foundation Grants 2016-133 and 2015-023, and National Science Foundation under DUE-1348564.

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