

## Introduction

Richardson and Suinn (1972) defined math anxiety as unpleasant feelings, specifically, those of tension and anxiety that impede an individual's ability to manipulate numbers and solve math problems in a variety of situations. The factors associated with math anxiety can be divided into one of three categories:

- 1) Situational factors - occur instantaneously and are directly linked with the stimulus.
- 2) Dispositional factors - essentially personality factors that make individuals more likely to experience math anxiety; and,
- 3) Environmental factors - an individual's previous experiences and perceptions regarding math that lead to attitudes that evoke math anxiety in relevant situations (Baloglu and Kocak, 2006).

Although all of these factors contribute to math anxiety, most of the research has focused on situational factors, with very little research investigating the dispositional and environmental factors. The research presented below investigates both dispositional (e.g., big five personality traits) and environmental factors (e.g., math experiences) associated with math anxiety.

## Research Questions

- 1) Are personality variables related to math anxiety in university students?
- 2) How do past math experiences relate to math anxiety in university students?

## Method

### Participants

- The sample consisted of 131 undergraduate students attending Memorial University of Newfoundland and Labrador. This sample contained 34 males, 96 females and 1 unknown, with a mean age of 21.25.

### Procedure

- Participants were asked to complete a questionnaire package containing the measures mentioned above. The questionnaires took participants roughly an hour to an hour and a half to complete and were administered in a group setting by the researcher or a research assistant.

### Measures

- Math Anxiety Rating Scale (MARS; *Suinn and Winston, 2003*)
- Math Experience Questionnaire
- International Personality Item Pool (Goldberg, 1999)
- Test Anxiety Inventory (TAI; *Spielberger, 1980*)
- Penn State Worry Questionnaire (PSWQ; *Meyer, Miller, Metzger and Borkovec, 1990*)
- Beck's Anxiety Inventory (BAI; *Beck, Brown, Epstein, & Steer, 1988*)

## Results

### Correlations Between Math Anxiety and Personality Variables

	MARS	Neuroticism	Openness	Conscientiousness	Agreeableness	Extraversion
MARS	1	.337**	0.063	-0.066	-0.053	0.023
Neuroticism	.337**	1	-0.012	-.296**	-.343**	-.330**
Openness	0.063	-0.012	1	0.033	0.057	.243**
Conscientiousness	-0.066	-.296**	0.033	1	.341**	.296**
Agreeableness	-0.053	-.343**	0.057	.341**	1	.196*
Extraversion	0.023	-.330**	.243**	.296**	.196*	1

- Although a significant positive relationship between Math Anxiety and Neuroticism was found, this relation becomes non-significant once one controls for general anxiety and test anxiety.

### Correlation between Math Experiences and Math Anxiety

	Math Anxiety <i>r</i>	Math Anxiety Controlling for General and Test Anxiety <i>sr</i>
<b>Elementary School</b>		
Support Scale	-.142	.074
Instruction Scale	-.337**	.155*
Math Marks	-.469**	.255**
<b>Junior High School</b>		
Support Scale	-.225**	.089
Instruction Scale	-.267**	.188
Math Marks	-.514**	.299**
<b>High School</b>		
Support Scale	-.314**	.116**
Instruction Scale	-.280**	.104**
Math Marks	-.459**	.217**

### Correlation between Math Anxiety and Experienced Gender Attitudes

	Math Anxiety
<b>Elementary School</b>	
Boys are favoured	.201*
Higher expectations of boys	-.270**
<b>Junior High School</b>	
Boys are favoured	.155
Higher expectations for boys	-.143
<b>High School</b>	
Boys are favoured	.199**
Higher expectations of boys	.175

- Significant positive relationships were found between math anxiety and experienced gender attitudes in both reported elementary and high school experiences. A significant negative relationship was also found between math anxiety and differences in expectations in elementary school.

## Conclusion

• Personality factors may not contribute to the level of math anxiety experienced by university students, with the exception of Neuroticism. This relation disappears, however, once the analysis controls for general and test anxiety.

• On the other hand, some environmental factors may contribute to the level of math anxiety experienced by university students. Specifically, the results showed significant negative relationships between math anxiety and support in junior high and high school, math anxiety and instructional method in elementary school, junior high and high school, and math anxiety and math marks in elementary school, junior high and high school.

• Many of these relations persisted even after controlling for test anxiety and general anxiety, which suggests that these experiences are uniquely related to Math anxiety.

## References

- Baloglu, M., and Kocak, R. (2006) A multivariate investigation of the difference in mathematics anxiety. *Personality and Individual Differences, 40*, 1325-1335.
- Richardson, C.F., & Suinn, M.R. (1972). The Mathematics Anxiety Rating Scale: Psychometric Data. *Journal of Counseling Psychology, 19*(6), 551-554.