

Benjamin Bogart Rickles

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EDUCATION

University of Maryland

Ph.D. Neuroscience and Cognitive Science (NACS) program; May 2023

Honors: 2022, Recipient of William Hodos Dissertation Assistantship

GPA: 3.8

University of Oregon

M.S., Psychology, June 2017

Georgia State University

Ph.D. Program, Cognitive Psychology (2014-2016)

Honors: 2014-2016, Recipient of Georgia State University Language and Literacy Initiative Graduate Student Fellowship

University of Pittsburgh

B.A., Psychology, May 2009

RESEARCH EXPERIENCE

November 2008 – June 2009 **University of Pittsburgh**

Research Assistant I. Learning and Research Development Center, Cognitive Psychology Department, Pittsburgh Science of Learning Center.

Supervisor: Gwen A. Frishkoff, PhD.

Responsibilities:

- Scheduling participants and recording EEG data
- ERP data preprocessing

February 2010 – July 2014 **University of Pittsburgh**

Research Assistant II. Learning Research and Development Center, Cognitive Psychology Department, Pittsburgh Science of Learning Center.

Supervisor: Charles Perfetti, PhD.

Responsibilities:

- Training other researchers in ERP and EEG techniques
- EEG/ERP data analysis and interpretation
- Published various research articles

August 2014 – 2015 **Georgia State University**

Doctoral Student. Department of Psychology

Supervisor: Gwen A. Frishkoff, PhD

Responsibilities:

- Training, Cognitive Task Design
- EEG/ERP and fMRI Data Analysis
- Analyzed ERP data looking at differences in memory retrieval between words that varied on lexical variables including frequency of occurrence and orthographic neighborhood
- Analyzed ERP data looking at correlations between behavioral indicators of literacy and the N170 ERP
- Designed an ERP experiment to examine neural indices of lexical processing and sentence comprehension
- Trained undergraduate researchers in ERP recording, processing, and analysis

August 2015 – June 2016 **University of Oregon**

Masters Student. Department of Psychology

Supervisor: Don Tucker , PhD.

Responsibilities:

- Writing research protocols for human participants research
- EEG Data collection and analysis
- Presenting research to a scientific audience
- Met regularly with advisor

August 2016 – July 2023 **University of Maryland**

Graduate Student Researcher, Department of Human Development and Quantitative Methodologies

Supervisor: Donald Bolger, PhD, Richard Prather, PhD, Rachel Romeo, PhD

Responsibilities:

- Cognitive task design, data collection, ERP data preprocessing
- EEG/ERP data analysis and interpretation
- Trained undergraduate researchers in ERP recording, processing, and analysis
- Wrote applications to the Institutional Review Board
- Developed course materials and lectured both in person and online
- Designed studies to assess the underlying components of math ability using event-related potentials
- Designed studies to track memory consolidation during vocabulary learning from context using behavioral measures
- Designing stimuli for child-friendly functional near-infrared spectroscopy experiments

- Designed studies to assess neurocognitive models of narrative comprehension using EEG and computational methods

2021 – July 2023 **Repurpose Farm Plastic**

Chief Technology Officer, Co-founder

Supervisor: Krisztina Christmon, PhD.

Responsibilities:

- Performed market research
- Created models to estimate consumption of agricultural plastic by Maryland farms
- Designed business model
- Performed customer discovery research
- Conducted interviews with experts and shareholders
- Advised USDA
- Taught metallurgy and woodworking
- Designed novel machines to aid the plastic recycling process

June 2021-August 2021 **Applied Research Laboratory for Intelligence and Security**

Research Assistant

Supervisor: Stefanie Kuchinsky, PhD.

Responsibilities:

- Recruited and human participants
- Crafted earbuds for electrical stimulation of the vagus nerve
- Administered electrical stimulation to participants
- Recorded eye movements and other behavioral responses
- Analyzed data using generalized additive mixed-models in R
- Cooperated with team over Github.

June 2022 –November 2022 **Adobe Inc.**

Summer Research Intern, College Park, MD

Supervisor: Chris Tensmeyer, PhD.

Responsibilities:

- Designed methods for implicit measurement of image preference employing co-registration of EEG and eye-tracking in a VR environment
- Wrote applications to the Institutional Review Board
- Modified existing hardware for experimental research
- Recruited participants and recorded data
- Wrote code for co-registration preprocessing and analysis of data in Python
- Met regularly with team members
- Delivered results to the company

October 2023 – present **Advanced Education Research and Development Fund**

Program Evaluator, Remote

Supervisor: Rebecca Sutherland, PhD.

Responsibilities:

- Designed methods for implementing remote literacy intervention for grades 3-8
- Administered intervention to children in grades 3-8.
- Wrote applications to the Institutional Review Board
- Met regularly with team members

PUBLICATIONS

Rickles, B., Tensmeyer, C., Healy, J., & Siu, A. (in prep). Event-related potential markers of implicit relevance are modulated by presentation mode and ease of selection.

Rickles, B., Bolger, D. J. (in prep). Differences in discourse-level constraint affect local lexical-semantic processing.

Rickles, B., Kodouovoh, C., Worthy, J., & Bolger, D. J. (in prep). Theta and alpha EEG power distinguishes successful narrative recall.

Rickles, B., (2023). *EEG Effects of Event Models in Story Comprehension* (Doctoral dissertation, University of Maryland, College Park). <https://drum.lib.umd.edu/items/5600dfe6-9cda-49cc-81eb-4ec549f1c5a3>

Harris, L. N., Creed, B., Perfetti, C. A., & **Rickles, B. B.** (2022). The role of word knowledge in error detection: a challenge to the broken error monitor account of dyslexia. *Annals of Dyslexia*, 72(2), 384-402.

Harris, L., **Rickles, B.**, Perfetti, C. (2018) Expertise seeks rewards: Error-related negativities and defensive motivation in spelling decisions. 40th annual meeting of the Cognitive Science Society. July 25-28, 2018.

Stafura, J. Z., **Rickles, B.**, & Perfetti, C. A. (2015). ERP evidence for memory and predictive mechanisms in word-to-text integration. *Language, Cognition and Neuroscience*, 30(10), 1273-1290.

Chang, L.Y., Stafura, J.Z., **Rickles, B.B.**, Chen, H.C., & Perfetti, C.A. (2014) Incremental learning of Chinese orthography: ERP indicators of animated and static stroke displays on character form and meaning acquisition. *Journal of Neurolinguistics*. 1-18.

Elgort, I., Perfetti, C. A., **Rickles, B.**, & Stafura, J. Z. (2014). Contextual learning of L2 word meanings: second language proficiency modulates behavioural and event-related brain potential (ERP) indicators of learning. *Language, Cognition and Neuroscience*, (ahead-ofprint), 1-23.

Harris, L.N., **Rickles, B.**, Perfetti, C.A. (2014). Error-Related Negativities During Spelling Judgments Expose Orthographic Knowledge. *Neuropsychologia*, 54,112-128.

Cao, F., **Rickles, B.**, Vu, M., Zhu, Z., Chan, D.H.L., Harris, L.N., Stafura, J., Xu, Y., Perfetti, C.A. (2013). Early stage visual-orthographic processes predict long-term retention of word form and meaning: A visual encoding training study. *Journal of Neurolinguistics*, 26 (4), 440-461.

CONFERENCE PRESENTATIONS

(* undergraduate mentees)

You, H.* , Worthy, J.* , **Rickles, B.**, & Bolger, D.J. (2024) Using LLMs to score Hierarchical Organization of Narrative Recall. Undergraduate Research Day. University of Maryland. College Park, MD. April, 2024. <http://hdl.handle.net/1903/32461>

Worthy, J.* , Chavan, S., Wokoma, S., You, H.* , Canter, A., Harris., N., Fatima, N., **Rickles, B.**, & Bolger, D.J. Effects of presentation order and delay on recall of narrative details. Undergraduate Research Day. University of Maryland. College Park, MD. April, 2024. <http://hdl.handle.net/1903/32460>

Koudouovoh, C.* , **Rickles, B.**, Worthy, J.* , & Bolger, D.J. (2023) The Relationship between Theta-Alpha Ratio during Narrative Comprehension and Recall. Neuroscience and Cognitive Science Research Day. University of Maryland. College Park, MD. May, 2023.

Rickles, B., Worthy, J.* , Koudouovoh, C.* , & Bolger, D.J. (2023) Individual differences in frontal-medial theta EEG power and recall during narrative comprehension. Omega Psi 8th Annual Conference. Johns Hopkins University, Baltimore, MD. April, 2023.

Worthy, J.* , **Rickles, B.**, Koudouovoh, C.* , & Bolger, D.J. (2023) Alpha power and inference during narrative comprehension. Language Science Day. University of Maryland. College Park, MD. March, 2023.

Womack, J.* , **Rickles, B.**, Bolger, D.J., & Prather, R. (2019). An EEG Study of number sense and arithmetic. Louis Stokes alliance for minority participation Summer research symposium. University of Maryland, College Park, MD. July, 2019.

Rickles, B., Dien, J., Carpuat, M., Bolger, D.J., & Prather, R. (2019). ERP indices of numerosity and arithmetic. Brain and Behavior Initiative Kavli Day poster session. University of Maryland, College Park. May, 2019.

Rickles, B., Balass, M., & Bolger, D.J. (2018). Episodic and semantic priming from novel words learned from context. 59th annual meeting of the Psychonomic Society. New Orleans, LA. November, 2018.

Rickles, B., Frishkoff, G. (2017). Verb constraints and semantic integration. Society for the Neurobiology of Language (SNL). Baltimore, MD. November, 2017.

- Rickles, B.**, Moore, S., & Frishkoff, G. (2016). The N250 ERP correlated with phoneme, but not letter length during visual word recognition. 11th meeting of the Georgia Psychological Society. Atlanta, GA. April, 2016.
- Smith, G.N.L., **Rickles, B.**, Galvis, J., Valdez, G.E., & Conway, C.M. (2016). The electrophysiological and behavioral effects of computerized training on structured sequence processing. *Cognitive Neuroscience Society 23rd Annual Meeting*, New York, NY, April 2016.
- Jacob, G., Ross, S.*, **Rickles, B.**, Frishkoff, G., (2016) Event-Related Potentials in Episodic and Semantic Memory for Concrete and Abstract Words. *Atlanta Neuroscience Symposium, Atlanta, GA, 2016*.
- Rickles, B.**, Harris, L., Frishkoff, G., Perfetti, C. (2015) N170 expertise effects differ among skilled and less-skilled adult native English speakers. Society for the Neurobiology of Language (SNL). Chicago, IL, October, 2015.
- Laing, E.J., **Rickles, B.**, Muth, K., Perfetti, C. (2015) Neural Oscillation Patterns during natural reading vary with text complexity and reading skill. Society for the Neurobiology of Language (SNL). Chicago, IL, October, 2015.
- Bello, N.*, **Rickles, B.**, Amin, J., and Frishkoff, G., (2015). Altering brain activity and working memory through cortical entrainment: A study of binaural beat stimulation during a two back task. Poster presented at the 61th annual Southeastern Psychological Association Conference. Hilton Head, SC, March 20, 2015.
- Rickles, B.B.**, Harris, L.H., Frishkoff, G.A., & Perfetti, C.A. (2014) N170 word effect related to individual differences in reading skill. *Society for Psychophysiological Research (SPR)*, Atlanta, GA, September, 2014.
- Frishkoff, G.A., **Rickles, B.B.**, Frank, R.M., Bird, C., Curran, T., Mah, R., Connolly, J., Connell, S. Kilborn, K., & Perfetti, C.A. (2014) Meta-analysis of event-related potentials in episodic and semantic memory: a cross-lab study. *Society for Psychophysiological Research (SPR)*, Atlanta, GA, September, 2014.
- Stafura, J.Z., **Rickles, B.**, Perfetti, C.A. (2013) Which way to integration? Examining Directional association in word-to-text integration using ERPs. *Psychonomic Society Convention*. Toronto, CA, November, 2013.
- Bhide, A., Stafura, J., **Rickles, B.**, Perfetti, C.A. (2013). Examining the effects of lexical quality on masked form priming effects using event-related potentials. *Society for the Neurobiology of Language Conference*, San Diego, CA, November, 2013.
- Elgort, I., Perfetti, C.A., **Rickles, B.**, & Stafura, J.Z. (2013). Second language proficiency modulates ERP and behavioral indicators of contextual word learning. Society for the Scientific Study of Reading (SSSR) Annual Meeting, Hong Kong, July, 2013.

Rickles, B., Elgort, I., and Perfetti, C.A. (2012). Individual differences associated with EEG frequency band power during sentence reading in L2. *Second Language Research Forum (SLRF)*, Pittsburgh, PA, October, 2012.

TEACHING

University of Maryland: Department of Human Development & Quantitative Methodology (EDHD)

EDHD 306 Research Methods in Human Development
Spring 2019: 30 students

EDHD 320: Human Development Through the Lifespan:
Fall 2019: 60 students
Spring 2020: 60 students

PROFESSIONAL SERVICE AND AFFILIATION Journal Reviews (in collaboration with advisor)

Neuropsychologia Brain &
Language
Journal of Cognitive Neuroscience

Member of Professional Societies

Psychonomic Society (2018)
Society for the Neurobiology of Language (2018) Psi Chi
National Honor Society in Psychology (2016)

TECHNICAL SKILLS

- In-depth knowledge of cognitive neuroscience and psycholinguistics
- In-depth knowledge of cardiac electrophysiology
- Excellent research, writing, and teaching skills
- Collaboration using Github and other data-sharing platforms
- Programming in E-basic, MATLAB, R, Python, C#, C++
- Data Analysis in Matlab, R, Python.
- Stimulus presentation in Unity, PsychoPy, E-prime.
- Signal processing using NetStation, MATLAB, EEGLab, Fieldtrip, Brainstorm, MNE- python, Evoked Potential (EP) toolkit
- Natural language processing in Python
- Machine Learning in R and Python
- Implementation of Independent Components Analysis (ICA), Principal Components Analysis (PCA), and wavelet analysis techniques using MATLAB, EEGLAB, FieldTrip, NetStation, and Evoked Potential (EP) toolkits.
- Statistical analysis in SPSS, Python, R, SAS
- June 2011 Electrical Geodesics Incorporated advanced ERP analysis course
- June 2013 MATLAB signal processing training course