Sean R. Anderson

Curriculum Vitae

Cochlear Americas
10350 Park Meadows Dr
Lone Tree, CO 80124
Phone: (303) 790-9010
sean.hearing@gmail.com

EDUCATION

2015 - 2022 ***University of Wisconsin-Madison***
Communication Sciences and Disorders, Ph.D.
Biometry, M.S.

2011 - 2015 ***Baldwin Wallace University***
Majors: Neuroscience, Mathematics, and Psychology, B.S.
Minor: Statistics

RESEARCH EXPERIENCE

Senior Auditory Research Scientist, Cochlear Americas, Oct 2022 –
Area: Sound coding for cochlear implants
Supervisor: Christopher Long

T32 Postdoctoral Fellow, University of Colorado Anschutz, Apr 2022 – Sep 2022
Area: Non-invasive biomarkers of binaural hearing
Supervisor: Daniel Tollin

F31 Doctoral Fellow, University of Wisconsin-Madison, Aug 2015 – Apr 2022
Area: Spatial hearing in listeners with cochlear implants and normal hearing
Supervisor: Ruth Litovsky

Research Intern, Cochlear Americas, June 2018 – Aug 2018
Topic: Speech understanding and spectral resolution with cochlear implants
Supervisor: Sara Duran; Harish Krishnamoorthi; Christopher Long; Zachary Smith

Visiting Research Assistant, Oregon Health and Science University, May 2015 – Jul 2015
Topic: Binaural pitch fusion in listeners with normal hearing
Supervisor: Lina Reiss

Visiting Research Assistant, University of Maryland, College Park, Jun 2013 – Aug 2014
Topic: Temporal processing and aging; sound source localization; cochlear implants
Supervisor: Matthew Goupell

Junior Research Assistant, Baldwin Wallace University, Dec 2011 – May 2014
Topic: Effects of ketamine (anesthetic) on *in vitro* and *in vivo* cortical neurons
Supervisor: Christopher Turner, Jacqueline Morris

AUTHORSHIP (*denotes statistical consulting)

Kalmanson, O., Takeda, H., **Anderson, S. R.***, Dondzillo, A., & Gubbels, S. Tracing the lineage of nestin-expressing cells in the mammalian inner ear. *eNeuro, under review.*

Peng, Z. E., Burg, E., Thakkar, T., Godar, S., **Anderson, S. R.**, & Litovsky, R. Y. Web-based psychoacoustics of binaural hearing: Two validation experiments. *J Acoust Soc Am, under review.*

2023 **Anderson, S. R.,** Gallun, F. J., & Litovsky, R. Y. Interaural Asymmetry of Dynamic Range: Abnormal fusion, bilateral interference, and shifts in attention. *Front Neurosci, 16,* 1018190.

2022 **Anderson, S. R.,** Kan, A., & Litovsky, R. Y. Asymmetric temporal envelope encoding: Within- and across-ear envelope comparisons in listeners with bilateral cochlear implants. *J Acoust Soc Am, 152(6),* 3294-3312.

2022 Uhler, K., **Anderson, S. R.*,** Walker, K., & Yoshinaga-Itano, C. Speech perception in infancy predicts language outcomes at 30 months for both children with normal hearing and those with hearing differences. *J Clin Med, 11(19),* 5821.

2022 **Anderson, S. R.,** Jocewicz, R., Kan, A., Zhu, J., Tzeng, S., & Litovsky, R. Y. Sound source localization patterns with bilateral cochlear implants: Age at onset of deafness effects. *PLoS One, 17(2),* e0263516.

2020 **Anderson, S. R.**, Glickman, B., Oh, Y., & Reiss, L. A. J. Binaural pitch fusion: Effects of sound level in normal-hearing listeners. *Hear Res, 396,* 108076.

2020 Thakkar, T., **Anderson, S. R.,** Kan, A., & Litovsky, R. Y. Evaluating the impact of age, acoustic exposure, and electrical stimulation on binaural sensitivity in bilateral cochlear implant patients. *Brain Sci, 10(6),* 406.

2019 **Anderson, S. R.**, Easter, K., & Goupell, M. J. Binaural temporal processing in aging cochlear-implant and normal-hearing listeners. *J Acoust Soc Am, 146(5),* 3232-3254.

2019 **Anderson, S. R.**, Kan, A., & Litovsky, R. Y. Asymmetric temporal envelope encoding: Implications for within- and across-ear envelope comparison. *J Acoust Soc Am,146(2),* 1189-1206.

2014 Brown, B. P., Kang, S., Gawelek, K., Zacharias, R., **Anderson, S. R.**, Turner, C., & Morris, J. K. (2014). In vivo and in vitro ketamine exposure exhibits a dose-dependent induction of activity-dependent neuroprotective protein in rat neurons. *Neuroscience, 290,* 31-40.

MANUSCRIPTS IN PREPARATION

Anderson, S. R., Burg, E., Suveg, L., & Litovsky, R. Y. Review of binaural processing with asymmetrical hearing outcomes in patients with bilateral cochlear implants. *Trend Hear, in prep.*

Anderson, S. R., Goupell, M. J., Kan, A., & Litovsky, R. Y. Asymmetric temporal envelope encoding: Lateralization and interactions with envelope shape and interaural place-of-stimulation mismatch. *J Acoust Soc Am, in prep.*

Anderson, S. R., Dietz, M., Kan, A., & Litovsky, R. Y. Asymmetric temporal envelope encoding: Lateralization and modeling in listeners with bilateral cochlear implants. *J Acoust Soc Am, in prep.*

CONFERENCE PROCEEDINGS

2019 **Anderson, S. R.,** Thakkar, T., Kan, A., & Litovsky, R. Y. Comparison of pitch-matching methods to predict interaural mismatch in cochlear-implant users. DAGA 2019 – 45. Jahrestagung für Akustik, Rostock, Germany.

INVITED TALKS

2023 Anderson, S. R. Bottlenecks to across-channel processing for patients with bilateral cochlear implants. Acoustical Society of America Psychological and Physiological Acoustics Journal Club, Online.

2023 Anderson, S. R. Factors that limit binaural outcomes for patients with hearing loss: Experience, aging, and asymmetry. Biophysics and Physiology Faculty seminar, University of Colorado Anschutz Medical Campus, Aurora, CO.

2021 Anderson, S. R. Interaural asymmetry and binaural hearing for patients with bilateral cochlear implants. Weekly Hearing and Donuts meeting, University of Wisconsin-Madison, Madison, WI.

2021 Anderson, S. R. Interaural asymmetry and binaural hearing for patients with bilateral cochlear implants. Weekly campus-wide auditory lab meeting, University of Colorado Anschutz Medical Campus, Aurora, CO.

2019 Anderson, S. R. & Litovsky, R. Y. Binaural hearing with asymmetrical abilities: How the poorer ear impacts perception. Weekly Department of Communication Sciences and Disorders Professional Seminar, University of Wisconsin-Madison, WI.

2018 Anderson, S. R. & Litovsky, R. Y. Phonological fusion in listeners with cochlear implants and simulations. Weekly Hearing and Donuts meeting, University of Wisconsin-Madison, Madison, WI.

2018 Anderson, S. R., Kan, A., & Litovsky, R. Y. Asymmetries in temporal encoding and their role in binaural hearing. Weekly campus-wide auditory lab meeting, University of Colorado Anschutz Medical Campus, Aurora, CO.

2018 Anderson, S. R., Kan, A., & Litovsky, R. Y. Relating temporal encoding in monaural and binaural hearing. Research and Development Team Meeting, Cochlear Americas, Centennial, CO.

2017 Anderson, S. R., Kan, A., & Litovsky, R. Y. A review of temporal aspects of binaural encoding in the brainstem: Implications for cochlear-implant users. Weekly Hearing and Donuts meeting, University of Wisconsin-Madison, Madison, WI.

2017 Anderson, S. R., Kan, A., & Litovsky, R. Y. Cochlear-implant users and the auditory periphery: Implications for listening in complex environments. Weekly Department of Communication Sciences and Disorders Professional Seminar, University of Wisconsin-Madison, WI.

2017 Anderson, S. R., Kan, A., & Litovsky, R. Y. Implications of poor encoding in the auditory periphery. Weekly Hearing and Donuts meeting, University of Wisconsin-Madison, Madison, WI.

2016 Anderson, S. R., Kan, A., & Litovsky, R. Y. Cochlear implants and the auditory periphery: Implications for understanding the auditory environment. National Center for Rehabilitative Auditory Research at Oregon Health and Science University, Portland, OR.

2015 Anderson, S. R., Oh, Y., & Reiss, L. A. J. Implications for hearing-impaired individuals: The effect of sensation level on pitch between the ears. Weekly Hearing and Donuts meeting, University of Wisconsin-Madison, Madison, WI.

SUBMITTED TALKS

2022 Anderson, S. R. & Tollin, D. J. Do field potentials from the binaural brainstem show adaptation to stimulus statistics? Cochlear Implant CRASH, University of Wisconsin-Madison, Madison, WI.

2021 Anderson, S. R. & Litovsky, R. Y. One bad ear interrupts binaural processing: Brainstem modeling and normal-hearing psychophysics. Association for Research in Otolaryngology MidWinter Meeting, Online.

2019 Anderson, S. R., Kan, A., & Litovsky, R. Y. Monaural temporal sensitivity and its implications for binaural hearing in normal-hearing and cochlear-implant listeners. Association for Research in Otolaryngology MidWinter Meeting, Baltimore, MD.

2018 Anderson, S. R., Duran, S. I., Krishnamoorthi, H., Smith, Z. M., & Long, C. J. The relationship between spectral resolution, spectral ripple discrimination, and speech in noise understanding. Cochlear Implant CRASH, University of Wisconsin-Madison, Madison, WI.

2018 Anderson, S. R., Swords, C. M., Kan, A., & Litovsky, R. Y. Poor monaural temporal encoding in bilateral cochlear implants: Interactions with place-of-stimulation mismatch in a normal-hearing simulation. Association for Research in Otolaryngology MidWinter Meeting, San Diego, CA.

2016 Anderson, S. R., Kan, A., & Litovsky, R. Y. Discrimination of across-channel amplitude modulation rate: Effects of different modulation depths. Binaural Bash, Boston University, Boston, MA.

2016 Anderson, S. R., Kan, A., & Litovsky, R. Y. Temporal sensitivity in the auditory periphery: Across-channel comparisons of concurrent amplitude modulation rates. Cochlear Implant CRASH, University of Wisconsin-Madison, Madison, WI.

2014 Anderson, S. R., Taliaferro, L., & Goupell, M. J. Effect of age on binaural processing in electric and acoustic hearing. Cochlear Implant CRASH, University of Wisconsin-Madison, Madison, WI.

2013 Anderson, S., Goupell, M., Newman, R., & Huang, Y. T. The use of secondary acoustic cues to prosodic stress in vocoded speech. Midwest/Great Lakes Undergraduate Research Symposium in Neuroscience, Wabash College, Crawfordsville, IN.

POSTER PRESENTATIONS

2022 Anderson, S. R. & Tollin, D. J. Timely areas of improvement in computational models of the binaural brainstem. Auditory Gordon Research Conference, Smithfield, RI.

2022 Anderson, S. R., Burg, E., Suveg, L., & Litovsky, R. Y. A conceptual framework for understanding interaural asymmetry with bilateral cochlear implants. Association for Research in Otolaryngology, Online.

2021 Anderson, S. R., Gallun, F. J., & Litovsky, R. Y. Bilateral speech perception is disrupted when one or two ears provide degraded speech. Conference on Implantable Auditory Prostheses, Online.

2020 Anderson, S. R., Gallun, F. J., & Litovsky, R. Y. Perceptual Integration of Speech Information Across Ears with Bilateral Cochlear Implants and Simulations in Normal-Hearing. Association for Research in Otolaryngology, San Jose, CA.

2019 Anderson, S. R., Jocewicz, R., Kan, A., & Litovsky, R. Y. Assessing sound source localization in listeners with bilateral cochlear implants. Conference on Implantable Auditory Prostheses, Lake Tahoe, CA.

2019 Anderson, S. R., Thakkar, T., Kan, A., & Litovsky, R. Y. Comparison of pitch-matching methods to predict interaural mismatch in cochlear-implant users. Jahrestagung für Akustik, Rostock, Germany.

2017 Anderson, S. R., Kan, A., & Litovsky, R. Y. Across-electrode sensitivity to differences in the envelope and its relation to the electrode-neuron interface. Conference on Implantable Auditory Prostheses, Lake Tahoe, CA.

2017 Anderson, S. R., Kan, A., & Litovsky, R. Y. Predicting Sensitivity to differences in concurrent, across-channel amplitude modulation rates from single-channel sensitivity. Association for Research in Otolaryngology MidWinter Meeting, Baltimore, MD.

2016 Anderson, S. R., Kan, A., & Litovsky, R. Y. Temporal sensitivity in the auditory periphery: Amplitude modulation sensitivity to stimuli presented to the same ear or across ears. Gordon Research Conference Auditory System Meeting, Bates College, Lewiston, ME.

2016 Anderson, S. R., Kan, A., & Litovsky, R. Y. Effects of elevated amplitude modulation rate discrimination threshold on simultaneous amplitude modulation discrimination. Acoustical Society of America Spring Meeting, Salt Lake City, UT.

2016 Anderson, S. R., Oh, Y., & Reiss, L. A. J. Binaural pitch fusion in normal-hearing listeners varies as a function of sound level. Association for Research in Otolaryngology MidWinter Meeting, San Diego, CA.

2015 Anderson, S. R. & Goupell, M. J. Aging affects binaural temporal processing in cochlear-implant and normal-hearing listeners. Conference on Implantable Auditory Prostheses, Lake Tahoe, CA.

2013 Anderson, S., Goupell, M., Newman, R., & Huang, Y. T. The use of secondary acoustic cues to prosodic stress in vocoded speech. Society for Neuroscience, San Diego, CA, Faculty for Undergraduate Neuroscience satellite meeting.

2013 Anderson, S., Goupell, M., Newman, R., & Huang, Y. T. The use of secondary acoustic cues to prosodic stress in vocoded speech. Summer Research Initiative Closing Reception and Poster Session, University of Maryland, College of Behavioral and Social Sciences, College Park, MD.

MENTORED STUDENT PRESENTATIONS

2019 Doyle, S. Understanding of vocoded speech that is aimed to restore binaural hearing and segregation of speech from noise. AuD Capstone, University of Wisconsin-Stevens Point, Stevens Point, WI.

2019 Feierabend, I. Lateralization of competing interaural cues in the envelope. AuD Capstone, University of Wisconsin-Stevens Point, Stevens Point, WI.

2017 Swords, C. M., Anderson, S. R., Kan, A., & Litovsky, R. Y. What affects spatial hearing abilities in cochlear implant users? Investigating different factors with normal-hearing simulation. Lawrence Symposium, Lawrence University, Appleton, WI.

RESEARCH SUPPORT

F31 DC018483-01A1

Title: Mechanisms that underlie poorer binaural outcomes in patients with asymmetrical hearing and bilateral cochlear implants

Source: National Institute on Deafness and Other Communication Disorders

Total Award: $68,488

Dates: 6/1/20 – 5/31/22
Role: Principal investigator

TEACHING EXPERIENCE

Guest Lecture, Behavioral Neuroscience (NRO320), Baldwin Wallace University, Jan 2022
Topics: Auditory psychophysics and clinical applications
Guest Lecture, Neuroscience of Speech, Language, & Hearing (CSD503), UW-Madison, Nov 2020
Topics: Transduction of acoustic signals to action potentials
Guest Lecture, Hearing Science I (CSD850), UW-Madison, Nov 2019
Topics: Neural correlates of pitch
Guest Lecture, Neuroscience of Speech, Language, & Hearing (CSD503), UW-Madison, Oct 2019
Topics: Transduction of acoustic signals to action potentials
Discussion Leader, Normal Aspects of Hearing (CSD202), UW-Madison, Aug – Dec 2018
Topics: Acoustics, anatomy and physiology of hearing, and psychoacoustics
Guest Lecture, Hearing Science I (CSD850), UW-Madison, Oct 2018
Topics: Periodicity coding through the auditory system
Guest Lecture, Normal Aspects of Hearing (CSD202), UW-Madison, Oct 2018
Topics: Cochlear anatomy and physiology
Guest Lecture, Normal Aspects of Hearing (CSD202), UW-Madison, Oct 2018
Topics: Outer and middle ear anatomy and physiology
Teaching Assistant, Normal Aspects of Hearing (CSD202), UW-Madison, Aug – Dec 2017
Topics: Acoustics, anatomy and physiology of hearing, and psychoacoustics
Guest Lecture, Normal Aspects of Hearing (CSD202), UW-Madison, Nov 2017
Topics: Relating frequency coding to pitch perception
Guest Lecture, Normal Aspects of Hearing (CSD202), UW-Madison, Nov 2017
Topics: Psychophysics of spatial hearing
Guest Lecture, Hearing Science I (CSD850), UW-Madison, Nov 2017
Topics: Psychophysics and neuroscience of pitch
Guest Lecture, Hearing Science I (CSD850), UW-Madison, Oct 2016
Topics: Neural encoding of pitch

STATISTICAL CONSULTING

Longitudinal, Unilateral Hearing Loss Outcomes, Dec 2022 – Present
Client: Olivia Kalmanson, Kenny Chan
Approach: Multivariate regression, dimensional reduction, machine learning
Speech and Language Outcomes in Children who are Hard of Hearing, June 2022 – Present
Client: Kristin Uhler
Approach: Multivariate, mixed- or fixed-effects generalized and linear regression and ANOVA
Sound Source Localization with Cochlear Implants, June 2022
Client: Stephen Dennison
Approach: Least-squares distance; non-parametric ANOVA
Gene Expression in Audition and Balance, May 2022 – September 2022
Client: Olivia Kalmanson, Anna Dondzillo, Samuel Gubbels

Approach: Mixed-effects ANOVA

Longitudinal Outcomes in Education, September 2017 – May 2019

Client: Andrew Garbacz, Drew Brandel

Approach: Mixed-effects regression and ANOVA

Polar Bear Biomarkers and Climate Change, June 2017 – September 2017

Client: Tricia Fry; doctoral dissertation data

Approach: Principal components analysis, broken stick regression, linear mixed model

Lead Bioavailability in Soil, June 2017 – September 2017

Client: Shannon Plunkett; doctoral dissertation data

Approach: Linear mixed model, least-squares distance

Mass Communications and Outcomes in Sobriety, September 2016

Client: Yan Liu, Rachel Kornfield; doctoral dissertation data

Approach: Generalized linear mixed model

SERVICE

2022-present Ad-hoc reviewer for Frontiers in Neuroscience
2022-present Ad-hoc reviewer for Ear and Hearing
2022 Special initiative task force leader for Association for Research in Otolaryngology
2020-present Ad-hoc reviewer for Journal of the Acoustical Society of America
2020 Young Investigator Symposium Co-organizer Association for Research in Otolaryngology, San Jose, CA
2017-2019 Journal club leader for undergraduate Communication Sciences & Disorders

PROFESSIONAL MEMBERSHIP

Association for Research in Otolaryngology
Acoustical Society of America

HONORS AND AWARDS

2022 T32 Postdoctoral Fellowship, Dept of Otolaryngology, CU Anschutz
2020 Emma Allen Conference Travel Award, UW-Madison
2019 Communication Sciences & Disorders Conference Travel Award, UW-Madison
2019 Conference on Implantable Auditory Prostheses Student Travel Award
2019 Student Research Grant Competition Winner, UW-Madison
2018 Emma Allen Conference Travel Award, UW-Madison
2018 Communication Sciences & Disorders Travel Award, UW-Madison
2018 Association for Research in Otolaryngology Student Travel Award
2017 Conference on Implantable Auditory Prostheses Student Travel Award
2016 Binaural Bash Student Registration Award
2016 Auditory System Gordon Research Conference Travel Award
2016 Acoustical Society of America School training for young scientists
2016 Association for Research in Otolaryngology Student Travel Award
2015 Conference on Implantable Auditory Prostheses Student Travel Award
2014 Nu Rho Psi Honor Society in Neuroscience
2014 Kappa Mu Epsilon Honor Society in Mathematics

2013 Kenneth and Lucy McCauliff first-generation student scholarship in Neuroscience, Baldwin Wallace University

2013 American Speech-Language-Hearing Association Research Mentoring-Pair Travel Award