

## Benjamin Bogart Rickles

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### EDUCATION

#### **University of Maryland**

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

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 – Present **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

## PUBLICATIONS

**Rickles, B.**, Tensmeyer, C., Healy, J., Siu, A. (in prep). Event-related potential markers of implicit relevance, 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). Ratio of theta-to-alpha EEG power during narrative comprehension predicts units of recall.

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. 40<sup>th</sup> 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)

- 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 8<sup>th</sup> 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. 59<sup>th</sup> 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 61<sup>th</sup> 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.

**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
- 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