Title: Longitudinal Relationships Between Achievement, Anxiety, and Attitudes in Mathematics in Middle School Children

Area: Developmental and Cognitive Psychology

Main Purpose: Prior research with this sample (Geary et al., 2019) suggested mathematical competence in 6th grade influenced mathematics attitudes and anxiety in 7th grade, controlling prior attituded and anxiety. These relations were only significant for girls, suggesting a sex difference in the relation between prior achievement and current attitudes and anxiety. The proposed study will examine the same sample through their 8th grade to determine if the achievement to attitudes and anxiety relations remain and to assess the stability of the sex difference.

Procedure: The sample contained 184 (94 boys) middle school students from Columbia Public Schools in Columbia, Missouri. As part of a larger project on the mathematical and cognitive (e.g. working) competencies that predict success in high school algebra, mathematics achievement was assessed in 6th to 8th grade, inclusive, as was attitudes about mathematics and mathematics anxiety. Assessments were conducted at the school site in sessions that lasted 30 to 45 minutes.

Results and Conclusion: Path analyses revealed little relation between boys' mathematics achievement in 7th grade and their mathematics attitudes or anxiety in 8th grade (ps > .15). For girls, there was no relation between 7th grade mathematics achievement and mathematics anxiety in 8th grade ($p = .85$), but there were relations between achievement and mathematics attitudes. Higher math achievement in 7th grade was associated with better attitudes in 8th

grade (β = .17, p = .034) and better attitudes in 7th grade were associated with higher achievements in 8th grade (β = .15, p = .027).