

Regina C. Calloway, Ph.D.

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Education

Ph.D., Psychology (Cognitive) 2019, University of Pittsburgh, Learning Research and Development Center

M.S., Psychology (Cognitive) 2016, University of Pittsburgh, Learning Research and Development Center

B.S., Psychology 2013, University of Maryland, College Park
Minor in Linguistics

Research Interests

In my research, I investigate ways of promoting neuroplasticity through behavioral and neural modulation interventions that can increase quality of life, such as improved speech-in-noise perception, learning outcomes, and anxiety reduction. I employ neuroimaging methods, such as EEG/ERPs and pupillometry to further understand the neural mechanisms that underlie high-level cognitive processes of communication, attention, learning, and memory. I am constantly looking for ways to apply new data analysis techniques to better understand and address national health issues.

Experience

Human Systems Engineer, May 2022 – present, Johns Hopkins Applied Physics Lab. Interact with sponsors and stakeholders and translate software needs into user and system requirements. Provide data analytics, user experience research, and external proposal evaluation across projects related to national health. Product owner of software tools geared toward displaying results of machine learning (ML) algorithms.

Lead a team to develop simulated scenarios used to model human performance, with a focus on the impact of cognitive and physical fatigue on patient outcomes. Co-PI of a research project designed to examine the impact of stress on human performance using (neuro)physiological metrics (e.g., functional near infrared spectroscopy (fNIRS), eye-tracking, pupillometry, heart rate).

Postdoctoral Research Associate, University of Maryland, College Park.

Information Systems Research (ISR); Center and Center for Comparative Evolutionary Biology of Hearing (C-CEBH), January 2019 – April 2022. Conduct research on behavioral cognitive-auditory training as a method for enhancing speech-in-noise perception in older adults using behavioral, pupillometry, and MEG methods. Examine auditory stream segregation processes in older and younger adults.

Applied Research Laboratory for Intelligence and Security (ARLIS), October 2019 – April 2021. Conduct neural and behavioral research on augmented second language learning via transcutaneous nerve stimulation (tNS) and transcutaneous cervical branch of the vagus nerve stimulation (tcVNS). Develop tests of second language acquisition and tone discrimination and assessing behavioral and neural performance, via EEG and ERP methods.

Research Associate, May – Oct. 2019, Optimal Solutions Group, LLC. Provide quality control and statistical analyses for education data related to the National Assessment of Educational Progress (NAEP) administered at the national, state, and district levels of the United States of America. Co-Project Director of external evaluation for Montgomery County’s Bridges to the Future which assists transition-age youth with behavioral health challenges.

Graduate Student Researcher, Aug. 2014- Apr. 2019, Perfetti and Plum Labs, University of Pittsburgh, Learning Research and Development Center. With advisor Dr. Charles Perfetti: Conducted behavioral and ERP studies of discourse processing, reading comprehension differences, motivation, and literacy training. Led reading comprehension studies focused on individual differences in predictive and integrative processes during reading.

With advisor Dr. Natasha Tokowicz: Conducted research concerning language learning processes, methods to enhance second language learning, and memory encoding and retrieval processes using behavioral and ERP methods.

Research Assistant Feb. – Jul. 2014, American Institutes for Research. Compiled and disseminated data on international and national education achievement outcomes and analyzed changes in these outcomes over time.

Research Assistant, Aug. 2011 – Dec. 2013, Decision, Attention, and Memory Lab, University of Maryland, College Park. With Dr. Michael Dougherty: Researched stopping rules in memory searches and the effects of anxiety on memory encoding, retrieval, and working memory tasks.

Publications

Johns, M. A., **Calloway, R. C.**, Phillips, I., Karuzis, V. P., Dutta, K., Smith, E., ... & Kuchinsky, S. E. (2023). Performance on stochastic figure-ground perception varies with individual differences in speech-in-noise recognition and working memory capacity. *The Journal of the Acoustical Society of America*, 153(1), 286-303.

Calloway, R. C., Helder, A., & Perfetti, C.A. (in press). A measure of individual differences in readers’ approaches to text and its relation to reading experience and reading comprehension. *Behavior Research Methods*.

Phillips, I., **Calloway, R. C.**, Karuzis, V. P., Pandža, N. B., O'Rourke, P., & Kuchinsky, S. E. (2021). Transcutaneous Auricular Vagus Nerve Stimulation Strengthens Semantic Representations of Foreign Language Tone Words during Initial Stages of Learning. *Journal of Cognitive Neuroscience*, 34(1), 127-152.

Bruett, H., **Calloway, R. C.**, Tokowicz, N., & Coutanche, M. (2020) Neural pattern similarity across concept exemplars predicts memory after a long delay. *Neuroimage*, 117030.

- Calloway, R. C.**, & Perfetti, C.A. (2020). Integration and structure building across a sentence boundary: ERP indicators of definite/indefinite article, noun repetition, and comprehension skill effects, *Language, Cognition and Neuroscience*, 35(1), 124-136.
- Popov, V., Zhang, Q., Koch, G. E., **Calloway, R.C.**, & Coutanche, M. N. (2019). Semantic knowledge influences whether novel episodic associations are represented symmetrically or asymmetrically, *Memory and Cognition*, 47(8), 1567-1581.
- Helder, A, Perfetti, C. A., van den Broek, P. C., Stafura, J. Z., **Calloway, R.**, (2019). ERP indicators of local and global text influences on word-to-text integration, *Language, Cognition and Neuroscience*, 34(1), 13-28.
- Calloway, R. C.**, & Perfetti, C. A. (2017). Integrative and predictive processes in text reading: The N400 across a sentence boundary. *Language, Cognition and Neuroscience*, 32(8), 1001-1016.

Peer Reviewed Conference Proceedings

- Calloway, R.C.** , Tseng, A., Karuzis, V.P., Martinez, D., & O'Rourke, P. (2020). Auricular Transcutaneous Vagus Nerve Stimulation (tVNS) Affects Mood and Anxiety during Second Language Learning. *In the 42nd Annual Conference of the Cognitive Science Society*, Toronto, Canada: Cognitive Science Society.
- Calloway, R. C.** (2020). Developing a Measure of Reader-based Standards of Coherence and its Relationship to Reading Habits and Reading Engagement. *The Annual Conference of the American Educational Research Association*, American Educational Research Association. (Conference canceled).
- Zhang, Q.*,Popov, V.* (co-first authors), Koch, G., **Calloway, R.** & Coutanche, M. (2018). Fast Memory Integration Facilitated by Schema Consistency. *In C. Kalish, M. Rau, J. Zhu, T. Rogers (Eds.), Proceedings of the 40th Annual Conference of the Cognitive Science Society*. Austin, TX: Cognitive Science Society.

Technical Reports

- Calloway, R.**, Martinez, D., McConnell, S., Tseng, A. M., Hersh, M., Arita, A....O'Rourke, P. (2020). Plasticity in L2 vocabulary/grammar learning with additional nerve targets. College Park, Maryland: University of Maryland Applied Research Laboratory for Intelligence and Security.
- Martinez, D., **Calloway, R.**, Tseng, A. M., Arita, A., McConnell, S., Lee, J...O'Rourke, P. (2020). Plasticity in L2 vocabulary and grammar learning: Phase II. College Park, Maryland: University of Maryland Applied Research Laboratory for Intelligence and Security.
- Phillips, I., **Calloway, R. C.**, Karuzis, V. P., Pandža, N. B., Turner, M. S., Lee, J. G. W... Kuchinsky, S.E. (2020). Investigating three parameterizations of taVNS-potentiated short-term neuroplasticity to facilitate Mandarin lexical tone learning: Interim report. College

Park, Maryland: University of Maryland Applied Research Laboratory for Intelligence and Security.

Conference Presentations

- Calloway, R. C.***, Johns, M. J.*, Phillips, I., Karuzis, V. P., Duttal, K., Smith, E., Shamma, S. A., Goupell, M. J., Kuchinsky, S. E. *Discontinuous Stochastic Figure Ground Task Predicts Speech-In-Noise Recognition*. Poster to be presented at the 45th Annual meeting of the Association for Research in Otolaryngology, San Jose, CA.
- Calloway, R.C.**, Decruy, L., Karunathilake, I. M. D., Dunlap, J. L., Anderson, S., Simon, J. Z., Kuchinsky, S. E. (2021). *Pupil diameter indexes time-course shifts in older adults' sustained listening effort*. Paper presented at the 8th International Symposium on Auditory and Audiological Research, Nyborg, Denmark (virtual).
- Helder, A., **Calloway, R.**, & Perfetti, C. (November 2020). *Incremental Processes in Text Comprehension: Word-to-Text Integration and Structure Building Captured by Event Related Potentials*. Poster presented at the 61st Annual meeting of the Psychonomic Society, virtual.
- Tokowicz, N., & **Calloway R.C.** (September 2019). *Swedish vs. Speedish: Musical Ability Relates to Early ERP Effects During Second Language Learning*. Poster to presented at the 59th Annual meeting of the Society of Psychophysiological Research, Washington, D.C.
- Perfetti, C.A., **Calloway, R. C.**, & Duff, D. (July 2019). *Understanding Words and Comprehending Texts*. Paper presented at the 26th Annual meeting of the Scientific Studies of Reading, Toronto, Canada.
- Zhang, Q., Popov, V., Koch, G. E., **Calloway, R.C.**, & Coutanche, M. N. (July 2018). *Fast Memory Integration Facilitated by Schema Consistency*. Poster presented at the 40th Annual Conference of the Cognitive Science Society.
- Calloway, R.C.** & Perfetti, C.A. (July 2018). *A Study, the Study: Individual Differences in Using Indefinite and Definite Articles as Cues for Structure Building*. Poster presented at the 28th Annual Meeting of the Society for Text and Discourse, Brighton, UK.
- Calloway, R.C.** & Perfetti, C. A. (November 2017). *A Study, The Study: Using Indefinite and Definite Articles to Examine the Nature of Structure Building*. Poster presented at the Ninth Annual meeting of the Society of the Neurobiology of Language, Baltimore, Maryland.
- Helder, A., Stafura, J., van den Broek, P., & Perfetti, C., **Calloway, R.**, (July 2017). *ERP Indicators of Local and Global Text Structure on Word-to- Text Integration*. Paper presented at the 27th Annual Meeting of the Society for Text and Discourse, Philadelphia, PA.
- Calloway, R.C.** & Perfetti, C. A. (July 2016). *Integrative and Predictive Processes in Text Reading: The N400 across a Sentence Boundary*. Poster presented at the 23rd Annual Meeting of the Society for the Scientific Study of Reading, Porto, Portugal.

Calloway, R.C. & Perfetti, C. A. (October 2015). *Integration and Prediction Processes in Text Reading: A Re-Examination of the N400*. Poster presented at the 21st Anniversary of the Center for the Neural Basis of Cognition, Pittsburgh, PA.

Helder, A., Stafura, J., **Calloway, R.**, van den Broek, P., & Perfetti, C. (July 2015). *Centrality Effects on Word-to-Text Integration During Reading: An ERP Study*. Oral presentation at the 25th Annual Meeting of the Society for Text and Discourse, Minneapolis, MN.

Chrabaszcz, J.S., Bolger, D.J, **Calloway, R.C.**, Brown, N., Wettroth, C., & Dougherty, M.R. (November 2014). *An alternative explanation for working memory training effects*. Poster presented at the 55th Annual Meeting of the Psychonomic Society, Long Beach, CA.

Chrabaszcz, J. S., Dougherty, M. R., Bolger, D. J., **Calloway, R. C.**, & Brown, N. (November 2014) *Stress during learning impairs probability estimation*. Poster presented at the 34th Annual Conference for the Society of Judgment and Decision Making, Long Beach, CA.

Teaching Experience

Teaching Fellow – Cognitive Psychology Lecture, Summer 2017; Cognitive Psychology Lab, Fall 2018, University of Pittsburgh

Invited Guest Lecturer – Memory and Cognition, Fall 2020, University of Maryland (online synchronous lecture – Language and Emojis)

Mentoring Experience and Service

Volunteer Reading and Math Tutor, Literacy Pittsburgh, October 2018 – April 2019; Tutored two adults in reading and math to help reach education goals of passing the GED and passing an exam required for a work certification. Met with students in one-on-one settings four hours per week and focused on reading and/or mathematics content. Developed lesson plans based on student needs.

First Year Experience in Research Mentor, *Spring* 2015 – 2019; The First Year Experience in Research program at the University of Pittsburgh that provides mentoring to undergraduate students interested in conducting empirical research on the Spring term. Spring 2015, James Westbay; Spring 2016, Nicholas Fuller; Spring 2017, Bari Zweben; Spring 2018, Lydia Chylpka; Spring 2019, Amiri Lake.

Diversity Committee Member, Fall 2015 – 2018; University of Pittsburgh – the organization promoted diversity within the Psychology department and provided workshops for underrepresented undergraduate students.

Directed Research Mentor, Fall 2016 – Spring 2019; Supervised students in Psychology and Neuroscience at the University of Pittsburgh in the research process, including literature reviews, data collection, and manuscript writing or poster presentations. Fall 2016 – Spring 2017 Joseph Maurizi; Fall 2017 – Spring 2018, Lindsay Ejoh, Spring 2018 – Nithya Ganesh; Fall 2018 – Lydia Chylpka, Fall 2018 – Spring 2019, Shansa Gaddam and Allyson Distler.

Cognitive Psychology Student Representative, Fall 2016 – Summer 2017; University of Pittsburgh – Co-organized events for cognitive psychology graduate students and co-organized applicant weekend for the cognitive psychology program.

Reading and Language Group Coordinator, Fall 2016 – Spring 2017; University of Pittsburgh – Coordinated presentations by graduate students and faculty members from the University of Pittsburgh to present on language-related topics.

Ph.D. Peer Mentor, Summer 2017 –2018, Zac Caddick; University of Pittsburgh – Provided peer support and course recommendations to a first-year graduate student.

Hot Metal Bridge Post Baccalaureate Program Mentor, Fall 2017 – Spring 2018, Alexandra Flores; University of Pittsburgh; Fall 2018 doctoral student at the University of Colorado Boulder – The one-year program allows post-baccalaureate students to take courses alongside graduate students and conduct research with faculty to help them prepare for graduate school. Mentors provide support on graduate program applications and provide social support.

Honors and Awards

Education Abroad Scholarship, 2012

University of Maryland, College Park

Arum Scholarship for Korean Language, 2012

University of Maryland, College Park

Global Public Health Scholars Program Citation, 2012

University of Maryland, College Park

Graduate and Professional Student Government Travel Grant, 2016

University of Pittsburgh

Arts and Sciences Graduate Student Organization Travel Grant, 2016 & 2018

University of Pittsburgh

Ruth L. Kirschstein National Research Service Award Institutional Postdoctoral Training Grant (T32), 2021-2022

National Institute of Deafness and Communicative Disorders of the National Institutes of Health; University of Maryland’s Center for Comparative and Evolutionary Biology of Hearing

Technical Experience

SPSS Statistical Software, R Statistical software, Python, PsychoPy, Microsoft Visual Basic, Net Station EEG software, Neuroscan EEG software, E-Prime Experimental software, Qualtrics Survey software.

Workshops

Attended

ERP Boot Camp: University of California Davis, July 2015; 10-day workshop on ERP techniques. Full scholarship to attend awarded.

Facilitated

Applying to Graduate School Workshop, May 30, 2017; Co-led a workshop on steps for applying to graduate school for Learning Research and Development Undergraduate Summer Interns who were part of a program that offered research opportunities for minority students.

CV and Statement of Purpose Workshop, October 28, 2018; Participated as a mentor in a workshop for prospective minority graduate students on constructing CVs and statements of purpose.