

Frank H. Guenther

Professor, Department of Cognitive and Neural Systems, Boston University, 677 Beacon Street, Boston, Massachusetts 02215. Phone: (617) 353-5765. Fax: (617) 353-7755. Email: guenther@cns.bu.edu.

OVERVIEW

I am a computational and cognitive neuroscientist specializing in speech and sensorimotor control. My research combines theoretical modeling with behavioral and neuroimaging experiments to characterize the neural computations underlying these faculties in humans. I am also involved in the development of speech prostheses that utilize brain-computer interfaces to restore synthetic speech to paralyzed individuals.

POSITIONS

- **Associate Professor, Boston University (Sep. 1998 – present)**
Responsibilities include teaching graduate-level courses in the Department of Cognitive and Neural Systems, supervising graduate student dissertation research, acting as Principal Investigator on research sponsored by the National Institutes of Health, and acting as an investigator on a number of other research projects. Research areas include neural modeling and functional brain imaging of speech production, speech perception, and communication disorders, as well as neural prosthetics for speech. I am Director of the CNS Speech Lab, including research supervision of 8 graduate students and 4 postdoctoral fellows on NIH- and NSF-sponsored projects.
- **Faculty Member, Harvard University/MIT (Sep. 1998 – Present)**
Responsibilities include graduate student dissertation research supervision and occasional teaching in the Harvard/MIT joint program in Speech and Hearing Bioscience and Technology, Division of Health Sciences and Technology.
- **Research Affiliate, Massachusetts Institute of Technology (April 1997 – Present)**
Perform collaborative research with Dr. Joseph Perkell and other members of the Speech Communication Group in the Research Laboratory of Electronics. This collaborative effort fuses our modeling work with the experimental program headed by Dr. Perkell.
- **Visiting Scientist, Massachusetts General Hospital (June 2003 – Present)**
Perform fMRI research at the MGH NMR Center in Charlestown, MA.
- **Assistant Professor, Boston University (Sep. 1992 – Aug. 1998)**
Responsibilities included teaching graduate-level courses in the Department of Cognitive and Neural Systems, supervising graduate student dissertation research, and performing research sponsored by the National Institutes of Health, the Alfred P. Sloan Foundation, and the Air Force Office of Scientific Research. Research involved studies of speech communication, adaptive sensorimotor control, spatial representation, and autonomous robot navigation.
- **Research Fellow, Boston University (Aug. 1989 – Aug. 1992)**
Performed NSF-supported research on adaptive sensory-motor control with Professors Stephen Grossberg and Daniel Bullock. Projects included neural modeling of spatial representation and inverse kinematics transformations for targeted arm movements. Emphasis was on autonomous learning and motor equivalence properties such as tool use and the ability to overcome constraints on the limb.

- **Engineer, Raytheon Company (Aug. 1987 – Aug. 1989)**
Performed specification, design, layout, and testing of VLSI chips and circuits. Wrote modeling software and application programs in C and PASCAL.
- **Teaching and Research Assistant, Princeton University (Aug. 1986 – June 1987)**
Acted as a teaching and research assistant while obtaining Masters degree in Electrical Engineering.

EDUCATION

- **PhD, Cognitive and Neural Systems, Boston University (Jan. 1993)**
4.0/4.0 GPA. Thesis entitled "Neural models of adaptive sensory-motor control for flexible reaching and speaking." Research focused on biologically inspired models of spatial representation and movement control. Curriculum covered the study and mathematical modeling of neural systems, including motor control, reinforcement learning, vision, speech, and memory systems.
- **MSE, Electrical Engineering, Princeton University (Aug. 1987)**
3.9/4.0 GPA. Coursework included digital systems design, probability theory, signal processing, computer algorithm theory, and complex analysis.
- **BS, Electrical Engineering, University of Missouri (May 1986)**
4.0/4.0 GPA. Ranked first in a graduating class of over 500 students in the College of Engineering.

AWARDS AND HONORS

- 2007 Editor's Award for top article in hearing, *Journal of Speech, Language, and Hearing Research*
- 2007 Willard R. Zemlin Lecture Award, American Speech-Language-Hearing Association
- 2006 M.D. Steer Distinguished Lecturer, Purdue University
- 2004 Distinguished Lecturer in Speech and Hearing Bioscience and Technology, Harvard/MIT
- 2002 - Nominated for Metcalf Cup and Prize for Excellence in Teaching
- 1998 - Awarded tenure at Boston University
- 1996-2001 - NIH FIRST Award
- 1995-1997 - Alfred P. Sloan Research Fellowship
- 1986 - Summa cum laude, University of Missouri (Valedictorian of College of Engineering)
- 1982-1986 - National Merit Scholar, University of Missouri
- 1982-1986 - Curators Scholar, University of Missouri
- 1982 - Valedictorian, Belton High School, Belton, Missouri

RESEARCH GRANTS

- **NIH R01 DC007683, Principal Investigator (4/1/2006-3/31/2011)**
\$1.56 million over five years. Project entitled "Sequencing and Initiation in Speech Production." Application received a percentile rank of 1.1%. This project investigates the neural mechanisms involved in the motor sequencing of speech sounds using a combination of neural modeling and functional magnetic resonance imaging.
- **NIH R01 DC002852, Principal Investigator (8/1/2006-7/31/2011)**
\$1.68 million over five years. Project entitled "Neural modeling and imaging of speech." The focus of this project is the continued development of a neural network model of speech production and perception (the DIVA model) and testing of this model using psychophysical experiments and functional magnetic resonance imaging at the Massachusetts General Hospital NMR Center.

- **NSF SBE-0354378, Investigator (10/1/2004– 09/30/2009)**
 \$20 million over 5 years. Project entitled “CELEST: A center of excellence for learning in education, science, and technology” (S. Grossberg, Principal Investigator), one of four NSF Science of Learning Centers chosen from the initial pool of over 100 applications. My role on the project involves neural modeling of speech production in noisy environments and speaker-independent auditory representations for speech motor learning.
- **NIH R01 DC03007, Investigator (12/1/2006 – 11/30/2011)**
 \$2.8 million over 5 years. MIT/BU collaborative project entitled “Effects of hearing status on adult speech production” (J. Perkell, Principal Investigator). My role on the project involves the definition and refinement of a theoretical framework that accounts for the results of kinematic, acoustic, and neuroimaging studies of speech in hearing impaired individuals, as well as the design and interpretation of experiments to test this framework.
- **NIH R01 DC01925, Investigator (12/1/1998 – 11/31/2008)**
 \$3.6 million over 5 years. MIT/BU collaborative project entitled “Constraints and strategies in speech production” (J. Perkell, Principal Investigator). Application received the highest score in a pool of approximately 140 applications (percentile rank of 0.7%). Prof. Guenther’s role on the project involves the definition and refinement of a theoretical framework that accounts for kinematic, acoustic, and neuroimaging measures of speech in neurologically normal individuals, as well as the design and interpretation of experiments to test this framework.
- **NIH F32 DC006782, Principal Investigator (6/1/2004 – 5/31/2007)**
 \$133,000 over three years. Postdoctoral training grant funding Dr. Kevin Reilly. The goal of this project is to identify brain networks involved in the acquisition and representation of a novel sensorimotor mapping involving the speech articulators using a combination of neural modeling and fMRI experiments.
- **NIH R01 DC02852, Principal Investigator (2/1/2001-1/31/2006)**
 \$1.8 million over five years. Project entitled “Neural modeling and imaging of speech.” Application received the highest score in a pool of approximately 170 applications (percentile rank of 0.6%). The focus of this project was the development of a neural network model of speech perception and production and testing of this model using functional magnetic resonance imaging at the Massachusetts General Hospital NMR Center and magnetoencephalography at the KIT/MIT MEG Joint Research Lab.
- **NIH FIRST Award, R29 DC02852, Principal Investigator (2/1/1996-1/31/2001)**
 \$578,000 over five years. Project entitled “Neural network modeling of speech production.” Application received the second highest score in a pool of approximately 120 applications (percentile rank of 1.7%).
- **Alfred P. Sloan Foundation Research Fellowship, Principal Investigator (9/1/1995-8/31/1997)**
 \$30,000 over two years. One of fifteen awardees nationwide in neuroscience.

JOURNAL PUBLICATIONS

- Bullock, D., Greve, D., and Guenther, F.H. (1992). Do reaches in the dark shed sufficient light on internal representations? Commentary to Flanders, M., Helms Tillery, S.I., and Soechting, J.F., Early stages in a sensorimotor transformation, *Behavioral and Brain Sciences*, **15**(2), pp. 330-332.
- Bullock, D., Grossberg, S., and Guenther, F.H. (1993). A self-organizing neural model of motor equivalent reaching and tool use by a multijoint arm. *Journal of Cognitive Neuroscience*, **5**, pp. 408-435.
- Greve, D., Grossberg, S., Guenther, F.H., and Bullock, D. (1993). Neural representations for sensory-motor control, I: Head-centered 3-D target positions from opponent eye commands. *Acta Psychologica*, **82**, pp. 115-138.
- Grossberg, S., Guenther, F.H., Bullock, D., and Greve, D. (1993). Neural representations for sensory-motor control II: Learning a head-centered visuomotor representation of 3-D target positions. *Neural Networks*, **6**, pp. 43-67.
- Guenther, F.H., Bullock, D., Greve, D., and Grossberg, S. (1994). Neural representations for sensory-motor control, III: Learning a body-centered representation of 3-D target position. *Journal of Cognitive Neuroscience*, **6**, pp. 341-358.
- Guenther, F.H. (1994). A neural network model of speech acquisition and motor equivalent speech production. *Biological Cybernetics*, **72**, pp. 43-53.
- Guenther, F.H. (1995). Speech sound acquisition, coarticulation, and rate effects in a neural network model of speech production. *Psychological Review*, **102**, pp. 594-621.
- Guenther, F.H., and Gjaja, M.N. (1996). The perceptual magnet effect as an emergent property of neural map formation. *Journal of the Acoustical Society of America*, **100**, pp. 1111-1121.
- Perkell, J.S., Matthies, M.L., Lane, H., Guenther, F.H., Wilhelms-Tricarico, R., Wozniak, J., and Guiod, P. (1997). Speech motor control: Acoustic segmental goals, saturation effects, auditory feedback and internal models. *Speech Communication*, **22**, pp. 227-250.
- Cameron, S., Grossberg, S., and Guenther, F.H. (1998). A self-organizing neural network architecture for navigation using optic flow. *Neural Computation*, **10**, pp. 313-352.
- Guenther, F.H. (1998). An account of the locus equation phenomenon based on speech movement planning. Commentary to Sussman, H.M., Fruchter, D., Hilbert, J., and Sirosh, J., Linear correlates in the speech signal: The orderly output constraint. *Behavioral and Brain Sciences*, **21**, pp. 268-269.
- Guenther, F.H., Hampson, M., and Johnson, D. (1998). A theoretical investigation of reference frames for the planning of speech movements. *Psychological Review*, **105**, pp. 611-633.
- Guenther, F.H., Espy-Wilson, C.Y., Boyce, S.E., Matthies, M.L., Zandipour, M., and Perkell, J.S. (1999). Articulatory tradeoffs reduce acoustic variability during American English /r/ production. *Journal of the Acoustical Society of America*, **105**, pp. 2854-2865.
- Guenther, F.H., Husain, F.T., Cohen, M.A., and Shinn-Cunningham, B.G. (1999). Effects of categorization and discrimination training on auditory perceptual space. *Journal of the Acoustical Society of America*, **106**, pp. 2900-2912.
- Guenther, F.H. (2000). An analytical error invalidates the "depolarization" of the perceptual magnet effect. *Journal of the Acoustical Society of America*, **107**, pp. 3576-3580.
- Callan, D.E., Kent, R.D., Guenther, F.H., and Vorperian, H.K. (2000). An auditory-feedback-based neural network model of speech production that is robust to developmental changes in the size and shape of the articulatory system. *Journal of Speech, Language, and Hearing Research*, **43**, pp. 721-736.

- Perkell, J.S., Guenther, F.H., Lane, H., Matthies, M.L., Perrier, P., Vick, J., Wilhelms-Tricarico, R., and Zandipour, M. (2000). A theory of speech motor control and supporting data from speakers with normal hearing and profound hearing loss. *Journal of Phonetics*, **28**, pp. 233-272.
- Micci Barreca, D., and Guenther, F.H. (2001). A modeling study of potential sources of curvature in human reaching movements. *Journal of Motor Behavior*, **33**, pp. 387-400.
- Guenther, F.H., and Bohland, J.W. (2002). Learning sound categories: A neural model and supporting experiments. *Acoustical Science and Technology*, **23**(4), pp. 213-220. Japanese-language version appeared in *Journal of the Acoustical Society of Japan*, **58**(7), pp. 441-449, July 2002.
- Nieto-Castanon, A., Ghosh, S.S., Tourville, J.A., and Guenther, F.H. (2003). Region-of-interest based analysis of functional imaging data. *NeuroImage*, **19**, pp. 1303-1316.
- Guenther, F.H., Nieto-Castanon, A., Ghosh, S.S., and Tourville, J.A. (2004). Representation of sound categories in auditory cortical maps. *Journal of Speech, Language, and Hearing Research*, **47**(1), pp. 46-57.
- Max, L., Guenther, F.H., Gracco, V.L., Ghosh, S.S., and Wallace, M.E. (2004). Unstable or insufficiently activated internal models and feedback-biased motor control as sources of dysfluency: A theoretical model of stuttering. *Contemporary Issues in Communication Science and Disorders*, **31**, pp. 105-122.
- Perkell, J.S., Guenther, F.H., Lane, H., Matthies, M.L., Stockmann, E., Tiede, M., and Zandipour, M. (2004). The distinctness of speakers' productions of vowel contrasts is related to their discrimination of the contrasts. *Journal of the Acoustical Society of America*, **116**(4) Pt. 1, pp. 2338-2344.
- Perkell, J.S., Matthies, M.L., Tiede, M., Lane, H., Zandipour, M., Marrone, N., Stockmann, E., and Guenther, F.H. (2004). The distinctness of speakers' /s-sh/ contrast is related to their auditory discrimination and use of an articulatory saturation effect. *Journal of Speech, Language, and Hearing Research*, **47**, pp. 1259-1269.
- Lane, H., Denny, M., Guenther, F.H., Matthies, M.L., Menard, L., Perkell, J.S., Stockmann, E., Tiede, M., Vick, J., and Zandipour, M. (2005). Effects of bite blocks and hearing status on vowel production. *Journal of the Acoustical Society of America*, **118**, pp. 1636-1646.
- Nieto-Castanon, A., Guenther, F.H., Perkell, J.S., and Curtin, H. (2005). A modeling investigation of articulatory variability and acoustic stability during American English /r/ production. *Journal of the Acoustical Society of America*, **117**, pp. 3196-3212.
- Horwitz, B., Husain, F.T., and Guenther, F.H. (2005). Auditory object processing and primate biological evolution. Commentary to Arbib, M.A., From monkey-like action recognition to human language: An evolutionary framework for neurolinguistics, *Behavioral and Brain Sciences*, **28**, p. 134.
- Guenther, F.H., Ghosh, S.S., and Tourville, J.A. (2006). Neural modeling and imaging of the cortical interactions underlying syllable production. *Brain and Language*, **96**, pp. 280-301.
- Guenther, F.H. (2006). Cortical interactions underlying the production of speech sounds. *Journal of Communication Disorders*, **39**, pp. 350-365.
- Bohland, J.W. and Guenther, F.H. (2006). An fMRI investigation of syllable sequence production. *NeuroImage*, **32**, pp. 821-841.
- Perkell, J.S., Denny, M., Lane, H., Guenther, F.H., Matthies, M.L., Tiede, M., Vick, J., Zandipour, M., and Burton, E. (2007). Effects of masking noise on vowel and sibilant contrasts in normal-hearing speakers and postlingually deafened cochlear implant users. *Journal of the Acoustical Society of America*, **121**, pp. 505-518.

- Lane, H, Denny, M., Guenther, F.H., Hanson, H., Marrone, N., Matthies, M.L., Perkell, J.S., Burton, E., Tiede, M., Vick, J., and Zandipour, M. (2007). On the structure of phoneme categories in listeners with cochlear implants. *Journal of Speech, Language, and Hearing Research*, **50**, pp. 2-14.
- Lane, H., Matthies, M.L., Denny, M., Guenther, F.H., Perkell, J.S., Stockmann, E., Tiede, M., Vick, J., and Zandipour, M. (2007). Effects of short- and long-term changes in auditory feedback on vowel and sibilant contrasts. *Journal of Speech, Language, and Hearing Research*, **50**, pp. 913-927.
- Villacorta, V.M., Perkell, J.S., and Guenther, F.H. (2007). Sensorimotor adaptation to feedback perturbations of vowel acoustics and its relation to perception. *Journal of the Acoustical Society of America*, **122**, pp. 2306-2319.
- Tourville, J.A., Reilly, K.J., and Guenther, F.H. (2008). Neural mechanisms underlying auditory feedback control of speech. *NeuroImage*, **39**, 1429-1443.
- Ghosh, S.S., Tourville, J.A., and Guenther, F.H. (in press). A neuroimaging study of premotor lateralization and cerebellar involvement in the production of phonemes and syllables. *Journal of Speech, Language, and Hearing Research*.
- Loui, P., Guenther, F.H., Mathys, C., and Schlaug, G. (2008). Action-perception mismatch in tone-deafness. *Current Biology*, **18**, R331-R332.

BOOK CHAPTERS

- Bullock, D., Grossberg, S., and Guenther, F.H. (1996). Neural network modeling of sensory-motor control in animals. In: Zelaznik, H. (ed.), *Advances in Motor Learning and Control* (pp. 261-292). Champaign, IL: Human Kinetics Press.
- Gaudio, P., Guenther, F.H., and Zalama, E. (1997). The neural dynamics approach to sensory-motor control: Overview and recent applications in mobile robot control and speech production. In: O. Omidvar and P. van der Smagt (eds.), *Neural Systems for Robotics* (pp. 153-194). San Diego, CA: Academic Press.
- Guenther, F.H., and Micci Barreca, D. (1997). Neural models for flexible control of redundant systems. In: P. Morasso and V. Sanguineti (eds.), *Self-organization, Computational Maps, and Motor Control* (pp. 383-421). Amsterdam: Elsevier-North Holland.
- Guenther, F.H. (2001). Neural networks: Biological models and applications. In N.J. Smelser and P.B. Baltes (eds.), *International Encyclopedia of the Social & Behavioral Sciences* (pp. 10534-10537). Oxford: Pergamon.
- Guenther, F.H. (2003). Neural control of speech movements. In: A. Meyer and N. Schiller (eds.), *Phonetics and Phonology in Language Comprehension and Production: Differences and Similarities*. Berlin: Mouton de Gruyter.
- Guenther, F.H., and Perkell, J.S. (2003). A neural model of speech production and its application to studies of the role of auditory feedback in speech. In: B. Maassen, R. Kent, H. Peters, P. Van Lieshout, and W. Hulstijn (eds.), *Speech Motor Control in Normal and Disordered Speech*. Oxford: Oxford University Press.
- Guenther, F.H., Ghosh, S.S., Nieto-Castanon, A., and Tourville, J.A. (2006). A neural model of speech production. In: J. Harrington and M. Tabain (eds.), *Speech Production: Models, Phonetic Processes, and Techniques*. London: Psychology Press.
- Perkell, J.S., Guenther, F.H., Lane, H., Marrone, N., Matthies, M.L., Stockmann, E., Tiede, M., and Zandipour, M. (2006). Production and perception of phoneme contrasts covary across speakers. In: J. Harrington and M. Tabain (eds.), *Speech Production: Models, Phonetic Processes, and Techniques*. London: Psychology Press.

- Guenther, F.H. (2007). Neuroimaging of normal speech production. In R. Ingham (Ed.), *Neuroscience Research in Communication Sciences and Disorders* (pp. 1-51). San Diego: Plural.

CONFERENCE PUBLICATIONS

- Bullock, D., Greve, D., Grossberg, S., and Guenther, F.H. (1992). A head-centered representation of 3-D target location derived from opponent eye position commands. In: *International Joint Conference on Neural Networks, Baltimore, MD, June 1992*, vol. I., pp. 79-85. Piscataway, NJ: Institute of Electrical and Electronics Engineers.
- Bullock, D., Grossberg, S., and Guenther, F.H. (1992). A self-organizing neural network model for redundant sensory-motor control, motor equivalence, and tool use. In: *International Joint Conference on Neural Networks, Baltimore, MD, June 1992*, vol. IV, pp. 91-96. Piscataway, NJ: Institute of Electrical and Electronics Engineers.
- Bullock, D., Greve, D., Grossberg, S., and Guenther, F.H. (1993). A self-organizing neural network for learning a body-centered invariant representation of 3-D target position. In: Gielen, S., and Kappen, B. (eds.), *Proceedings of the International Conference on Artificial Neural Networks, Amsterdam, The Netherlands, 13-16 September 1993*, pp. 90-95. London: Springer-Verlag. Also in: *World Congress on Neural Networks*, vol. II, pp. 405-408. Hillsdale, NJ: Erlbaum.
- Guenther, F.H. (1993). A self-organizing neural model for motor equivalent phoneme production. In: *World Congress on Neural Networks*, vol. III, pp. 6-9. Hillsdale, NJ: Erlbaum. Also in: Gielen, S., and Kappen, B. (eds.), *Proceedings of the International Conference on Artificial Neural Networks, Amsterdam, The Netherlands, 13-16 September 1993*, pp. 71-74. London: Springer-Verlag.
- Guenther, F.H. (1993). Sensorimotor transformations in a neural model of motor equivalent speaking. *Society for Neuroscience Abstracts*, **19** Pt. 1, p. 553.
- Guenther, F.H. (1994). Skill acquisition, coarticulation, and rate effects in a neural network model of speech production. Program of the 127th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **95**(5) Pt. 2, p. 2924.
- Cameron, S., Grossberg, S., and Guenther, F.H. (1995). A self-organizing heading and depth detection network. *Proceedings of the World Congress on Neural Networks, Washington, D.C.*, vol. 1, pp. 3-7. Mahwah, NJ: Erlbaum.
- Guenther, F.H. (1995). A modeling framework for speech motor development and kinematic articulator control. In: Elenius, K., and Branderud, P. (eds.), *Proceedings of the XIIIth International Congress of Phonetic Sciences, Stockholm, Sweden, 13-19 August, 1995*, Vol. 2, pp. 92-99. Stockholm, Sweden: KTH and Stockholm University.
- Guenther, F.H., and Johnson, D. (1995). A computational model using formant space planning of articulator movements for vowel production. Program of the 129th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **97**(5) Pt. 2, p. 3402.
- Guenther, F.H., and Micci Barreca, D. (1995). Efficient curved reaches resulting from kinematic biases in the DIRECT model. *Proceedings of the IEEE International Conference on Systems, Man, and Cybernetics*, Vancouver, B.C., Canada.
- Johnson, D., and Guenther, F.H. (1995). Acoustic space movement planning in a neural model of motor equivalent vowel production. *Proceedings of the World Congress on Neural Networks, Washington, D.C.*, vol. 1, pp. 481-485. Mahwah, NJ: Erlbaum.
- Micci Barreca, D., and Guenther, F.H. (1995). Efficient trajectory formation using a learned approximate pseudoinverse in the DIRECT model of reaching. *Proceedings of the World Congress on Neural Networks, Washington, D.C.*, vol. 1, pp. 388-392. Mahwah, NJ: Erlbaum.

- Guenther, F.H., and Gjaja, M.N. (1996). The perceptual magnet effect as an emergent feature of neural map formation. Program of the 131st Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **99**(4) Pt. 2, p. 2590.
- Guenther, F.H., Hampson, M., and Micci Barreca, D. (1996). Approximate vocal tract shape invariance without vocal tract shape targets. Program of the Third Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan, *Journal of the Acoustical Society of America*, **100**(4), Pt. 2, p. 2658.
- Gjaja, M.N., and Guenther, F.H. (1997). Experience-based auditory map formation and the perceptual magnet effect. In: J. Bower (ed.), *Proceedings of the 1996 Computational Neuroscience Meeting*. New York: Plenum.
- Guenther, F.H., Espy-Wilson, C.Y., Boyce, S.E., Matthies, M.L., Zandipour, M., and Perkell, J.S. (1997). Articulatory trade-offs reduce acoustic variability in American English /r/ productions. Program of the 134th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **102**(5) Pt. 2, p. 3094.
- Husain, F.T., and Guenther, F.H. (1998). Inducing a "perceptual magnet"-like effect in a non-speech modality. Program of the 16th International Congress on Acoustics and the 135th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **103**(5) Pt. 2, p. 2982.
- Hampson, M., Guenther, F.H., and Cohen, M.A. (1998). Visual influences on the perception of alveolar/velar place discrimination. Program of the 136th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **104**(3) Pt. 2, p. 1854.
- Callan, D.E., Kent, R.D., Guenther, F.H., and Vorperian, H.K. (1998). An auditory feedback based model of speech production in the developing child. Program of the 136th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **104**(3) Pt. 2, p. 1854.
- Guenther, F.H. (1998). A theoretical framework for speech acquisition and production. *Proceedings of the Second International Conference on Cognitive and Neural Systems, Boston University, Boston, May 28-30, 1998*, p. 57. Boston: Boston University Center for Adaptive Systems.
- Husain, F.T. and Guenther, F.H. (1998). Experimental tests of the neural models of the perceptual magnet effect. *Proceedings of the Second International Conference on Cognitive and Neural Systems, Boston University, Boston, May 28-30, 1998*, p. 92. Boston: Boston University Center for Adaptive Systems.
- Husain, F.T. and Guenther, F.H. (1999). Psychophysical investigations of category and discrimination learning. Cognitive Neuroscience Society Annual Program 1999, *Journal of Cognitive Neuroscience Supplement*, p. 44.
- Guenther, F.H., and Husain, F.T. (1999). Psychophysical investigations of auditory space deformations resulting from category and discrimination learning. *Proceedings of the XIVth International Congress of Phonetic Sciences*, pp. 2061-2064. Berkeley: Regents of the University of California.
- Nieto-Castanon, A., and Guenther, F.H. (1999). Constructing speaker-specific articulatory vocal tract models for testing speech motor control hypotheses. *Proceedings of the XIVth International Congress of Phonetic Sciences*, pp. 2271-2274. Berkeley: Regents of the University of California.
- Perkell, J.S., Zandipour, M., Vick, J., Matthies, M., Lane, H., Guenther, F., and Gould, J. (2000). Rapid changes in speech production parameters in response to a change in hearing. *Proceedings of the 5th Seminar on Speech Production & CREST Workshop on Models of Speech Production, Kloster Seeon, Bavaria, Germany*, pp. 245-248.
- Perrier, P., Perkell, J., Payan, Y., Zandipour, M., Guenther, F., and Khalighi, A. (2000). Degrees of freedom of tongue movements in speech may be constrained by biomechanics. *Proceedings of the 6th International Conference on Spoken Language Processing, Beijing, China*, vol. II, pp. 162-165.

- Guenther, F.H., Nieto-Castanon, A., Tourville, J.A., and Ghosh, S.S. (2000). The representation of prototypical and non-prototypical vowels in peri-sylvian cortical areas. *Society for Neuroscience Abstracts*, vol. 26, part 2, p. 1971.
- Perkell, J.S., and Guenther, F.H. (2000). A model of speech motor control and supporting data: Influences of quantal effects. Program of the 140th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **108**(5) Pt. 2, p. 2626.
- Ghosh, S., Nieto-Castanon, A., Tourville, J., and Guenther, F. (2001). ROI-based analysis of fMRI data incorporating individual differences in brain anatomy. *Proceedings of the 7th Annual Meeting of the Organization of Human Brain Mapping, Brighton, UK*.
- Guenther, F.H. (2001). Neural modeling of speech production. *Proceedings of the 4th International Nijmegen Speech Motor Conference*, Nijmegen, The Netherlands, June 13-16, 2001.
- Guenther, F.H. (2001). A neural model of cortical and cerebellar interactions in speech. *Society for Neuroscience Abstracts*.
- Perkell, J., Guenther, F., Lane, H., Matthies, Vick, J., and Zandipour, M. (2001). Planning and auditory feedback in speech production. *Proceedings of the 4th International Nijmegen Speech Motor Conference*, Nijmegen, The Netherlands, June 13-16, 2001.
- Guenther, F.H., Nieto-Castanon, A., Tourville, J.A., and Ghosh, S.S. (2001). The effects of categorization training on auditory perception and cortical representations. *Proceedings of the Speech Recognition as Pattern Classification (SPRAAC) Workshop*, Nijmegen, The Netherlands, July 11-13, 2001.
- Perkell, J., Guenther, F., Lane, H., Matthies, M., Payan, Y., Perrier, P., Vick, J., Wilhelms-Tricarico, R., and Zandipour, M. (2001). The sensorimotor control of speech production. *Proceedings of The First International Symposium on Measurement, Analysis and Modeling of Human Functions, Sapporo, Japan*.
- Guenther, F.H. (2002). Effects of category learning on auditory perception and cortical maps. Program of the 143rd Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **111**(5) Pt. 2, p. 2383.
- Marrone, N., Stockmann, E., Guenther, F.H., Vick, J., Perkell, J.S., and Lane, H. (2002). Audio-visual integration in listeners with normal hearing and hearing aid users. Program of the 144th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **112**(5) Pt. 2, p. 2251.
- Vick, J.C., Perkell, J.S., Lane, H., Matthies, M., Zandipour, M., Stockmann, E., Guenther, F., and Tiede, M. (2002). Effects of hearing status and perturbation with a bite block on vowel production. Program of the 144th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **112**(5) Pt. 2, p. 2358.
- Guenther, F.H. (2003). Introductory remarks on neural modeling in speech perception research. Program of the 145th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **113**(4) Pt. 2, p. 2209.
- Guenther, F.H., Tourville, J.A., and Bohland, J. (2003). Modeling the representation of speech sounds in auditory cortical areas. Program of the 145th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **113**(4) Pt. 2, p. 2210.
- Ghosh, S., Bohland, J., and Guenther, F. (2003). Comparisons of brain regions involved in overt production of elementary phonetic units. *Proceedings of the 9th Annual Meeting of the Organization for Human Brain Mapping, New York*.

- Guenther, F.H. and Ghosh, S.S. (2003). A model of cortical and cerebellar function in speech. In M.J. Sole, D. Recasens & J. Romero (eds.), *Proceedings of the XVth International Congress of Phonetic Sciences* (pp. 169-173). Barcelona: Universitat Autònoma de Barcelona.
- Perkell, J.S., Guenther, F.H., Lane, H., Matthies, M.L., Stockmann, E., Tiede, M., and Zandipour, M. (2003). Cross-subject relations between measures of vowel production and perception. *Proceedings of the XVth International Congress of Phonetic Sciences*. Barcelona: 15th ICPHS Organizing Committee.
- Max, L., Gracco, V.L., Guenther, F.H., Ghosh, S., and Wallace, M. (2003). A sensorimotor model of stuttering: Insights from the neuroscience of motor control. In A. Packman, A. Meltzer, & H.F.M. Peters al. (Eds.), *Proceedings of the 4th World Congress on Fluency Disorders*. Nijmegen, The Netherlands: University of Nijmegen Press.
- Vick, J.C., Perkell, J.S., Hanson, H., Lane, H., Matthies, M., Marrone, N., and Guenther, F. (2003). Changes in the categorical perception of speech sounds following experience with a cochlear implant. *Proceedings of the 2003 Conference on Implantable Auditory Prostheses, Pacific Grove, California*.
- Nieto-Castanon, A., and Guenther, F.H. (2003). A model of auditory cortical representations underlying speech perception and production. *Society for Neuroscience Abstracts*.
- Guenther, F.H., Ghosh, S.S., and Nieto-Castanon, A. (2003). A neural model of speech production. *Proceedings of the 6th International Seminar on Speech Production, Sydney, Australia* (pp. 85-90).
- Bohland, J.W. and Guenther, F.H. (2004). An fMRI investigation of the neural bases of sequential organization for speech production. *Proceedings of the 10th Annual Meeting of the Organization for Human Brain Mapping, Budapest, Hungary*.
- Zandipour, M., Guenther, F., Perkell, J., Perrier, P., Payan, Y., and Badin, P. (2004). Vowel-vowel sequence planning in acoustic and muscle space. *Proceedings of From Sound to Sense: Fifty+ Years of Discoveries in Speech Communication, Cambridge, MA*.
- Guenther, F.H., and Perkell, J.S. (2004). A neural model of speech production and supporting experiments. *Proceedings of From Sound to Sense: Fifty+ Years of Discoveries in Speech Communication, Cambridge, MA*.
- Villacorta, V., Perkell, J., and Guenther, F. (2004). Sensorimotor adaptation to acoustic perturbations in vowel formants. Program of the 147th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **115**, p. 2430.
- Tiede, M.K., Guenther, F.H., Perkell, J.S., Ostry, D.J., Zandipour, M., and Houle, G. (2004). Perturbation and compensation in speech acoustics using a jaw-coupled robot. Program of the 148th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **116**, p. 2631.
- Yoo, J.J., Guenther, F.H., and Perkell, J.S. (2004). Cortical networks underlying audio-visual speech perception in normally hearing and hearing impaired individuals. Program of the 148th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **116**, p. 2524.
- Tourville, J.A., Guenther, F.H., Ghosh, S.S., and Bohland, J.W. (2004). Effects of jaw perturbation on cortical activity during speech production. Program of the 148th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **116**, p. 2631.
- Guenther, F.H. (2004). A neural network model of cortical and cerebellar involvement in speech motor control. *Proceedings of the Conference on Motor Speech, Albuquerque, New Mexico*.
- Perkell, J., Matthies, M., Guenther, F., Lane, H., Stockmann, E., Tiede, M., and Zandipour, M. (2004). Relationship between perceptual ability and the effects of perturbations on produced vowel contrasts. *Proceedings of the Conference on Motor Speech, Albuquerque, New Mexico*.

- Civier, O. and Guenther, F.H. (2005). Simulations of feedback and feedforward control in stuttering. *Proceedings of the Oxford Dysfluency Conference, St. Catherine's College, Oxford, 29th June to 2nd July, 2005.*
- Matthies, M.L., Guenther, F.G., Denny, M., Perkell, J.S., Burton, E., Vick, J., Tiede, M., and Lane, H. (2005). Perception and production of /r/ allophones improve with hearing from a cochlear implant. Program of the 150th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **118**, p. 1964.
- Tourville, J.A., Guenther, F.H., Ghosh, S.S., Reilly, K.J., Bohland, J.W., and Nieto-Castanon, A. (2005). Effects of acoustic and articulatory perturbation on cortical activity during speech production. *NeuroImage (Proceedings of the 11th Annual Meeting of the Organization for Human Brain Mapping, Toronto)*, **26**(S1), p. S49.
- Villacorta, V., Perkell, J.S., and Guenther, F.H. (2005). Relations between speech sensorimotor adaptation and perceptual acuity. Program of the 149th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **117**, pp. 2618-2619.
- Yoo, J.J., Guenther, F.H., and Perkell, J.S. (2005). Cortical networks underlying audio-visual speech perception in normally hearing and hearing impaired individuals, *Proceedings of the Workshop on Plasticity in Speech Perception June 15-17, 2005*. London: UCL Centre for Human Communication.
- Bohland, J., Guenther, F., and Bullock, D. (2006). Modeling and imaging of sequencing in speech production. *Proceedings of the Tenth International Conference on Cognitive and Neural Systems, Boston, MA.*
- Reilly, K.J., Guenther, F.H., and Tourville, J.A. (2006). Learning of a novel sensorimotor mapping involving the speech articulators. *Proceedings of the Conference on Motor Speech, Austin, Texas.*
- Zandipour, M., Perkell, J., Guenther, F., Tiede, M., Honda, K., and Murano, E. (2006). Speaking with a bite block: Data and modeling. *Proceedings of the 7th International Seminar on Speech Production.*
- Perkell, J., Zandipour, M., Ghosh, S., Ménard, L., Lane, H., Tiede, M. and Guenther, F. (2007). Variation in vowel production. Program of the 152nd Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **120**, p. 505.
- Zandipour M., Perkell J., Guenther, F., Tiede, M., Honda, K., Murano, E. (2007). Different motor strategies for increasing speaking rate Data and modeling. Program of the 152nd Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, **120**, p. 3293.
- Peeva, M.G., Guenther, F., Anton, J.L., Nazarian, B, and Alario, F.X. (2007). Investigating the neural bases of syllable construction and execution. *Society for Neuroscience Abstracts.*
- Siebert, S., Andreasen, D.S., Bartels, J., Brumberg, J., Guenther, F., Kennedy, P.R., and Wright, E.J. (2007). Human speech cortex long-term recordings [1]: Spike sorting and noise reduction. *Society for Neuroscience Abstracts.*
- Wright, E.J., Andreasen, D.S., Bartels, J., Brumberg, J., Guenther, F., Kennedy, P.R., Miller, L., Rebesco, J., Schwartz, A.B., Siebert, S., and Velliste, M. (2007). Human speech cortex long-term recordings [3]: Neural net analyses. *Society for Neuroscience Abstracts.*
- Miller, L., Andreasen, D.S., Bartels, J., Brumberg, J., Guenther, F., Kennedy, P.R., Rebesco, J., Siebert, S., and Wright, E.J. (2007). Human speech cortex long-term recordings [4]: Bayesian analyses. *Society for Neuroscience Abstracts.*
- Brumberg, J., Andreasen, D.S., Bartels, J., Guenther, F., Kennedy, P.R., Schwartz, A.B., Siebert, S., Velliste, M., and Wright, E.J. (2007). Human speech cortex long-term recordings [5]: Formant frequency analyses. *Society for Neuroscience Abstracts.*

- Peeva, M.G., Guenther, F., Anton, J.-L., Nazarian, B., and Alario, F.-X. (2007). Syllable sequence production: An fMRI repetition priming study. *Proceedings of the XVth Meeting of the European Society for Cognitive Psychology, Marseilles, France.*
- Reilly, K.J., Guenther, F.H., Tourville, J.A., and Bohland, J.W. (2007). A neuroimaging investigation of auditory-motor learning. *Proceedings of the 154th Meeting of the Acoustical Society of America. New Orleans, LA.*
- Tourville, J.A. and Guenther, F.H. (2007). Neural mechanisms underlying sensory feedback control of speech. *Proceedings of the 154th Meeting of the Acoustical Society of America. New Orleans, LA.*
- Patel, R. Campellone, P., Reilly, K.J., Niziolek, C., and Guenther, F.H. (in press). Prosodic compensations to pitch perturbation during running speech. *Proceedings of the Conference on Motor Speech, Monterey, California.*
- Perkell, J.S., Ghosh, S., Guenther, F.H., Lane, H., Matthies, M.L., Ménard, L., and Tiede, M. (in press). Mechanisms of vowel production: Auditory goals and speaker acuity. *Proceedings of the Conference on Motor Speech, Monterey, California.*
- Robin, D.A., Guenther, F.H., Narayana, S., Jacks, A., Tourville, J.A., Ramage, A.E., Lancaster, J.L., Franklin, C., Ghosh, S., and Fox, P.T. (in press). A transcranial magnetic stimulation virtual lesion study of speech. *Proceedings of the Conference on Motor Speech, Monterey, California.*
- Terband, H., Maassen, B., Brumberg, J., and Guenther, F.H. (in press). Increased levels of neural noise as the core deficit in childhood apraxia of speech (CAS). *Proceedings of the Conference on Motor Speech, Monterey, California.*

OTHER PUBLICATIONS

- Guenther, F.H. (1992). *Neural Models of Adaptive Sensory-motor Control for Flexible Reaching and Speaking*. Boston University Ph.D. Dissertation.
- Guenther, F.H., and Bullock, D. (1992). Book Review: *Neural Networks for Control*, Miller, W.T. III, Sutton, R.S., and Werbos, P.J., eds. *Neural Networks*, **5**, pp. 531-535.
- Fiala, J., and Guenther, F.H. (1994). Book Review: *Handbook of Intelligent Control: Neural, Fuzzy, and Adaptive Approaches*, White, D.A., and Sofge, D.A., eds. *Neural Networks*, **7**, pp. 851-852.
- Guenther, F.H., and Meyers, C. (1995). Book Review: *An Introduction to the Modeling of Neural Networks*, Peretto, P. *Neural Networks*, **8**, pp. 1487-1489. Also appeared in *SIAM Review*, **37**(4).
- Guenther, F.H., Espy-Wilson, C.Y., Boyce, S.E., Matthies, M.L., Zandipour, M., and Perkell, J.S. (1997). Intraspeaker comparisons of acoustic and articulatory variability in American English /t/ productions. Technical Report CAS/CNS-97-010. Boston: Boston University.
- Hampson, M., Guenther, F.H., Cohen, M. (1999). Changes in the McGurk effect across phonetic contexts. I. Fusions. Technical Report CAS/CNS-TR-99-031. Boston: Boston University.
- Callan, D.E., Honda, K., Masaki, S., Kent, R.D., Guenther, F.H., and Vorperian, H.K. (2001). Robustness of an auditory-to-articulatory mapping for vowel production by the DIVA model to subsequent developmental changes in vocal tract dimensions. ATR Technical Report TR-H-309. Kyoto, Japan: Advanced Telecommunications Research Institute.
- Hampson, M. Guenther, F.H., Cohen, M.A., and Nieto-Castanon, A. (2003). Changes in the McGurk Effect across phonetic contexts. Technical Report CAS/CNS-TR-03-006. Boston: Boston University.
- Tourville, J.A. and Guenther, F.H. (2003). A cortical and cerebellar parcellation system for speech studies. Technical Report CAS/CNS-03-022. Boston, MA: Boston University.

INVITED LECTURES

- "Skill acquisition, coarticulation, and rate effects in a neural model of speech production." Boston University Center for Adaptive Systems Colloquium Series, April 12, 1994.
- "Acquisition, coarticulation, and rate effects in a neural model of speech production." Haskins Laboratories, New Haven, Connecticut, June 23, 1994.
- "Neural models of sensory-motor interactions for flexible movement control." Cognition, Brain, and Neural Nets Workshop on Brain and Space, Ruhr-Universitat, Bochum, Germany, July 21-22, 1994.
- "Skill acquisition, coarticulation, and rate effects in a neural model of speech production." Massachusetts Institute of Technology RLE Speech Group Seminar Series, October 7, 1994.
- "A modeling framework for speech motor development and kinematic articulator control. 1/3 plenary lecture at the XIIIth International Congress on Phonetic Sciences, Stockholm, Sweden, August 15, 1995.
- "Motor control issues in speech production." Brandeis University Department of Psychology Colloquium Series, November 9, 1995.
- "Neural network modeling of speech production." Boston University College of Engineering Speech Processing Seminar Series, March 26, 1996.
- "The perceptual magnet effect as an emergent property of neural map formation." Boston University Biomedical Engineering Department Hearing Research Center Seminar Series, May 31, 1996.
- "A computational view of infant babbling." Marsh Chapel "Food for Thought" lecture series, Boston University, November 26, 1996.
- "A neural modeling view of speech development in infants." Massachusetts General Hospital Center for Morphometric Analysis, April 8, 1997.
- "The perceptual magnet effect as a consequence of auditory map formation." Eaton Peabody Laboratory Seminar Series, April 18, 1997.
- "The perceptual magnet effect as an emergent property of auditory map formation." Massachusetts Institute of Technology RLE Speech Group Seminar Series, May 7, 1997.
- "Articulatory tradeoffs reduce acoustic variability during /r/ production." Massachusetts Institute of Technology RLE Speech Group Seminar Series, Oct. 1, 1997.
- "A neural network model of speech production." Invited 90-minute talk with ensuing panel discussion, 1997 Annual Convention of the American Speech-Language-Hearing Association, Boston, MA, November 20, 1997.
- "A theoretical framework for speech acquisition and production." Boston University Psychology Department's Brain, Behavior, and Cognition Seminar Series, March 20, 1998.
- "A theoretical framework for speech acquisition and production." Second International Conference on Cognitive and Neural Systems, Boston University, Boston, MA, May 29, 1998.
- "Using computational models to investigate speech perception and production." UCLA Department of Linguistics, Los Angeles, CA, June 11, 1999.
- "Effects of categorization and discrimination training on auditory perceptual space." Massachusetts Institute of Technology RLE Speech Group Seminar Series, October 27, 1999.
- "Neural network models of speech perception and production." Invited 80-minute lecture with commentary, International Institute for Advanced Studies Neuroscience of Language Workshop, Kyoto, Japan, November 20, 1999.
- "Neural models of speech perception and production." Laboratoire Parole et Langage, Universite de Provence, Aix-en-Provence, France, May 19, 2000.

- “Neural modeling of speech production.” Institut de la Communication Parlee, Institut National Polytechnique de Grenoble, Grenoble, France, May 24, 2000.
- “A model of speech motor control and supporting data: Influences of quantal effects.” Special session on Kenneth Stevens’ contributions to speech research, 140th Meeting of the Acoustical Society of America, Newport Beach, CA, December 7, 2000.
- “Neural modeling of speech perception and production.” School of Communication Sciences and Disorders, McGill University, March 19, 2001.
- “Neural modeling of speech production and perception.” Department of Neurology, Yale University School of Medicine, March 29, 2001.
- “A model of cortical and cerebellar interactions in speech.” Massachusetts Institute of Technology RLE Speech Group Seminar Series, May 16, 2001.
- “Neural modeling of speech production.” Keynote Lecture, 4th International Nijmegen Speech Motor Conference, Nijmegen, The Netherlands, June 13, 2001.
- “The effects of categorization training on auditory perception and cortical representations.” Speech Recognition as Adaptive Pattern Classification Workshop, Nijmegen, The Netherlands, July 11, 2001.
- “A model of the neural bases of speech motor control.” Massachusetts Eye and Ear Infirmary/Harvard Medical School, Boston, Massachusetts, January 15, 2002.
- “A model of the neural bases of speech motor control.” Sixth International Conference on Cognitive and Neural Systems, Boston, Massachusetts, May 29, 2002.
- “Effects of category learning on auditory perception and cortical maps.” 143rd Meeting of the Acoustical Society of America, Pittsburgh, Pennsylvania, June 4, 2002.
- “A model of the neural bases of speech production.” NTT Basic Research Laboratories, Atsugi, Japan, October 15, 2002.
- “Effects of category learning on auditory perception and cortical maps.” ATR International, Kyoto, Japan, October 17, 2002.
- “A model of the neural bases of speech production.” ATR International, Kyoto, Japan, October 18, 2002.
- “Elucidating the neural bases of speech.” Boston University Linguistics Association, Boston, Massachusetts, April 24, 2003.
- “Introductory remarks on neural modeling in speech perception research.” 145th Meeting of the Acoustical Society of America, Nashville, Tennessee, April 29, 2003.
- “Using a neural model to investigate the learning of speech motor skills.” Conference on Ontogeny and Phylogeny of Syllable Organization, Barcelona, Spain, August 3, 2003.
- “A model of cortical and cerebellar function in speech.” XVth International Congress of Phonetic Sciences, Barcelona, Spain, August 7, 2003.
- “A neural model of speech production.” Keynote lecture, 6th International Seminar on Speech Production, Sydney, Australia, December 8, 2003.
- “A neural model of speech production and supporting data.” National Institutes of Health, Bethesda, Maryland, June 1, 2004.
- “A neural model of speech production and supporting data.” University of Maryland Dental School, Baltimore, Maryland, June 2, 2004.

- "A neural model of speech production and supporting experiments." Plenary lecture, From Sound to Sense: Fifty+ Years of Discoveries in Speech Communication, Cambridge, Massachusetts, June 12, 2004.
- "Auditory, somatosensory, and motor interactions in speech production." Distinguished Lecture in Speech and Hearing Bioscience and Technology, Harvard-MIT Division of Health Sciences and Technology, Cambridge, Massachusetts, December 9, 2004.
- "Auditory, somatosensory, and motor interactions in speech production." CELEST Science of Learning Seminar, Boston University, Boston, Massachusetts, December 10, 2004.
- "Cortical interactions underlying the production of speech sounds." American Speech and Hearing Association (ASHA) Research Institute, San Diego, California, November 18, 2005.
- "Using modeling and neuroimaging to investigate normal and disordered speech." 2005 American Speech and Hearing Association (ASHA) Convention, San Diego, California, November 19, 2005.
- "Auditory, somatosensory, and motor interactions in speech production." M.D. Steer Distinguished Lecture, Department of Speech, Language, and Hearing Sciences, Purdue University, February 23, 2006.
- "Auditory, somatosensory, and motor interactions in speech production." Department of Cognitive and Linguistic Sciences, Brown University, March 13, 2006.
- "Auditory, somatosensory, and motor interactions in speech acquisition and production." Symposium on Efference Copy, Auditory Feedback, and Speech Production, University of California at San Francisco, April 7, 2006.
- "Neural modeling and imaging of the cortical interactions underlying speech." Experimental and Computational Cognitive Neuroscience: Towards a Synthesis, Satellite Symposium at the 2006 Annual Meeting of the Cognitive Neuroscience Society, San Francisco, California, April 8, 2006.
- "Auditory, somatosensory, and motor interactions in speech production." University of Texas Health Science Center, San Antonio, Texas, September 19, 2006.
- "Brain Mechanisms of Speech Perception and Production". From Synapse to Schoolroom: The Science of Learning, Satellite Symposium at the 2006 Annual Meeting of the Society for Neuroscience, Atlanta, Georgia, October 13, 2006.
- "Auditory, somatosensory, and motor interactions in speech production." Department of Linguistics, University of Maryland, December 8, 2006.
- "Auditory, somatosensory, and motor interactions in speech production." CONTACT International Workshop, Is a Neural Theory of Language Possible? Lecce, Italy, June 30, 2007.
- "The neural control of speech." Willard R. Zemlin Lecture in Speech Science, Annual Convention of the American Speech-Language-Hearing Association, November 16, 2007.
- "The neural control of speech." Department of Speech-Language Pathology, Northeastern University, December 14, 2007.

PERSONAL INTERESTS

- Avid go player (5 kyu ranking) and golfer.
- Placed 10th out of 398 entries in the brisket category of the 2003 American Royal Barbeque Competition.