MATTHEW B. WINN

CURRICULUM VITAE (SYNOPSIS)

Speech-Language-Hearing Sciences
University of Minnesota
164 Pillsbury Dr. SE
Minneapolis, MN 55455

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PROFESSIONAL SUMMARY

I study speech communication and the factors that make it difficult for people with hearing loss.

My lab focuses on **listening effort** in people with **cochlear implants**, which are devices used to restore a sensation of hearing in those who have severe to profound deafness.
We also work on detailed measurements and manipulations of **speech acoustics**, viewing speech through the lens of the auditory system.
I work to improve effective **communication skills** among fellow scientists through seminars, workshops and consultations. I have produced publicly available video materials for introductory classes and research tutorials as part of my mission to increase visibility of the field and to increase access to quality research tools.

Education

2011 PhD (Hearing and Speech Sciences) University of Maryland
2010 Au.D. (Doctor of Audiology), University of Maryland
2005 BA, University of Delaware, Psychology & Philosophy

Employment

University of Minnesota Department of Speech-Language-Hearing Sciences
2021-present: Associate Professor
2018 – 2021: Assistant Professor

University of Washington Department of Speech & Hearing Sciences
2015 – 2018: Assistant Professor

University of Wisconsin-Madison Waisman Center
2012-2015: Postdoctoral researcher

Veterans Affairs Medical Center, Washington DC
2009-2010: Audiology Extern
2010-2012: Audiologist

Peer-reviewed publications (36)

Winn, M.B. & Idsardi, W.J. (2008). Musical evidence regarding trochaic inversion. *Language and Literature*, 17 (4), 335-349.

Winn, M.B., Chatterjee, M., & Idsardi, W.J. (2012). The use of acoustic cues for phonetic identification: Effects of spectral degradation and electric hearing. *Journal of the Acoustical Society of America*, 131, 1465-1479. doi: 10.1121/1.3672705

Winn, M.B., Chatterjee, M., & Idsardi, W.J. (2013). The roles of voice onset time and F0 in stop consonant voicing perception: Effects of masking noise and low-pass filtering. *Journal of Speech, Language and Hearing Research,* 56, 1097-1107. doi: 10.1044/1092-4388(2012/12-0086)

Winn, M.B., Rhone, A.E., Chatterjee, M., & Idsardi, W.J. (2013). Auditory and visual context effects in phonetic perception by normal-hearing listeners and listeners with cochlear implants. *Frontiers in Psychology: Auditory Cognitive Neuroscience*, 4, article 824, 1-13. doi: 10.3389/fpsyg.2013.00824

Chrabaszcz, A.V., Winn, M.B., Lin, C.Y., & Idsardi, W.J. (2014). Acoustic cues to perception of word stress by English, Mandarin and Russian speakers. *Journal of Speech, Language, and Hearing Research*, 57, 1468-1479. doi:10.1044/2014_JSLHR-L-13-0279

Winn, M.B., Edwards, J.R., and Litovsky, R.Y. (2015). The impact of auditory spectral resolution on listening effort revealed by pupil dilation. *Ear and Hearing.* 36(4):e153-65. doi: 10.1097/AUD.0000000000000145

Winn, M.B. & Litovsky, R.Y. (2015) Using speech sounds to test functional spectral resolution in listeners with cochlear implants. *Journal of the Acoustical Society of America*, 137, 1430-1442. doi: 10.1121/1.4908308

Stilp, C.E., Anderson, P.W., Winn, M.B. (2015) Predicting contrast effects following reliable spectral properties in speech perception. *Journal of the Acoustical Society of America, 137*, 3466-3476. doi: 10.1121/1.4921600

* Ehlers, E., Kan, A., Winn, M.B., Stoelb, C., Litovsky, R. (2016). Binaural hearing in children using Gaussian enveloped and transposed tones. *Journal of the Acoustical Society of America, 139,* 1724-1733. doi: 10.1121/1.4945588

Winn, M.B., Won, J.H., Moon, I.J. (2016). Assessment of spectral and temporal resolution in cochlear implant users using psychoacoustic discrimination and speech cue categorization. *Ear and Hearing,* 37(6):e377–e390. doi: 10.1097/AUD.0000000000000328

Kong, Y.-Y., Winn, M.B., Poellmann, K., Donaldson, G. (2016) Discriminability and perceptual saliency of temporal and spectral cues for final fricative consonant voicing in simulated cochlear-implant and bimodal hearing. *Trends in Hearing, 20, 1-15.* doi: 10.1177/2331216516652145

Reidy, P., Kristensen, K., Winn, M.B., Litovsky, L., Edwards, J. (2016). The acoustics of word-initial fricatives and their effect on word-level intelligibility in children with bilateral cochlear implants. *Ear and Hearing*. doi: 10.1097/AUD.0000000000000349

Winn, M.B. (2016). Rapid release from listening effort resulting from semantic context, and effects of spectral degradation and cochlear implants. *Trends in Hearing*, 20, 1-17. doi: 10.1177/2331216516669723

*DiNino, M., Wright, R., Winn, M.B., Bierer, J.A. (2016). Vowel and consonant confusion patterns resulting from spectral manipulations in vocoded stimuli designed to replicate poor electrode-neuron interfaces in cochlear implants. *Journal of the Acoustical Society of America*, 140(6), 4404–4418.

* Kapnoula, E., Winn, M.B., Kong, E.J., Edwards, J., McMurray, B. (2017). Evaluating the sources and functions of gradiency in phoneme categorization: An individual differences approach. *Journal of Experimental Psychology: Human Perception and Performance*, 43, 1594-1611. doi: 10.1037/xhp0000410

Winn, M.B., Wendt, D., Koelewijn, T., Kuchinsky, S. (2018). Best practices in using pupillometry to measure listening effort: an introduction for those who want to get started. *Trends in Hearing*, 22, 1-32. doi: 10.1177/2331216518800869

Winn, M.B., Moore, A. (2018). Pupillometry reveals that context benefit in speech perception can be disrupted by later-occurring sounds, especially in listeners with cochlear implants. *Trends in Hearing*, 22, 1-22. doi: 10.1177/2331216518808962

Winn, M.B., Kan, A., Litovsky, R. (2019). Temporal dynamics and uncertainty in binaural hearing revealed by anticipatory eye movements. *Journal of the Acoustical Society of America*, 145, 676–691.

*Gianakas, S., & Winn, M.B. (2019). Lexical bias in word recognition by cochlear implant listeners. *Journal of the Acoustical Society of America*, 146, 3373-3383.

Winn, M.B. (2020). Accommodation of gender-related phonetic differences by listeners with cochlear implants and in a variety of vocoder simulations. *Journal of the Acoustical Society of America*, 147, 174-190.

Geller, J., Winn, M.B., Mahr, T., Mirman, D. (2020). GazeR: A package for processing gaze position and pupil size data. *Behavior Research Methods*, 52, 2232–2255 https://doi.org/10.3758/s13428-020-01374-8

Winn, M.B. (2020). Manipulation of voice onset time in speech stimuli: A tutorial and flexible Praat script. *Journal of the Acoustical Society of America*, 147, 852-866.

* DiNino, M., Arenberg, J., Duchen, A., Winn, M.B. (2020). Effects of age and cochlear implantation on spectrally cued speech categorization. *Journal of Speech, Language and Hearing Research*, 63, 2425-2440.

* Dirks, C., Nelson, P., Winn, M.B., Oxenham, A. (2020). Sensitivity to binaural temporal-envelope beats with single-sided deafness and a cochlear implant as a measure of

tonotopic match. *Journal of the Acoustical Society of America*, 147, 3626-3630.

Winn, M.B & Moore, A.N. (2020). Acoustic cues used for accommodating gender-related voice differences heard by listeners with cochlear implants and with normal hearing. *Journal of the Acoustical Society of America*, 148, 496-510.

Winn, M.B. & Teece, K. (2021). Slower speaking rate reduces listening effort and increases benefit of contextual cues among listeners with cochlear implants. *Ear & Hearing*, 42, 584-595. doi: 10.1097/AUD.0000000000000958

* Smith, M.L. & Winn, M.B. (2021) Individual variability in the adjustment to simulated shallow cochlear implant insertion depths. *Ear and Hearing, 42,* 1412-1427. doi: 10.1097/AUD.0000000000001043.

Winn, M.B. & Teece, K. (2021). Listening effort is not the same as speech intelligibility score. *Trends in Hearing*, 25, 1-26. doi: 10.1177/23312165211027688

Winn, M.B. & O'Brien, G. (2022). Distortion of spectral ripples through cochlear implants has major implications for interpreting performance scores. *Ear and Hearing*, 43, 764-772. doi: 10.1097/AUD.0000000000001162

* Fleming, J.T. & Winn, M.B. (2022). Strategic perceptual weighting of acoustic cues for word stress in listeners with cochlear implants, acoustic hearing, or simulated bimodal hearing. *Journal of the Acoustical Society of America,* 152(3), 1300-1316. doi: 10.1121/10.0013890

Winn, M.B. & Wright, R.A. (2022). Reconsidering commonly used stimuli in speech perception experiments. *Journal of the Acoustical Society of America,* 152, 1394-1403. doi: 10.1121/10.0013415

Winn, M.B. & Teece, K.H. (2022). Effortful listening despite correct responses: the cost of mental repair in sentence recognition by listeners with cochlear implants. *Journal of Speech, Language, and Hearing Research,* 65(10), 3966-3980. doi: 10.1044/2022_JSLHR-21-00631

**** Editor's award: Designated as most meritorious single article appearing in JSLHR hearing section in the preceding year. Winning articles are selected by the editor-in-chief in collaboration with the editors on the basis of experimental design, teaching-education value, scientific or clinical merit, contribution to the professions, theoretical impact, and/or other indices of merit.*

Winn, M.B., Tripp, A., Munson, B. (2022). A critique and call for action, in response to sexist commentary about vocal fry. *Perspectives of the ASHA Special Interest Groups*. doi: 10.1044/2022_PERSP-21-00319

* Gianakas, S.P., Fitzgerald, M.B., Winn, M.B. (2022). Identifying listeners whose speech intelligibility depends on an extra moment to repair perceptual mistakes. *Journal of Speech, Language, and Hearing Research, 65(12), 4852-4865.* doi: 10.1044/2022_JSLHR-21-00622

Winn, M.B., Wright, R., Tucker, B. (2023). Reconsidering classic ideas in speech

communication (introduction to special issue). The Journal of the Acoustical Society of America, 153(3), 1623-1625. https://doi.org/10.1121/10.0017487

Winn, M.B. (2023). Time scales and moments of listening effort revealed in pupillometry. Seminars in Hearing, 44(2), 106–123. https://doi.org/10.1055/s-0043-1767741

Book Chapters

Winn, M.B. & Stilp, C. (2019) "Phonetics and the Auditory System" in *The Routledge Handbook of Phonetics* (W. Katz & P. Assmann, eds).

Winn, M.B. & Nelson, P.B. (2021) "Cochlear Implants" in *Oxford Research Encyclopedia of Linguistics. doi: 10.1093/acrefore/9780199384655.013.893*

Selected Conference Presentations & Talks

Winn, M.B., Blodgett, A., Bauman, J., Bowles, A., Charters, L., Rytting, C.A., & Shamoo, J. (2008). Vietnamese monophthong vowel production by native speakers and American adult learners. Poster presented the Acoustical Society of America, Paris, France.

O'Brien, G., Winn, M.B. (2017). Uncertainty in binaural hearing linked to inherent envelope fluctuations. Podium presentation at the Association for Research in Otolaryngology, Baltimore, MD.

*Smith, M., & Winn, M.B. (2019). Individual differences in recalibrating to upward spectral shifts. Poster presented at the Conference on Implantable Auditory Prostheses, Lake Tahoe, CA.

Winn, M.B. (2020). Cue weighting as evaluation of the auditory system. Invited presentation at "Cue weighting: Thinking outside the box" satellite workshop at Laboratory Phonology.

Winn, M.B. & Moore, A. (2019). Backwards and indirect context effects in accommodating gender differences in speech. Podium presentation at the Acoustical Society of America, Louisville, KY.

Winn, M.B. (2019). Listening effort: How it affects your patients' lives and how to measure it. Invited podium presentation at the American Speech-language Hearing Association, Orlando, FL.

Winn, M.B. (2020). Using Praat for high-quality speech manipulation and illustration: recommended practices and demonstrations. Invited podium presentation at the Acoustical Society of America.

Winn, M.B. & Wright, R. (2021). A critical look at commonly used stimuli in speech perception experiments. Invited podium presentation at the Acoustical Society of America.

Winn, M.B. & Teece, K.H. (2022) Listening effort in CI users impairs perception of later utterances. Podium presentation at the American Auditory Society, Scottsdale, AZ.

*Gianakas, S.P. & Winn, M.B. (2022). The impact of prior topic awareness on listening effort

during speech perception. Poster presented at the Acoustical Society of America, Denver CO.

Winn, M.B. & Munson, B. (2022). Perception and expression of talker gender at the beginning and end of words. Poster presented at the Acoustical Society of America, Denver CO.

Winn, M.B. (2022). Making listening effort visible in the lab and in the clinic. Invited presentation at the British Cochlear Implant Group annual meeting in Cardiff, Wales.

Winn, M.B. (2022) Making listening effort visible in the lab and in the clinic. Invited podium presentation at the annual meeting of the Canadian Academy of Audiology. Niagara Falls, ON, Canada

Winn, M.B. (2022). Listening effort in cochlear implant users impairs perception of later utterances. Invited presentation at the Speech Science Forum Series at University College London in London, UK.

Winn, M.B. (2022). The timing and mechanisms of listening effort during speech perception. Invited podium presentation at the Gordon Research Conference on preventing loss and recovering function of the auditory system. Providence, RI.

Teece, K. & Winn, M.B. (2023). Insights on speech perception testing directly from patients. Poster presented at the annual meeting of the American Auditory Society, Scottsdale, AZ.

*Mohamed, M. & Winn, M.B. (2023). Acoustical analysis of Taylor Swift's speech and singing throughout her career. Poster presented at the 184th meeting of the Acoustical Society of America, Chicago, IL.

*Gianakas, S. & Winn, M.B. (2023). Measuring the timeline of retroactive sentence repair in listeners with cochlear implants. Poster presented at the Conference in Implantable Auditory Prostheses, Tahoe City, CA.

*Smith, M. & Winn, M.B. (2023). Measuring the timing and duration of listening effort needed to mentally repair misperceptions in cochlear implant listeners. Poster presented at the Conference in Implantable Auditory Prostheses, Tahoe City, CA.

*Wheeler, H. & Winn, M.B. (2023). Perception of prosodic cues for contrastive focus in sentences. Poster presented at the Conference in Implantable Auditory Prostheses, Tahoe City, CA.

Winn, M.B. (2023). The invisible effort of listening with hearing loss. Invited podium presentation at the NIH NIDCD seminar series, Bethesda, MD.

COURSES TAUGHT

Introduction to Phonetic Science	U. Maryland
Implantable Auditory Prostheses	U. WI-Madison
Phonetics	U. Washington
Hearing Science	U. Washington
Advanced Hearing Science	U. Washington
Physics and Biology of the Voice	U. Minnesota
Cochlear Implants	U. Minnesota

Instructional Activity – Science Communication and other topics

Best Practices in Scientific Presentations
Speech-Language-Hearing Sciences graduate student ProSeminar 2018

Preparing for Job Talks
Speech-Language-Hearing Sciences graduate student ProSeminar 2019

Best Practices in Data Visualization in Scientific Presentations
Guest lecture in Neuroscience Research Training program 2019

Best Practices for Data Visualization
Guest lecture in Neuroscience Research Training program 2019

Preparing Elevator Pitches
Speech-Language-Hearing Sciences graduate student ProSeminar 2019

Writing Results & Discussion Sections in Research Articles
Guest lecture in SLHS 8410 Research Seminar 2020

More Readable Code in R Using Pipes and Layers.
Ancillary meeting at the Association for Research in Otolaryngology, 2020

Preparing Short Scientific Talks
Speech-Language-Hearing Sciences graduate student ProSeminar 2021

Designing and Delivering Effective Scientific Presentations
Research Audiologist Information and Support Network annual seminar, presentation with Kelsey Anbuhl 2021

Designing and Delivering Effective Scientific Presentations
Association for Research in Otolaryngology annual meeting, presentation with Kelsey Anbuhl 2022

Media Contributions

	Date
"Speech: It's Not as Acoustic as You Think" *Acoustics Today*, volume 14, issue 2, 2018. *Acoustics Today* is a publication covering basic and practical applications of acoustics to a global audience. It reaches educators, designers, engineers, buyers, and the service sector.	Summer 2018
"There is only one Beethoven", Minnesota Public Radio (on the nature of hearing impairment and how it affects peoples' lives and how it affected Beethoven) available at https://www.decomposedshow.org/episode/2019/05/14/there-is-only-one-beethoven	May 2019

"Making Sense: How sound becomes hearing"
Vox Unexplainable (podcast on auditory perception, cochlear implants, and the perception of music and speech). Unexplainable is the #1 highest ranked Life Sciences podcast in the United States, and #5 highest ranked science podcast overall, according to Rephonic. This episode won an online journalism award for Excellence in Audio Digital Storytelling. March 2022

"How do Hearing Aids Work?"
Brains On! - an award-winning science podcast for kids and curious adults from American Public Media. April 2023

"Reconsidering classic ideas in speech communication"
Across Acoustics - the official podcast of the Acoustical Society of America's Publications' Office. August 2023

Editorial service

Associate Editor, Trends in Hearing
Guest Associate Editor, Journal of the Acoustical Society of America

Website: www.mattwinn.com

Website for class videos and software tutorials:

https://www.youtube.com/@listenlab6528/videos

Funding

CURRENT
Award: NIH-NIDCD R01 DC017114
"Listening effort in cochlear implant users"
Principal Investigator: Matthew B. Winn
Team members on all associated projects:
Status: Funded, Renewed, ongoing
Sponsoring Organization: National Institutes of Health / NIDCD
Major Goals: This study explores the effort of listening to speech and how it is impacted by the use of a cochlear implant. The project specifically looks at the effortful cost of mentally repairing words that were misperceived, and the timeline of recovering from that mental repair process.
Award Dates: 8/7/2018 – 8/31/2028
Funded Amount: $1,837,970 (Y1-5); $1,932,709 (Y6-10); $3,770,679 total
Direct Amount: $1,250,000 (Y1-5); $1,369,656 (Y6-10); $2,619,656 total
Indirect Amount: $587,970 (Y1-5); $563,053 (Y6-10); $1,151,023 total

Award: NSF FAIN 2146885
"Determinants of perceptual learning for speech perception"
Principal Investigator: Rachel Theodore; Co-PI: Matthew Winn
*Major Goals: This study explores the ways that listeners adapt to an unfamiliar voice by incorporating new evidence from the talker's voice, how they use existing knowledge about the speech sounds in their language, and how they learn what to ignore.
Sponsoring Organization: National Science Foundation
Award Dates: 06/01/2022 – 05/31/2025
Total Award Amount (including Indirect Costs): $360,987

Award: NIH-NIDCD R01 DC020303
"Perception of speech in context by listeners with healthy and impaired hearing"
Co-Principal Investigators: Christian E. Stilp and Matthew B. Winn
Status: Funded, ongoing
Sponsoring Organization: National Institutes of Health / NIDCD
Major Goals: This project investigates the perception of speech in the context of surrounding sounds for the normal auditory system, and the effects of background noise, hearing loss, and cochlear implant processing on speech perception.
Award Dates: 9/2022 – 8/2027
Funded Amount: $ 1,455,987
Direct Amount: $ 1,125,112
Indirect Amount: $ 330,875

COMPLETED
Award: NIH-NIDCD R21 DC018070
"Race, ethnicity, and speech intelligibility in normal hearing and hearing impairment"
Principal Investigator: Benjamin Munson
Sponsoring Organization: National Institutes of Health / NIDCD
Award Dates: July 2019 – June 2021 (NCE)
Funded Amount: $389,318
Direct Amount: $250,000
Indirect Amount: $139,318
My Role: Consultant, 2%

Award: NIH-NIDCD R03 DC014309
"Measuring listening effort and spectral resolution in cochlear implant patients"
Principal Investigator: Matthew B. Winn
Team members on all associated projects:
Sponsoring Organization: National Institutes of Health / NIDCD
Award Dates: January 2016 – August 2019
Funded Amount: $454,796
Direct Amount: $300,000
Indirect Amount: $154,796