



# Examining Relations Among Teacher Math Anxiety, Classroom Error Climate, and Child Math Anxiety Among Math Anxious Children



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## Introduction

- Both teachers and students experience math anxiety (Ganley et al., 2019; Ramirez et al., 2013).
- Teacher math anxiety relates to student math anxiety, which relates to their math achievement (Beilock et al., 2010).
- One way teacher math anxiety might impact children's classroom experiences is through their handling of math mistakes.
- Research has shown that classrooms where teachers are less supportive in response to students' math mistakes are more likely to have students with higher math anxiety (Blazar & Kraft, 2017).
- However, little work has examined if teachers with math anxiety respond differently to student errors in math.

## Research Questions

- Are teacher and child reports on a shortened and adapted version of Steuer and colleagues' (2013) classroom error climate survey reliable?
- Is there agreement between students' reports of the classroom error climate within the same classroom and the reports of their teachers?
- Do child- and teacher-reported classroom error climate relate to teacher and child math anxiety?

## Materials and Methods

- We used pretest data from a math anxiety intervention study with 2<sup>nd</sup> and 3<sup>rd</sup> grade children (n = 231) with moderate to high math anxiety.
- Children were nested within 68 classrooms.
- Teachers and students completed a 6-item measure of classroom error climate items adapted from Steuer et al. (2013) worded to be from their perspective
- Teachers and students completed math anxiety measures (teachers: Ganley et al., 2019; students: Ganley & McGraw, 2016).

## Perceived Error Climate Survey (Adapted select items)

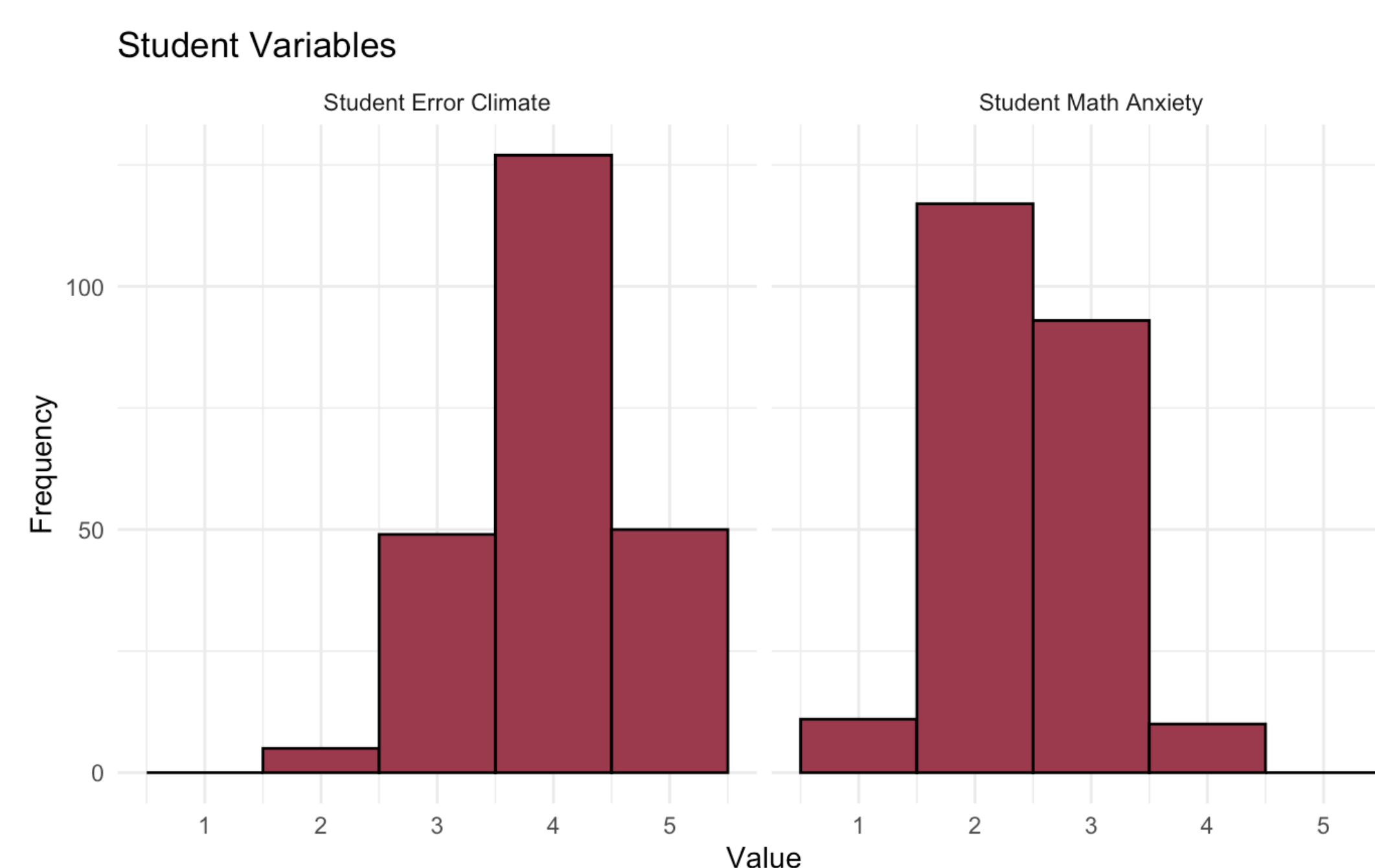
Steuer et al. (2013)

1 = Strongly Disagree 4 = Agree  
2 = Disagree 5 = Strongly Agree  
3 = Neither Agree Nor Disagree

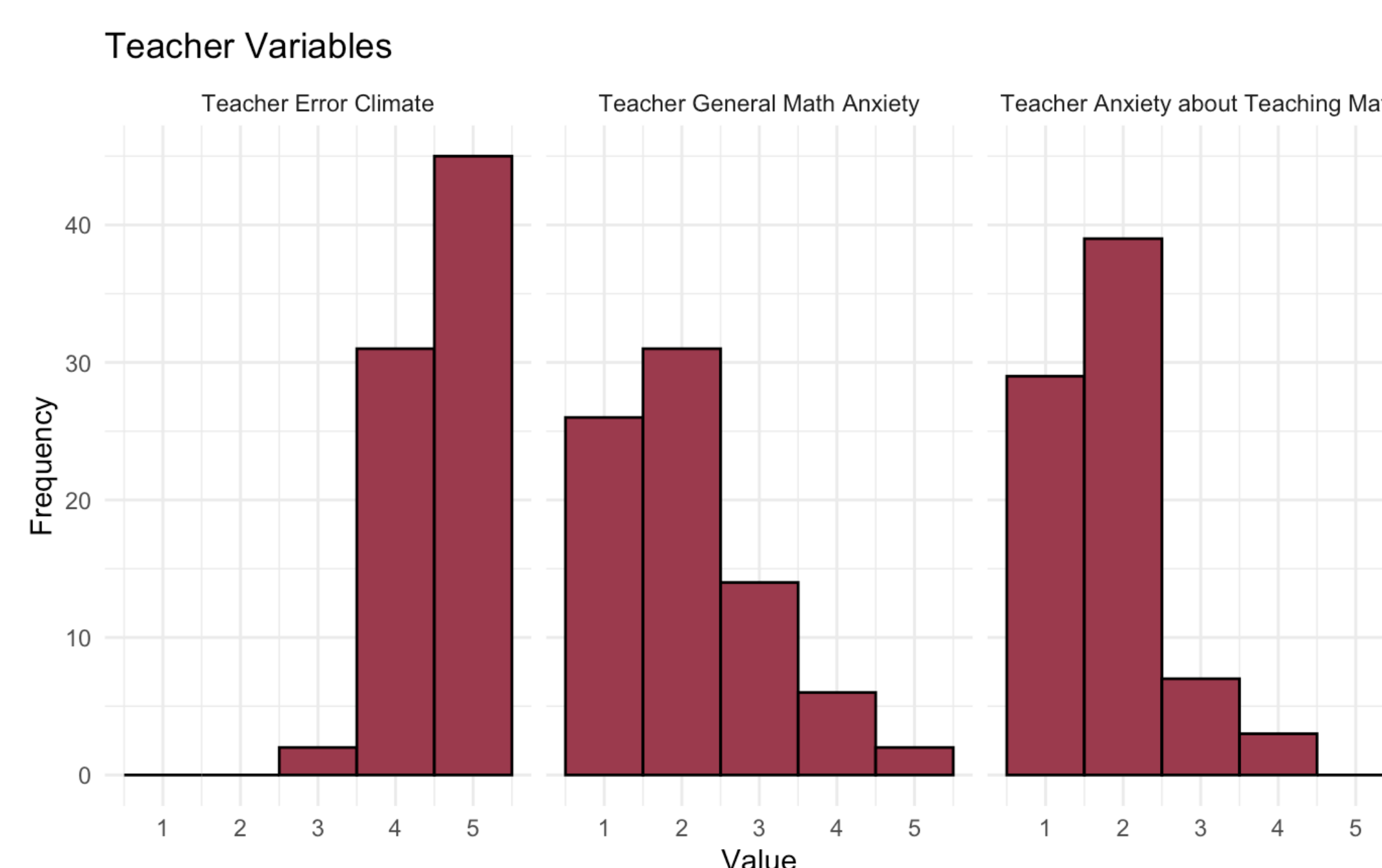
### Child Classroom Error Climate

- If someone in my class can't figure out the answer to a math problem, the teacher will help.
- If someone in my class gets the wrong answer in math, the teacher will patiently explain the problem.
- If someone in my class does a math problem wrong, they will get support from the teacher.
- If someone in my class makes a mistake in math, the teacher looks annoyed with them
- If someone in my class says something wrong in math, sometimes the teacher will embarrass them in front of the entire class.
- If someone in my class doesn't do well on a math activity, sometimes the teacher will become angry.

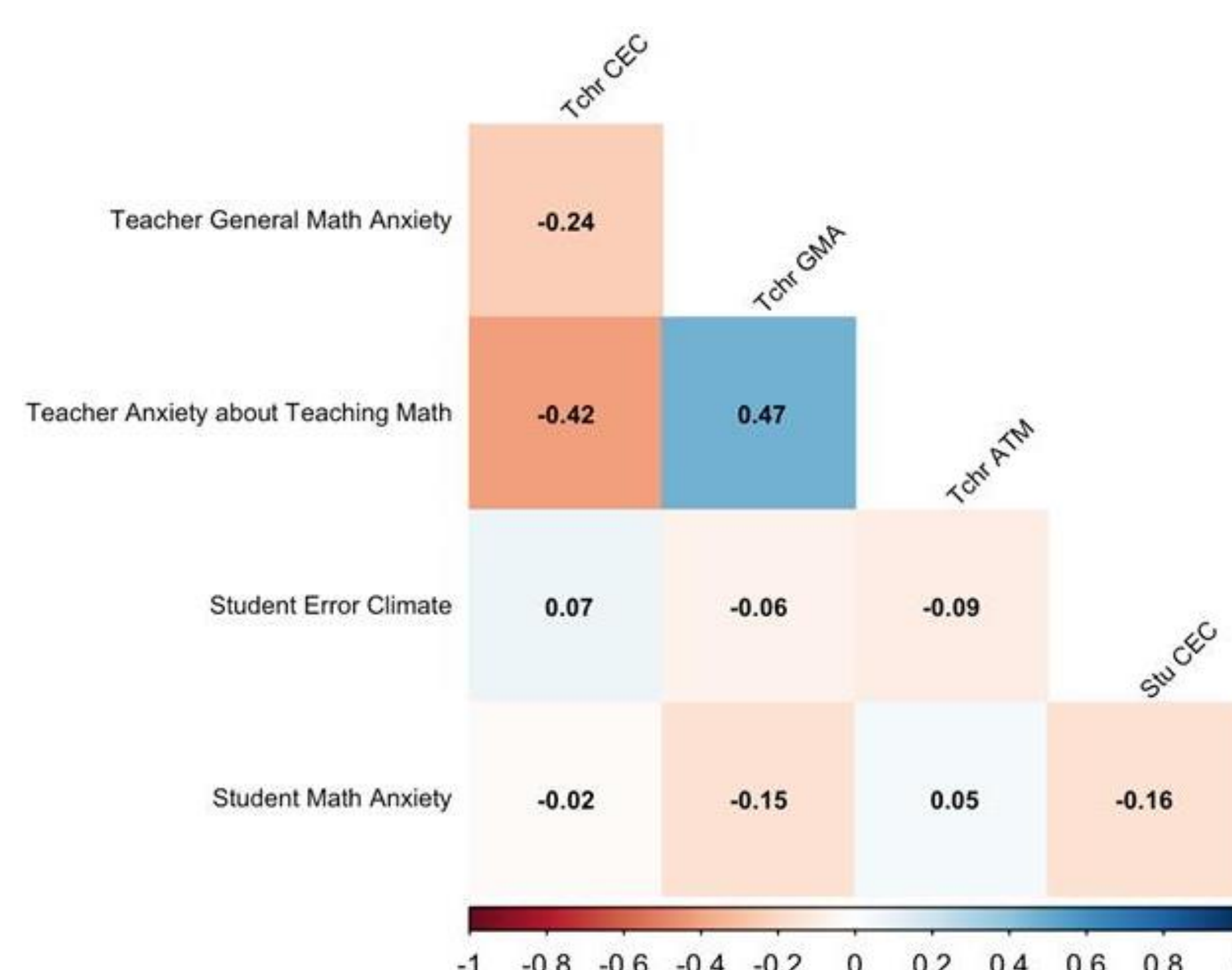
**Figure 1**  
Student Reported Error Climate and Math Anxiety



**Figure 2**  
Teacher Reported Error Climate, Math Anxiety, and Math Teaching Anxiety



**Figure 3**  
Teacher/Student Report Correlations



## Results

### Descriptive Statistics

- Histograms in Figures 1 and 2 show highly skewed error climate ratings
- Correlations are in Figure 3

### Research Question 1: Reliability

- Internal consistency was high for teachers (ordinal alpha=.94) and moderate for students (ordinal alpha=.73).

### Research Question 2: Agreement

- Student reports showed adequate within-class consensus (median rwg=.78) despite low reliability of class means (ICC(2)=.08).
- Agreement between teachers and their students was fairly low (standardized b=.08, p=.26).

### Research Question 3: Relations

- Teachers with higher anxiety about teaching math reported less supportive classroom error climates (standardized b=-.06, p=.01) but this was not the case for their general math anxiety and there was no relation with child math anxiety.
- Children with higher math anxiety rated their classroom error climates as less supportive (p=.02).

## Discussion

- These findings suggest this is a measurable construct within children and teachers, but the agreement between them is low.
- However, both within-teacher and within-student results show their reported math anxiety relates to ratings of the classroom error climate as less supportive.
- This means teachers' math teaching anxiety and children's math anxiety were related to their individual perceptions of the classroom environment. Thus, future interventions should target the individual level to address math anxiety and perceived classroom support.

## References



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