

**Taylor-Paige Guba**

College of Education and Human Development

University of Delaware

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**EDUCATIONAL HISTORY**

University of Delaware (expected May 2026)

Education PhD

Primary Specialization: Learning Sciences

Secondary Specialization: Mathematics Education

Indiana University (May 2021)

GPA: 3.944

Graduated with Highest Distinction and Honors Notation

- Cognitive Science BA
  - Concentration: Linguistics
  - Honors Thesis: Effects of Attentional Momentum on Addition Verification
- Jewish Studies BA
- Linguistics Minor

**AWARDS AND SCHOLARSHIPS**

Foundry10 Diversity Travel Award (MCLS)	Summer 2024
Diversity Scholarship for Summer Program in Quantitative Methods (ICPSR)	Summer 2023
1st Place Paper at Steele Symposium 2023 (UD)	Spring 2023
Diversity Registration Grant for CDS (Templeton Foundation)	Spring 2022
Dean's Scholar (UD)	2021-Present
Kate Hevner Mueller Award (IU)	Spring 2021
Dr. Carolyn Lipson-Walker Outstanding Senior Award/Scholarship (IU)	Fall 2020
Sandra and Stanley Trockman Scholarship (IU)	2020-2021
Friends of the Borns Jewish Studies Program Scholarship (IU)	2020-2021
Executive Dean Award: Undergraduate Research & Creative Activity (IU)	Spring 2020
Cognitive Science Undergraduate Outstanding Contribution Award (IU)	Spring 2020
Leonard Goldstein Scholarship (IU)	2019-2020
IU Founders Scholar	2018-2021
Phi Eta Sigma—IU Chapter	2018-2021
Judd Scholarship (IU)	2018-2019
McIntire Scholarship (IU)	2018-2019

Herbert Presidential Scholarship (IU)	2017-2021
Kroot Scholarship (IU)	2017-2021
Provost Scholarship (IU)	2017-2021
Balfour Scholarship (IU)	2017-2021
IU Executive Dean's List	2017-2021
Mary Fink Scholarship (National Council of Jewish Women)	2017-2018
Indiana Elks Scholarship (Indiana Elks Association)	2017-2018
Departmental Scholarship (IU)	2017-2018

## **RESEARCH EXPERIENCE**

### **Center for Improving Fraction Learning (PI: Nancy Jordan)**

#### ***Graduate Research Assistant***

2021-Present

#### *Fraction Sense Intervention*

- Conducted experimental research for an IES-funded project on fraction learning in 6th graders with math learning disabilities in order to evaluate the efficacy of curriculum materials for future distribution to teachers.
- Refined lesson plans and materials for use in the intervention so teachers could effectively instruct students.
- Designed a database in Microsoft Access to keep all data organized and accessible.
- Collected student test and classroom observation data to establish the efficacy of the lessons.
- Presented work at Cognitive Development Society and Society for Research in Child Development and contributed to a manuscript to report results to both practitioners and researchers.

#### *Qualifying Study: Multiplication Format Differences*

- Implemented an original study on undergraduate teachers-in-trainings' processing of non-traditionally formatted multiplication problems in order to investigate the relationship between directional biases and math cognition.
- Designed the experimental procedures and methods, programmed stimuli using Lab.js and JavaScript, prepared an IRB protocol, collected data, and wrote manuscript reporting results.
- Presented findings internationally at Mathematical Cognition and Learning Society and submitted a manuscript which is under review.

#### *Open Educational Resources Curricula Analysis*

- Led an analysis of elementary math open educational resources to investigate the presentation and requirements of multiplication tasks

- Designed coding schemes and analyzed data using chi-square analyses in R
- Presented preliminary findings internationally at Mathematical Cognition and Learning Society and writing a manuscript with full findings.

*Mentoring*

- Managed and trained undergraduate students to complete various tasks to assist in the completion of the above projects.

**Math Methods & Motivation Lab (PI: Christina Barbieri)**

***Graduate Research Assistant***

2021-Present

*Revision Thinking for Fraction Comparisons Project*

- Lead data analysis on an experimental research project investigating how instructional techniques can best support teachers in training with a focus on math education and metacognition.
- Coded and analyzed data using qualitative and quantitative methods, including conducting a split-plot ANOVA in SPSS.
- Drafted a conference proposal and manuscript on the project as lead author to distribute findings to educators and educational researchers
- Presented findings at AERA 2023 and Steele Symposium 2023

*Errorful Learning and Calibration Project*

- Designed study materials (student worksheets for different conditions, pretest and posttest measures, teacher materials, etc.) to be used in schools by students and their teachers.
- Analyzed data in R, which included multiple imputation, data screening, mixed ANOVAs and multiple regression.
- Submitted conference proposal to present data on student fraction arithmetic improvement, metacognitive strategy usage, and calibration improvement.
- Writing a manuscript about the metacognitive strategies and calibration of students who use errorful learning materials.

*Mentoring*

- Oversaw undergraduate students as they completed independent projects, including leading them through statistical analyses in RStudio and data management

**Learning, Education, and Development Lab (PI: Emily Fyfe)**

***Undergraduate Research Assistant***

2018-2021

*Abstract Pattern Labels Project*

- Performed experimental research on children's early learning skills in order to determine what methods of patterning instruction and description are most effective for 5-year old children.
- Developed coding schemes for children's explanations of their responses to the patterning task and coded the verbal and gesture responses of 90 children qualitatively and quantitatively so data could be properly analyzed.
- Presented results at a Cognitive Development Society and contributed to a published manuscript in the Journal of Experimental Child Psychology as second author to disseminate findings to other math cognition researchers.

*An Inductive Approach to Critical Thinking Skills*

- Contributed to a project examining how critical thinking skills can be trained through inductive learning in undergraduate students and adults to identify simple ways educators can improve students' logical reasoning abilities.
- Refined study materials including programming Qualtrics surveys to collect data from MTurk participants.
- Presented results at the Psychonomics Society and contributed to a published manuscript in the Journal of Applied Research in Memory and Cognition as third author to illustrate findings to both researchers and educators.

*Honors Thesis: Attentional Momentum Effects of Addition Verification*

- Completed an independent Honors Thesis on adults' mathematics processing ability and the effects of attentional momentum in order to investigate the relationship between directional biases and math cognition.
- Designed the experiment's procedure and methods, prepared the IRB protocol, recruited participants, collected data from 50 participants, and managed a research assistant to execute the project
- Presented work at an Cognitive Science Society to share findings with cognitive scientists

## **Midwest Undergraduate Cognitive Science Conference**

*Director*

2019-2021

- Managed a conference planning committee of 5 undergraduates, secured 2 keynote speakers, created and distributed advertisement materials both internally and externally, requested funding from multiple sources, acquired a location for the event (and built the web-based platform for the virtual conference during COVID-19), and oversaw the conference details to ensure the event ran smoothly.

## **Gregory S. Fehribach Center**

*Research Intern at the Regenstrief Institute*

Summer 2019

- Assisted with data collection, participant recruitment, and auditing research studies for projects involving mental agility in old age, diabetes, and weight loss in women

## **Midwest Undergraduate Cognitive Science Conference**

*Assistant Director*

2018-2019

- Helped organize a full-day conference for undergraduate researchers in Cognitive Science. Planned details of the event and set up a graduate student panel.

## **PUBLISHED ARTICLES**

Jordan, N. C., Dyson, N., **Guba, T. P.**, Botello, M., Suchanec-Cooper, H., & May, H. Exploring the Impact of a Fraction Sense Intervention in Authentic School Environments: An Initial Investigation. Accepted for publication in *Journal of Experimental Child Psychology*.

Motz, B. A., Fyfe, E. R., **Guba, T. P.** (2022). Learning to Call Bullsh\*t via Induction: Categorization Training Improves Critical Thinking Performance. *Journal of Applied Research in Memory and Cognition*. <https://doi.org/10.1037/mac0000053>

Flynn, M. E., **Guba, T. P.**, & Fyfe, E. R. (2020). ABBABB or 1212: Abstract language facilitates children's early patterning skills. *Journal of Experimental Child Psychology*, 193, 104791. doi:10.1016/j.jecp.2019.104791

## **CONFERENCE PRESENTATIONS**

Jordan, N.C., Dyson, N., **Guba, T. P.**, Suchanec, H., Botello, M. (2024, September). *Evaluating a Fraction Sense Intervention Conducted by Teachers in 6th Grade Math Support Classes*. Paper

presented at the National Council for Teachers of Mathematics (NCTM) Annual Meeting, Chicago, Illinois.

Dyson, N., Jordan, N.C., **Guba, T. P.**, Suchanec, H., Botello, M. (2024, September). *A Fraction Sense Intervention Grounded in Principles from the Science of Learning for Students with Mathematical Difficulties*. Paper presented at the meeting of the Society for Research Effective Education (SREE), Baltimore, MD.

Dyson, N., **Guba, T. P.**, Botello, M., Suchanec-Cooper, H., & Jordan, N. C. Evaluating a Fraction Sense Intervention Conducted by Teachers in 6<sup>th</sup> Grade Math Support Classes. Oral Presentation at National Council for Mathematics (NCTM) Teachers Research Conference 2024, Chicago, IL.

**Guba, T. P.** “High Quality” US Elementary Math Textbooks Lack Promotion of Flexibility in Equation and Arithmetic Understanding. Submitted as part of a symposium to the Mathematical Cognition and Learning Society (MCLS) 2024 Annual Meeting, Washington, DC.

**Guba, T. P.** *Analysis of Multiplication Equation Formats Presented in Elementary Math Textbooks*. Submitted to the Steele Symposium 2024, Newark, DE.

**Guba, T. P.** *Look At It This Way: Math Anxiety and Multiplication Problem Format Affect Problem-Solving Reaction Time*. Poster at the American Educational Research Association (AERA) 2024 Annual Meeting, Philadelphia, PA.

**Guba, T. P.**, Dyson, N., Botello, M., Suchanec-Cooper, H., Jordan, N.C., & May, H. (2024 March). *Fraction nonsense to fraction sense: impact of a fraction sense intervention on 6th grade students with math learning difficulties in an authentic classroom setting*. Poster at the Biennial Meeting of the Cognitive Development Society (CDS) 2024, Pasadena, CA.

Dyson, N., **Guba, T. P.**, Botello, M., Suchanec-Cooper, H., & Jordan, N. C. (2024, February). *Using Principles from the Science of Learning to Develop Fraction Sense in Struggling Math Students*. Workshop at Association for Mathematics Teacher Educators (AMTE) 2024, Orlando, FL.

Dyson, N., **Guba, T. P.**, Botello, M., Suchanec-Cooper, H., & Jordan, N. C. (2023, October). *Building Fraction Sense in Struggling Students Using Effective Approaches from the Science of Learning*. Workshop at National Council for Mathematics (NCTM) Teachers Research Conference 2023, Washington, DC.

**Guba, T. P.** (2023, June). *Look At It This Way: Equal Sign Position and Blank Position in Multiplication Problems Affect Reaction Time*. Poster at the Mathematical Cognition and Learning Society (MCLS) 2023 Annual Meeting, Loughborough, UK.

**Guba, T. P.**, De Coteau, A., Barbieri, C.A., Jansen, A., & Morris, A.B., (2023, April). *Revision Thinking for Fraction Comparisons: An Investigation of Metacognitive Monitoring in Preservice Teachers*. Paper Talk at the American Educational Research Association (AERA) 2023 Annual Meeting, Chicago, IL.

Botello, M., **Guba, T. P.**, Dyson, N., Jordan, N. (2023, March). *Measuring Success: How 6th Graders with Math Learning Disabilities Can Learn to Read Rulers*. Poster Presentation at Society for Research on Child Development (SRCD) in Salt Lake City, UT.

Dyson, N., Jordan, N., Suchanec, H., **Guba, T. P.**, Botello, M. (2023, March) *Building Fraction Knowledge in Students Who Have Fallen Behind in Math: Preliminary Findings from an Efficacy Study*. Paper Symposium at Society for Research on Child Development (SRCD) in Salt Lake City, UT.

**Guba, T. P.**, E. R. Fyfe, & B. Motz (2022, November). *An Inductive Approach to Improving Critical Thinking*. Poster presented at the 63rd Annual Meeting of the Psychonomics Society, Boston, MA.

**Guba, T. P.** & E. R. Fyfe (2022, July). *Attentional momentum effects on addition verification*. Poster presented at CogSci 2022, Toronto, Canada.

**Guba, T. P.** (2022, April). *Preliminary investigation of attentional momentum effects on arithmetic fluency*. Research Proposal Poster accepted at the Steele Symposium, Newark, DE.

**Guba, T. P.**, Dyson, N., & Jordan, N. (2022, April). *Fraction sense intervention improves number line estimation skills in students with diagnosed learning disabilities*. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Madison, WI.

**Guba, T. P.** & Fyfe, E. R. (2020, April). *Storytelling as Problem Solving*. Poster presented at the Center of Excellence for Women & Technology's (CEWIT) 7th Annual Women's Research Poster Competition in Bloomington, IN.

Flynn, M. E., **Guba, T. P.**, & Fyfe, E. R. (2019, October). *Using quantitative labels to promote children's patterning skills*. Poster presented at the Biennial Meeting of the Cognitive Development Society (CDS), Louisville, KY.

Flynn, M. E., **Guba, T. P.**, & Fyfe, E. R. (2019, April). Abstract language facilitates children's early patterning skills. Oral presentation at the 11th Annual Midwest Undergraduate Cognitive Science Conference (MUCSC) in Bloomington, IN.

### **SUBMITTED CONFERENCE PRESENTATIONS**

**Guba, T.P.**, McKinney, G., Morra, G., Silla, E.M., Miller-Cotto, D., Barbieri, C.A. *Metacognitive Monitoring and Calibration During Fraction Arithmetic: Effects of Visual Signaling Cues and Metacognitive Prompts*. Submitted to the American Educational Research Association (AERA) 2025 Annual Meeting, Denver, CO.

### **MANUSCRIPTS IN PROGRESS**

**Guba, T. P.**, De Coteau, A., Barbieri, C.A., Jansen, A., & Morris, A.B. *Revision Thinking for Fraction Comparisons: An Investigation of Metacognitive Monitoring in Preservice Teachers*. (under review)

**Guba, T. P.** *Analysis of Multiplication Question Formats Presented in Open Access Elementary Math Curricula*. (in prep)

**Guba, T. P.** *Look At It This Way: How Non-Traditionally Formatted Multiplication Problems Influence Reaction Time*. (in prep)

### **TEACHING EXPERIENCE**

#### **University of Delaware College of Arts and Sciences**

*Instructor of Record for Psychology Research Methods*

Summer 2024

- Designed research methods course for 10 students over 4 weeks (20 classes) focused on the basics of psychological study design and evaluation
- Organized canvas page, created and graded assignments, prepared and presented lectures, worked with students individually, and facilitated class discussion

#### **University of Delaware College of Arts and Sciences**

*Teaching Assistant for Psychology Research Methods*

Spring 2024

- Assisted in course facilitation for a 15-week core course for undergraduate pre-service teachers consisting of 80 students which gave students an introduction to psychology research methods with a focus on how to evaluate scientific research and design novel research



- Taught class on external validity and statistical validity, communicated with students via canvas, graded assignments and assessments, and collaborated with instructor of record on course material

### **University of Delaware School of Education**

*Teaching Assistant for Human Development in Education*

Spring 2023

- Assisted in course facilitation for a 15-week core course for undergraduate pre-service teachers consisting of 30 students which discussed fundamentals of child development, academic skill acquisition, scientific literacy, and student engagement.
- Taught class on research methods, communicated with students via email and canvas, designed new assignments, organized canvas page, graded assignments and assessments, and collaborated with instructor of record on course material

### **Collins Living-Learning Center**

*Q-Instructor*

Fall 2020

- Taught an 8-week course for eight incoming freshmen at the Collins Living-Learning Center which included developing a syllabus with five unique assignments, holding weekly office hours, hosting one-on-one meetings with students, and grading assignments and giving detailed feedback.
- Covered topics related to adapting to life at Indiana University and the Collins Living-Learning Center including managing stress and academic planning, getting involved in clubs and organizations, embracing the diverse student population, living sustainably, and creating programs for other students

## **PROFESSIONAL EXPERIENCE**

### **IU College of Arts and Sciences Executive Deans' Office**

*Student Manager*

2020-2021

- Managed 15 student workers, which included scheduling shifts, planning and executing meetings, coordinating student workers for events, hiring new student workers, and constant communication with student workers to ensure that the office ran smoothly.
- Assisted in the daily happenings of the office including, but not limited to, receiving appointments of the deans and academic advisors and announcing them, keeping inventory of the building's supplies, and

helping progress general projects within the office in order to keep the office organized and efficient.

### **Jewish Federation of Greater Indianapolis**

#### *Educational Initiatives Intern*

Summer 2018

- Designed a curriculum based on educational theory for training assistant teachers at religious schools so training programs for assistant teachers at the different synagogues in the area could be consistent and effective.
- Taught lunch-and-learns with colleagues about topics of Jewish history and philosophy to share information with the staff that I had learned through my undergraduate studies.
- Formed a new youth organization based around philanthropy in the community to engage Jewish youth from around the area in philanthropic activities such as fundraising, volunteering, and allocating funds to those in need.

### **Indianapolis Hebrew Congregation**

#### *Life-Long Learning Intern*

Summer 2018

- Served as an assistant to the Director of Life-Long Learning, which included organizing materials for the coming school year, helping set up a recycling program, and creating curriculums for elementary school students in religious school

### **COLLEGE AND COMMUNITY INVOLVEMENT AND SERVICE**

#### **University of Delaware Graduate Student Government (GSG)**

##### *Parliamentarian*

2024-Present

- Elected by GSG senators to this position on the GSG Executive Council
- Lead the senate during monthly meetings, approved legislation before it came to the senate floor, assisted senators in writing legislation, chaired the governance committee, and wrote amendments to the GSG constitution and by-laws

#### **Education Graduate Student Association**

##### *Panelist*

Spring 2024

- Presented to fellow graduate students about summer opportunities within and outside of the university

#### **University of Delaware Graduate Student Government (GSG)**

*Senator and Chair of Operations Committee*

2022-2024

- Elected by graduate students in the School of Education to represent them and voice their concerns in GSG meetings
- Managed a committee of 7 other GSG senators in charge of allocating funds to Graduate Student Organizations (GSOs)
- Planned and led bi-weekly meetings to discuss funding allocation and requirements for GSOs to receive funding
- Promoted equitable funding by prioritizing GSOs centered around underrepresented students
- Supported a culture of learning by GSOs that produce educational, cultural, and community outreach events.
- Contributed to legislation brought before GSG senators about university policies and procedures

**Collins Living-Learning Center Board of Educational Programming**

*Co-chair*

2019-2021

- Coordinated meetings with potential instructors of Collins courses to give feedback on syllabi and course ideas before submission, evaluated 25+ proposed courses each semester for the living-learning center, and led the decision process of the committee to determine which 6 courses to accept to accept; this included 2 rounds of evaluating candidates, 15 interviews, and a faculty meeting each semester; informed applicants of decisions and managed further correspondence with them.
- Scheduled bi-weekly board meetings, created agendas, and ran meetings to discuss public matters such as upcoming events, course proposals, funding proposals, and elections of new officers.
- Created a constitution and by-laws to ensure the consistency and efficacy of the board for years to come.
- Oversaw a treasurer, secretary, instructor liaison, and two programmers in order to manage the internal and external affairs of the board, including implementing educational programs and coordinating with current instructors.

**Indiana University College of Arts and Sciences**

*Member of the Inaugural Executive Dean's Advisory Board*

2020-2021

- Established the purpose of the advisory board with the eight other members and wrote governing documents for future members

- Advised the dean on decisions which affected undergraduate students in the college and voiced concerns of undergraduate students

### **Indiana University Student Government**

*Executive Director of Academic Affairs*

2020-2021

- Managed a freshman intern and a committee of five undergraduates who worked to enact policies approved by the student congress to better the university.
- Discussed university policies (drop/add fees, transcript fees, COVID-19 classroom accountability, accessibility in online courses, etc.) with administrators in order to make changes that benefited students.

### **Collins Living-Learning Center Director Search Committee**

*Student Representative*

2020

- Served as the sole student representative on a committee to hire the new Executive Director of Collins Living-Learning Center.
- Interviewed faculty applicants for the position of Executive Director of Collins Living-Learning Center.
- Contributed to committee's recommendation of hire for the Executive Dean of the College of Arts and Sciences.

### **Student Organization for Cognitive Science**

*Co-President*

2019-2021

- Organized weekly meetings in which 10 to 20 students engaged in small group discussions with professors in the IU Cognitive Science Program

### **RELEVANT COURSEWORK**

- Math Cognition: a Systematic Review Fall 2024
- Education Measurement Theory Spring 2024
- How People Learn Spring 2024
- Mathematics Learning Disabilities Fall 2023
- Multilevel Modelling Fall 2023
- Grant Writing Fall 2023
- Design of Learning Environments Spring 2023
- Research and Theory of Math Learning Fall 2022
- Randomized Controlled Trials in Education Fall 2022
- Introduction to Inferential Statistics Spring 2022

- Motivation in Education Spring 2022
- Qualitative Research Methods Fall 2021
- Research and Theory of Math Curriculum Fall 2021

**RELEVANT WORKSHOPS AND AUDITS**

- Innovative Teaching Strategies Summer 2024
- Intermediate ANOVA and Regression Fall 2023
- Introduction to Bayesian Statistics Summer 2023
- Math for Social Science Research Summer 2023
- Structural Equation Modeling: From Beginner to Intermediate Spring 2023