

## VITA

Richard L. Freyman  
56 Terry Drive  
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### EDUCATION

University of Minnesota - Minneapolis, Minnesota; Ph.D., July, 1984.

Major areas of study: Audiology and Hearing Science. Thesis title: "Mechanisms of Frequency Discrimination in Listeners with Sensorineural Hearing Loss".

Temple University - Philadelphia, Pennsylvania; M.A., May 1978. Major: Audiology.

Pennsylvania State University - State College, Pennsylvania; B.S., May 1976. Major: Speech Pathology and Audiology.

### PROFESSIONAL EMPLOYMENT

Professor - University of Massachusetts, Department of Communication Disorders, Amherst, Massachusetts. September, 1998 to the present.

Responsibilities of the UMass positions include teaching graduate and undergraduate courses in hearing science and audiology, conducting a research program in psychoacoustics and speech perception, directing graduate and undergraduate student research, clinical supervision in audiology for several years, service as Director of the department's Communication Sciences Laboratory and Chief Undergraduate Advisor for many years.

Associate Professor - University of Massachusetts, Department of Communication Disorders, Amherst, Massachusetts. July, 1989 to August 1998.

Assistant Professor - University of Massachusetts, Department of Communication Disorders, Amherst, Massachusetts. August 1984 to July, 1989.

Instructor - University of Massachusetts, Department of Communication Disorders, Amherst, Massachusetts. September 1983 - August 1984.

Visiting Scientist - Massachusetts Institute of Technology - Research Laboratory of Electronics - Spring, 1990

Audiologist - Caswell Center, Kinston, North Carolina. August 1978 to July 1980.

Responsibilities included: the audiological management of severely and profoundly developmentally delayed residents, including hearing evaluations, hearing aid fittings, aural rehabilitation, and in-service training of residential staff.

## TEACHING EXPERIENCE

Introduction to Hearing Science (undergraduate), 1983 - present.

Theories of Hearing (graduate), 1983 - present.

Hearing Conservation (graduate), 1984 - present.

Laboratory Instrumentation (graduate), 1984 - 1992.

Introduction to Speech Science (undergraduate), 1992.

Occupational Hearing Conservation (biannual minicourse), 1984 - 1988.

Academic advisor to approximately 20 undergraduates and 6 graduate students per year until 2014, when an undergraduate advisor was hired.

## SIGNIFICANT MENTORSHIP

Examples at different education/career levels (some are primary mentorship. Others are co-mentorship):

Catherine Palmer (senior honors thesis): Professor and Director of the AuD program at the University of Pittsburgh.

Pamela Souza (senior honors thesis): Professor and Chair of the Department of Communication Sciences and Disorders, Northwestern University.

Jeffrey DiGiovanni (senior thesis in engineering): Professor and Chair of the Department of Communication Sciences and Disorders, University of Cincinnati.

Antony Joseph (Clinical Master's in Audiology): Spent 24 years as a Naval Officer focusing on hearing conservation, and is now an Associate Professor at Illinois State University.

Gabrielle Merchant (AuD capstone thesis): Director, Translational Auditory Physiology and Perception Laboratory, Boys Town National Research Hospital

Ruth Litovsky (PhD dissertation): Professor and Chair of the Department of Communication Sciences and Disorders at the University of Wisconsin.

Amanda Griffin (PhD dissertation): Director of Audiology Research at Boston Children's Hospital, Department of Otolaryngology and Communication Enhancement.

Varsha Rallipalli (current K01 co-mentor): Research Assistant Professor at Northwestern University.

Karen Helfer (long-time faculty mutual mentorship): Professor and Chair of our Department of Communication Disorders at the University of Massachusetts.

## RESEARCH PUBLICATIONS

Ruggero, M.A., Rich, N.C., and Freyman, R. (1983). "Spontaneous and impulsively evoked oto-acoustic emissions: indicators of cochlear pathology?" *Hearing Research* 10, 283-300.

Nelson, D.A., Stanton, M.E., and Freyman, R.L. (1983). "A general equation describing frequency discrimination as a function of frequency and sensation level." *J. Acoust. Soc. Am.*, 73, 2117 - 2123.

Nelson, D.A., and Freyman, R.L. (1984). "Broadened forward-masked tuning curves from intense masking tones: time-delay and probe-level manipulations," *J. Acoust. Soc. Am.*, 75, 1570-1577.

Freyman, R.L. and Nelson, D.A. (1986). "Frequency discrimination as a function of tonal duration and excitation-pattern slopes in normal and hearing-impaired listeners," *J. Acoust. Soc. Am.*, 79, 1034-1044.

Nelson, D.A. and Freyman, R.L. (1986). "Psychometric functions for frequency discrimination from listeners with sensorineural hearing loss." *J. Acoust. Soc. Am.*, 79, 799-805.

Freyman, R.L. and Nelson, D.A. (1987). "Frequency discrimination of short- vs. long- duration tones by normal and hearing-impaired listeners," *J. Speech Hear. Res.*, 30, 28-36.

Nelson, D.A. and Freyman, R.L. (1987). "Temporal resolution in sensorineural hearing-impaired listeners," *J. Acoust. Soc. Am.*, 81, 709-720.

Freyman, R.L. and Nerbonne, G.P. (1989). "The importance of consonant-vowel intensity ratio for speech intelligibility," *J. Speech Hear. Res.*, 32, 524-535.

Clifton, R.K. and Freyman, R.L. (1989). "Effect of click rate and delay on breakdown of the precedence effect," *Perception and Psychophysics*, 46, 139-145.

Nelson, D.A., Chargo, Kopun, and Freyman, R.L. (1990). "Effects of stimulus level on forward-masked psychophysical tuning curves in quiet and in noise," *J. Acoust. Soc. Am.*, 88, 2143-2151.

Freyman, R.L., Nerbonne, G.P., and Cote, H.A. (1991). "Effect of consonant-vowel ratio modification on amplitude envelope cues for consonant recognition," *J. Speech Hear. Res.* 34, 415-426.

Freyman, R.L., Clifton, R.K., and Litovsky, R.Y. (1991). "Dynamic processes in the precedence effect," *J. Acoust. Soc. Am.* 90, 874-884.

Freyman, R.L. and Nelson, D.A. (1991). "Frequency discrimination as a function of signal frequency and level in normal-hearing and hearing-impaired listeners," *J. Speech Hear. Res.* 34, 1371-1386.

Rankovic, C.M., Freyman, R.L., and Zurek, P.M. (1992). "Potential benefits of adaptive frequency gain characteristics for speech reception in noise," *J. Acoust. Soc. Am.* 91, 354-362.

Clifton, R.K., Freyman, R.L., Litovsky, R.Y. and McCall, D. (1994) "Listener expectations about echoes can raise or lower echo threshold," *J. Acoust. Soc. Am.* 95, 1525-1533.

- Balakrishnan, U., Freyman, R.L., Chiang, Y.C., Nerbonne, G.P., and Shea, K.J. (1996). "Consonant recognition for spectrally degraded speech as a function of consonant-vowel intensity ratio," *J. Acoust. Soc. Am.*, 99, 3758-3769.
- Freyman, R.L., and Nerbonne, G.P. (1996) "Consonant confusions in amplitude expanded speech," *Journal of the Speech and Hearing Research*, 39, 1124-1137.
- Clifton, R.K., and Freyman, R.L. (1997) "The precedence effect: beyond echo suppression," Chapter in R.H. Gilkey & T.B. Anderson (Eds.), Binaural and Spatial Hearing in Real and Virtual Environments, Lawrence Erlbaum, Hillsdale, N.J.
- Freyman, R.L. Zurek, P.M., Balakrishnan, U., and Chiang, Y.C., (1997) "Onset dominance in lateralization," *J. Acoust. Soc. Am.* 101, 1649-1659.
- Freyman, R.L, McCall, D.D. and Clifton, R.K (1998) "Intensity discrimination for precedence effect stimuli," *Journal of the Acoustical Society of America*, 103, 2031-2041.
- McCall, D.D, Freyman, R.L., and Clifton, R.K. (1998) "Sudden changes in room acoustics influence the precedence effect," *Perception and Psychophysics*, 60, 593-601.
- Chiang, Y.C., and Freyman, R.L. (1998). "The influence of broadband noise on the precedence effect," *J. Acoust. Soc. Am.* 104, 3039-3047.
- Freyman, R.L., Helfer, K.S., McCall, D.D., and Clifton, R.K. (1999) "The role of perceived spatial separation in the unmasking of speech," *Journal of the Acoustical Society of America* 106, 3578-3588.
- Freyman, R.L., Balakrishnan, U., and Helfer, K.S. (2001) "Spatial release from informational masking in speech recognition," *Journal of the Acoustical Society of America*, 109, 2112-2122.
- Kales, S.N., Freyman, R.L., Hill, J.M., Polyhronopoulos, G.N., Aldrich, J.M., and Christiani, D.C. (2001). "Firefighters' Hearing: A Comparison with Population Databases from the International Standards Organization" *Journal of Occupational and Environmental Medicine*, 43, 650-656.
- Clifton, R.K., Freyman, R.L, and Meo, J. (2002) "What echoes tell us about the auditory environment," *Perception and Psychophysics*, 64, 180-188.
- Balakrishnan, U., and Freyman, R.L. (2002) "Lateralization and detection of pulse trains with alternating interaural time delays," *Journal of the Acoustical Society of America*, 112, 1605-1616.
- Zurek, P.M., Freyman, R.L., and Balakrishnan, U. (2004) "Auditory target detection in reverberation," *Journal of the Acoustical Society of America*, 115, 1609-1620.
- Freyman, R.L., Balakrishnan, U., and Helfer, K., (2004). "Effect of number of masking talkers and auditory priming on informational masking in speech recognition," *Journal of the Acoustical Society of America*, 115, 2246-2256.

- Helfer, K.S. and Freyman, R.L. (2005). "The role of visual cues in reducing energetic and informational masking," *Journal of the Acoustical Society of America*, 117, 842-849.
- Freyman, R.L., Helfer, K.S., and Balakrishnan, U. (2005). "Spatial and spectral factors in release from informational masking in speech recognition," *Acta Acustica united with Acustica*, 91, 537-545.
- Brungart, D.S., Simpson, B.D., and Freyman, R.L. (2005). Precedence-based speech segregation in a virtual auditory environment," *J. Acoust. Soc. Am.* 118, 3241-3251.
- Poissant, S.F., Whitmal III, N.A., and Freyman, R.L. (2006). "Effects of reverberation and masking on speech intelligibility in cochlear implant simulation," *J. Acoust. Soc. Am.*, 119, 1606-1615.
- Bernstein, L.R., Trahiotis, C., and Freyman, R.L. (2006) "Binaural detection of 500-Hz tones in broadband and in narrowband masking noise: Effects of signal/masker duration and forward masking fringes," *J. Acoust. Soc. Am.*, 119, 2981-2193.
- Freyman, R.L., and Keen, R. "Constructing and disrupting listeners' models of auditory space," (2006). *J. Acoust. Soc. Am.*, 120, 3957-3965.
- Freyman, R.L., Helfer, K.S., and Balakrishnan, U. (2007). "Variability and uncertainty in masking by competing speech," *J. Acoust. Soc. Am.*, 121, 1040-1046.
- Whitmal, N. Poissant, S., Freyman, R.L., and Helfer, K. (2007). "Speech intelligibility in cochlear implant simulations: effects of carrier type, interfering noise, and subject experience." *J. Acoust. Soc. Am.* 122, 2376-2388.
- Helfer, K.S., and Freyman, R.L. (2008). "Aging and speech-on-speech masking," *Ear and Hearing* 29, 87-98. PMID: PMC2987598
- Freyman, R.L., Balakrishnan, U., and Helfer, K.S. (2008). "Spatial release from masking with noise-vocoded speech," *J. Acoust. Soc. Am.* 124, 1627-1737. PMID: PMC2736712
- Balakrishnan, U., and Freyman, R.L. (2008). "Speech detection in spatial and non-spatial speech maskers," *J. Acoust. Soc. Am.* 123, 2680-2691. PMID: PMC2811546
- Sanders, L.D., Joh, A.S., Keen, R.E., and Freyman, R.L. (2008). "One sound or two? Object-related negativity," *Percept. Psychophys.* 70, 1558-1570. PMID: PMC2688387
- Helfer, K.S., and Freyman, R.L. (2009). "Lexical and indexical cues in masking by competing speech," *J. Acoust. Soc. Am.* 125, 447-456. PMID: PMC2736724
- Keen, R., and Freyman, R.L., (2009) "Release and re-buildup of listeners' models of auditory space," *J. Acoust. Soc. Am.* 125, 3243-3252. PMID: PMC2736742
- Freyman, Balakrishnan, and Zurek (2010). "Lateralization of noise-burst trains based on onset and ongoing interaural delays," *J. Acoust. Soc. Am.* 128, 320-331. PMID: PMC2921432.

Helfer, K.S., Chevalier, J., and Freyman, R.L. (2010). "Aging, spatial, cues, and dual task performance in competing speech perception," J. Acoust. Soc. Am., 128, 3625-3633. PMCID: PMC3037770.

Sanders, L.D., Zobel, B. H., Freyman, R. L., and Keen, R. (2011). "Manipulations of listeners' echo perception are reflected in event-related potentials" J. Acoust. Soc. Am., 129, 301-309. PMCID: PMC3055288.

Jones, J.A. and Freyman, R.L. (2012). "Effect of priming on energetic and informational masking in a same-different task," Ear and hearing, 33, 124-133. PMCID: PMC3227770.

Poissant, S.F., Freyman, R.L., MacDonald, A.J., and Nunes, H.A. (2012). "Characteristics of noise exposure during solitary trumpet playing: immediate impact on distortion-product otoacoustic emissions and long-term implications for hearing," Ear and Hearing 33, 543-553. PMID: 22531575

Freyman, R.L., Griffin, A.M., Oxenham, A.J. (2012). "Intelligibility of whispered speech in stationary and modulated noise maskers," J. Acoust. Soc. Am. 132, 2514-2523. PMCID: PMC3477190.

Freyman, R.L., Griffin A.M., Macmillan, N.A. (2013). "Priming of lowpass-filtered speech affects response bias, not sensitivity, in a bandwidth discrimination task," J. Acoust. Soc. Am., 134, 1183-1192. PMCID: PMC3745481

Ruggles, D.R., Freyman, R.L., and Oxenham, A.J. (2014). "Influence of musical training on understanding voiced and whispered speech in noise," PloS one, 9(1):e86980. PMCID: PMC3904968

Freyman, R.L., Griffin, A.M., and Zurek, P.M. (2014). Threshold of the precedence effect in noise," J. Acoust. Soc. Am., 135, 2923-2930. PMCID: PMC4032431

Helfer, K.S. and Freyman, R.L. (2014). "Stimulus and listener factors affecting age-related changes in competing speech perception," J. Acoust. Soc. Am., 136, 748-759. PubMed [journal] PMID: 25096109, PMCID: PMC4187459

Zobel, B.H., Freyman, R.L., and Sanders, L.D. (2015) "Attention is critical for spatial auditory object formation," Attention, Perception & Psychophysics. 77, 1998-2010. PMCID: PMC4522208

Freyman, R. L., Morse-Fortier, C., and Griffin, A. M. (2015). "Temporal effects in priming of masked and degraded speech," J. Acoust. Soc. Am. 138, 1418-1427. PMCID: PMC4567576.

Helfer KS, Freyman RL. Age equivalence in the benefit of repetition for speech understanding. (2016). J Acoust Soc Am. Nov;140(5):EL371. doi: 10.1121/1.4966586. PubMed PMID: 27908048; PubMed Central PMCID: PMC5392078.

Helfer KS, Merchant GR, Freyman RL. (2016). Aging and the effect of target-masker alignment. *J Acoust Soc Am*. 2016 Nov;140(5):3844. doi: 10.1121/1.4967297. PubMed PMID: 27908027; PubMed Central PMCID: PMC5392104.

Morse-Fortier C, Parrish MM, Baran JA, Freyman RL. (2017) The Effects of Musical Training on Speech Detection in the Presence of Informational and Energetic Masking. *Trends Hear*. 2017 Jan-Dec;21:2331216517739427. doi: 10.1177/2331216517739427. PubMed PMID: 29161982; PubMed Central PMCID: PMC5703091.

Freyman RL, Zurek PM. Strength of onset and ongoing cues in judgments of lateral position. (2017) *J Acoust Soc Am*. 2017 Jul;142(1):206. doi: 10.1121/1.4990020. PubMed PMID: 28764482; PubMed Central PMCID: PMC5511054.

Freyman RL, Terpening J, Costanzi AC, Helfer KS. (2017) The Effect of Aging and Priming on Same/Different Judgments Between Text and Partially Masked Speech. *Ear Hear*. 2017 Nov/Dec;38(6):672-680. doi: 10.1097/AUD.0000000000000450. PubMed PMID: 28650352; PubMed Central PMCID: PMC5659933.

Freyman RL, Morse-Fortier C, Griffin AM, Zurek PM. (2018) Can monaural temporal masking explain the ongoing precedence effect?. *J Acoust Soc Am*. 2018 Feb;143(2):EL133. doi: 10.1121/1.5024687. PubMed PMID: 29495692; PubMed Central PMCID: PMC5826740.

Griffin, A. M., Poissant, S. F., & Freyman, R. L. (2019). Speech-in-Noise and Quality-of-Life Measures in School-Aged Children With Normal Hearing and With Unilateral Hearing Loss. *Ear and hearing*, 40(4), 887-904.

Griffin, A.M., Poissant, S.F., & Freyman, R.L. (2020) "Auditory comprehension in school-aged children with normal hearing and with unilateral hearing loss," *Lang. Speech Hear. Serv. Sch*. 51, 29-41.

Heifer, K. S., Freyman, R. L., van Emmerik, R., & Banks, J. (2020). Postural control while listening in younger and middle-aged adults. *Ear and hearing*, 41(5), 1383.

Helfer, K. S., van Emmerik, R., Banks, J. J., & Freyman, R. L. (2020). Early aging and postural control while listening and responding. *The Journal of the Acoustical Society of America*, 148(5), 3117-3130.

Zobel, B. H., Freyman, R. L., & Sanders, L. D. (2022). Spatial release from informational masking enhances the early cortical representation of speech sounds. *Auditory Perception & Cognition*, 5(3-4), 211-237.

Helfer, K. S., van Emmerik, R., Freyman, R. L., & Banks, J. J. (2023). An Exploratory Study of Walking, Listening, and Remembering in Younger and Middle-Aged Adults. *Journal of Speech, Language, and Hearing Research*, 66(10), 4052-4065.

## RESEARCH PRESENTATIONS

Thomas, K.H., Freyman, R.L., "The effectiveness of a manually controlled operant technique in the audiometric evaluation of the severely mentally retarded." Presented at the 14th Annual Gatlinburg Conference on Research in Mental Retardation, Gatlinburg, Tennessee, March, 1981.

Freyman, R.L., Penner, S.G., and Van Tasell, D.J., "The intelligibility of band-pass filtered spondees." Paper presented at the annual convention of the American Speech-Language-Hearing Association, Toronto, November 1982.

Freyman, R.L. and Nelson, D.A. (1984). "Intensity and duration effects in pure-tone frequency discrimination in listeners with sensorineural hearing loss," J.Acoust.Soc.Am.75 Suppl. 1, S6. Paper presented at the 107th meeting of the Acoustical Society of America, Norfolk, Virginia, May, 1984.

Freyman, R.L. and Nelson, D.A.(1984). "DLF duration functions and estimated excitation-pattern slopes in normal and hearing-impaired listeners," J. Acoust. Soc.Am.76 Suppl. 1, S13. Paper presented at the 108th meeting of the Acoustical Society of America, Minneapolis, Minnesota, October 1984.

Palmer, C., Vaillancourt, P., Nerbonne, G.P., and Freyman, R.L. (1986). "Sound pressure level in personal cassette recorder use." Paper presented at the annual convention of the American Speech-Language-Hearing Association, Detroit, MI, November, 1986.

Freyman, R.L. and Balakrishnan, U. (1986). "The effects of a broadband masker on frequency DLs for short tones," J.Acoust.Soc. Am.80 Suppl. 1, S60. Paper presented at the 108th meeting of the Acoustical Society of American, Anaheim, December 1986.

Nelson, D.A. and Freyman, R.,L.(1986). "Temporal masking curves and recovery from adaptation in hearing-impaired listeners," J.Acoust.Soc.Am. 80 Suppl.1, S60. Paper presented at the 112th meeting of the Acoustical Society of America, Anaheim, December 1986.

Freyman, R.L. and Nerbonne, G.P. (1987). "The effects of consonant-vowel intensity ratio on speech intelligibility." Paper presented at the annual convention of the American Speech-Language-Hearing Association, New Orleans, November 1987.

Clifton, R.K. and Freyman, R.L. (1987). "Effect of click rate and delay on breakdown of the precedence effect." J.Acoust.Soc.Am., 82, Suppl. 1, S58. Paper presented at the 114th meeting of the Acoustical Society of America, Miami, November, 1987.

Hughes, C.B., Wilson, J.M., Freyman, R.L., and Nerbonne, G.P. (1988). "Detection and recognition of isolated voiceless consonants." Paper presented at the annual convention of the American Speech-Language-Hearing Association, Boston, November 1988.

Freyman, R.L., Clifton, R.K., Litovsky, R.Y., and Balakrishnan, U. (1989). "Buildup and breakdown of the precedence effect." Paper presented at the 117th meeting of the Acoustical Society of America, Syracuse, May 1989.

Litovsky, R.Y., Freyman, R.L., Balakrishnan, U. and Clifton, R.K. (1989). "Prior auditory stimulation influences the precedence effect," Paper presented at the 118th meeting of the Acoustical Society of American, St.Louis, November, 1989.



Freyman, R.L., Nerbonne, G.P., Cote, H.A., and Shea K.J. (1989). "C-V ratio modification without consonant-to-noise ratio improvement," Paper presented at the annual convention of the American Speech-Language-Hearing Association, St.Louis, November 1989.

Freyman, R.L. and Zurek, P.M. (1991). "Importance of onset cues in lateralization," Paper presented at the 121st meeting of the Acoustical Society of America, Baltimore, MD, May 1991. J.Acoust.Soc.Am., 89, S1, 1995.

Freyman, R.L., Clifton, R.K., and Litovsky, R.Y. (1991). "Changing echo thresholds." Paper presented at the 121st meeting of the Acoustical Society of America, Baltimore, MD, May 1991. J.Acoust.Soc.Am., 89, S1, 1995.

Balakrishnan, U., Freyman, R.L., Chiang, Y.C., Nerbonne, G.P., and Shea, K.J. (1991). "Effect of consonant-vowel intensity ratio on the intelligibility of spectrally degraded speech." Paper presented at the 121st meeting of the Acoustical Society of America, Baltimore, MD, May, 1991.

Balakrishnan, U., and Freyman, R.L (1993). "Lateralization of click trains with alternating ITDs." Paper presented at the 125th meeting of the Acoustical Society of America, Ottawa, May, 1993.

Clifton, R.K., and Freyman, R.L. (1993). "Context and learning affect echo perception," Paper presented at the Conference on Binaural Hearing, Wright-Patterson Air Force Base, Ohio, September, 1993.

Freyman, R.L., Clifton, R.K., and McCall, D.D. (1994). "Sudden changes in simulated room acoustics influence echo suppression," Paper presented at the 127th meeting of the Acoustical Society of America, Cambridge, MA, June, 1994.

Freyman, R.L., Nerbonne, G.P., Tharp, D., and Stanford, E. (1994). "Amplitude envelope cues for consonant recognition with simulated loudness recruitment," Paper presented at the 127th meeting of the Acoustical Society of America, Cambridge, MA, June, 1994.

Freyman, R.L., Speicher, D.J. , and Nerbonne, G.P. (1995). "Effects of amplitude expansion and compression on nonsense sentence recognition," Paper presented at the 129th meeting of the Acoustical Society of America, Washington, DC, May, 1994.

McCall, D.D., Costantino, B.L., Clifton, R.K., and Freyman, R.L. (1995). "Perception of multiple echoes," Paper presented at the 129th meeting of the Acoustical Society of America, Washington, DC, May, 1994.

Chiang, Y.C., and Freyman, R.L. (1995). "The effect of background noise on the precedence effect." Paper presented at the 129th meeting of the Acoustical Society of America, Washington, DC, May, 1994

Silk, M.L. Freyman, R.L, and McCall, D.D (1997). "The influence of two-source noise on the echo suppression," Paper presented at the 133rd meeting of the Acoustical Society of America, Penn State, June, 1997.

Freyman, R.L. and Clifton, R.K. (1998) "The influence of auditory context on the precedence effect," Invited paper presented at the annual meeting of the Association for Research in Otolaryngology, February, 1998.

Freyman, R.L. McCall, D.D., and Helfer, K.S. (1999) "The role of perceived spatial separation in the unmasking of speech," paper presented at the annual meeting of the Association for Research in Otolaryngology, February, 1999.

Freyman, R.L. Balakrishnan, U., and Helfer, K.S. (2000) "Release from informational masking in speech recognition," paper presented at the annual meeting of the Association for Research in Otolaryngology, February, 2000.

Freyman, R.L. "Spatial release from masking in speech recognition", presented at the Conference on Binaural Hearing, Binaural Hearing Aids, and Cochlear Implants, June, 2000, Iowa City, Iowa.

Freyman, R.L., Balakrishnan, U., and Zurek (2001). "Effect of reverberation on the masking of narrow-band signals," paper presented at the 141<sup>st</sup> meeting of the Acoustical Society of America in Chicago, June, 2001.

Freyman, R.L. and Zurek, P.Z. (2002) "Effect of room reverberation on spatial release from masking," paper presented at the 143rd meeting of the Acoustical Society of America, Pittsburgh, June 2002.

Helfer, K.S., Freyman, R.L., and Balakrishnan, U. (2002) "Auditory-visual speech perception in informational masking". Paper presented at the annual meeting of the American Academy of Audiology in Philadelphia, April, 2002.

Freyman, R.L. Balakrishnan, U. and Helfer, K.S. (2002) "When does informational masking of speech occur and how can it be overcome?" Presented at the International Workshop on Binaural Hearing at Cocktail Parties, Delmenhorst, Germany, August 2002.

Freyman, R.L. and Zurek, P.Z. (2003) "Predicting masked detection and speech recognition in reverberant rooms," Paper presented at the 26<sup>th</sup> Annual Midwinter Meeting of the Association for Research in Otolaryngology, February, 2003.

Freyman, R.L., (2003). "Spatial and non-spatial factors in informational masking," Paper presented at Workshop on Spatial and Binaural Hearing, Utrecht, Holland, June, 2003.

Whitmal, N., Poissant, S., Freyman, R., & Helfer, K. (2004). "Effect of combining different carriers across bands on speech intelligibility in cochlear implant simulation." Presented at the Advances in Research in Otolaryngology (ARO) annual conference, Daytona Beach, FL, February 2004.

Poissant, S.F. & Freyman, R.L. (2004). Feasibility, validity, & reliability of cross-modality matching in assessing loudness in adult and pediatric cochlear implant recipients. VIII International Cochlear Implant Conference, Indianapolis, Indiana.

Helfer, K.S. and Freyman, R.L. "Development of a topic-related sentence corpus for speech perception research," Paper presented at the 147<sup>th</sup> meeting of the Acoustical Society of America in New York, May 2004.

Freyman, R.L. and Keen R. "Disrupting the build-up of the precedence effect," Paper presented at the 147<sup>th</sup> meeting of the Acoustical Society of America in New York, May 2004.

Whitmal, N., Poissant, S., Freyman, R., & Helfer, K. "Effect of Low-noise noise carriers on speech intelligibility in simulations of cochlear implant processors with normal-hearing listeners," Presented at the Advances in Research in Otolaryngology (ARO) annual conference, New Orleans, LA, February 2005.

Poissant S.F. and Freyman, R.L. (2005) "Assessing loudness with cross-modality matching in CI users", presented at the annual convention of the American Academy of Audiology, Washington, D.C. April.

Helfer, K., & Freyman, R. Speech-on-speech masking: Factors that help or hinder performance. Presented at the International Adult Aural Rehabilitation Conference, Portland, ME, May 2005.

Freyman, R., Helfer, K., & Balakrishnan, U. "Sources of variation in masking by competing speech." Presented at the Acoustical Society of America conference, Vancouver, B.C., May 2005.

Freyman, R.L. "Informational Masking In Speech Recognition: Potential Implications for Implant Users," Invited talk at the Conference on Implantable Auditory Prostheses, Asilomar, August, 2005.

Poissant, S.F., Whitmal III, N.A., and Freyman, R.L., "Effects of reverberation and masking on speech intelligibility in cochlear implant simulation," Presented at the conference on implantable auditory prosthesis at Asilomar, August, 2005.

Freyman, RL (2006). "What is informational masking and how does it matter in sensorineural hearing loss", paper presented at the International Hearing Aid Conference, Lake Tahoe, August, 2006.

Bibeau, L., Davis, G. A, Clifton, C.C, and Freyman, R.L. The influence of strategies on lexical access in aphasia," Presented at the Clinical Aphasiology Conference, Ghent, June, 2006.

Helfer, K.S., & Freyman, R.L. "How do task instructions influence speech-on-speech masking," Journal of the Acoustical Society of America, May, 2006, page 3238.

Helfer, K.S., and Freyman, R.L. "Aging and speech-on-speech masking," Presented at the American Auditory Society Conference, Scottsdale, AZ, March, 2006.

Freyman, R.L., Balakrishnan, U. and Helfer (2006) "Exploration of spatial release from masking in a simulation of cochlear implant listening," Presented at the Association for Research in Otolaryngology (ARO) annual conference, Baltimore, February, 2006.

Helfer, K.S., and Freyman, R.L "Lexical and indexical influences in selective and divided attention" Paper presented at the annual meeting of the American Auditory Society, Scottsdale, AZ, March, 2008.

... Stopped itemizing presentations ...

### GRANT AWARDS

Freyman, R.L. "The effects of stimulus spectrum shape on short-duration pure-tone frequency discrimination." Biomedical Research Support Grant, The University of Massachusetts Graduate School, 1983-1984 (\$5,000).

Freyman, R.L. "The effects of stimulus frequency on the auditory precedence effect." Biomedical Research Support Grant, The University of Massachusetts Graduate School, 1986-1987 (\$1,800).

Freyman, R.L. "Computerized laboratories in hearing science." Teaching grant from University IDEAS program, 1987-1988 (Zenith Z-248 microcomputer plus \$500).

Nerbonne, G.P. and Freyman, R.L. "Acoustic variables affecting speech recognition for hearing-impaired individuals," Biomedical Research Support Grant, The University of Massachusetts Graduate School, 1987-1988 (\$3,480).

Freyman, R.L. and Clifton, R.K. (Co-P.I.'s) "The precedence effect as a dynamic process," Research grant awarded by the National Science Foundation, 1988-1991 (\$97,825).

Freyman, R.L. and Nerbonne, G.P. "Enhancement of speech for the hearing impaired via digital signal processing," Research grant awarded by the Whitaker Foundation, 1/89 to 12/91 (\$101,682).

Freyman, R.L. "Studies in sound localization and speech perception," Biomedical Research Support Grant, the University of Massachusetts Graduate School, 1991-1992 (\$4,700).

\*Freyman, R.L. and Clifton, R.K. (Co-P.I.'s) "The precedence effect as a dynamic process," "Research grant awarded by NIH, 1992-1995 (approximately \$200,000).

Freyman, R.L. and Nerbonne, G.P. "Amplitude envelope cues in speech recognition," Research grant awarded by NIH, 1992-1995 (approximately \$300,000).

Fisher, D., (Freyman, R.L. and others) "The development of an integrated eye tracker, driving simulator, and virtual acoustic environment," Research equipment grant awarded by NSF, 1994-1997 (\$150,000).

Freyman, R.L. "The role of the precedence effect in understanding speech" Healey Foundation Grant, 5-1-97 to 4-30-98 (\$4,980).

\*Freyman, R.L. (P.I.) and Clifton, R.K. "The precedence effect as a dynamic process," Research grant awarded by NIH, 1997-2001 (\$429,000).

\*Freyman, R.L. (P.I.), Clifton, R.K., and Helfer, K.S. "Precedence: Its role in recognizing speech in noise." Research grant awarded by NIH, 2002-2006 (\$607,794.)

\*Freyman, R.L. (P.I.), Clifton, R.K., and Helfer, K.S. “Precedence: Its role in recognizing speech in noise.” Supplement for underrepresented minorities. (about \$65,000)

Poissant, S.F. (P.I.), Whitmal, N.A. III, and Freyman, R.L. “Noise and masking interactions with cochlear implant processing,” NIH, 9-05 to 8-07 (\$147,440)

\*Freyman, R.L. (P.I.), Keen, R., and Helfer, K.S. “Spatial hearing in complex sound fields,” NIH, 12-05-06 to 11-04-2010, (\$913,000).

\*Freyman, R.L. (P.I.), Helfer, K.S., and Sanders, L. “Spatial hearing in complex sound fields,” NIH, 6-1-2011 to 5-31-2016 (about \$1.3 million)

Helfer, K.S. (P.I.), Freyman, R.L., and Jesse, A. “Aging and speech perception in complex listening environments,” NIH, 7-1-2012 to 6-30-2017 (about \$1.3 million).

\*Freyman, R.L. (P.I.), Helfer, K.S., and Fitzpatrick, D.C. “Spatial hearing in complex sound fields,” NIH R01, 4-1-2016 to 3-31-2021, (~\$1,600,000).

Helfer, K.S., (P.I.) Freyman, R.L., and Souza, A. “Aging and speech perception in complex listening environments,” NIH R01, 7-1-2017 to 6-30-2022 (\$2,020,470).

Freyman, R.L. (P.I.) “Testing a compact speaker array”. Subcontract of a DHA (Defense Health Agency federal grant to Sensimetrics Corporation. 6-2019 to 5-2022 (\$91,440 during the second year of grant).

\*Freyman, R.L. (P.I.), and Buss, E., “Spatial hearing in complex sound fields,” NIH R01, 2-12-2022 to 31-31-2025 (\$1,192,759)

\*Original, competing renewals, and supplements of R01 DC-01625.

## PROFESSIONAL SERVICE

### Department, School, University, and National Service

Director, Communication Sciences Laboratory, 1983 - .

Consultant to Rachel Clifton on NIH grant, Department of Psychology, 1983 - 1987.

Department Graduate Admissions Committee, many years.

Department Personnel Committee, many years.

Department Curriculum Committee, many years.

Department Comprehensive Examination Committee, 1986 – 1987, 2021-2022.

Department Liaison to University Library, 1986 - 1988.

Department Undergraduate Program Director, Summer, 1988 – 2001, 2007-2016.

School of Health Sciences Personnel Committee, 1986 – 1987, 2001-2003.

Technical Reviewer, University Biomedical Research Support Grants, 1985, 2009.

\*Ad Hoc Review panelist on NIH R01 (many years) and F31/F32 panels (occasionally) .

\*Associate Editor of the Journal of the Acoustical Society of America, July 2006-June, 2009.

\*National Science Foundation grant reviewer, 2011

University Faculty Senate, 1987 - 1990.

School of Health Sciences Human Subject Review Committee, 1993-1996.

School of Health Sciences Undergraduate Curriculum Committee, 1995-2001.

Acting Associate Dean for the School of Public Health and Health Sciences, January-August 2003.

Editorial Consultant, Journal of the Acoustical Society of America, Journal of Speech and Hearing Research, Perception and Psychophysics, Ear and Hearing, many years.

Member, ASHA committee to recruit males to the professions, 1993.

Member, Hearing Science subcommittee for ASHA convention, 1997-1998.

Member of the Physiological and Psychological Acoustics Technical Committee for the Acoustical Society of America (1999-2003, 2006-2009, 2014-2017, 2018-2021).

\*Standing Study Section Member of AUD Panel for NIH CSR, July, 2013 to June, 2016.  
Chair of AUD Panel for NIH CSR, July, 2016 to June, 2017.

\*Participated in the Grant Reviewer and Reviewer Training (GRRT) program of the American Speech-Language-Hearing Association (ASHA). Two-day program as a reviewer of ASHA Foundation grants while at the same time mentoring younger grant reviewers. Gaithersburg, MD, July 2017, 2018, 2019, 2020, 2021.

\*Participated in Lessons for Success program of the American Speech-Language-Hearing Association (ASHA). Three-day program as faculty of ASHA program to mentor junior investigators with grant preparation. 2019, 2020, 2021.

\*Three-year (2019-2022) term on the RSAC (Research and Scientific Affairs Committee) of the American Speech-Language-Hearing Association. The committee runs three programs: GRRT, Lessons for Success, and programs at the Association's Annual Convention.

\*Major discipline-level service.

#### Community Service -- Unpaid Consultantships and Presentations

Consultant to the town of Amherst for drafting of community noise ordinance (1985).

Consultant to Amherst Public Schools for noise measurements and conversion of a work room into a sound-treated room for audiometric testing (1986-present).

Consultant to Valley Citizens for a Safe Environment concerning noise levels associated with proposed relocation of C-5A transport planes to Westover AFB. (1987, 1988).

Consultant to Springfield Science Museum concerning proposed addition of exhibits related to sound and hearing (May, 1987).

"Hearing and Aging." Invited presentation to Holyoke Jewish Seniors (March, 1986).

"Education and Careers in Communication Disorders." Workshop for the Massachusetts 4H "A look ahead" program (June, 1987).

"Hearing Aids for Seniors," Invited presentation to Holyoke Jewish Seniors (March, 1987).

Consultant to Goshen Schools and Pittsfield Schools for concerning classroom acoustics, several years.

Consultant to the Amherst schools concerning classroom noise and acoustics, 1998.

Board of Directors, Willie Ross School for the Deaf. My involvement is related to my roles as an audiologist and professor at the University, 2011-present.

"Hearing Loss in Aging," Invited presentation to Holyoke 39ers (Nov, 2019).

"Science of Hearing in Aging" Invited presented to Longmeadow Adult Center (Dec, 2021).

#### CERTIFICATION AND MEMBERSHIPS

Certificate of Clinical Competence in Audiology, July, 1979.

Massachusetts State Licensure in Audiology, January, 1984.

Member - American Speech-Language-Hearing Association.

Member and Fellow - Acoustical Society of America.

Member – Association for Research in Otolaryngology

Member – American Auditory Society

Member – National Hearing Conservation Association