

# Parents' Approaches to Early Numeracy Support Do Not Match the Approach They Think is Most Important



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## Background

- + Parents' beliefs influence the early numeracy support they provide their children (Douglas, et al., 2021; Mutaf-Yildiz et al., 2020)
- + One understudied belief is parents' beliefs about pedagogical approach for supporting their child's math development
- + Pedagogical approach: Approach and context for supporting their child's math learning (e.g., during daily routines; direct teaching)
- + Three previous studies:

Study	Results for Most Important/Best Pedagogical Approach
DeFlorio & Beliakoff (2015)	Low SES: Direct Teaching Middle SES: Daily Routine
Sonnenschein et al. (2016)	Direct Teaching
Cannon & Ginsburg (2008)	During Daily Routines & During Activities Their Child Enjoys

- + Some evidence that pedagogical approach relates to child skill (DeFlorio & Beliakoff, 2015).
- + No agreed upon measure. For instance, Cannon & Ginsburg (2008) and Sonnenschein et al. (2016) asked open ended questions, while DeFlorio & Beliakoff (2015) asked close ended questions. There was also a difference in samples, specifically SES
- + No study measures both the approach(es) parents use and the approach(es) parents believe are important or compares them.
- + This comparison is important to further understand the connection between parents' beliefs and early numeracy support, and what ways beliefs and support differ.

## Questions

- + Is there a difference between the approach(es) parents use at home and what approach they believe is most important?
- + Are there SES differences?
- + How do these approach(es) relate to the frequency of home numeracy activities?

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## Participants

- + Survey data collected via Amazon MTurk
- + 89 parents of 3- and 4-year-olds (52% girls). Most were mothers (69%) and White (72%) and completed some college (79% of mothers, 96% of fathers). 70% of parents reported a household income of greater than \$45,000 (middle to high income)

## Method

### Pedagogical Approach (4 approaches)

List of provided approaches:

- + I give my child math-related tasks or ask math-related questions during ongoing daily living experiences or routines (for example, we use measuring cups or spoons while preparing food) – **(During Daily Routine)**
- + I set aside time to focus on teaching my child math skills (for example, we look at a math workbook or use math flashcards) – **(Direct Teaching)**
- + I enrich my child's playtime by providing math-related toys and materials that they use alone or with other children (for example, my child spontaneously plays with cards or shape puzzles alone) – **(Give Math-related toys)**
- + I play math games with my child or incorporate math during activities that I think my child will enjoy to engage my child's math interest (for example, we talk about math while playing board games or watching Sesame Street together) - **(During Activities Their Child Enjoys)**

Questions asked about Approaches:

- + Which of the following approaches do you use at home on a regular basis to help your child develop mathematical knowledge and skills? If select more than one approach: Which approach do you use most often?
- + Rank the following approaches from least important (1) to most important (4) in your home (Subset of participants, N = 45)

### Home Numeracy Activities (15 items)

- + How often do you do the following activities with your child? (10 Formal, 5 Informal)
  - + Add simple sums or talk about number facts (for example, 2+2=4)
  - + Practice subtracting items (for example, when playing with 2 toy cars, asking "How many cars will you have if I take away one of your cars?")

## Socioeconomic Status (SES)

- + Parent Highest Education Level as proxy for SES
- + From (1) Elementary to (7) Master's, Professional, or doctoral degree
- + Median split for analyses to become two groups: (1) Less than Bachelor's degree vs. (2) Bachelor's degree or more

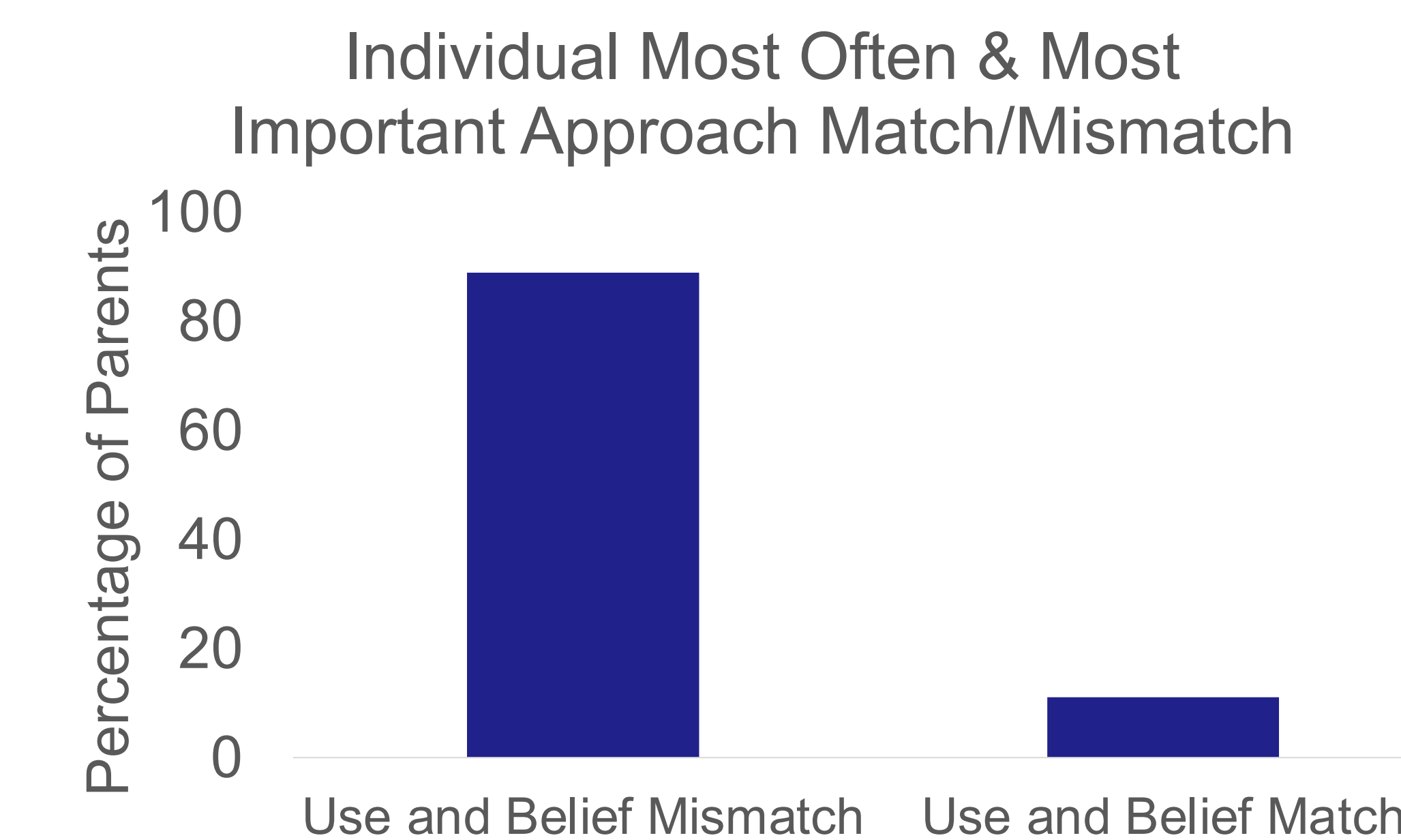
## Results

### Use and Importance

- + Overall, observed differences between percentage of parents choosing each approach as most often vs. most important

General Pedagogical Approach	Percentage of Parents	
	Most often (N = 89)	Most Important (N= 45)
During Daily Routines	40%	9%
Direct Teaching	10%	60%
Give Math-related Toys	20%	22%
During Activities Their Child Enjoys	29%	9%

- + At the individual level, most parents (89%) did not match in the approach they used most often and what they believed is most important



### SES Differences in Pedagogical Approach

- + The pedagogical approaches parents use did not differ for parents with bachelor's degrees compared to no bachelor's degree.
- + Current data did not have enough variability to analyze pedagogical approach beliefs differences by education
- + Additionally, there was not enough variability by income for either variable (use or belief).

## Pedagogical Approach & Numeracy Support

	Frequency of Numeracy Activities (Mean (SD))	
	Most often (N = 89)	Most Important (N= 45)
During Daily Routines	3.88(.95)	3.62(1.07)
Direct Teaching	3.98(.94)	3.87(.92)
Give Math-related Toys	3.97(.90)	4.29(1.11)
During Activities Their Child Enjoys	4.12(.74)	3.83(.53)

- + Neither parents' pedagogical approach use nor beliefs were related to the frequency of their numeracy support.

## Discussion

- + Large difference between most often vs. most important pedagogical approach.
- + Parents believed direct teaching to be the most important pedagogical approach, but reported using the during daily routine approach most often.
- + We found no relation between frequency of home numeracy activities and pedagogical approach (use or belief)
- + Limitation: Small sample; specifically, variability in pedagogical approach categories (use and belief) was small when looking at demographic characteristics.
- + No difference by education and not enough variability in income for analyses although DeFlorio & Beliakoff (2015) found difference by SES (using an income proxy).
- + Future research is needed on why and how parents use and believe in different approaches to home math support.

## Selected References

- + Cannon, J., & Ginsburg, H. P. (2008). "Doing the math": Maternal beliefs about early mathematics versus language learning. *Early education and development, 19*(2), 238-260.
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- + Mutaf-Yildiz, B., Sasanguie, D., De Smedt, B., & Reynvoet, B. (2020). Probing the relationship between home numeracy and children's mathematical skills: A systematic review. *Frontiers in Psychology, 2024*.
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