Zhiying Shen

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research interests: *auditory processing, neurobiology of language, cognitive development*

EDUCATION

Aug 2024 - Present — **Creighton University** — Omaha, NE
current graduate student
Y2 Pharmacology and Neuroscience Ph.D. Program

Aug 2016 - May 2020 — **University of Arizona** — Tucson, AZ
graduated with honors and summa cum laude
B.S. Neuroscience and Cognitive Science
B.A. Linguistics

PUBLICATIONS

published manuscripts organized from newest to oldest

4. Heinrichs-Graham, E., **Shen, Z.**, Lee, W.H., Benavente, A.A., Eastman, J.A., Frenzel, M.R., Wiesman, A.I., Wilson, T.W., Walker, E.A., McCreery, R.W. Cross-modal impact of auditory experience on visual cortical entrainment in children who are hard-of-hearing. *Imaging Neuroscience*. Published online.

3. Arif, Y., Heinrichs-Graham E., Wildy, A.M., Ward, T.W., Diedrich A., Embury, C.M., Rempe, M.P., Glesinger, R.J., **Shen, Z.**, McDonald, K.M., Huang, P.J., Bashford S., Taylor, B.K., Kurz, M.J., Wilson, T.W. Oscillatory and evoked neural responses underlying gating in the primary somatosensory cortices: Evidence from optically-pumped magnetometry. *Neurolamge, 318*, 121393.

2. **Shen, Z.**, Lee, W.H., Eastman, J.A., Frenzel, M.R., Wiesman, A.I., Wilson, T.W., Walker, E.A., McCreery, R.W., Heinrichs-Graham, E. (2025). Alterations in cortical 40-Hz auditory steady-state response dynamics in children with mild-to-severe hearing loss are related to hearing aid use. *Cerebral Cortex, 35(7)*, bhaf178.

1. Diedrich, A., Arif, Y., Taylor, B.K., **Shen, Z.**, Astorino, P.M., Lee, W.H., McCreery, R.W., & Heinrichs-Graham, E. (2025). Distinct age-related alterations in alpha-beta neural oscillatory activity during verbal working memory encoding in children and adolescents. *The Journal of Physiology, 603(8)*, 2387-2408.

in prep — **Neural mechanisms underlying speech-in-noise recognition in children and adolescents.** Hong, J., Shen, Z., Lee, W.H., Diedrich, A., Bashford, S., Leibold, L.J., McCreery, R.W., Walker, E.A., Heinrichs-Graham, E.

in prep — **Multi-spectral neural dynamics underlying the development of semantic judgment support language-specific and domain-general cognition.** Shen, Z., Zhussubali, A., Diedrich, A., Petro, N.M., Spooner, R.K., Astorino, P.M., Lee, W.H., Heinrichs-Graham, E.

in prep — **Age-related changes in alpha and beta oscillations during spatial working memory support task performance in youth.** Salloum, G.K., Shen, Z., Diedrich, A., Petro, N.M., Spooner, R.K., Astorino, P.M., Lee, W.H., Heinrichs-Graham, E.

PRESENTATIONS *(selected)*

Mar 29 - Apr 1 — **CNS 2025** — Boston, MA

Shen, Z., Zhussubali, A., Diedrich, A., Lee, W.-H., Heinrichs-Graham, E. (2025, March). *Age-related changes in alpha and beta oscillatory dynamics during semantic processing in children and adolescents*. Poster E91.

Sep 28-30 **Flux Congress 2024** Baltimore, MD

Shen, Z., Lee, W.-H., Benavente, A. A., McCreery, R., Heinrichs-Graham, E. (2024, September). *Altered neural dynamics serving visual entrainment in children with hearing loss*. Poster S25.

Sep 6-9 **Flux Congress 2023** Santa Rosa, CA

Shen, Z., Lee, W.-H., Benavente, A. A., McCreery, R., Heinrichs-Graham, E. (2023, September). *Characterizing the Effects of Hearing Loss on Auditory Entrainment in Children*. Poster 3-C-17.

RESEARCH EXPERIENCE *(selected)*

Cognitive and Sensory Imaging Lab Boys Town, NE

Graduate Student, Research Assistant | P.I.: Elizabeth Heinrichs-Graham, Ph.D.

Dec 2021 - Jul 2024

As an RA: Run studies involving children 7 to 15 years old using neuroimaging technologies such as magnetoencephalography (MEG) and magnetic resonance imaging (MRI) to investigate the relationship between neural oscillations and cognitive capabilities, with a focus on the impact of hearing loss during development.

Perform administrative tasks in support of successfully running studies (e.g., recruitment, outreach, cross-site collaboration, etc.).

Aug 2024 - Present

As a GS: Analyze data for multiple projects and present data in occasions casual and formal. Partake in co-mentoring fellow RAs.

1. Sensory Entrainment (auditory, visual)
2. Neural Underpinnings of Language Processing (semantics, speech-in-noise)

Jun 2019 - May 2020

Language and Neuroimaging Research Lab Tucson, AZ

Research Assistant | P.I.: Aneta Kielar, Ph.D.

Helped run participants for studies involving electroencephalogram (EEG), functional magnetic resonance imaging (fMRI), and transcranial magnetic stimulation (TMS), and design stimuli for new fMRI-TMS study.

Completed honors thesis by creating and piloting new experimental tasks used in a fMRI-TMS study investigating the effects of TMS on speech recovery in aphasia patients. Thesis title: *fMRI Localizer Task for Cortical Responses to Phonology, Semantics, and Orthography: A Pilot Study*.

Jan 2019 - May 2020

Douglass Phonetics Lab Tucson, AZ

Research Member | P.I.: Natasha Warner, Ph.D.

Extracted, sliced, re-synthesized raw acoustic materials in Praat and ran participants for phonemic detection studies in sound booths using created stimuli.

Completed honors thesis by designing novel tasks and creating stimuli in order to test individuals' perception of the English word "just" in reduced speech. Thesis title: *An Experimental Design to Delineate the Effect of Reduction in Recognizing "Just" in Spontaneous Speech*.

May 2018 - May 2019

Tigger Child Cognition Lab Tucson, AZ

Research Assistant | P.I.: Rebecca Gomez, Ph.D.

Recruited participants and collected data for the study on the effects of nap on memory formation in kids (6-month-old to 6-year-old); fulfilled supportive duties along other lab members to ensure successful execution of research.