CURRICULUM VITAE

NAME **Curtis J. Billings** **DATE** **4/24/2024**

I. PRESENT POSITIONS

Primary Position:	**Associate Professor** **Department of Communication Sciences and Disorders** **Idaho State University, Pocatello, ID**
Secondary Position:	**Principal Investigator & Research Audiologist** **National Center for Rehabilitative Auditory Research** **Veteran Affairs (VA) Portland Health Care System, Portland, OR**
Professional Address:	**921 South 8th Ave, Stop 8116** **Pocatello, ID 83209**
E-Mail Address:	**curtisbillings@isu.edu**

II. EDUCATION

Undergraduate and Graduate:

2008	Ph.D.	Speech & Hearing Science	University of Washington, Seattle, WA
2002-2004	Fellowship	Audiology	VA Puget Sound Health Care System, WA
2002	M.S.	Audiology	University of Washington, Seattle, WA
2000	B.S.	Speech & Hearing Science Spanish Minor	University of Utah, Salt Lake City, UT

Certification and Licensure:

American Speech-Language-Hearing Association, CCC-A	#12044533	Initial: 2004	Status: active
Audiology Licensure Idaho	#AUD-5057	Initial: 11/2021	Status: active
Audiology Licensure Oregon	#023139	Initial: 9/2008	Status: active
Audiology Licensure Washington		Initial: 2004	Status: inactive

III. PROFESSIONAL EXPERIENCE

Academic:

2024-present	Associate Professor, Department of Communication Sciences and Disorders, Idaho State University, Pocatello, ID
2008-present	Principal Investigator & Audiologist, National Center for Rehabilitative Auditory Research Portland Veterans Affairs Medical Center, Portland, OR
2021-2024	Assistant Professor, Department of Communication Sciences and Disorders, Idaho State University, Pocatello, ID
2017-2022	Associate Professor, Department of Otolaryngology, Oregon Health & Science University Oregon Health & Science University, Portland, OR
2016-2017	Research Associate Professor, Department of Otolaryngology, Oregon Health & Science University Oregon Health & Science University, Portland, OR
2013-2021	Adjunct Instructor, School of Audiology, Pacific University, Hillsboro, OR
2009-2016	Research Assistant Professor, Department of Otolaryngology, Oregon Health & Science University Oregon Health & Science University, Portland, OR
2000-2008	Research Assistant, Brain & Behavior Laboratory. University of Washington, Seattle, WA.
2002-2005	Audiologist (full- & part-time). Veterans Affairs Puget Sound Health Care System, Seattle, WA.

IV. SCHOLARSHIP

Grants and Contracts:

Principal Investigator

Relating Preferred Hearing-Aid Settings to Clinical Estimation of Spectro-Temporal Modulation Detection Abilities
William Demant Foundation — Research Grant
Co-PI: Feeney/Billings — 2022-2024

Hearing aid effects on brain and behavior
VA/RR&D, Merit — Investigator-initiated Merit Award
PI: Billings — 2021-2025

The Brain-Behavior Relationship: Age, Hearing, and Their Effects on Understanding Speech in Noise
NIH/NIDCD, R01 — Investigator-initiated Research Project Grant
PI: Billings — 2016-2024

Neural Representation of Reverberant Speech
ISU Office of Research — FY23 Year-End Research Award
PI: Billings — 2023

Using Electrophysiology to Complement Speech Understanding-in-Noise Measures
VA/RR&D, Merit — Investigator-initiated Merit Award
PI: Billings — 2017-2021

Hearing aids and the brain
VA/RR&D, SPiRE — Small Projects in Rehabilitation Research
PI: Billings — 2017-2021

Effects of Speech in Noise Training on Physiology and Perception
VA/RR&D, CDA2 — Career Development Award II
PI: Billings — 2012-2016.

Electrophysiology and Perception of Speech in Noise
NIH/NIDCD, R03 — Small Grants Program
PI: Billings — 2011-2015

Neural Encoding of Signals in Noise: Participant Payments
VA/NCRAR — PI: Billings — 2011

Neural Encoding of Signals in Noise: Effects of Hearing Impairment & Age
VA/RR&D, CDA1 — Career Development Award I
PI: Billings — 2009-2011

Hearing Aids and Auditory Evoked Potentials
NIH/NIDCD, F31 — Individual Predoctoral National Research Service Award
PI/Mentor: Billings/Tremblay — 2007-2008

Auditory Neuroscience Training Program
NIH/NIDCD, T32 — Institutional National Research Service Award
PI/Mentee: Covey/Billings — 2004-2007

Undergraduate Summer Research Grant Recipient
University of Utah — PI/Mentor: Billings/Alvord — 1998

Co-Investigator & Mentor

Evaluating device-based rehabilitation for Veterans with functional hearing difficulties: a randomized controlled trial
VA/RR&D, Merit — Investigator-initiated Merit Award
PI/Consultant: Papesh/Billings — 2023-2027

Effects of non-blast mTBI on binaural processing and speech understanding in noise.
VA/RR&D, CDA2 — Career Development Award II
Trainee/Co-mentor: Koerner/Billings — 2022-2026

Reverberant Speech Perception: Effects of Hearing Loss and Cognition
Oregon Medical Research Foundation: Early Career Investigator Grant
PI/Mentor: Muralimanohar/Billings — 2020-2023

Mechanisms of impaired speech perception in Veterans with non-blast TBI
VA/RR&D, CDA1 — Career Development Award I
Trainee/Co-mentor: Koerner/Billings — 2020-2022

Oregon Clinical and Translational Research Institute TL1 Program

NIH/NCATS, TL1	Institutional Clinical Research Training Award Trainee/Mentor: Bologna/Billings	2018-2020
Polytrauma and Traumatic Brain Injury Advanced Research Fellowship		
VA/OAA	Office of Academic Affiliations: Advanced Polytrauma Fellowship Program Trainee/Co-mentor: Koerner/Billings	2017-2019
Physiological Assessment of Auditory Processing Disorders in TBI		
VA/RR&D, CDA2	PI/Co-Mentor: Papesh/Billings	2018-2022
Uncovering Physiological Markers of Hidden Hearing Loss		
VA/RR&D, CDA2	PI/Co-Mentor: Bramhall/Billings	2016-2020
Effects of Blast Exposure on Sensory Gating and Speech Perception in Noise		
VA/RR&D, CDA1	PI/Co-Mentor: Papesh/Billings	2015-2017
Impacts of Blast-Induced TBI on Speech Understanding in Noise		
VA/OAA, Fellowship	PI/Co-Mentor: Papesh/Billings	2013-2015

Publications/Creative Work:

Peer-reviewed

Billings CJ, Olsen TM, Charney L, Madsen BM, Holmes C. (2023). Speech-in-noise testing: an introduction for audiologists. Seminars in Hearing, 45(1):1-28

Molis MR, Bologna WJ, Madsen BM, Muralimanohar R, **Billings CJ**. (2023). Frequency following responses to tone glides: effects of age and hearing loss. Journal of the Association for Research in Otolaryngology: JARO, 10.1007/s10162-023-00900-7. Advance online publication.

Bologna WJ, Molis MR, Madsen BM, **Billings CJ**. (2023). Effects of age on brainstem coding of speech glimpses in interrupted noise. Hearing Research. 434, 108771.

Billings CJ, Madsen BM, Grush LD, Koerner TK, McMillan GP, Bologna WJ. (2022). Oddball paradigm complexity in multi-token auditory evoked potentials. Neuroscience Letters, 788(136856):1-7

Koerner, T. K., Muralimanohar, R.K., Gallun, F.J., **Billings, C.J.** (2020). Age-Related Deficits in Electrophysiological and Behavioral Measures of Binaural Temporal Processing. *Front Neurosci.* 14:578566.

Papesh, M.A., Stefl, A.A., Gallun, F.G., **Billings, C.J.** (2020). Effects of Signal Type and Noise Background on Auditory Evoked Potential N1, P2, and P3 Measurements in Blast-Exposed Veterans. *Ear Hear.* 42(1):106-121.

Bramhall, N.F., Niemczak C.E., Kampel, S.D., **Billings, C.J.**, McMillan, G.P. (2020). Evoked potentials reveal noise exposure-related central auditory changes despite normal audiograms. *American Journal of Audiology.* 29(2):152-164.

Billings, C.J., Gordon, S.Y., McMillan, G.P., Dille, Gallun, F.J., Molis, M.R., Konrad-Martin, D. (2020). Noise-induced enhancement of envelope following responses in individuals. *Journal of the Acoustical Society of America*. 147(2): EL201.

Billings, C.J., Bologna, W.J., Muralimanohar, R.K., Madsen, B.M., Molis, M.R. (2019). Frequency following response to tone glides: effects of frequency extent, direction, and electrode montage. Hearing Research. 375:25-33

Gustafson, S.J., **Billings, C.J.,** Hornsby, B.W.Y., Key, A.P. (2019). Effect of competing noise on cortical auditory evoked potentials elicited by speech sounds in 7- to 25-year-old listeners. *Hearing Research*. 373:103-112

Billings, C.J., McMillan, G.P., Dille, M.F., Konrad-Martin, D. (2019). Compensatory and serial processing models for relating electrophysiology, speech understanding, and cognition. *Ear & Hearing.* 40(4):1035-1038.

Grush, L.D., Gallun, F.J., **Billings, C.J.** (2018). Cognition and neural coding: perspectives for audiologists. *Perspectives of the ASHA Special Interest Groups.* 3(SIG 6): 61-76

Billings, C.J., Dillard, L.K., Hoskins, Z.B., Penman, T.M., Reavis, K.M. (2018). A large-scale examination of Veterans with normal pure-tone hearing thresholds within the Department of Veterans Affairs. *J Am Acad Audiol.* 29(10):928-935

Billings, C.J., Madsen, B.M. (2018). A perspective on brain-behavior relationships and effects of age and hearing using speech-in-noise stimuli. *Hearing Research.* 369:90-102.

Billings, C.J., Grush, L.D., Maamor, N. (2017). Acoustic change complex in background noise: phoneme level and timing effects. *Physiological Reports.* 5(20): e13464: 1-8

Maamor, N., **Billings, C.J.** (2017). Cortical signal-in-noise coding varies by noise type, signal-to-noise ratio, age, and hearing status. Neurosci Lett, 636: 258-264.

Billings, C.J., Grush, L.D. (2016). Signal type and signal-to-noise ratio interact to affect cortical auditory

evoked potentials. *J Acoust Soc Am. 140(2)*:EL221-226.

Billings, C.J., Penman, T.M., Ellis, E., Baltzell, L., McMillan, G.P. (2016). Phoneme and word scoring in speech-in-noise audiometry. *Am J Aud.* 25(1): 75-83.

Chun, I., **Billings, C.J.**, Miller, C., Tremblay, T. (2016). Aided electrophysiology using direct audio input: effects of amplification and absolute signal level. *Am J Aud*. 25(1): 14-24.

Konrad-Martin, D., **Billings, C.J.**, McMillan, G.P., McDermott, D., Gordon, J., Austin, D., Dille, M.F. (2016). Diabetes-associated changes in cortical auditory evoked potentials in relation to normal aging. *Ear Hearing*. 37(3): e173-e187.

Billings C.J., Penman T.M., McMillan G.P., Ellis, E. (2015). Electrophysiology and perception of speech in noise in older listeners: effects of hearing impairment & age. *Ear Hearing*. 36(6): 710-722.

Papesh, M., **Billings C.J.**, Baltzell, L. (2015). Background noise can enhance cortical auditory evoked potentials under certain conditions. *Clin Neurophys*. 126(7): 1319-1330

Baltzell, L., **Billings, C.J.** (2014). Sensitivity of offset and onset cortical auditory evoked potentials to signals in noise. *Clin Neurophys*. 125(2): 370-380

Brummer, N.B., Rawson, J.A., Grimm, M.W., Tupper, P., Miller, A.J.L., **Billings, C.J.**, Jacobs, P.G. (2013). Electrode selection and other design considerations for a modular, portable single-channel EEG-augmented hearing aid. Paper #WeET5.10 presented at 6th International IEEE EMBS Conference on Neural Engineering. Nov 6-8, San Diego, CA.

Billings, C.J. (2013) Uses and limitation of electrophysiology with hearing aids. *Semin Hear*, 34(04): 257-269.

Billings C.J., McMillan G.P., Penman T.M., Gille S. (2013). Predicting perception in noise using cortical auditory evoked potentials. *J Assoc Res Otolaryngol*, 14(6): 891-903.

Billings, C.J., Papesh, M., Penman, T., Baltzell, L., Gallun, F. (2012). Clinical use of aided cortical auditory evoked potentials as a measure of physiological detection or physiological discrimination. *Int J Otolaryngol*. vol 2012, ID 365752.

Folmer RL, Hutter MM, Lilly DJ, Shannon J, Casiana L, Wilmington D, Lewis MS, **Billings CJ**, Krisky C, Berlow Y, Pallaro J, Rooney W, Bourdette D. (2012). Electrophysiological measures of auditory processing in patients with multiple sclerosis. *Seminars in Hearing*, 33(3):274-82.

Bennett, K.O., **Billings, C.J.,** Molis, M.R., Leek, M.R. (2012). Neural encoding and perception of speech signals in informational masking. *Ear Hear,* 32(2): 231-8.

Billings, C.J., Tremblay, K.L. , Miller, C.W. (2011). Aided cortical auditory evoked potentials in response to changes in hearing aid gain. *Int J Aud.* 50: 459-467.

Folmer, R.L., **Billings, C.J.,** Diedesch, A.C., Gallun, F.J., Lew, H.J. (2011). Electrophysiological assessments of cognition and sensory processing in TBI: applications for diagnosis, prognosis and rehabilitation. *Int J Psychophys.* 82(1):4-15.

Billings, C.J., Bennett, K.O., Molis, M.R., Leek, M.R. (2011). Cortical encoding of signals in noise: effects of stimulus type and recording paradigm. *Ear Hear*, 32(1): 53-60. PMCID: PMC3010248

Billings C.J., Tremblay K.L., Stecker G.C., Tolin W.M. (2009). Human evoked cortical activity to signal-to-noise ratio and absolute signal level. *Hearing Research*, 254(1-2): 15-24. PMCID: PMC2732364

Billings C.J., Tremblay K.L., Souza P.E., Binns M.A. (2007). Effects of hearing aid amplification and stimulus intensity on cortical auditory evoked potentials. *Audiol Neurotol,*12: 234–246.

Tremblay K.L., Kalstein L., **Billings C.J.**, Souza P.E. (2006). The neural representation of consonant-vowel transitions in adults who wear hearing aids. *Trends in Amplification*, 10: 155-162.

Tremblay K.L., **Billings C.J.**, Friesen L.M., Souza P.E. (2006). Neural representation of amplified speech-sounds. *Ear Hear*, 27(2): 93-103.

Tremblay K.L., **Billings C.**, Rohila N. (2004). Speech Evoked Cortical Potentials: Effects of Age and Stimulus Presentation Rate. *J Am Acad Audiol*, 15(3): 226-37

Non-peer-reviewed

Billings C.J. (2014). What aided auditory-evoked potentials can tell us about the aided auditory system. *Audiology Today*, Jul/Aug2014:34.

Billings C.J. (2008). Effects of tone level and signal-to-noise ratio on neural encoding. Doctoral Dissertation, University of Washington.

Billings C.J., Tremblay K.L. (2007). Hearing Aids and the Brain: What's the Connection? *ASHA Leader* (May 2007 edition), 12(7): 5.

Billings C.J. (2002). The N1-P2 complex: age and stimulus effects. Clinical Master's Thesis, *University of Washington*, # 51994.

Chapters

Billings C.J., Chase K, Brockett J, Holst J. (in revision). Other Diagnostic Tests. In Clinical Audiology Concepts with SmartVS, edited by David Brown. Intelligent Hearing Systems.

Billings C.J., White L., Atcherson S.R. (in press). "Cortical event-related potentials" in Auditory Electrophysiology: A Clinical Guide, edited by S.R. Atcherson and T.M Stoody. Thieme. New York.

Billings C.J., Tremblay K.L., Willott J.W. "The aging auditory system" in Translational Perspectives in Auditory Neuroscience: Hearing Across the Lifespan – Assessment and Disorders, edited by K. Tremblay and R. Burkard. 2012. Plural Publishing, Inc., San Diego.

Invited Presentations

Bologna W, Molis M, Madsen B, **Billings C.** (2022). Effects of age on brainstem coding of speech in interrupted noise. Invited podium presentation at 182nd Meeting of the Acoustical Society of America. May 23-26, Denver, CO.

Billings C. (2022). Brain-Behavior Approaches in Auditory Assessment and Rehabilitation. Invited Keynote Podium presentation at 6th Annual Regional Audiology Student Research Symposium. April 15, Pocatello, ID.

Billings C. (2018). Listening difficulties in background noise: using electrophysiology to complement behavioral measures. Invited presentation at Canadian Academy of Audiology Conference and Exhibition, Oct 17-20, Niagara Falls, Ontario, Canada.

Billings C. (2018). Aging and hearing loss in Veterans: a brain-behavior approach. Invited presentation at Joint Defense Veterans Audiology Conference; 2018; Mar 26-28, Atlanta, GA.

Billings C., Gallun F.* (2017). Contributions of cognition and hearing loss to speech perception in noise. Invited presentation, American Speech-Language-Hearing Association Annual Convention, Nov 9-11, Los Angeles, CA. *co-presenters

Billings C. (2017). Electrophysiological and behavioral evidence of aging and hearing loss. Invited presentation, Aging & Speech Communication Meeting, Nov 5-8, Tampa, FL.

Billings C. (2016). EEG approaches to assist with HA fitting and future hearing aid design. Invited presentation, World Congress of Audiology. Sept 18-21, Vancouver, Canada.

Billings C. (2015). Potential clinical uses of cortical auditory evoked potentials. Invited presentation at American Speech-Language-Hearing Association Annual Convention, Nov 12-14, Denver, CO.

Tremblay K, **Billings C.*** (2015). Helping People Hear: From Cell to Society. Invited presentation at American Speech-Language-Hearing Association Annual Convention, Nov 12-14, Denver, CO.
*Presentation given by Billings

Billings C. (2014). Electrophysiology and perception of speech in noise—research update from National Center for Rehabilitative Auditory Research. Invited presentation AudiologyOnline Course #24840. Oct 29.

Billings C. (2014). What aided auditory-evoked potentials can tell us about the aided auditory system. Invited presentation at the Academy Research Conference, part of the American Academy of Audiology AudiologyNOW! Conference; 2014, March 26, Orlando, FL.

Billings C, (2013). Speech in noise and the brain-behavior relationship. Invited presentation at Workshop on Use of Evoked Potentials to Measure Central Auditory Function; 2013, Sept 30-Oct 1, Omaha, NE.

Billings C, Penman T. (2013). What can the brain tell us about understand speech in noise. Invited presentation at American Academy of Audiology AudiologyNOW! Conference; 2013, April 2-6, Anaheim, CA.

Billings C. (2012). Neural correlates of speech perception in background noise. Invited presentation at World Neuroscience Online Conference, http://targetmeeting.com//Modules/Meetings/MeetingDetails.aspx?Id=23, June

Billings CJ. Cortical auditory evoked potentials in clinical research. Invited presentation at the 7th Tanta International Meeting on Advanced Otorhinolaryngology, Cairo, Egypt, January 2011.

Billings C., Tremblay KL. (2010). How cortical evoked potentials can be used in the clinic. Invited presentation, American Academy of Audiology AudiologyNOW! 2010 conference, San Diego, CA, April 2010.

Billings C. (2009). Aided evoked potentials and implications for auditory training in hearing aid users. Invited presentation, the Nordic Audiology College: Scientific Seminar about Hearing. Sept 24-25. Stromstad, Sweden.

Tremblay K, **Billings C.*** (2005) Effects of Age and Age-Related Hearing Loss on the Neural Representation of Speech-Cues. Invited Featured Session at American Academy of Audiology Convention. March 28-April 1, Washington D.C. Abstract # FS202.
*Presentation given by Billings

Conference Presentations

International and National

Chase K, Vieira D, **Billings C**. (2024). Clinical use of electrophysiology in central auditory processing evaluation. Poster presentation at American Academy of Audiology AudiologyNOW!, April 17-20 2024, Atlanta, GA.

Billings C, Patel S. (2024). Planning for Programmatic Research for PhD Students & Postdocs. Podium presentation at American Speech-Language-Hearing Association Lessons for Success. April 15-17, Gaithersburg, MD.

van Ginkel C, Perry TT, **Billings C**, Hamilton-Sutherland M, Santurette S, Laugesen S, Zaar J, Feeney MP. Evaluating the Audible Contrast Threshold (ACT™) Test for Improving Hearing Aid Customization in US Veterans. Poster presentation at the 2024 Joint Defense Veterans Audiology Conference, March 2024, Valley Center, CA.

Billings C, van Ginkel C, Hutter M, Scarlet A. Changes in Brain and Behavioral Measures with Hearing Aid Use. Poster presentation at the 2024 American Auditory Society Annual Scientific & Technology Meeting, February 15-17, Scottsdale, AZ.

Rotman T, Maamor N, **Billings C**. Age and hearing effects on cognition and speech-in-noise recognition. Poster presentation at the 2024 American Auditory Society Annual Scientific & Technology Meeting, February 15-17, Scottsdale, AZ.

Knudsen M, Muralimanohar R, Ebert C, **Billings C**. (2024). Neural representation of noisy and reverberant speech. Poster presentation at the 2024 American Auditory Society Annual Scientific & Technology Meeting, February 15-17, Scottsdale, AZ.

van Ginkel C, Perry TT, **Billings C**, Hamilton-Sutherland M, Santurette S, Laugesen S, Zaar J, Feeney MP. Predicting Hearing Aid Benefit Using the Audible Contrast Threshold Test. Poster presentation at the 2024 American Auditory Society Annual Scientific & Technology Meeting, Scottsdale, February 15-17, Scottsdale, AZ.

Burnett E, Chase K, Knudsen M**, Billings C**. (2023). Cortical encoding of acoustic changes in different noise types. Poster presentation at the American Auditory Society. Mar 2-4, Scottsdale, AZ.

Muralimanohar RK, Charney L, Wrobleski M, Molis M, **Billings C.** (2022). Cortical encoding and cognition in reverberant speech perception in older adults. Podium presentation at 182nd Meeting of the Acoustical Society of America. May 23-26, Denver, CO.

Billings C, Martin-Harris B. (2022). Planning for Programmatic Research for PhD Students & Postdocs. Podium presentation at American Speech-Language-Hearing Association Lessons for Success. April 25-27, virtual conference.

Bochat S, Grush L, Madsen B, Gulack A, Hoagland A, **Billings C**. (2020). Behavioral and physiological amplification effects in new hearing aid users. Podium presented at the American Auditory Society. Mar 5-7, Scottsdale, AZ.

Muralimanohar R, Wroblewske M, Molis M, Koerner T, **Billings C**. (2020). Brain-behavior measures in reverberant speech perception. Podium presented at the American Auditory Society. Mar 5-7, Scottsdale, AZ.

Koerner T, Muralimanohar R, Gallun F, **Billings C**. (2020). Effects of age on the neural coding and perception of binaural cues. Poster at the Association for Research in Otolaryngology Midwinter Meeting. Jan 25-29, San Jose, CA.

Papesh M, Frederick M, Billings C, Gallun F. (2020). Electrophysiological measurement of working memory in veterans with APD: effects of sensory modality on the N-back test. Poster at the Association for Research in Otolaryngology Midwinter Meeting. Jan 25-29, San Jose, CA.

Bramhall N, Niemczak C, Kampel S, **Billings C**. (2019). Auditory evoked potentials in Veterans with noise exposure. Podium presented at the American Auditory Society. Scottsdale, AZ.

Koerner TK, Lelo de Larrea-Mancera ES, **Billings CJ**, Seitz A, Gallun FJ. (2019). Evaluation of a Binaural FM Detection Task in PART for Assessing TFS Processing in Hearing Impaired Listeners. Poster at the 4th International Hearing Loss Conference. Niagara-on-the-Lake, Ontario.

Bologna WJ, Molis MR, Madsen BM, **Billings CJ**. (2019). Neural coding of vowels in interrupted noise: effect of glimpse duration. Poster at Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, Baltimore, MD.

Niemczak C, Kampel S, **Billings C**, Bramhall N. (2019). Examining the effects of noise exposure on the auditory system using evoked potentials. Podium at Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, Baltimore, MD.

Koerner T, Grush L, Vachhani J, Papesh M, Gallun FJ, **Billings CJ**. (2019). Relationships between the neural coding of IPD cues and binaural perception in aging listeners. Poster at Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, Baltimore, MD.

Muralimanohar RK, Wroblewski M, Vachhani J, Molis MR, **Billings CJ**. (2019). Cortical auditory encoding of reverberant speech. Poster at Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, Baltimore, MD.

Koerner TK, Grush L, Madsen BM, **Billings CJ**. (2018). Exploring relationships between speech understanding and auditory ERPs. Podium at EEG & Clinical Neuroscience Society Annual Conference, Sept 4-9, Pittsburg, PA.

Hanscom K, Papesh M, **Billings C**, Gallun F. (2018). Effects of blast exposure on p300 in a go/no-go paradigm. Poster at American Auditory Society Scientific Technology Meeting. Mar 1-4, Scottsdale, AZ.

Molis M, Bologna W, Madsen B, Roten A, Muralimanohar R, Milligan C, **Billings C**. (2018). Envelope-following and frequency-following responses elecited by signals of increasing complexity. Poster at the Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, San Diego, CA.

Papesh M, Hanscom K, **Billings C**, Gallun F. (2018). Electrophysiological measurement of auditory cognition in veterans with blast-exposure: results of a P300 go/no-go paradigm. Poster at the Association for Research in Otolaryngology MidWinter Meeting. Feb 9-14, San Diego, CA.

Bologna W, Milligan C, Madsen B, Roten A, **Billings C**, Molis M. (2017). Frequency-following responses elicited by tones and single formants with static and dynamic spectral features. Poster at the 7th Biennial National Center for Rehabilitative Auditory Research International Conference, Oct 4-6, Portland, OR

Gustafson S, **Billings C**, Hornsby B, Key A. (2017). Understanding the development of speech-in-noise perception using auditory evoked potentials. Podium at the American Speech-Language-Hearing Association Annual Convention. Nov 9-11, Los Angeles, CA.

Dillard L, Hoskins Z, Penman T, **Billings C.** (2017). Normal-hearing thresholds in the Department of Veterans Affairs. Poster at American Auditory Society Scientific and Technology Meeting. Mar, Scottsdale, AZ.

Madsen B, Penman T, Grush L, **Billings C.** (2016) Brain-behavior relationships using a multi-token oddball paradigm. Poster at the World Congress of Audiology. September 18-21. Vancouver, Canada.

Grabowski J, **Billings C.**, Molis M, Gordon S, Frederick M, Kampel S. (2016). Effects of hearing impairment and age on FFR encoding to dynamic tonal stimuli. Poster at the American Auditory Society Meeting. June 12-16. Scottsdale, Arizona.

Grabowski J, **Billings C.**, Molis M. (2016). Group Differences and Individual Variability in the Frequency-Following Response to Dynamic Stimuli as a Function of Age and Hearing Impairment. Poster at Frequency-Following Response Workshop. May 19-20. Boston, Massachusetts.

Papesh M, **Billings, C.**, Folmer R, Gallun F. (2016). Late Auditory Evoked Potentials in Blast-Exposed Veterans. Poster at the Association for Research in Otolaryngology MidWinter Meeting. February 20-24. San Diego, CA.

Billings C, Pendergraft P, Srinivasan N, Penman T, Gallun F. (2015). Signal-in-noise electrophysiology and behavior: noise type, age, and hearing effects. Podium presentation at the Annual Scientific and Technology Conference for the American Auditory Society, Mar 5-7, Scottsdale, AZ.

Madsen B, **Billings C**, Penman T, Pendergraft P. (2015). Cortical auditory-evoked potentials and speech-in-noise performance in older hearing-impaired adults. Mentored poster presentation at the Annual Scientific and Technology Conference for the American Auditory Society, Mar 5-7, Scottsdale, AZ.

Eilbes A, Maamor N, Penman T, **Billings C**. (2014). Neural encoding of the syllable /sa/: effects of signal-to-noise ratio and phoneme context. Poster at American Speech-Language-Hearing Association Annual Convention. Nov 20-22, Orlando, FL.

Maamor N, **Billings C**. (2014). Human auditory cortical coding of speech in background noise as a function of age and noise type. Poster at Society for Neuroscience Annual Meeting, Nov 15-19, Washington, DC.

Chun I, **Billings C**, Tremblay K, Miller C. (2014). Aided evoked potentials: effects of stimulus onset and signal-to-noise ratio. Poster at American Auditory Society Scientific and Technology Meeting, Scottsdale, AZ, March 2014.

Billings C, (2013). Acoustic signal-to-noise-ratio dominates auditory long latency responses. Podium at the International Evoked Response Audiometry Study Group Biennial Conference; 2013, June 9-13, New Orleans, LA.

Penman T, **Billings C**. (2013). Effects of Patient & Stimulus Factors on Speech Perception in Noise. Podium at Joint Defense Veterans Audiology Conference; 2013; February 25-27, Nashville, TN.

Billings CJ, Penman TM. (2013). Electrophysiology & Perception of Speech in Noise: Effects of Age & Hearing Impairment. Poster at Association for Research in Otolaryngology MidWinter Meeting; 2013, Feb 16-20, Baltimore, MD.

Papesh MA, **Billings CJ.** (2013). Enhancement of the N1 Cortical Auditory Evoked Potential in Low-Level Background Noise. Poster at Association for Research in Otolaryngology MidWinter Meeting; 2013, Feb 16-20, Baltimore, MD.

Baltzell L, **Billings CJ**, Gallun F. (2013). Human Cortical Auditory Evoked Offset and Onset Response Sensitivity to Signals in Noise. Poster at Association for Research in Otolaryngology MidWinter Meeting; 2013, Feb 16-20, Baltimore, MD.

Billings C, Penman T. Perception in noise: measures of brain and behavior. Podium at Joint Defense Veterans Audiology Conference, Dallas, TX, March 2012.

Papesh MA, **Billings C**. (2012). Enhancement of cortical processing in low-noise backgrounds. Poster at American Auditory Society Scientific and Technology Meeting, Scottsdale, AZ, March

Ellis E, Penman T, **Billings C**. (2012). Listening in noise: measures of electrophysiology and behavior. Poster at American Auditory Society Scientific and Technology Meeting, Scottsdale, AZ, March

Ellis E, Penman T, **Billings C.** (2011). Listening in noise: effects on brain and behavior. Poster at the 5th Biennial National Center for Rehabilitative Auditory Research International Conference, Portland, Oregon. October 2011

Baltzell L, **Billings C.** (2011). Neural encoding of signals in noise: comparing auditory evoked offset and onset responses. Poster at the 5th Biennial National Center for Rehabilitative Auditory Research International Conference, Portland, Oregon. October 2011.

Billings CJ, Bennett KO, Molis MR, Leek MR. (2011). Event related potentials and perception of speech in several types of noise background. Poster at the Meeting of the Acoustical Society of America, Seattle, WA. May.

Billings CJ, Ong S. (2011). Electrophysiology and perception of speech in noise. Poster at the American Auditory Society Annual Meeting, Scottsdale, AZ. March 2011.

Tremblay K, **Billings C.** (2011). Auditory evoked cortical potentials do not reliably reflect hearing aid gain. Poster, Association for Research in Otolaryngology 34th Midwinter Meeting. Feb 19-23. Baltimore, Maryland.

Tremblay K, **Billings C.** Hearing aids and the brain: what's the connection. (2010). Podium at the Northwest Auditory Vestibular Research Meeting. Oct 22-23. Seattle, Washington.

Hutter MM, Folmer RL, Shannon JM, Lewis MS, Wilmington DJ, Lilly DJ, Casiana L, **Billings CJ**, Fitzpatrick MA, Bourdette DN, Fausti SA. (2010). Central auditory processing deficits in multiple sclerosis. Intl J of MS Care, 2010; 12 (Supplement 1): 38. http://mscare.org/cmsc/images/pdf/IJMSC-2010-May-Supp.pdf

Folmer RL, Hutter M, Shannon J, Lewis MS, Wilmington D, Casiana L, **Billings C**, Fitpatrick M, Fausti S, Bourdette D. (2010). Evoked potential measures of central auditory processing in patients with multiple sclerosis. Podium presentation at AudiologyNOW! 2010, San Diego, California, April 2010.

Billings C. (2010). "Age and signal type effects on signal-in-noise cortical encoding." Poster, The American Auditory Society Annual Meeting, Scottsdale, AZ, March.

O'Connell K, **Billings C**, Molis M, Leek M. (2009). "The effects of competing noise types on auditory evoked responses to speech and tones." Poster, The American Auditory Society Annual Meeting, Scottsdale, AR, March 2010.

O'Connell K, **Billings C**, Molis M, Leek M. (2009). "The effects of competing noise types on auditory evoked responses to speech and tones." Poster, The 4th International National Center for Rehabilitative Auditory Research Conference. Oct 8-9. Portland, Oregon.

Dille, M., Diedesch, A., **Billings, C.**, Gallun, F. (2009). "Electrophysiological measurements during rapid sound processing." Poster, The 4th International NCRAR Conference. Oct 8-9. Portland, Oregon.

Billings C, Tremblay K., & Stecker GC. (2009). "Signal-in-noise encoding and implications for people with hearing loss." Podium presentation at the annual American Auditory Society Meeting. Mar 5-7. Scottsdale, Arizona.

Fitzer J, Dille M, Diedesch A, **Billings C**, Gallun F. (2009). "Electrophysiological measurements of the auditory attentional blink." Poster at the annual American Auditory Society Meeting. Mar 5-7. Scottsdale, Arizona.

Gallun F, Dille M, Diedesch A, **Billings C.** (2009). "Human auditory memory for intensity." Poster (#215) at the Association for Research in Otolaryngology Midwinter Research Meeting. Feb 14-19. Baltimore, Maryland.

Folmer R, Hutter M, Shannon J, Lilly D, Casiana L, **Billings C**, Lewis MS, Wilmington D, Fausti S, Bourdette D. (2009). "Electrophysiological measures of central auditory processing in patients with multiple sclerosis." Presentation at 23rd Annual Meeting of the Consortium of Multiple Sclerosis Centers. May 27-30. Atlanta, Georgia.

Billings C, Tremblay K, & Souza P. (2007). "Cortical auditory evoked potentials recorded with and without hearing aids: effects of stimulus intensity and amplification." Podium presentation at the International Evoked Audiometry Response Study Group. June 10-14. Bled, Slovenia.

Billings C, Tremblay K, & Souza P. (2006). "Aided evoked potentials: effects of amplification and stimulus intensity." Podium at the Rotman Research Institute. Toronto, Ontario, Canada.

Billings C, Tremblay K, & Souza P. (2006). "Effects of amplification and stimulus intensity on cortical auditory evoked potentials." Poster at the American Auditory Society Meeting. Scottsdale, Arizona.

Billings C, Tremblay K, & Souza P. (2006). "Effects of amplification and stimulus intensity on cortical auditory evoked potentials." Poster at the Association for Research in Otolaryngology Midwinter Meeting. Baltimore, Maryland. Abstract # 220.

Billings C, Tremblay K, & Souza P. (2004) "Neural Representation of Amplified Speech-Sounds." NIH-sponsored student poster session at the annual American Auditory Society Meeting. March 7-10, Scottsdale, Arizona.

Tremblay K, Kalstein L, Souza P, Friesen L, & **Billings C.** (2004). "Neural representation of amplified speech cues in persons with and without hearing loss." Poster at the Association for Research in Otolaryngology. Abstract #1325.

Tremblay K, Piskosz M, & **Billings C.** (2001). "The effects of aging on the neural representation of speech." Poster at International Evoked Audiometry Response Study Group. Vancouver, Canada

Regional and Local

Ebert C, Rotman T, Maamor N, **Billings C**. (2024). Age and hearing effects on cognition and speech-in-noise recognition. Poster presentation at 8th Annual Regional Audiology Student Research Symposium. April 12, Salt Lake City, UT.

Chase K, Vieira D, **Billings C**. (2024). Clinical use of electrophysiology in central auditory processing evaluation. Poster presentation at 8th Annual Regional Audiology Student Research Symposium. April 12, Salt Lake City, UT.

Rotman T, Maamor N, **Billings C**. Age and hearing effects on cognition and speech-in-noise recognition. Poster presentation at the Idaho State University Research Symposium, March 13, Meridian, ID.

Knudsen M, Muralimanohar R, Ebert C, **Billings C**. (2024). Neural representation of noisy and reverberant speech. Poster presentation at the Idaho State University Research Symposium, March 13, Pocatello, ID.

Olsen T, Holmes J, **Billings C**. (2023). Speech-in-noise testing: an introduction for audiologists. Poster presentation at 7th Annual Regional Audiology Student Research Symposium. April 15, Logan, UT.

Beutler N, Sanford C, **Billings C,** Bargen G. (2023). Helping audiology graduate students navigate ABR assessments. Poster presentation at 7th Annual Regional Audiology Student Research Symposium. April 15, Logan, UT.

Burnett E, Knudsen M, Chase K, **Billings C**. (2023). Relating the acoustic change complex to speech understanding in noise. Poster presentation at 7th Annual Regional Audiology Student Research Symposium. April 15, Logan, UT.

Burnett E, Bochat S, **Billings C**. (2022). Amplification effects in new hearing aid users. Poster presentation at 6th Annual Regional Audiology Student Research Symposium. April 15, Pocatello, ID.

Muralimanohar R, Wroblewske M, Molis M, Koerner T, **Billings C.** (2020). Cortical Evoked Potentials in Reverberant Speech Perception. Online presentation at OHSU Virtual Research Week. June, Portland, OR.

Bologna W, Molis M, Madsen B, **Billings C**. (2019). Separating the sensory and cognitive contributions to speech recognition in noise. Podium at OHSU Research Week. Portland, OR.

Koerner, T.K., Muralimanohar, R.K. Gallun, F.J., & Billings, C.J. (2019). Effects of Age on Electrophysiological and Behavioral Measures of Binaural Processing in Humans. Podium Presentation at the Oregon Brain Institute's Annual Forum at the National Primate Research Center. Oct, Beaverton, Oregon.

Praska E, Muralimanohar R, Vachhani J, Grush L, **Billings C.** (2018). The effects of noise type and SNR on the frequency following response. Poster at The 9th Biennial Ohio Audiology Conference. Oct 26-27, Strongsville, OH.

Praska E, Muralimanohar R, Vachhani J, Grush L, **Billings C.** (2018). The effects of noise type and SNR on the frequency following response. Poster at Pacific University Student Poster Open House. May 7, Hillsboro, OR.

Billings C. (2017). Brain and behavior perspectives on the complaint "I can hear you but can't understand you." Invited presentation at Brain Research Awareness and Information Network (BRAINet). 2017, Sept 18, Portland, OR.

Hoskins Z, **Billings C.** (2016). Effects of stimulus repetition and context on human electrophysiology. Poster at Northwest Auditory & Vestibular Research Meeting; 2016, Oct 14-15, Portland, OR.

Billings C. (2016). How can brain measures improve the diagnosis and treatment of hearing loss. Invited presentation, The Oregon Hearing Society, Summer Seminar. Jun 24-26 Yachats, Oregon.

Billings C., Grush L, Penman T. (2015). Effects of Stimulus Paradigm Complexity on Late Auditory Evoked Potentials. Poster NCRAR Conference. September 16-18. Portland, Oregon.

Billings CJ, Penman TM. (2012). Signals in noise: measures of electrophysiology & behavior. Poster at Northwest Auditory & Vestibular Research Meeting; 2012, Oct 25-26, Portland, OR.

Papesh MA, Baltzell LS, **Billings CJ.** (2012). Can background noise enhance cortical encoding? Poster at Northwest Auditory & Vestibular Research Meeting; 2012, Oct 25-26, Portland, OR.

Baltzell L, Dillman F, Gallun F, Molis M, Konrad-Martin D, **Billings C**. (2012). Auditory brainstem encoding of envelope and fine structure: recording the human frequency-following response. Poster at Northwest Auditory & Vestibular Research Meeting; 2012, Oct 25-26, Portland, OR.

Billings C. (2012). Brain and behavioral measures of speech perception in noise. Podium at NCRAR Seminar Series. September, 2012; Portland, OR.

Billings C. Finding solutions to hearing difficulties using measures of brain and behavior. Invited podium at Portland VA Medical Center Research Day 2012; 2012 Apr 27; Portland, OR.

Billings C. (2010). "A neuroscience perspective on hearing aid acclimatization, auditory training, and perception in noise." Invited podium, The Oregon Hearing Society, Summer Seminar. Jun 11-13. Welches, Oregon.

Tolin W, **Billings C**, Tremblay K. (2008). "Effect of tone level and signal-to-noise ratio on neural responses." Poster at the University of Washington Undergraduate Research Symposium. May 16. Seattle, Washington.

Billings C, Tremblay K. (2007). "Hearing aids & cortical auditory evoked potentials: effect of amplification, stimulus intensity, and noise." Podium at Auditory Neuroscience Retreat. May 10. Seattle, Washington.

Billings C, Tremblay K. (2006). "Effect of amplification and stimulus intensity on cortical auditory evoked potentials." Podium at Auditory Neuroscience Retreat. May 11. Seattle, Washington.

Billings C, Tremblay K. (2005). "Neural representation of amplified speech sounds." Podium at Auditory Neuroscience Retreat. May 26. Seattle, Washington.