

# Parent Perceptions and the Home Numeracy Environment: The RESET Framework



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## Introduction

- Mastery of key math competencies in early childhood is critical to later success in math, school, and life, yet many children do not develop the requisite skills & knowledge before entering, much less leaving kindergarten. (Duncan et al., 2007; Claessens & Engel, 2013)
- Shared parent-child math activities have been shown to increase children's math knowledge at school entry, leading to higher levels of math achievement as they move through school and beyond. (Gunderson & Levine, 2011; Kleemans et al. 2012)
- Unfortunately, meaningful parent-child math engagement remains somewhat limited, especially when compared to parent-child literacy engagement. (Levine et al., 2010)
- Researchers are lacking common tools and tools for the study of the Home Math Environment(HME); this study seeks to test a framework (RESET) for the examination of parent perceptions/participation related to the HME. (Blevins-Knabe, 2016)

## Research Question

**How do the different dimensions of *Role, Expectations, Skills & Knowledge, Efficacy, and Time & Energy* interact and influence parent decisions about shared parent-child math practices in the home?**

(See more info on this framework at right, in top center column)

## Methodology

This **exploratory mixed-methods** study is an initial exploration of how the five dimensions of the RESET framework interact and relate to parent-child shared math practices in the home.

### Participants

- This study drew a sample of parents from the Los Angeles, CA area
- $N = 23$  parents of 4-5-year-old children who had not yet entered Kindergarten (Parents 72.9% female, children 52.2% female)
- Education: Highschool/GED or less (13%), Some College/Vocational (43.5%), College Graduate (43.5%)
- Income: Less than \$50K (34.8%), \$50K to \$100K (34.7%), more than \$100K (30.4%)
- Ethnicity: White (30.4%), African American (21.7%), LatinX (34.8%), Multi-racial (13%)

### Methods

- Parents independently completed a digital survey related to the RESET framework (25 items) and shared math activities in the home.
- Each parent participated in a semi-structured interview to answer questions about their perceptions along RESET dimensions and activities in the HME.
- Interview responses were coded using RESET as a conceptual framework. Subcodes within RESET were created using an inductive coding strategy; these codes were then transformed into quantitative data for further analysis. (Miles & Huberman, 1994)
- Survey and Interview data were examined for correlations across the RESET framework and shared parent-child math practices.

## RESET Framework

- The RESET Framework builds on work by Hoover-Dempsey and colleagues (2005), identifying parent perceptions of *Role, Efficacy, Skills & Knowledge*, and *Time & Energy* as important factors influencing parent engagement.
- Parent's *Expectations* for child performance has also been shown to be a critical factor influencing parent engagement. (Davis-Kean, 2005)
- The RESET framework was crafted to specifically examine parent perceptions along the dimensions listed above as they relate specifically to mathematics in the home.

RESET Dimensions	RESET Framework Scale	
<b>Role:</b> influenced by parents' early experiences with learning math, their own parents, school, and societal influences. It is socially constructed and may change in response to changing social conditions or efforts (by parent or outside groups, like an intervention program) to alter it.	<b>R</b>	<div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div>UninvolvedInvolved</div>
<b>Expectations:</b> influenced by parent perceptions of the value of mathematics, it's role in the life of the parent and future life of the child, and their understanding/ awareness of early childhood mathematics.	<b>E</b>	<div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div>Math UnimportantMath Very Important</div>
<b>Skills &amp; Knowledge:</b> Parents' perceptions of their own math skills and knowledge impact the ways in which they choose to interact with their children, the types of skills and concepts they emphasize, and the expectations they have for their children's math development.	<b>S</b>	<div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div>Low Skills/KnowledgeHigh Skills/Knowledge</div>
<b>Efficacy:</b> Parents' perceptions of their own self-efficacy is related to their belief in their ability to successfully support the math development of their child. It is influenced by their perceptions of math skills and knowledge and affects their expectations and modes of math engagement.	<b>E</b>	<div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div>Lacks ConfidenceConfident</div>
<b>Time &amp; Energy:</b> Parent engagement in shared math activity is influenced by their perceptions of the time and energy available to participate.	<b>T</b>	<div><div>1</div><div>2</div><div>3</div><div>4</div></div> <div>UnavailableAvailable</div>

## Results

### Using RESET to examine results...

#### ROLE: Parenting Role as Teacher or Partner

- Parents who viewed themselves as a “**Partner**” with a teacher were more likely to score higher on the **Expectations** survey items of RESET ( $r = .433, p < .05$ ).
- “**Partner**” parents were also more likely to adopt a **Simple** approach to math engagement, focusing mostly on simple number knowledge and counting skills ( $r = .439, p < .05$ ).
- “**Teacher**” parents, who viewed themselves as responsible for teaching their child early math, were more likely to perceive themselves as having **Strong** math skills ( $r = .538, p < .001$ ).

## Results (Continued)

### EXPECTATIONS: Parenting Emphasis on Performance or Emotion

- **Performance Focused** parents, who focused on grades and achievement, were more likely to perceive themselves as having **Strong** Math Skills (*Skills*), ( $r = .523; p < .001$ ), and were also more likely to have expressed stronger *Efficacy* on the RESET survey items ( $r = .439; p < .05$ ).
- **Emotion Focused** parents, who focused on developing child's confidence in and love for math, were more likely to focus on a wider range of **Total Math Skills** ( $r = .410, p < .05$ ), rather than only on simple number knowledge and counting
- **Emotion Focused** parents also placed a stronger emphasis on more **Geo. & Meas.** activities in the home ( $r = .433, p < .05$ ); an emphasis which was significantly correlated with **Total Math Skills** ( $r = .537, p < .01$ ), indicating that parents that included more **Geo. & Meas.** activities in the home were more likely to engage in more math, and more diverse math skills, overall.

### SKILLS: Parents' View on their Own Math Skills

- As mentioned in the *Role* dimension, parents who adopted the role of “**Teacher**” were more likely to view themselves as having **Strong** math skills
- Parents who perceived themselves as having **Weak** math skills were more likely to express higher levels of **Math Anxiety** (discussed in *Efficacy* below)

### EFFICACY: Parental Math Anxiety

- **Math Anxiety** was significantly negatively correlated with *Efficacy* ( $r = -.526, p < .01$ ) and *Skills* ( $r = -.500, p < .001$ ), and overall **RESET** scores ( $r = -.555, p < .001$ ); meaning that parents with higher math anxiety were more likely to score lower across the dimensions of RESET.
- Parents with higher levels of **Math Anxiety** were less likely to be **Performance Focused** in their parenting ( $r = -.604, p < .001$ )
- Additionally, parent **Math Anxiety** was highly significantly correlated to parents' expressions of **Negative** experiences learning math as a student ( $r = .816, p < .000$ )

### TIME: Parent Perceptions of Time and Energy

- Most parents expressed concerns about time/energy, however **Emotion Focused** parenting was significantly negatively correlated with **Time** on **RESET** ( $r = -.502, p < .05$ ); these parents felt as if they had less time to support math.

## Key Takeaways

- Parents with different **Role** constructions and **Expectations** of their children's math development engage differently in activities and tend to emphasize different skills. For example...
  - “**Partner**” Parents (**Role**), who viewed their role as a partner with the teacher, focused more on the development of **Simple** number and counting skills...
  - While **Emotion Focused** parents (**Expectations**) tended to incorporate more skills, and more variety (breadth) of skills, including **Geo. & Meas.** as well as **Advanced** number and counting skills and concepts.
- High **Math Anxiety** (*Efficacy*) was associated with low parent math **Skills**, *Efficacy*, and overall **RESET** scores. It was also negatively associated with **Performance Focused** parenting.
- The RESET framework appears to be a useful tool for examining the ways parents are involved in their children's math development. Future studies may look to validate a rating scale based on the framework.
- Further analysis of the data from this study has the potential for additional insights, including the ways in which the RESET dimensions interact and influence the incorporation of specific types of shared math activities (e.g. boardgames, flashcards, and other formal/informal activities, etc.)

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