

Introduction

- Beginning in middle school, women and minorities in United States exhibit diminished interest in math and math-related fields
- Increasing national need to ensure adequate and diverse math workforce is available
- Gender and academic year may influence student math interest
- Need for research exists to investigate causes of gender and academic year differences in student math interest

Research Questions

- How do boys and girls in grades 7, 9, and 11 discuss Math Interest?
- Are there differences in the discussion of Math Interest by gender or by grade?
- Are there relationships among Math Self-Efficacy, Math Outcome Expectations and Math Interest for boys and girls in grades 7, 9 and 11?
- Are there differences in Math Self-Efficacy, Math Outcome Expectations and Math Interests by gender or by grade?
- Do Math Self-Efficacy and Math Outcome Expectations explain Math Interest for boys and girls in grades 7, 9 and 11?

Theoretical Framework

Social Cognitive Career Theory (Lent, Brown & Hackett, 1994; Figure 1)

- Constructs: Interests, Self-Efficacy, Outcome Expectations, Perceived Barriers, Perceived Supports (Teacher, Parent & Peer)
- Added Environment & Learning, Engagement, and Sense of Belonging to the model (Shoffner, 2006)

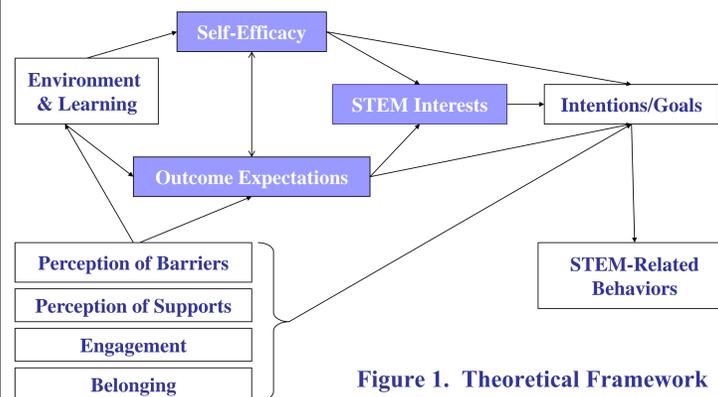


Figure 1. Theoretical Framework

Site and Sample

Third Year Study Sample (n=229)

- Students from a Virginia school district (3 middle and 2 high schools)
- Academic year: Grades 7 (48.9%), 9 (34.1%) and 11(17%)
- Gender: 39.7% male 61.3% female
- Race/Ethnicity: African American (41.5%); White (43.7%); Asian, Asian American (2.6%); Hispanic (3.5%); Other (7%)

Data Analysis

Qualitative: Codes developed are based on the literature as well as emergent codes

Survey consists of 9 scales and 130 items: Scales measuring Math Self-Efficacy, Math Outcome Expectations, and Math Interests were utilized

Analyses: Descriptive, multivariate analyses of variance, correlation and linear regression
Math Interest, Math Outcome Expectations and Math Self-Efficacy are measured in relation to each other, gender, and academic year

Definitions:

Math Interest: student likes and dislikes of the variety of activities, objects, and types of persons associated with math (Lent, Brown & Hackett, 1994)

Math Outcome Expectations: student perceptions of the expected benefits and costs of performing a behavior (Lent, Brown & Hackett, 1994)

Math Self-Efficacy: student belief in their capability to perform or succeed at math tasks at a specified level of competency (Bandura, 1997)

Preliminary Qualitative Findings

Different Math Outcome Expectations by Academic Year	“I get frustrated then I just get mad because then I don’t want to do it but I do it anyway because I know I’ve got to get good grades.” (7 th grade girl)	“Math gives you the skills to think, just to think. It goes to every subject. It gives you the ability to analyze and process everything.” (11 th grade boy)
Mixed Discussions of Math Interest	“All math to me seems the same. To me it’s all numbers and shapes so I just do it to get by.” (11 th grade girl)	“I think physics is really fun. That’s math in a way that I enjoy it when you mix it with something more real instead of just being numbers.” (11 th grade girl)
Similar Math Outcome Expectations by Gender	“architect “, “engineer or serve in the armed forces” (9 th grade boys)	“pharmacist” , “business”, “nursing” (11 th grade girls)

Correlations

	Math Interest	Math Outcome Expectations	Math Self-Efficacy
Math Interest	--		
Math Outcome Expectations	.487	--	
Math Self-Efficacy	.503	.522	--

Results

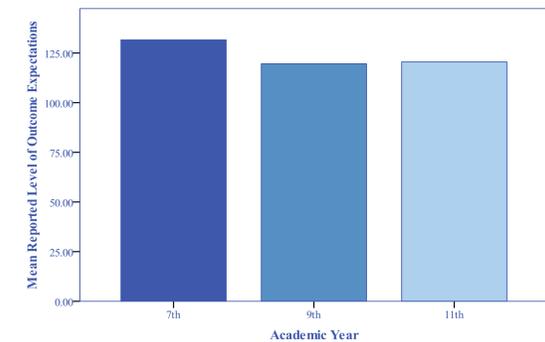
MANOVA:

7th grade students reported significantly higher outcome expectations (M = 125.3) compared to 9th (M = 116.2) and 11th (M = 119.1) grade students.

Regression Analysis:

Math Self-Efficacy: $\Delta R^2 = .253^{**}$ $\beta = .503^{**}$
 Math Outcome Expectations: $\Delta R^2 = .069^{**}$ $\beta = .342^{**}$
 **p < .001

Academic Year on Outcome Expectations



Research Findings

Question 1: Both genders discuss math interest with a mixture of positive and negative comments.

Question 2: Comment types do not significantly differ across gender or grade.

Question 3: There is a correlational relationship between Math Interest, Math Outcome Expectations and Math Self-Efficacy. Both genders report the three dimensions similarly, but Math Outcome Expectations is significantly higher in 7th grade when compared to 9th and 11th grade reports.

Question 4: There were no statistically significant differences between genders for the measured dimensions. Math Outcome Expectations were reported higher among 7th graders of both genders.

Question 5: Math Self-Efficacy explains 25.3 % and Math Outcome Expectations explains an additional 6.9 % of Math Interest of students in grades 7, 9 and 11.

Implications

- Highlights the need for educational research to investigate causes of gender and academic year differences
- Students are more likely to develop and maintain an interest in math if they expect favorable outcomes
- Math Self-Efficacy and Math Outcome Expectations are predictors of Math Interest
- Math Self-Efficacy and Math Outcome Expectations can be addressed in curricula and are amenable to change

References

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