BRIAN RIVERA, Ph.D.
Curriculum Vitae

I. PERSONAL

Department of Psychology
Phone: (323) 439-1555 (c)
St. Olaf College, RNS 272
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1520 St. Olaf Avenue
Northfield, MN 55057

II. EDUCATION

2021 **Ph.D., Educational Psychology, Educational Neuroscience Concentration**
Department of Educational Studies, University of Alabama, Tuscaloosa, AL
Advisor: Firat Soylu, Ph.D.
Dissertation: *The neurocognitive mechanisms of arithmetic knowledge verification*

2015–2016 **Post-baccalaureate Studies, Cognition and Action Lab**
University of Massachusetts, Amherst, MA
Advisor: Rebecca Spencer, Ph.D.

2013 **B.A., Scientific and Philosophical Studies of the Mind**
Franklin & Marshall College, Lancaster, PA

Areas of Expertise and Research Interests

Educational neuroscience, mathematical and numerical cognition, fraction processing, EEG/ERP methods, multivariate pattern analysis (MVPA) and machine-learning decoding of neural signals, cognitive development, functional brain development in children residing in poverty

PROFESSIONAL EXPERIENCE

St. Olaf College, Northfield, MN
2025–Current Visiting Assistant Professor, Department of Psychology

University of Nebraska–Lincoln, Lincoln, NE
2023–2025 Assistant Research Professor, Department of Psychology
2021–2023 Postdoctoral Research Associate, Department of Psychology (Advisor: Timothy Nelson, Ph.D.)

Teaching Interests

Biopsychology, Cognitive Psychology, Cognitive Neuroscience, EEG/ERP Methods, Research Methods, Learning and Cognition

SUPERVISED UNDERGRADUATE STUDENT RESEARCH

St. Olaf College
2025–2026 Root Lab students: B. Alamir, I. Baker, S. Bilal, B. Goldman, B. Hansen, M. Hendrickson, R. Herrera Zelaya, E. Leitner, E. Linder, A. Nagy, A. Rodriguez, A. Seiberlich, A. Sticka-Jacobs, P. Weiss, G. Woog, S. Zins
CURI Research (Spring): M. Hendrickson, A. Sticka-Jacobs
CURI Summer Research: K. Casselman, A. Sticka-Jacobs

McNair Summer Research: R. Herrera Zelaya

PEER-REVIEWED PUBLICATIONS (*DENOTES STUDENT CO-AUTHORS)

1.Salehzadeh, R., **Rivera, B.**, Man, K., Jalili, N., & Soylu, F. (2023). EEG decoding of finger numeral configurations with machine learning. *Journal of Numerical Cognition, 9*(1), 206–221. https://doi.org/10.5964/jnc.10441

2.**Rivera, B.**, & Soylu, F. (2021). Incongruity in fraction verification elicits N270 and P300 ERP effects. *Neuropsychologia, 161*, 108015. https://doi.org/10.1016/j.neuropsychologia.2021.108015

3.Soylu, F., **Rivera, B.**, Anchan, M., & Nathaniel, N. (2019). ERP differences in processing canonical and non-canonical finger numeral representations. *Neuroscience Letters*. https://doi.org/10.1016/j.neulet.2019.04.032

Manuscripts Under Review or in Revision

1.Rico-Pico, J., **Rivera, B.**, Fox, N. A., Noble, K. G., & Troller-Renfree, S. V. (under review). Associations between functional brain activity and cognitive skill among children residing in poverty.

Manuscripts in Preparation

1.**Rivera, B.**, & Salehzadeh, R. (in preparation). Multivariate pattern analysis of fraction processing: Dissociating holistic magnitude from component representations in EEG.

2.**Rivera, B.**, Hendrickson, M.*, & Sticka-Jacobs, A.* (in preparation). EEG responses to incorrect arithmetic answers: Evidence of format-dependent arithmetic processing.

Conference Proceedings

1.**Rivera, B.**, & Soylu, F. (2018). Semantic processing in fraction comparison: An ERP study. Paper accepted to the 40th Annual Conference of the Cognitive Science Society. Madison, WI: Cognitive Science Society.

POSTER PRESENTATIONS (*DENOTES STUDENT PRESENTER/CO-AUTHOR)

1.**Rivera, B.** (2026, accepted). *Format-dependent arithmetic processing: N400 responses to semantic violations.* Poster to be presented at the EARLI SIG 22: Neuroscience and Education Conference, Leiden, The Netherlands: September 3–4, 2026.

2.**Rivera, B.** (2026, accepted). *Processing costs of fraction comparisons across different scales.* Poster to be presented at the 2026 Conference of the Mathematical Cognition and Learning Society, University of Padua, Italy: June 23–25, 2026.

3.Hendrickson, M.*, Sticka-Jacobs, A.*, & **Rivera, B.** (2026). *EEG responses to incorrect arithmetic answers: Evidence of format-dependent arithmetic processing.* Poster presented at the Minnesota Undergraduate Psychology Conference (MUPC).

4.**Rivera, B.**, & Troller-Renfree, S. (2024). *Associations between functional brain development and cognitive abilities in children born into poverty.* Poster presented at the 2024 Annual Meeting of the Fetal, Infant & Toddler Neuroimaging Group, Baltimore, MD.

5.**Rivera, B.** (2024). *What fraction am I thinking of? Decoding fraction magnitude from EEGs.* Poster presented at the 2024 Annual Meeting of the Mathematical Cognition and Learning Society, Washington, D.C.

6.**Rivera, B.** (2022). *The neurocognitive mechanisms of arithmetic verification in children.* Poster presented at the Cognitive Development Society Biennial Conference, Madison, WI.

7.**Rivera, B.**, & Soylu, F. (2019). *The ERP effects of shared components in fraction comparisons.* Poster presented at the Annual Meeting of the Mathematical Cognition and Learning Society, Carleton University, Ottawa, Canada.

8.**Rivera, B.**, & Soylu, F. (2018). *The effects of shared components in fraction comparisons: Evidence from ERPs.* Poster presented at the 6th Biennial International Mind, Brain and Education Conference, University of Southern California, Los Angeles, CA.

9.**Rivera, B.** (2018). *Online experiments with Wolfram technologies.* Poster presented at the 2018 Wolfram Technology Conference, Urbana-Champaign, IL.

10.**Rivera, B.**, Shannon, N., & Soylu, F. (2017). *ERP markers for number gesture processing.* Poster presented at SACNAS: The National Diversity in STEM Conference, Salt Lake City, UT.

11.**Rivera, B.**, & Park, J. (2016). *Chunking during child visuomotor sequence learning.* SPINES Summer Program, Marine Biological Laboratory, Woods Hole, MA.

PODIUM SESSIONS, COLLOQUIA, AND INVITED PRESENTATIONS

1.**Rivera, B.** (2026, March). *Parts and wholes: Decoding fraction processing insights from EEG brain signals.* Mathematics, Statistics, and Computer Science (MSCS) Department Colloquium, St. Olaf College, Northfield, MN.

2.**Rivera, B.** (2024). *Baby's First Years: An overview of the study and its findings.* Invited talk presented at Science Thursdays, Boys Town National Research Hospital, Omaha, NE.

3.**Rivera, B.** (2024). *Math development and learning difficulties.* Invited guest lecture in Developmental Psychopathology, Teachers College, Columbia University, New York, NY.

4.**Rivera, B.** (2022). *How does the brain do math? Lessons from the study of fractions.* Mathematics Department Colloquium Series, University of Nebraska, Omaha, NE.

TEACHING EXPERIENCE

Course Instructor

St. Olaf College, Department of Psychology

Psych 390 Electrophysiology of Complex Cognition: EEG Methods and Analysis, Spring 2026

Psych 237 Cognitive Psychology, Spring 2026

Psych 290 A Big History of the Brain, January Term 2026

Psych 238 Biopsychology, Fall 2025

University of Alabama, College of Education

Research Methods in Educational Neuroscience, Spring 2021

Intro to Learning Skills & Strategies, Spring 2020

University of Alabama, OLLI – *A History of Information*, Summer 2019

Teaching Assistant

University of Alabama, College of Education – *Intro to Learning Skills & Strategies*, Fall 2019

University of Alabama, College of Education – *Research Methods in Educational Neuroscience*, Spring 2018

HONORS, AWARDS, AND FUNDING

2026 Recipient: St. Olaf College Professional Development Grant, Faculty Life Committee ($2,100). *Developing and Evaluating an Undergraduate EEG/ERP Methods Course as a Replicable Model for Liberal Arts Institutions* (conference travel and registration). **Rivera, B.**

2025 Exemplary rating (peer review): *ERP Peak Detective: Introduction to Event-Related Potential Analysis with MATLAB*, teaching activity, Teaching Computation in the Sciences Using MATLAB collection, Science Education Resource Center (SERC), Carleton College

2024 FIT'NG 2024 Young Investigator Award, Fetal, Infant & Toddler Neuroimaging Group, Baltimore, MD

2023 ERP Boot Camp Attendance Award, San Diego, CA

2018 Wolfram Summer School Attendance Award, Waltham, MA

REVIEWING AND PROFESSIONAL SERVICE

Reviewing

2026–present Ad Hoc Reviewer for the following professional journals: *Behavioral and Brain Functions*

PROFESSIONAL DEVELOPMENT

2025 Participant: Teaching Computation with MATLAB (and GenAI) Workshop, Science Education Resource Center (SERC), Carleton College, Northfield, MN, October 26–28, 2025. Developed and contributed a peer-reviewed teaching activity (*ERP Peak Detective*) to the national SERC teaching collection.

2023 ERP Boot Camp, University of California, San Diego, CA