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An Exploration of Parent Attitudes, Beliefs, and Home Numeracy Practices by Child Gender

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Abstract

This thesis is a quantitative case study investigating parents' beliefs about home numeracy, mathematics, and mindset by child gender. The research questions explored are as follows: 1) Do parents' home numeracy practices differ by child gender? 2) Do parents' beliefs about mathematics differ by child gender? 3) Do parents' mindset beliefs differ by child gender? 42 parents completed a surveyand results showed no differences between parents of boys and parents of girls. The results provide insight into how parents' beliefs may not differ between the gender of their child and how that affects their home numeracy environment.

Introduction

The purpose of this study was to examine parents' home numeracy practices and explore parents' beliefs about mathematics in young children. Though gender differences in mathematics performance have been extensively researched over the last 50 years, few studies have explored gender differences in the belief systems of parents. Current research suggests that many parents may struggle with math anxiety. Cosso et al. (2023) found a negative correlation between parent anxiety and children's mathematics achievement. Specifically, the more anxious parents are about mathematics and teaching mathematics to their children, the lower the level of achievement in their children. Cosso and colleagues speculated that this relationship led parents to have fewer interactions with their children, due to fear and uncertainty, which resulted in lower achievement scores for children. The specific research questions are as follows: 1) Do parents' home numeracy practices differ by child gender? 2) Do parents' beliefs about mathematics differ by child gender? 3) Do parents' mindset beliefs differ by child gender?

Methods

This study used convenience sampling and included parents of elementary-aged students in grades K-2. The sample contained 42 parents of students, both male and female. Participants included parents of children enrolled in the Young Men's Christian Association (YMCA) Summer Camp in Southcentral

Pennsylvania, specifically in Chambersburg. Potential participants were contacted through a mass email sent out from the director of the YMCA camp that reached all parents of enrolled children, all considered "typically developing" with average to above average academic ability.

This study includes a total of 46 completed survey responses. Table 1, provided in the attached appendix, shows 44 of those 46 responses. This is due to a select few participants not completing the survey in its entirety. This participant breakdown by age, grade level, and gender of the child is shown in Table 1.

Results

The results of this study provided data to answer the questions regarding the differences between parents of boys and parents of girls in home numeracy practices and beliefs about mathematics. Across all research questions, independent T-tests revealed that there were no significant differences in the practices or the mathematical beliefs of parents for each gender.

Discussion

The results indicate that parents of boys and parents of girls engage in similar at-home numeracy activities with no statistically significant differences in frequency across different activities (i.e., counting games, participating in cooking). These findings contrast with some pre-existing literature that suggests that parental support in the Home Numeracy Environment (HNE) may differ by the gender of the child due to preconceived notions about boys' and girls' mathematical abilities (Gunderson et al., 2012). The lack of differences in this sample may indicate that parents are prioritizing mathematical engagement with their children in both genders equally, which reflects a shift towards a more gender-neutral mathematics approach in early childhood education.

Parents' beliefs about mathematics were also similar for parents of boys and parents of girls. This suggests that parents hold similar beliefs about math engagement regardless of the child's gender. This result fits in with recent research, which suggests that although parents may have predisposed beliefs about boys' and girls' mathematical abilities, these beliefs do not strongly affect the way they choose to approach math activities at home (Mues et al., 2022).

When assessing parents' answers about gender stereotypes, specifically if girls are better than boys at math, parents tended to disagree with those statements. This shows that parents in my sample did not endorse any of the negative gendered stereotypes that are pushed onto girls to discourage them from performing and pursuing math. This can also be looked at in a career way; these parental beliefs show that parents do not endorse the discouragement of girls in the STEM career workspace. This contradicts work from earlier research, which says that women are being discouraged due to stereotypes from participating and pursuing STEM careers, therefore making them severely underrepresented (Levine & Pantoja, 2021).

When examining mindset beliefs of parents, I did not find statistically significant differences between parents of boys and parents of girls. Most parents, regardless of the gender of their child, lean towards a growth mindset versus a fixed mindset. This was shown through items such as "You can't change your basic intelligence." This is particularly encouraging as a growth mindset has been linked to higher academic success in young children that extends into adulthood (Levine & Pantoja, 2021). These results support the idea that parents may be recognizing at higher rates the importance of a flexible mindset and growth-oriented beliefs and ways of practicing mathematics, which could positively affect their children's

academic learning experience and create more well-rounded human beings (Dweck, 2007). This study, although making contributions to the literature, did not find significant gender differences in home numeracy practices and beliefs. This was an interesting discovery as it contradicted what the previous research seemed to point to.

References

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Appendix

Table 1. *Descriptive Information about Participants*

Gender	N	Age				Grade		
		5	6	7	8	Kindergarten	First	Second
Parent of Boy	23	4.3% (1)	43.5% (10)	39.1% (9)	8.7% (2)	4.3% (1)	43.5% (10)	47.8% (11)
Parent of Girl	21	14.3% (3)	19% (4)	42.9% (9)	19% (4)	14.3% (3)	19% (4)	42.9% (9)

Note: Frequency counts are shown in parentheses. There was one parent of a boy who did not provide age or grade information. In the girl data, five parents did not provide grade information, and one did not provide age information.