

# Xiang Cheng

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## EDUCATION

### University of Wisconsin-Madison

Ph.D. Educational Psychology

Sep 2024 – May 2029 (Expected)

Madison, WI

- Advisor: Dr. Percival G. Matthews

### University of Wisconsin-Madison

M.S. Educational Psychology

Sep 2024 – Dec 2026 (Defended Sep 2026)

Madison, WI

- **Thesis:** *The Translation of Ratios across Sensory Modalities and Formats: Evidence for Abstract Representations of Non-Symbolic Ratios*
- **Committee:** Dr. Percival G. Matthews, Dr. Edward M. Hubbard, Dr. Martha W. Alibali

### University of Wisconsin-Madison

B.S. Education Studies, Mathematics

Sep 2020 – May 2024

Madison, WI

## AWARDS AND HONORS

- February 2026: UW-Madison Educational Psychology Department Travel Award
- August 2024 - May 2025: Data Recognition Corporation Graduate Research Fellowship
- July 2022 - August 2022: NSF Summer UW-Madison REU in Analysis Stipend

## MANUSCRIPT UNDER REVIEW

- Komosa, S., Stephens, A. C., **Cheng, X.**, Viegut, A. A., Matthews, P. G., & Alibali, M. W. *Does having multiple understandings of the equal sign matter? Evidence from Grades 7-9 students' algebraic problem solving*

## MANUSCRIPT IN PREPARATION

- **Cheng, X.**, Hubbard, E. M., & Matthews, P. G. (in prep). *When you can compare apples to oranges: Cross-modal nonsymbolic ratio processing*
- **Cheng, X.\***, Murray, J.\*, Westerberg, L., Alibali, M. W., Stephens, A. C., Berg, V., Bolt, D. M., Matthews, P. G., & Viegut, A. A. (in prep). *Untangling the Fractions-Algebra relation in 7th-9th graders*  
\*Authors contributed equally to this manuscript

## RESEARCH PRESENTATIONS

- **Cheng, X.**, Hubbard, E. M. & Matthews, P. G. (Accepted) *One Metric to Rule them All? Nonsymbolic Ratio Estimation across Different Sensory Modalities..* Poster presentation for the 2026 Psychonomic Society Annual Meeting, San Diego, CA
- **Cheng, X.**, Murray, J., Westerberg, L., Axness, C., Berg, V., Alibali, M. W., Matthews, P. G., Viegut, A. A., & Stephens, A. C. *Math Anxiety and Working Memory in Symbolic and Nonsymbolic Fraction Performance Across Grades 7-9.* Poster presentation for the 2026 Cognitive Development Society Biennial Conference, Montréal, Canada
- Viegut, A. A., Murray, J., Westerberg, L., Alibali, M. W., Stephens, A. C., **Cheng, X.**, Berg, V., Bolt, D. M., & Matthews, P. G. (2025, August) *An Interdisciplinary Approach to Untangling the Fraction-Algebra Relation.* Paper presentation for the 2025 European Association for Research on Learning and Instruction Biennial Conference, Graz, Austria
- Park, S., **Cheng, X.**, Murray, J., Stephens, A. C., Viegut, A. A., Alibali, M. W., & Matthews, P. G. (2025, May) *Developmental differences in fraction knowledge across timed and untimed contexts.* Poster presentation for 2025 Society of Research in Child Development Biennial Meeting, Minneapolis, MN

- **Cheng, X.**, Hubbard, E. M. & Matthews, P. G. (2025, April) *Lines vs Sounds: Nonsymbolic Ratio Comparison Across Sensory Modalities*. Roundtable presentation for 2025 American Educational Research Association Annual Meeting, Denver, CO
- Komosa, S., Bruschi, S., **Cheng, X.**, Stephens, A., Viegut, A., & Alibali, M. (2025, April 25) *Relations between grades 7-9 students' conception of the equal sign and algebraic reasoning: Does having a dual interpretation matter?* Poster Presentation for 2025 Undergraduate Research Symposium, Madison, Wisconsin.
- **Cheng, X.**, & Matthews, P. G. (2024, April) *Visual vs. Sound: Nonsymbolic Ratio Comparison Between Two Different Sensory Modalities*. Poster presented at the Undergraduate Research Symposium of University of Wisconsin-Madison, Madison, WI

## RESEARCH EXPERIENCE

### UW-Madison Math Education Learning and Development Lab

Jun 2024 – Present

#### Graduate Research Assistant

Madison, WI

- Conceptualize, design, and execute independent graduate research projects, overseeing literature reviews, experimental pilot testing, participant recruitment, and data collection
- Conduct data cleaning, coding, and statistical analyses for the longitudinal Fraction Algebra project investigating mathematical cognition; currently drafting manuscript for publication
- Mentor and onboard undergraduate Research Assistants, delivering structured training on research methodology, data integrity, and protocol execution
- Facilitate weekly undergraduate lab meetings, present specialized research topics, and deliver progress updates during executive administrative meetings

### UW-Madison Math Education Learning and Development Lab

Mar 2022 – May 2024

#### Undergraduate Research Assistant

Madison, WI

- Initiated and led an independent research project exploring the relationship between ratio discrimination acuity and various sensory modalities
- Coordinated large-scale data collection ( $N > 100$ ) for a dissertation project examining the effect of action fading on children's mathematical equivalence concepts
- Designed a database in FileMaker to streamline data entry, coding, and workflow efficiency for research
- Contributed to weekly lab seminars, critically evaluating literature on mathematical cognition and learning

## TEACHING EXPERIENCE

### UW-Madison Summer Education Research Program

May 2026 – July 2026

#### Quantitative Methods Workshop Co-Instructor

Madison, WI

- Co-designed and lead a quantitative methods workshop for visiting undergraduates from external universities
- Developed original instructional slides and delivered training in RStudio, guiding students through power analysis, data cleaning, statistical analysis, and result interpretation
- Facilitated models on the broader research workflow, including refining research questions, study design, IRB protocols, and data management support participants' individual research projects

## MENTORING

- **Emily Gomez** (2026–Present) – *Undergraduate Independent Project*
- **Sophia Komosa** (2024–Present) – *Undergraduate Independent Project*
- **Yifan Mo** (2026) – *Undergraduate Independent Project*
- **Amelia Tang** (2025–2026) – *Undergraduate Independent Project*
- **Sofia Bruschi** (2024–2025) – *Undergraduate Independent Project*

## QUANTITATIVE & COMPUTATIONAL SKILLS

- **Methods & Design:** Generalized Linear Models, ANOVA/ANCOVA, Power Analysis, Model Diagnostics
- **Software & Tools:** R, MATLAB, Qualtrics, FileMaker, LaTeX

## SERVICE AND OUTREACH

- **Little Picassos** — Volunteer Teacher Jan 2023 – Present  
*Deliver weekly art enrichment for K–12 youth using culturally responsive curricula.*
- **UW-Madison Global Engagement Office** — Volunteer Jan 2026 – Present  
*Co-organize cultural programming and provide event logistics for international academic forums.*