

SARA MILLIGAN

smilliga@usf.edu | 727-564-2211 | 4030 Bell Grande Drive, Valrico FL 33596

EDUCATION

University of South Florida, Tampa, FL

Ph.D. in Psychology 2018 – 2024

Dissertation: *Causes and consequences of word skipping during reading: Evidence from the co-registration of eye movements and EEG*

M.A. in Psychology 2018 – 2022

Thesis: *Influences of sentence context and individual differences in lexical quality on early phonological processing during silent reading*

B.A. in Psychology 2008 – 2013

B.A. in English-Literary Studies 2008 – 2013

Honors Thesis: *Catch 22: World War II narrative, Cold War commentary*

RESEARCH POSITIONS

Postdoctoral Researcher – Eye Movements and Cognition Lab 2024 -Present

PI: Elizabeth Schotter, Psychology Department, University of South Florida

Funded by NSF Grant #BCS-2341665 – Collaborative Research: Linking saccadic behavior to cognitive-linguistic processing in goal-directed reading via coupled analysis of eye movements and EEG

Graduate Research Assistant 2022 – 2023

PI: Lisa Penney, MUMA College of Business/Institute of Applied Engineering, University of South Florida

Funded by USSOCOM Research Grant (TO-035) – Can Mindfulness Improve Soldier Decision-Making Under Stress?

Graduate Research Assistant – Eye Movements and Cognition Lab

PI: Elizabeth Schotter, Psychology Department, University of South Florida

Funded by NSF Grant #2120507 – Collaborative Research: 2022 – 2024

The Role of Perceptual and Word Identification Spans in Reading Efficiency: Evidence from Deaf and Hearing Adults

Funded by NSF Grant #1724623 – Collaborative Research: Attention in Games and Decisions 2018 – 2019

Professional Research Assistant – Cognitive Neuroscience of Language Lab 2015 – 2017

PI: Albert Kim, Institute of Cognitive Science, University of Colorado Boulder

Funded by NSF Grant #1431223 - Syntax-Semantics Interaction During Sentence Comprehension: An Individual Differences Approach

Post-bacc Research Assistant – Folstein Categorization Lab 2013 – 2015

PI: Jonathan Folstein, Psychology Department, Florida State University

Undergraduate Research Assistant – Cognitive Psychophysiology Lab 2013

PI: Emmanuel Donchin, Psychology Department, University of South Florida

PROFESSIONAL EXPERIENCE

Florida Data Science for Social Good Internship Summer 2022

Data curation, analysis, and visualization; development of a standardized *Arts in Schools* grading system and interactive dashboard for the Cathedral Arts Project of Jacksonville for assessing and understanding disparities in access to arts in public schools in Duval County, FL

PUBLICATIONS

(student mentees denoted by asterisk)

Schotter, E. R., **Milligan, S.**, Cooley, F. & Emmorey, K. (2026). Identifying the visual and linguistic sources of reading efficiency: A comparison of individual differences among deaf and hearing readers. *Journal of Vision*

Milligan, S. & Schotter, E. R. (2026). Understanding the eye-brain interface during reading: Connecting word skipping and comprehension using behavior-contingent fixation-related potentials. *Psychophysiology*

Nestor, B.*, Elaboudi, A.* & **Milligan, S.** & Schotter, E. R., (2025). Parafoveally perceived orthographic cues facilitate foveal semantic processing: Evidence from event-related potentials. *Brain and Language*, 268, 105609.

- Milligan, S.**, Nestor, B.*, Elaboudi, A.*, & Schotter, E. R. (2025). Individual differences in subcomponents of the N400: Comprehension ability predicts contextual support effects while spelling ability predicts orthographic anomaly effects. *Cognitive Affective and Behavioral Neuroscience*. Online first.
- Milligan, S.**, Jaime Brunet, M.*, Caliskan, N.*, & Schotter, E. R. (2025). Parafoveal N400 effects reveal that word skipping is associated with deeper lexical processing in the presence of context-driven expectations. *Attention, Perception, & Psychophysics*, 87, 76-93.
- Milligan, S.** & Schotter, E. R. (2024). Do readers here what they sea?: Effects of lexicality, predictability, and individual differences on the phonological preview benefit. *Journal of Memory and Language*, 135, 104480.
- Milligan, S.**, Nestor, B.*, Antúnez, M., & Schotter, E. R. (2023). Out of sight, out of mind: Foveal processing is necessary for semantic integration of words into sentence context. *Journal of Experimental Psychology: Human Perception and Performance*, 49(5), 687–708.
- Caliskan, N.*, **Milligan, S.** & Schotter, E. R. (2023). Readers scrutinize lexical familiarity only in the absence of expectations: Evidence from lexicality effects on event-related potentials. *Journal of Memory and Language*, 238, 105232.
- Schotter, E. R., **Milligan, S.** & Estevez, V.* (2023). Event-related potentials show that parafoveal vision is insufficient for semantic integration. *Psychophysiology*, 60(7), e14246.
- Milligan, S.**, Antúnez, M., Barber, H. A. & Schotter, E. R. (2022). Are eye movements and EEG on the same page?: A co-registration study on parafoveal preview and lexical frequency. *Journal of Experimental Psychology: General*, 52(1), 188–210.
- Antúnez, M., **Milligan, S.**, Hernández-Cabrera, J. A., Barber, H. A., & Schotter, E. R. (2022). Semantic parafoveal processing in natural reading: Insight from fixation-related potentials & eye movements. *Psychophysiology*, 59, e13986.

SUBMITTED MANUSCRIPTS

- Snyder, B.*, **Milligan, S.**, & Schotter, E. R. (under review after minor revision). EyeSort: an EEGLAB-integrated toolbox for behavioral categorization of eye fixation events in EEG-EM co-registered data. *Behavior Research Methods*. <https://osf.io/zx4un/files/jrb5f>

MANUSCRIPTS IN PREPARATION

- Milligan, S.**, Adeyemi, J.*, & Schotter, E. R. (in preparation). Fixation-related brain potentials reveal a direct link between regressive eye movements and the time course of predictive conflict detection and repair.

Milligan, S., Copeland, A., Silcox, J., Payne, B. R., & Schotter, E. R. (in preparation). Semantic and orthographic FRP effects in natural reading vary as a function of trial-level oculomotor decisions and subject-level lexical quality.

Copeland, A., **Milligan, S.**, Silcox, J., Schotter, E. R., & Payne, B. R. (in preparation). Knowing your frenemies: Form-level expectation violations facilitate initial semantic access, but trigger downstream repair processes.

Schotter, E. R., **Milligan, S.**, Copeland, A., Silcox, J., & Payne, B. R. (in preparation). Avoiding pitfalls in co-registration of eye tracking and EEG: Practical and conceptual guidelines for naturalistic reading studies.

Milligan, S., Mejia Castellon, S.*, & Adeyemi, J.* (in preparation). Does it matter which fixation the potential is related to?: A co-registration investigation of EEG neural responses to re-fixated words during natural reading.

CONFERENCE PRESENTATIONS

Spoken Presentations

Milligan, S., Copeland, A., Jamie Brunet, M.*, Trendova, S.*, Silcox, J., Payne, B. R., Schotter, E. R. (forthcoming). Orthographic predictability facilitates and precedes semantic predictability effects on the parafoveal N400 during natural reading. *Psychonomic Society Annual Meeting, San Diego, CA, USA*

Copeland, A., **Milligan, S.**, Schotter, E. R., Silcox, J., Payne, B. R. (forthcoming). Knowing your frenemies: Form-level expectation violations facilitate initial semantic access, but trigger downstream repair processes. *Psychonomic Society Annual Meeting, San Diego, CA, USA*

Schotter, E. R., **Milligan, S.**, Copeland, A., Jamie Brunet, M.*, Trendova, S.*, Silcox, J., Payne, B. R. (2026). Co-registration of eye tracking and electroencephalography supports the idea of mislocated fixations as functional skips. *European Conference on Eye Movements, Ulm, Germany*

Schotter, E. R., **Milligan, S.** & Emmorey, K. (2025). Identifying the Sources of Reading Efficiency: A Comparison of Individual Differences Among Deaf and Hearing Readers. *Psychonomic Society Annual Meeting, Denver, CO, USA*

Milligan, S. & Schotter, E. R. (2025). Linguistic and oculomotor causes and consequences of word skipping: Insights from parafoveal N400 fixation-related potentials. *Conference on Human Sentence Processing, College Park, MD*

Schotter, E. R., **Milligan, S.**, Antúnez, M., & Barber, H. A. (2022). Distinct patterns in eye movements and fixation-related potentials put constraints on models of eye movements in reading. *European Conference on Eye Movements, Leicester, UK*

Milligan, S. & Schotter, E. R. (2022). Does it matter which fixation the potential is related to? *Leading Edge Workshop on Co-registration, Tampa, FL, USA*

Schotter, E. R. & **Milligan, S.** (2022). How co-registration can inform models and architectures of the reading process. *Leading Edge Workshop on Co-registration, Tampa, FL, USA*

Milligan, S., Sciuto, A., Antúnez, M., & Schotter, E. R. (2020). Differences in lexical retrieval and reintegration processes between foveal and parafoveal processing during reading: Evidence from event related potentials. *Architectures and Mechanisms for Language Processing, Potsdam, Germany (presented remotely)*

Milligan, S., Sciuto, A., Antúnez, M., & Schotter, E. R. (2020). Event-related potentials reveal differences between foveal and parafoveal integration of visual and contextual information during sentence processing. *42nd Annual Conference of the Cognitive Science Society (CogSci 2020), Toronto, Ontario, Canada (presented remotely)*

Invited Talks

Milligan, S. (2024). The eye-mind link during reading: Insights from eye movement behavior and fixation-related brain potentials. *University of Utah Psychology Dept. CNS Area Colloquium*

Posters

Milligan, S., Adeyemi, J.* & Schotter, E. R. (2026). Regressive eye movements and fixation-related potentials show that parafoveal preview invalidity and sentence context invalidity evoke similar conflict resolution processes. *European Conference on Eye Movements, Ulm, Germany*

Milligan, S. & Schotter, E. R. (2025). Disruption to trans-saccadic integration engages the same Late Positive Component (LPC) activity as sentence-level expectation violations. *Psychonomic Society Annual Meeting, Denver, CO, USA*

Milligan, S. & Schotter, E. R. (2025). Parafoveal N400 fixation-related potential effects vary as function of eye movement behavior (i.e., word skipping) during natural sentence reading. *Cognitive Neuroscience Society Annual Meeting, Boston, MA, USA*

Milligan, S., Jaime Brunet, M., Caliskan, N., & Schotter, E. R. (2024). Fixation-Related Brain Potentials Reveal that Word Skipping during Reading Reflects Deeper Parafoveal Word Identification. *Psychonomic Society Annual Meeting, New York City, NY, USA*

- Milligan, S.,** Estevez, V., & Schotter, E. R. (2022). Parafoveal Processing Provides a Head Start on Word Recognition & Reduces Foveal N400 Effects. *Psychonomic Society Annual Meeting, Boston, MA, USA*
- Milligan, S.,** Antúnez, M., Barber, H. A. & Schotter, E. R. (2021). Eye Movements and FRPs Reveal Distinct Effects of Lexical Frequency on Parafoveal Processing. *Psychonomic Society Annual Meeting, Virtual*
- Milligan, S.** & Schotter, E. R. (2020). Phonological parafoveal preview benefit depends on phonological decoding efficiency and contextual support. *Psychonomic Society Annual Meeting, Virtual*
- Milligan, S.** & Schotter, E. R. (2020). Sentence context and spelling ability influence parafoveal processing of phonology in reading. *CUNY Conference on Human Sentence Processing, Virtual*
- Milligan, S.,** Schotter, A. & Schotter, E. R. (2019). Situational factors and individual traits influence the allocation of attention during risky decision making: Evidence from eye tracking. *Psychonomic Society Annual Meeting, Montreal, Canada*
- Milligan, S.** & Schotter, E. R. (2019). Individual differences in gaze patterns during risky financial decision-making. *European Conference on Eye Movements, Alicante, Spain*
- Milligan, S.** & Schotter, E. R. (2019). Frequency, predictability & lexical quality effects: Individual differences in reading & proofreading. *CUNY Conference on Human Sentence Processing, Boulder, CO, USA*
- Hsu, N., **Milligan, S.,** Bell-Souder, D., Kim, A. & Novick, J. (2017). Dynamic cognitive control engagement modulates conflict resolution during real-time language processing: An ERP study. *Psychonomic Society Annual Meeting, Vancouver, Canada*
- McKnight, S., Bell-Souder, D., **Milligan, S.,** Miyake, A. & Kim, A. (2017). Individual differences in working memory correlate with brain responses during sentence embedded word reading. *CUNY Conference on Human Sentence Processing, Cambridge, MA, USA*
- Monfared, S. S., **Milligan, S.,** & Folstein, J. (2015). Isolation of ventral stream EEG sources using steady state EEG and independent components analysis. *Journal of Vision, 15(12), 613. Vision Sciences Society Meeting, St. Petersburg, FL, USA*
- Milligan, S.,** Eckert, N., Kamp, S.-M. & Donchin, E. (2013). Frontal slow wave activity associated with working memory processes over full word lists. *University of South Florida Undergraduate Research Colloquium, Tampa, FL, USA*

Student/Research Assistant Supervised Posters
(mentees denoted by asterisk)

Snyder, B.*, **Milligan, S.** & Schotter, E. R. (2025). The EyeSort toolbox for identifying fixations for co-registration research. *Psychonomic Society Annual Meeting, Denver, CO, USA*

Sulcaj., N.*, **Milligan, S.**, Brothers, T., Schotter, E.R. (2025). Are You Positive You Read That Right? Parafoveal Vision and the Frontal Positivity in Sentence Reading. *Psychonomic Society Annual Meeting, Denver, CO, USA*

Trendova, S.*, Jaime Brunet, M. *, **Milligan, S.**, Schotter E.R. (2025) Backtrack and repair: Eye-brain dynamics in response to orthographic mismatches. *Psychonomic Society Annual Meeting, Denver, CO, USA*

Sulcaj, N. *, **Milligan, S.**, & Schotter, E.R. (2025). Parafoveal Vision and the Frontal Positivity in Sentence Reading. *OneUSF Undergraduate Research Conference, Tampa, FL.*

Trendova, S.*, Jaime Brunet, M. *, **Milligan, S.**, & Schotter, E.R. (2025). The influence of subtle orthographic errors on reading behavior and lexical processing. *Florida Psycholinguistic Meeting, Tallahassee, FL.*

Elaboudi, A. *, **Milligan, S.**, & Schotter, E.R. (2023). The relation between sentence constraint and expectancy to diverse spelling ability and reading comprehension: Evidence from the N400 ERP Component. *Florida Psycholinguistic Meeting, Gainesville, FL.*

Nestor, B. *, Schotter, E.R., **Milligan, S.**, & Elaboudi, A. * (2022). Investigating the Relationship Between Language Skill and Semantic vs. Orthographic Processing: Evidence from the N400 ERP Component. *Psychonomic Society Annual Meeting, Boston, MA, USA*

Caliskan, N. *, **Milligan, S.**, Schotter, E. R. (2022). ERPs Reveal That Lexical Familiarity Only Matters in the Absence of Expectations. *Psychonomic Society Annual Meeting, Boston, MA, USA*

Caliskan, N. *, **Milligan, S.**, Brunet, M. J. *, Schotter, E. R. (2022). Interactive effects of semantic diversity and word frequency in natural reading. *European Conference on Eye Movements, Leicester, UK*

Caliskan, N. *, **Milligan, S.**, Schotter, E. R. (2022). The effect of orthographic relationships, lexical status and contextual constraint on visual word recognition: Evidence from event-related potentials. *42nd Annual Conference of the Cognitive Science Society (CogSci 2022), Toronto, Ontario, Canada*

- Caliskan, N. *, **Milligan, S.**, Schotter, E. R. (2022). The Impact of Orthographic Similarity and Sentence Constraint on Visual Word Recognition: An Event-Related Potential Study. *Conference on Human Sentence Processing, Santa Cruz, CA, USA*
- Elaboudi, A. *, Thomas, H.M. *, Rodriguez, S.S. *, **Milligan, S.**, & Schotter, E.R. (2021). Investigating the Impact of Lexical Quality in Word Processing using Sentence Context with Various Spelling Abilities: Evidence from the N400 ERP Component. *USF Psychology Expo (virtual)*
- Estevez, V. *, **Milligan, S.**, & Schotter, E.R. (2021). Is parafoveal vision sufficient for semantic integration?: Evidence from event-related potentials. *USF Psych Expo, Tampa, FL (virtual)*
- Hodges, M. *, Hansen, J. *, **Milligan, S.** & Schotter E. R. (2020). Stress and rhythm patterns as elements of contextual predictions in silent reading. *Florida Psycholinguistics Meeting, (virtual)*
- Caliskan, N. *, **Milligan, S.** & Schotter E. R. (2020). The Impacts of Higher-Order Integration and Reanalysis During Sentence Comprehension: An Event Related Potential Investigation. *Florida Psycholinguistics Meeting, (virtual)*
- Sciuto, A. *, **Milligan, S.**, & Schotter, E. R. (2020). Visual quality and lexical quality reduce readers' reliance on sentence context for word recognition. *42nd Annual Conference of the Cognitive Science Society, Toronto, Canada*
- Sciuto, A. *, **Milligan, S.**, & Schotter, E. R. (2020). Visual clarity and spelling ability affect the use of sentence context for word recognition. *CUNY Conference on Human Sentence Processing, (virtual)*

TEACHING

Course Assistant – Drugs and Behavior	Spring 2021
Course Assistant – Physiological Psychology	Fall 2020
Lab Instructor – Introduction to Psychology	Summer 2020
Course Assistant – Experimental Design & Analysis	Fall 2020, Spring 2020, Fall 2019
Guest Lecturer – Psychology of Language	Fall 2018, Spring 2019

AWARDS & GRANTS

APF Graduate Student Scholarship Departmental Nominee	2020
Student Government Conference Presentation Grant (\$750)	2019

Student-awarded Grants for Supervised Research

Psi Chi Undergraduate Research Grant (Student mentee: Nadija Sulcaj*) <i>Are you positive you read that right?: Parafoveal vision and the frontal positivity in sentence reading</i> (\$600)	2025
USF Undergraduate Research Fellowship in Visualization, Virtualization, and Simulation (Student mentee: Jeremiah Adeyemi*) <i>Using deconvolution to understand cognitive processes in reading and language comprehension</i> (\$1,000)	2024
Psi Chi Undergraduate Research Grant (Student mentee: Neslihan Caliskan*) <i>The impact of lexical relationships and contextual information on visual word recognition: an event-related potential study</i> (\$1,500)	2021
Psi Chi Undergraduate Research Grant (Student mentee: Victoria Estevez*) <i>Is parafoveal vision sufficient for semantic integration?: Evidence from event-related potentials</i> (\$1,500)	2021
Psi Chi Undergraduate Research Grant (Student: Alex Sciuto*) <i>How do the reliability of perceptual input and spelling ability modulate readers' reliance on predictions to facilitate word identification?</i> (\$1,500)	2020

AD HOC REVIEW ACTIVITY

Independent Reviewer

Scientific Reports
Journal of Experimental Psychology: General
Brain & Language
Psychological Research
Journal of Neuroscience
BMC Psychology
Cognition

Co-reviewer

Journal of Cognitive Neuroscience
Journal of Experimental Psychology: Human Perception and Performance
Journal of Experimental Psychology: Learning, Memory, and Cognition
CUNY Conference on Human Sentence Processing 2020

SERVICE

Departmental Graduate Student to Faculty Representative	2020-2021
CNS Concentration Colloquium Organizer	2019-2020
USF Brain Bee Club Graduate Student Advisor	Fall 2018

PROFESSIONAL ORGANIZATIONS

American Psychological Association
Society for Psychophysiological Research
Psi Chi (The International Honor Society in Psychology)
Cognitive Science Society
Psychonomic Society
Cognitive Neuroscience Society
USF Graduate Student Union

PROFESSIONAL REFERENCES

Elizabeth R. Schotter, PhD., Associate Professor
Psychology Department, University of South Florida
4202 East Fowler Ave, PCD 4118G, Tampa, FL 33620, USA
(813) 974-0377
eschotter@usf.edu

Brennan R. Payne, PhD., Associate Professor
Psychology Department, University of Utah
380 South 1530 East, 1004 BEHS, Salt Lake City, UT 84112, USA
(801) 581-5040
brennan.payne@utah.edu

Karen Emmorey, PhD., Distinguished Professor
Speech, Language, and Hearing Sciences, San Diego State University
6495 Alvarado Road, Suite 200, San Diego, CA 92120, USA
(619) 594-8080
kemmorey@sdsu.edu