CURRICULUM VITAE

Joseph S. Perkell

Education

School	Field	Degree	Date
Massachusetts Institute of Technology	Mechanical Engineering	S.B.	1962
Harvard School of Dental Medicine	Dentistry	D.M.D.	1967
Massachusetts Institute of Technology	Speech Communication	Ph.D.	1974

Principal Fields of Interest

Speech motor control, including the influences of hearing and biomechanical and other constraints

Employment History

Position	Beginning	Ending
Division of Sponsored Research Staff Member, Research Laboratory of Electronics (RLE), Massachusetts Institute of Technology (MIT)	1964	1967
Dental Officer (Captain), U.S. Army (including 1 year in Viet Nam)	1967	1969
NIH Postdoctoral Trainee, MIT	1969	1970
NIH Special Fellow, MIT	1970	1973
Instructor, Dept. of Electrical Engineering, MIT	1973	1974
Research Associate, RLE, MIT	1974	1980
Assistant Dentist, (one day/wk), MIT Dental Clinic	1973	1976
Dentist (one day/wk), private practices	1976	1986
Principal Research Scientist, RLE, MIT	1980	1989
Lecturer, Oral Diagnosis and Oral Radiology, Harvard School of Dental Medicine, Boston, MA	1984	1989
Senior Research Scientist, RLE and Dept. of Brain and Cognitive Sciences, MIT	1989	2012
Affiliated Faculty member, Harvard-MIT Graduate Program in Speech and Hearing Bioscience and Technology	1992	2011
Adjunct Professor, Department of Cognitive and Neural Systems, Boston University (BU)	1997	2011
Senior Research Scientist, Dept. of Speech, Language and Hearing Sciences, Sargent College, BU	2011	present
Research Affiliate, RLE, MIT	2012	present

Consulting

Individual consulting Boston University	1980	present

Mass. Eye and Ear Infirmary
Haskins Laboratories (New Haven, CT)
Proctor and Gamble

Department, Laboratory, and Institute Committees, Other Assigned Duties, M.I.T.

Activity	Beginning	Ending
Admissions Committee, Speech and Hearing Biosciences and Technology, MIT	1992	2009
Chair/Co-Chair of above committee	1996	2002
Executive Committee, Speech and Hearing Biosciences and Technology, MIT	1996	2002
Admissions Committee, Harvard-MIT Program in Health Science and Technology	1992	2002
Promotions Committee, RLE, MIT	2002	present

Department Committees, Other Assigned Duties, B.U.

Faculty Search Committee, Chair, Speech, Language and Hearing Sciences,	2011	present

Professional service

Activity	Beginning	Ending
Member, Communicative Disorders Review Committee, National Institute of Neurological and Communicative Disorders and Stroke, N.I.H.	1984	1988
Co-Chair, Expert Panel on Speech and Speech Disorders Section, National Strategic Research Plan, National Institute on Deafness and Other Communication Disorders, N.I.H.	1996	1997
Ad-hoc reviewer: N.I.H., N.S.F., Human Frontier Science Program, Natural Sciences and Engineering Research Council of Canada, Fonds pour la Formation de Chercheurs et l'Aide a là Recherche de Québec	1980	present
Ad-hoc reviewer: *Journal of the Acoustical Society of America, Journal of Speech, Language and Hearing Research, Journal of Phonetics, Speech Communication, Cleft Palate Journal, Journal of Neuroscience, Ear and Hearing, Audiology, Phonetica*	1975	present
Editorial Review Board, *Linguistics*	1979	1982
Member, Users' Oversight Committee, X-ray Microbeam Facility, University of Wisconsin (nationally shared facility for measuring speech movements)	1985	1991

Member, Medals and Awards Committee Acoustical Society of America	1992	1995
Member, Speech Communication Technical Committee, Acoustical Society of America	1979 1988	1982 and 1999
Member, Panel of three to evaluate candidates for Professor of Phonetics, Stockholm University	2010	
Member, Scientific Advisory Council, National Institute on Deafness and Other Communication Disorders, N.I.H.	2012	present

Honors and Awards

Bronze Star Medal, U.S. Army – for service in Viet Nam, 1968-69

Fellow, Acoustical Society of America, 1992

Keynote Lecturer, Conference on Motor Speech, Albuquerque, NM, 2004*

Zemlin Lecturer, American Speech Language and Hearing Association, 2004*

Keynote Lecturer, 11th Australasian International Conference on Speech Science and Technology, Auckland, New Zealand, December, 2006*

Honoree, Special Session, Ninth International Seminar on Speech Production, Montreal, Canada, June 20-23, 2011*

Invited Service as Opponent at Ph.D. Thesis Defenses in Sweden

1. Sydney Wood, X-Ray and Model Studies of Vowel Articulations, Lund University, Dept. of Linguistics, Lund, June, 1982.

2. Olov Engwall, Tongue Talking: Studies in Intraoral Speech Synthesis, Royal Institute of Technology, Dept. of Speech Music and Hearing, Stockholm, June, 2002.

* Also listed under Invited Lectures

Current Organization Membership

Acoustical Society of America

American Speech, Language and Hearing Association

Sigma Xi

Society for Neuroscience

Publications

1. Books

1. Perkell, J.S. (1969). *Physiology of Speech Production: Results and Implications of a Quantitative Cineradiographic Study.* Research Monograph No. 53, The M.I.T. Press, Cambridge, MA.
2. Perkell, J.S. and Klatt, D. (eds.) (1986). *Invariance and Variability of Speech Processes*, Lawrence Erlbaum Assoc., Hillsdale, NJ. (Proceedings of an international conference organized by J. Perkell and D. Klatt at MIT with support from NIH and NSF)

2. Papers in Refereed Journals

1. Nelson, W.L., Perkell, J.S. and Westbury, J.R. (1984). Mandible movements during increasingly rapid articulations of single syllables: Preliminary observations, *J. Acoust. Soc. Am. 75*, pp. 945-951.
2. Perkell, J.S. and Nelson, W.L. (1985). Variability in production of the vowels /i/ and /a/, *J. Acoust. Soc. Am. 77*, 1889-1895.
3. Perkell, J.S. (1986). Coarticulation strategies: Preliminary implications of a detailed analysis of lower lip movements, *Speech Communication 5,* No. 2, 47-68.
4. Holmberg, E., Hillman, R.E. and Perkell, J.S. (1988). Glottal air flow and transglottal pressure measurements for male and female speakers in soft, normal and loud voice, *J. Acoust. Soc. Am. 84*, pp. 511-529.
5. Perkell, J.S. and Cohen, M.H. (1989). An indirect test of the quantal nature of speech in the production of the vowels /i/, /a/ and /u/, *J. Phonetics 17*, 123-133.
6. Hillman, R.E., Holmberg, E., Perkell, J.S., Walsh, M. and Vaughan, C. (1989). Objective assessment of vocal hyperfunction: A theoretical framework and preliminary results, *J. Speech and Hearing Res. 32*, 373-392.
7. Holmberg, E.B, Hillman, R.E., Perkell, J.S. (1989). Glottal air flow and transglottal pressure measurements for male and female speakers in low, normal and high pitch, *J. Voice 3*, 294-305.
8. Hillman, R.E., Holmberg, E., Perkell, J.S., Walsh, M. and Vaughan, C. (1990). Phonatory function associated with hyperfunctionally-related vocal fold lesions, *J. Voice 4,* 52-63.
9. Perkell, J.S., Holmberg, E.B. and Hillman, R.E. (1991). A system for signal processing and data extraction from aerodynamic, acoustic, and electroglottographic signals in the study of voice production, *J. Acoust. Soc. Am. 89,* 1777-1781.
10. Lane, H., Perkell, J., Svirsky, M., and Webster, J. (1991). Changes in speech breathing following cochlear implant in postlingually deafened adults, *J. Speech Hear. Res. 34*, 526-533.
11. Perkell, J.S. and Matthies, M.L. (1992). Temporal measures of anticipatory coarticulation for the vowel /u/: Within- and cross-subject variability, *J. Acoust. Soc. Am. 91*, 2911-2925.
12. Perkell, J., Lane, H., Svirsky, M. and Webster, J. (1992). Speech of cochlear implant patients: A longitudinal study of vowel production, *J. Acoust. Soc. Am. 91*, 2961-2979.
13. Svirsky, M., Lane, H., Perkell, J., and Webster, J. (1992). Speech of cochlear implant patients: Results of a short-term auditory deprivation study, *J. Acoust. Soc. Am. 92*, 1284-1300.
14. Perkell, J., Cohen, M., Svirsky, M., Matthies, M., Garabieta, I., and Jackson, M. (1992). Electro-magnetic midsagittal articulometer (EMMA) systems for transducing speech articulatory movements, *J. Acoust. Soc. Am. 92*, 3078-3096.
15. Perkell, J.S., Matthies, M.L., Svirsky, M.A. and Jordan, M.I. (1993). Trading relations between tongue-body raising and lip rounding in production of the vowel /u/: A pilot motor equivalence study, *J. Acoust. Soc. Am*. *93*, 2948-2961

16. Holmberg, E., Perkell, J., Hillman, R. and Gress, C. (1994). Individual variation in measures of voice, *Phonetica 51,* 30-37.

17. Perkell, J., Hillman, R. and Holmberg, E. (1994). Group differences in measures of voice production and revised values of maximum airflow declination rate, *J. Acoust. Soc. Am. 96,* 695-698.

18. Holmberg, E., Hillman, R., Perkell, J. and Gress, C. (1994). Relationships between intra-speaker variation in aerodynamic measures of voice production and variation in SPL across repeated recordings, *J. Speech Hear. Res. 37,* 484-495.

19. Sperry, E., Hillman, R. and Perkell, J. (1994). Use of inductance plethysmography to assess respiratory function in a patient with vocal nodules, *J. Medical Speech-Language Pathology 2,* 137-145.

20. Lane, H., Wozniak, J. and Perkell, J.S. (1994). Changes in voice-onset time in speakers with cochlear implants, *J. Acoust. Soc. Am. 96,* 56-64.

21. Matthies, M.L., Svirsky, M.A., Lane, H., and Perkell, J.S. (1994). A preliminary study of the effects of cochlear implants on the production of sibilants, *J. Acoust. Soc. Am. 96,* 1367-1373.

22. Perkell, J.S., Matthies, M.L., Svirsky, M.A. and Jordan, M.I. (1995). Goal-based speech motor control: A theoretical framework and some preliminary data, *Journal of Phonetics, 23*, 23-35. Also in *Disorders of Motor Speech: Assessment, Treatment, and Clinical Characterization*, Baltimore: Paul H. Brookes, pp. 27-42.

23. Holmberg, E.B., Hillman, R.E., Perkell, J.S. and Goldman, S. (1995). Comparisons among aerodynamic, electroglottographic, and acoustic spectrum measures of female voices, *Journal of Speech and Hearing Research 38*, 1212-1223.

24. Lane, H., Wozniak, J., Matthies, M.L., Svirsky, M.A. and Perkell, J.S. (1995). Phonemic resetting vs. postural adjustments in the speech of cochlear implant users: an exploration of voice onset time. *J. Acoust. Soc. Am 98,* 3096-3106.

25. Matthies, M.L., Svirsky, M.A., Perkell, J.S. and Lane, H. (1996). Acoustic and articulatory measures of sibilant production with and without auditory feedback from a cochlear implant, *J. Speech and Hearing Res. 39*, pp. 936-946.

26. Perkell, J.S. (1996). Properties of the tongue help to define vowel categories: Hypotheses based on physiologically-oriented modeling, *Journal of Phonetics, 24*, 3-22.

27. Lane, H., Wozniak, J., Matthies, M.L., Svirsky, M.A., Perkell, J.S., O'Connell, M. and Manzella, J. (1997). Changes in sound pressure and fundamental frequency contours following changes in hearing status, *J. Acoust. Soc. Am. 101,* 2244-2252.

28. Svirsky, M.A., Stevens, K.N., Matthies, M.L., Manzella, J., Perkell, J.S. and Wilhelms-Tricarico, R. (1997). Tongue surface displacement during obstruent stop consonants, *J. Acoust. Soc. Am.* 102, 562-571.

29. Lane, H., Wozniak, J., Matthies, M.L., Svirsky, M.A., Perkell, J.S., O'Connell, M. and Manzella, J. (1997). Changes in sound pressure and fundamental frequency contours following changes in hearing status, *J. Acoust. Soc. Am. 101*, 2244-2252.

30. Perkell, J.S., Matthies, M.L., Lane, H., Guenther, F.H., Wilhelms-Tricarico, R., Wozniak, J. and Guiod, P. (1997). Speech motor control: Acoustic goals, saturation effects, auditory feedback and internal models, *Speech Communication* 22, 227-250.

31. Lane, H., Perkell, J., Wozniak, J., Manzella, J., Guiod, P., Matthies, M., MacCollin, M. and Vick, J. (1998). The effect of changes in hearing status on speech sound level and speech breathing: A study conducted with cochlear implant users and NF-2 patients, *J. Acoust. Soc. Am. 104*, 3059-3069.

32. Guenther, F., Espy-Wilson, C., Boyce, S., Matthies, M., Zandipour, M. and Perkell, J. (1999). Articulatory tradeoffs reduce acoustic variability during American English /r/ production, *J. Acoust. Soc. Am.* 105, 2854-2865.
33. 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 with profound hearing loss, *J. Phonetics, 28,* 233-372.
34. Matthies, M., Perrier, P., Perkell, J. and Zandipour, M. (2001). Variation in coarticulation with changes in clarity and rate, *J. Speech, Language and Hearing Res. 44*, 552-563.
35. Gould, J., Lane, H., Perkell, J., Vick, J., Matthies, M., and Zandipour, M. (2001). Changes in the intelligibility of postlingually deaf adults after cochlear implantation. *Ear and Hearing, 22*: 453-60.
36. Lane, H., Matthies, M., Perkell, J., Vick, J., and Zandipour, M. (2001). The effects of changes in hearing status in cochlear implant users on the acoustic vowel space and coarticulation. *J. Speech, Language and Hearing Res. 44*, 552-63.
37. Perkell, J., Numa, W., Vick, J., Lane, H., Balkany, T. and Gould, J. (2001). Language-specific, hearing-related changes in vowel spaces: A preliminary study of English- and Spanish-speaking cochlear implant users. *Ear and Hearing*, *22*: 461-470.
38. Vick, J., Lane, H., Perkell, J., Matthies, M., Gould, J., and Zandipour, M. (2001). Speech perception, production and intelligibility improvements in vowel-pair contrasts in adults who receive cochlear implants. *J. Speech, Language and Hearing Res., 44*, 1257-68.
39. Perkell, J., Zandipour, M., Matthies, M. and Lane, H. (2002). Economy of effort in different speaking conditions. I. A preliminary study of intersubject differences and modeling issues, *J. Acoust. Soc. Am. 112*, 1627-41.
40. Perkell, J., and Zandipour, M. (2002). Economy of effort in different speaking conditions. II. Kinematic performance spaces for cyclical and speech movements, *J. Acoust. Soc. Am. 112*, 1642-51.
41. Holmberg, E.B., Doyle, P., Perkell, J.S., Hammarberg, B. & Hillman R.E. (2003) Aerodynamic and acoustic voice measurements of patients with vocal nodules: Variation in baseline and changes across voice therapy, *J. Voice 17*, 262-282.
42. Perrier P, Payan Y, Zandipour M, Perkell J. (2003). Influences of tongue biomechanics on speech movements during the production of velar stop consonants: a modeling study. *J Acoust. Soc. Am. 114*, 1582-99.
43. Perkell J.S., Guenther F.H., Lane, H., Matthies, M.L., Stockmann, E., Tiede, M., Zandipour, M. (2004). The distinctness of speakers' productions of vowel contrasts is related to their discrimination of the contrasts, *J. Acoust. Soc Am. 116, 2338-44*.
44. 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/—/ʃ/ Contrast is related to their auditory discrimination and use of an articulatory saturation effect, *J. Speech, Language and Hearing Res. 47*, 1259-69.
45. 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, *J. Acoust Soc Am. 117*, 3196-3212.
46. Lane, H., Denny, M., Guenther, F.H., Matthies, M.L., Menard, L., Perkell, J.S., Stockmann, E., Tiede, M., Vick, J. & Zandipour, M. (2005). Effects of bite blocks and hearing status on vowel production, *Journal of the Acoustical Society of America, 118,* 1636-1646*.*
47. Lane, H. & Perkell, J.S. (2005). Control of voice-onset time in the absence of hearing: A review, *J. Speech Lang. Hear. Res.48,* 1334-43*.*
48. Perkell, J.S., Denny, M., Lane, H., Guenther, F.H., Matthies, M.L., Tiede, M., Vick, J., Zandipour, M. & 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,* 505-514.

49. Perkell, J.S., Lane, H., Denny, M., Matthies, M.L., Tiede, M., Zandipour, M., Vick, J., & Burton, E. (2007). Time course of speech changes in response to short-term changes in hearing state, J. Acoust. Soc. Am. 121, 505-518.
50. Lane, H., Matthies, M, Denny, M., Guenther, F., 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. J. Speech, Language and Hearing Res.h 50, 913-927.
51. Lane, H., Denny, M., Guenther, F. H., Matthies, M., Perkell, J. S., Stockmann, E., Tiede, M., Vick, J. and Zandipour, M. (2007). On the structure of phoneme categories in listeners with cochlear implants. J.Speech, Language and Hearing Res. 50, 2-14.
52. Ménard , L., Polak, M., Denny, M., Lane, H., Matthies, M.L., Perkell, J.S., Burton, E., Marrone, N., Tiede, M. and Vick, J. (2007). Effects of speaking condition and hearing state on vowel production in postlingually deaf adults with cochlear implants, J. Acoust. Soc. Am. 121, 3790-3801.
53. Villacorta, V., Perkell, J.S. and Guenther, F.H. (2007). Sensorimotor adaptation to feedback perturbations of vowel acoustics and its relation to perception, J. Acoust. Soc. Am.a 122, 2306-3219.
54. Matthies, M.L, Guenther, F. H., Denny, M., Perkell, J. S., Burton, E., Vick, J., Lane, H., Tiede, M. And Zandipour, M. (2008) Perception and production of /r/ allophones improve with hearing from a cochlear implant, Journal of the Acoustical Society of America, 124, 3191-3202.
55. Cai S, Ghosh SS, Guenther FH, Perkell JS. (2010). Adaptive auditory feedback control of the production of the formant trajectories in the Mandarin triphthong /iau/ and its patterns of generalization. J. Acoust. Soc. Am. 128(4):2033-2048.
56. Ghosh, S.S., Matthies, M.L. Maas, E. Hanson, A. Tiede, M. Ménard, L. Guenther, F.H., Lane, H and Perkell J.S. (2010). An investigation of the relation between sibilant production and somatosensory and auditory acuity, Journal of the Acoustical Society of America 128,3079-87.
57. Brunner, J., Ghosh, S.S., Hoole, P., Matthies, M., Tiede, M. & Perkell, J. (2011). The influence of auditory acuity on acoustic variability and the use of motor equivalence during adaptation to a perturbation. *Journal of Speech, Language and Hearing Research*, 54(3), 727-739.
58. Cai S, Ghosh SS, Guenther FH, Perkell JS. (2011). Focal manipulations of formant trajectories reveal a role of auditory feedback in the online control of both within-syllable and between-syllable speech timing. J. Neurosci. 31(45):16483-16490.
59. Perkell, J.S. (2012). Movement goals and feedback and feedforward control mechanisms in speech production. Journal of Neurolinguistics 25, 382–407.
60. Cai S, Beal DS, Ghosh SS, Tiede MK, Guenther FH, Perkell JS. (2012). Weak responses to auditory feedback perturbation during articulation in persons who stutter: Evidence for abnormal auditory-motor transformation. PLoS ONE. 7(7):e41830.

3. Proceedings of Refereed Conferences (* - invited lecture)

1. Perkell, J. (1965). Physiology of speech production: Implications of a detailed analysis of certain articulatory movements, Proceedings of the Vth International Congress of Phonetic Sciences, Liege, Belgium, September.
2. Perkell, J.S., (1974). A physiologically oriented model of tongue activity during speech production, Proceedings of the VIIIth International Congress of Phonetic Sciences, Leeds, England, July.

3. Perkell, J. (1979). On the use of orosensory feedback: An interpretation of compensatory articulation experiments, Proceedings of the IXth International Congress of Phonetic Sciences, Copenhagen, vol. II, 358-364.*

4. Holmberg, E., Hillman, R. & Perkell, J. (1983). Relationships among indirect measurements of glottal resistance and vocal efficiency and derived glottal waveform characteristics for normal speakers. Proceedings of the Xth International Congress of Phonetic Sciences, Utrecht, Aug. 1-6, vol. IIA, 445.

5. Perkell, J. (1983). Individual and possible language-related differences in two aspects of coarticulation: Time of beginning of anticipation and the production of "troughs". Proceedings of the Xth International Congress of Phonetic Sciences, Utrecht, Aug. 1-6, vol. IIA, 474.

6. Cohen, M. & Perkell, J. (1986). Palatographic and acoustic measurements of the fricative consonant pair /s/ and /ʃ /, Proceedings of the 12th International Congress on Acoustics, Toronto, July 24-31, A3-5.

7. Perkell, J. and Cohen, M. (1986). Preliminary support for a "hybrid model" of anticipatory coarticulation, Proceedings of the 12th International Congress on Acoustics, Toronto, July 24-31, A3-6.

8. Holmberg, E., Hillman, R. & Perkell, J. (1986). Relationships among parameters of the glottal waveform and intensity variation for male and female speakers, Proceedings of the 12th International Congress on Acoustics, Toronto, July 24-31, A3-10.

9. Perkell, J. (1991). Models theory and data in speech production, Proceedings of the XIIth International Congress of Phonetic Sciences, Aix-en-Provence, France, pp. 1:182-191.*

10. Lane, H., Perkell, J., Svirsky, M. & Webster, J. (1991). Changes in speech breathing following cochlear implant in postlingually deafened adults, Proceedings of the XIIth International Congress of Phonetic Sciences, Aix-en-Provence, France, pp. 4:334-337.

11. Wilhelms-Tricarico, R. and Perkell, J. (1995). Toward a physiological model of speech production, Proceedings of the XIIIth International Congress of Phonetics Sciences, Stockholm, Aug. 13-19, Vol. 2, 68-75.

12. Holmberg, E., Hillman, R. & Perkell, J. (1995). Measures of glottal airflow waveform, EGG and acoustic spectral slope for female voice. Proceedings of the XIIIth International Congress of Phonetics Sciences, Stockholm, Aug. 13-19, Vol. 3, 178-181.

13. Perkell, J., Manzella, J., Wozniak, J., Matthies, M., Lane, H., Svirsky, M., Guiod, P., Delhorne, L., Short, P., MacCollin, M., & Mitchell, C. (1995). Changes in speech production following hearing loss due to bilateral acoustic neuromas, Proceedings of the XIIIth International Congress of Phonetics Sciences, Stockholm, Aug. 13-19, Vol. 3, 194-197.

14. Perkell, J., Matthies, M., Wilhelms-Tricarico, R., Lane, H. & Wozniak, J. (1996). Speech motor control: Phonemic goals and the use of feedback, 4th Speech Production Seminar: Models and Data, Autrans, France, May 20-24, 133-136.

15. Perrier, P., Payan, J., Perkell, J., Jolly, F., Zandipour, M. & Matthies, M. (1998). On loops and articulatory biomechanics, Fifth International Conference on Spoken Language Processing, Sydney, Nov. 30-Dec. 4.

16. Perkell, J., Zandipour, M., Matthies, M. & Lane, H. (1999). Articulatory kinematics: Preliminary data on the effects of speaking condition, articulator and movement type, Proceedings of the XIVth International Congress of Phonetics Sciences, San Francisco, Aug. 1-7.

17. Perkell, J., Zandipour, M., Vick, J., Matthies, M., Lane, H., Guenther, F. & Gould, J. (2000). Rapid changes in speech production parameters in response to a change in hearing, Proceedings of the 5th Seminar on Speech Production: Models and Data, Kloster Seeon, Bavaria, May 1-4, 245-248.

18. Perrier, P., Payan, J., Perkell, J., Zandipour, M., Pelorson, X., Coisy, V. & Matthies, M. (2000). An attempt to simulate fluid-walls interactions during velar stops, Proceedings of the 5th Seminar on Speech Production: Models and Data, Kloster Seeon, Bavaria, May 1-4, 149-152.
19. Perrier, P., Perkell, J., Payan, J., Zandipour, M., Guenther, F. & Khaligi, 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, Oct. 16-20, II: 162-165.
20. Perkell, J., Guenther, F., Lane, H., Matthies, M., Stockmann, E., Tiede, M., & Zandipour, M. (2003). Cross-subject relations between measures of vowel production and perception, Proceedings of the XVth International Congress of Phonetics Sciences, Barcelona, Aug. 3-9, 439-442.
21. Tiede, M., Perkell, J., Zandipour, M., Matthies, M. & Stockmann, E. (2003). A new approach to pressure-sensitive palatography using a capacitive sensing device, Proceedings of the XVth International Congress of Phonetics Sciences, Barcelona, Aug. 3-9, 3149-3152.
22. Guenther, F.H., and Perkell, J.S (2004). A neural model of speech production and supporting experiments. Proceedings: From Sound to Sense: Fifty+ Years of Discoveries in Speech Communication, Cambridge, MA.
23. Yoo, J. J., Guenther, F. H., and Perkell, J. S., "Cortical Networks Underlying Audio-Visual Speech Perception in Normally Hearing and Hearing Impaired Individuals", in Proceedings of the workshop Plasticity in Speech Perception, London: UCL Centre for Human Communication, June 15-17, 2005.
24. Zandipour, M., Guenther, F., Perkell, J., Perrier, P., Payan, Y., and Badin, P. (2004). Vowel-vowel planning in acoustic and muscle space. Proceedings: From Sound to Sense; 50+ Years of Discoveries in Speech Communication, June 2004, Cambridge, MA, 103-108.
25. Perkell, J.S. (2006). Sensorimotor Control of Speech Production: Models and Data, Proceedings of the International Speech Communication Association Workshop on Experimental Linguistics, Athens, Greece, Aug. 28-30.*
26. Perkell, J.S. (2006). Achieving Speech Motor Goals: Feedback and Feedforward Control, Proceedings of the Seventh International Seminar on Speech Production, Ubatuba, Brazil, Dec. 13-15.
27. Zandipour, M., Perkell, J.S., Guenther, F.H., Tiede, M., Honda, K. and Murano, E. (2006). Speaking with a bite block: Data and Modeling, Proceedings of the Seventh International Seminar on Speech Production, Ubatuba, Brazil, Dec. 13-15.
28. Cai, S. Boucek, M., Ghosh, S.S., Guenther, F.H. and Perkell, J.S. “A System for Online Dynamic Perturbation of Formant Frequencies.” Proceedings of the 8th International Seminar on Speech Production, Dec. 8-12, Strasbourg, 2008, p. 65-68.
29. J.S. Perkell, J.S. (2009). Movement goals and feedback and feedforward control mechanisms in speech production, Proceedings of the Third International Symposium on Biomechanics, Human Function and Information Science, Kanazawa, Japan, Feb. 20-22, 2009, Vol. II, pp. 21-45.
30. Perkell, J.S., Lane, H, Ghosh, S.S., Matthies M.L., Tiede, M.K, Guenther, F.H. and Ménard, L. “Mechanisms of vowel production: auditory goals and speaker acuity,” Proceedings of the 8th International Seminar on Speech Production, Dec. 8-12, Strasbourg, 2008, p. 29-32.
31. Brunner, J., Hoole, P., Guenther, FH. & Perkell, JS. (2010). Dependency of compensatory strategies on the shape of the vocal tract during speech perturbed with an artificial palate. Proceedings of Meeting on Acoustics 9.

4. Other Major Publications

1. Perkell, J.S. (1977). Articulatory Modeling, phonetic features and speech production strategies, In *Articulatory Modeling and Phonetics,* R. Carre, R. Descout, and M. Wajskop (eds.), Groupe de la Communication Parlee.
2. Stevens, K.N. and J.S. Perkell (1977). Speech physiology and phonetic features, in *Dynamic Aspects of Speech Production*, M. Sawashima and F. Cooper (eds.), University of Tokyo Press, Tokyo.
3. Perkell, J.S. (1979). On the nature of distinctive features: Implications of a preliminary vowel production study, in *Frontiers of Speech Communication Research,* B. Lindblom and S. Öhman (eds.), Academic Press, London.
4. Perkell, J.S., Boyce, S.E. & Stevens, K.N. (1979). Articulatory and acoustic correlates of the [s-sh] distinction, Speech Communication Papers, 97th Meeting of the Acoustical Society of America, J.J. Wolf and D.H. Klatt (eds.), 109-113.
5. Perkell, J.S. (1980). Phonetic features and the physiology of speech production, in *Language Production*, B. Butterworth (ed.), Academic Press, New York.
6. Perkell, J.S. (1981). On the use of feedback in speech production, in *The Cognitive Representation of Speech*, T. Myers, J. Laver and J. Anderson (eds.), North Holland, New York.
7. Perkell, J.S. (1990). Testing theories of speech production: Implications of some detailed analyses of variable articulatory data, in *Speech Production and Speech Modeling*, edited by W.J. Hardcastle and A. Marchal, 263-288 (Kluwer, Dordrecht).
8. Wilhelms-Tricarico, R. and Perkell, J.S. (1996). Biomechanical and physiologically-based speech modeling, in *Progress in Speech Synthesis*, J.P.H. van Santen, R.W. Sproat, J.P. Olive and J. Hirshberg (eds.), Springer, New York, pp. 221-234.
9. Perkell, J.S. (1997). Articulatory Processes, in W. Hardcastle and J. Laver (eds.) *The Handbook of Phonetic Sciences*, Blackwell, pp. 333-370.
10. Perkell, J.S. and Cohen, M.H. (1997). Token-to-token variation of tongue-body vowel targets: The effect of context, in S. Kiritani, H. Hirose & H. Fujisaki (Eds.), *Speech Production and Language: In Honor of Osamu Fujimura*, pp. 229-249, New York: Mouton de Gruyter.
11. Guenther, F. and Perkell, J. (2004). A Neural Model of Speech Production and its Application to Studies of the Role of Auditory Feedback in Speech, in *Speech Motor Control in Normal and Disordered Speech,* Eds: B. Maassen, R. Kent, H.F.M. Peters, P. Van Lieshout & W. Hulstijn, Oxford University Press, 29-50.
12. 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 *Speech Production: Models, Phonetic Processes, and Techniques*, J. Harrington & M. Tabain (eds.), Psychology Press, 69-84.

5. Internal Memoranda and Progress Reports

1. Perkell, J.S. and Cohen, M.H. (1986). An Alternating Magnetic Field System for Tracking Multiple Speech Articulatory Movements in the Midsagittal Plane, Technical Report No. 512, Research Laboratory of Electronics, Massachusetts Institute of Technology, Cambridge, MA.
2. Guenther, F. H., Espy-Wilson, C., Boyce, S. E., Matthies, M. L., Zandipour, M. and Perkell, J. S. (1997) Intraspeaker comparisons of acoustic and articulatory variability in American English /r/ productions. Boston University Technical Report CAS/CNS-97-010.

6. Invited Lectures (selected)

1. Techniques for transducing movements of points on articulatory structures, 116th Meeting of the Acoustical Society of America (Second Joint Meeting of the ASA and the Acoustical Society of Japan), Honolulu, Nov. 14-18, 1988.
2. Trading relations between tongue-body raising and lip rounding in production of the vowel /u/, Symposium on Current Research Paradigms: Implications for Speech Motor Control, Stockholm, Aug. 13-16, 1991.
3. Models Theory and Data in Speech Production, XIIth International Congress of Phonetic Sciences, Aix-en-Provence, Aug. 19-24, 1991.
4. Measuring articulatory movements with an electro-magnetic midsagittal articulometer (EMMA) system, 125th Meeting of the Acoustical Society of America, Ottawa, May 17-21, 1993.
5. Variation in speech movement kinematics and temporal patterns of coarticulation with changes in clarity and rate, Third Joint Meeting of the Acoustical Society of America and the Acoustical Society of Japan, Honolulu, Dec. 2-6, 1996.
6. Individual differences in cyclical and speech movements, 134th Meeting of the Acoustical Society of America, San Diego, CA, Dec. 1-5, 1997.
7. Speech motor control: Acoustic goals, saturation effects, auditory feedback and internal models, ATR Human Information Processing Laboratories, Kyoto, Japan, Nov. 2, 1998; also given at a symposium, Dynamics of the Production and Perception of Speech, Martinez, CA, July 31, 1999.
8. A theory of speech motor control with supporting data from speakers with normal hearing and with profound hearing loss, Chicago Linguistics Society, April 23, 1999.
9. Theory of speech motor control and supporting data from speakers with varying hearing status, 1999 Conference on Implantable Auditory Prostheses, Aug. 29-Sept. 3, 1999, Asilomar Conference Center, Pacific Grove, CA
10. Planning and Auditory Feedback in Speech Production, 4th International Speech Motor Conference, Nijmegen, June 13-16, 2001.
11. The Sensorimotor Control of Speech Production, IMEKO/SICE/IEEE International Symposium on Measurement, Analysis and Modeling of Human Functions, Sapporo, Sept. 21-23, 2001.
12. Language-specific, hearing-related changes in vowel spaces: A study of English- and Spanish-speaking cochlear implant users, 144th Meeting of the Acoustical Society of America (First Pan-American/Iberian Meeting on Acoustics), Cancun, Dec. 2-6, 2002.
13. Sensorimotor Control of Speech Production: Models and Data, Keynote lecture at the Conference on Motor Speech, Albuquerque, NM, March 18-21, 2004.
14. Sensorimotor Control of Speech Production: Models and Data, Zemlin Lecture, American Speech, Language and Hearing Association, November 18-20, 2004.
15. Sensorimotor Control of Speech Production: Models and Data, Weinberg Lecture, Department of Speech, Language and Hearing Sciences, Purdue University, Department of Speech, Language and Hearing Sciences, March 10, 2005.
16. Speech Motor Control: Movement Goals and Sensory Feedback Mechanisms, Symposium on Experimental and Computational Neuroscience: Toward a Synthesis, Satellite to the Annual Meeting of the Cognitive Neuroscience Society, San Francisco, April 8, 2006.
17. Sensorimotor Control of Speech Production: Models and Data, International Speech Communication Association Workshop on Experimental Linguistics, Athens, Greece, Aug. 28-30, 2006.

18. Sensorimotor Control of Speech Production: Models and Data, 11th Australasian International Conference on Speech Science and Technology, Auckland, New Zealand, December 6-8, 2006.
19. Movement Goals and Feedback and Feedforward Mechanisms in Speech Production, International workshop, “Development of unified representations in natural and artificial systems", Lecce, Italy, June 28-30, 2007.
20. The role of hearing in speech production: Studies with cochlear implant users and speakers with normal hearing. Research Symposium, “Hear Our Voices: New Mechanisms in Auditory Discrimination and Speech in Deafness” at the AG Bell 2008 biennial convention in Milwaukee, Wisconsin.
21. Five decades of research in speech motor control: What have we learned and where should we go from here? Special Session, Ninth International Seminar on Speech Production, Montreal, Canada, June 20-23, 2011.

Additional invited lectures at:

Bell Laboratories, Murray Hill, NJ

Dept. of Linguistics, University of Massachusetts

Harvard School of Dental Medicine

Dept. of Cognitive and Neural Systems, Boston University

Showa University, School of Dental Medicine, Tokyo, Japan

Massachusetts Eye and Ear Infirmary

Dept. of Speech Music and Hearing, Royal Institute of Technology, Stockholm, Sweden

Dept. of Linguistics, Stockholm University

Dept. of Psychology, Northeastern University

NTT Communication Sciences Laboratories, Atsugi, Japan

Dept. of Otolaryngology, Indiana University School of Medicine

Dept. of Psychology, Queen’s University, Kingston, Ontario, Canada.

Institut de la Communication Parlée, Institut National Polytechnique de Grenoble, Grenoble, France

Institut für Phonetik und Sprachliche Kommunikation, Ludwig-Maximilians-Universität München, Munich, Germany

Department of Catalan Philology, Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain

Institute of Natural Language Processing, Experimental Phonetics Group, University of Stuttgart, Stuttgart, Germany

Department of Linguistics, Saarland University

Research Funding (since 1991)

Title of Project:	Effects of Hearing Status on Adult Speech Production
Project Number:	R01-DC003007
Principal Investigator:	Joseph Perkell
Source:	NIH/NIDCD
Dates of Project:	5/1/1996–11/30/2011

Title of Project:	Degradation of Speech and Hearing from Acoustic Neuromas
Project Number:	R01DC001291
Principal Investigator:	Joseph Perkell

Source:	NIH/NIDCD
Dates of Project:	1991-1994
Title of Project:	Constraints and Strategies in Speech Production
Project Number:	R01-DC01925
Principal Investigator:	Joseph Perkell
Source:	NIH/NIDCD
Dates of Project	12/1/1993-11/30/2008 (with a 1-year unfunded extension)
Title of Project:	Neuroanatomical and Behavioral Anomalies in Persistent Developmental Stuttering
Project Number:	R56-DC01084
Principal Investigator:	Joseph Perkell
Source:	NIH/NIDCD
Dates of Project:	5/1/2010-4/30/2011

Theses Supervised

Summary	Total
Bachelor's	12
Master's	2
Doctoral	
As Supervisor	3
As Reader	8

Bachelors Theses

1. Dowla, Farid, Speech Posture of the Vocal Mechanisms: An Electromyographic and Cineradiographic Investigation, EE&CS, May, 1978.
2. Spohrer, James, Strain-Gauge Transduction of the Effects of Speech Rate on the Coarticulation of Lip Rounding, Physics, June, 1978.
3. Cuevas, Carlos, Evaluation of the Field of a Magnetic System to Transduce Articulatory Movement, EE&CS, May, 1980.
4. Jacques, Anne, Evaluation of a Two-dimensional Transducer to Track Articulatory Movement, EE&CS, May, 1980.
5. Song, Chuan-Luan, A Study of Apparent Discontinuities in Coarticulation in Speakers of American English, French and Spanish, EE&CS, Jan., 1981.
6. Beach, Kerry, The Reciprocal Effects of Tongue Height and Lip Rounding on F2 of the Vowel /u/, EE&CS, May, 1982.
7. Wan, Pong-Liang, A Synthesis of Vowels Using Electronic Methods, EE&CS, Aug., 1983.
8. Fleury, Victor, Context-dependent Effects on Upper Lip Protrusion, EE&CS, Aug., 1986.
9. Chiang, Chih-ming, Models of Coarticulation, EE&CS, May, 1987.
10. O'Roark, Douglas, Co-Articulation of Slow and Fast Speech, EE&CS, May, 1989.
11. Pearson, Jeffrey, Display and Analysis of Electropalatographic Data on the MacIntosh II, May, 1989.

12. Williams, Monica, Investigation of Accelerometric Nasality Measurements for Cochlear Implant Patients, EE&CS, Dec., 1991.

Master's Theses

1. Oka, David, The Design and Test of a Ranging Transducer to Monitor Articulator Movement, EE, Feb., 1980.
2. Sun, Felice, Integrating Statistical and Knowledge-based Methods for Automatic Phonemic Segmentation, EE&CS, May, 1999.

Doctoral Theses – (with Prof. Frank Guenther, Boston University)

1. Villacorta, Virgilio, "Studies in Sensorimotor Adaptation of Speech Production," Speech and Hearing Bioscience and Technology, 2005.
2. Yoo, Julie, "fMRI Studies of Speakers with Hearing Loss," Speech and Hearing Bioscience and Technology, 2007.
3. Cai, Shanqing, "An Investigation of the Role of Auditory Feedback in Online Control of Suprasegmental Articulation," Speech and Hearing Bioscience and Technology, 2012

Teaching Experience

M.I.T. Courses

Term	Subject Number	Title	Role
SS 77 SS 79 SS 82 SS 86	6.68S	Speech Communication	Lectures (part)
FT 90 FT 91 FT 93 FT 95 FT 97 FT 99 FT 01 FT 03	6.541J	Laboratory in the Physiology, Acoustics and Perception of Speech	Lectures (part)
FT 93-present	HST.722	Brain Mechanisms for Hearing and Speech	Lectures (part)
FT 93- FT 99 IAP 00-present	HST.718	Anatomy of Speech and Hearing	Lectures (part)

Linguistics Society of America 2005 Institute

Speech Articulation (with Prof. Frank Guenther, Dept. of Cognitive and Neural Systems, Boston University)