Eric J. Hunter

CONTACT INFORMATION

Work Address: National Center for Voice and Speech
University of Utah
201 Presidents Circle, Rm 210
Salt Lake City UT 84112-9011

Phone 801.596.2012

Fax 801.596.2013

Email: eric.hunter@utah.edu

TITLES

Deputy Executive Director, *National Center for Voice and Speech*

Associate Research Scientist, *National Center for Voice and Speech*

Adjunct Associate Professor*, University of Utah*
Department of Bioengineering, College of Engineering
Department of Communications Sciences and Disorders, College of Health

Adjunct Professor*, University of Utah*
Department of Surgery, Division of Otolaryngology/Head and Neck Surgery, University of Utah School of Medicine

Instructor*, University of Iowa*
Department of Speech and Hearing Sciences, College of Liberal Arts and Sciences

EDUCATIONAL HISTORY

Dec 2001 Ph.D University of Iowa – Speech and Hearing Science (*multidisciplinary curriculum in speech and hearing physiology, acoustics, and engineering*)
National Research Service Award Doctoral Fellow
Dissertation: "Three-Dimensional Biomechanical Model of Vocal Fold Posturing"

Aug 1997 M.S. Brigham Young University – Physics (*acoustics emphasis*)
Masters Thesis: "Geometric Display of Speech Spectra as an Aid to Lipreading"
Received *BYU Office of Research and Creative Work Recognition Award*

Aug 1995 B.S Brigham Young University – Physics (*major*), Mathematics (*minor*)

Additional Seminars and Training

February 2009 "COMSOL Multiphysics Workshop," COMSOL, Inc.

July 2008 "High Frequency Options of Malvern Instruments PRV Rheometer," Malvern Instruments

August 2007	"Musculoskeletal Modeling and Simulation of Movement," American Society of Biomechanics
July/Aug 2007	"ANSYS Workbench and Structural Nonlinearities," JLR Engineering Solutions; Colorado School of Mines, Golden CO
November 2003	"Forensic Acoustic Seminar," Acoustical Society of America

PROFESSIONAL SOCIETIES

2008 - present	Member	American Physical Society, division of Biological Physics (DBP)
2002 - present	Member	American Society of Biomechanics
1996 - present	Member	Acoustical Society of America

REVIEWER AND SERVICE EXPERIENCE

2010	Reviewer	The University of Utah Seed Grant Committee
2009	Grant Reviewer (Ad Hoc)	Special Emphasis Panel (SEP), Biobehavioral and Behavioral Processes (BBBP); Biobehavioral Mechanisms of Emotion, Stress, and Health (MESH), National Institutes of Health *(teleconference)*
2009	Grant Reviewer (Ad Hoc)	Special Emphasis Panel (SEP), Vascular Cell and Molecular Biology Study Section (VCMB), National Institutes of Health *(teleconference)*
2008	Grant Reviewer	ASHFoundation & ASHA's Research & Scientific Affairs Committee
2008 - present	Editorial Board	The Open Acoustics Journal, Bentham Science Publishers
2005	Grant Reviewer (Ad Hoc)	Special Emphasis Panel (SEP), Biobehavioral and Behavioral Processes (BBBP-D), National Institutes of Health *(teleconference)*
2005	Grant Reviewer	Canada Foundation for Initiative (CFI) New Initiatives Fund
2004 - present	Editorial Board	International Journal of Research in Choral Singing

COURSE DEVELOPMENT AND EXPERIENCE (*evaluations available upon request*)

2009 - present	University of Utah *CSD:4200 Hearing Science (3 credit hours)*
2004– present (Summers)	Summer Vocology Insitute, University of Iowa *3:221 Voice Instrumentation (3 credit hours)*
2005 – 2009	University of Colorado-Denver *5500 Acoustics of Vocal Performance & Recording (1 credit hour)* *3620 Physics of Music and Sound (3 credit hours)*
2000, 2001	University of Iowa *3:111 Basic Acoustics, Speech & Hearing (3 credit hours)*

STUDENT DIRECTION

2010-present	Brian Monson (University of Arizona) Co-Sponsor: Ruth L. Kirschstein National Research Service Award, Individual Fellowship "High-Frequency Energy in Speech and Voice"
2009 – present	Brian Monson (University of Arizona) Doctoral Committee "High-Frequency Energy in Speech and Voice"

RESEARCH AND PROFESSIONAL EXPERIENCE

2008	Expert Witness (Acoustics)	American Civil Liberties Union of Colorado, et al. v. City and County of Denver, et al.; Case No. 08-cv-910-MKS-KMT
2008 - 2009	Assoc Research Scientist	National Center for Voice & Speech, Denver
2003 - 2008	Asst Research Scientist	National Center for Voice & Speech, Denver
2001 - 2003	Asst Research Scientist	National Center for Voice & Speech, Univ. of Iowa

CURRENT GRANT PARTICIPATION AND PROJECTS

(NIH, NIDCD R01DC009616), *Project Period: 2009 – 2014*

Title: "Influence of subglottic anatomy on voice production"
PI – Thomson (Brigham Young University, Provo UT)
Role: **Subcontract PI, Subcontract Total Direct Costs: $462,848. (F&A: $230,035)**
Tasks: Consult in procurement of laryngeal specimen, micro-CT imaging, and histological slides. Develop research protocols and train primary site location students in locating and selecting anatomical landmarks on images. Image histological slides and design online repository for images.

(NIH, NIDCD-R01DC006101), *Project Period: 2008 – 2013*

Title: "Biomechanical characterization of vocal fold tissues"
PI –Chan (University of Texas Health Science Center)
Role: **Subcontract PI, Subcontract Total Direct Costs: $309,553. (F&A: $153,848)**

Tasks: Characterize tissue properties in terms of constitutive equations to be used in laryngeal biomechanical models of posturing and phonation. Provide systematic analysis of effects of such properties on posturing and phonation.

(NIH, NIDCD: R01DC008612), *Project Period: 2007-2012*
Title: "A Simulator for Sound Production in Airways"
PI –Titze (National Center for Voice & Speech, Denver CO)
Role: **Co-Investigator**
Tasks: Develop aerodynamic, acoustic and biomechanical constructs of simulation, as well as its technical design (using Fortran, C++, Matlab, and ANSYS APDL)

(NIH, NIDCD R01DC008290), *Project Period: 2007 – 2012*
Title: "Hybrid Model of Vocal Fold Inflammation & Tissue Mobilization"
PI – Verdolini (University of Pittsburgh)
Role: **Acoustic consultant**
Tasks: Consultant for field recordings and monitoring of voice use to develop a hybrid model simulating vocal fold inflammation pertaining to the biomechanics of phonation.

(NIH, NIDCD: R01 DC04436), *Project Period: 2005-2012 (extended with supplemental funding)*
Title: "Research toward Occupational Safety in Vocalization"
PI –Titze (National Center for Voice & Speech, Denver CO)
Role: **Co-Investigator**
Tasks: Lead multidisciplinary team of clinicians and researchers collecting data related to effects of vocal loading. Lead team in collecting data related to efficacy of vocal economy therapies, with necessary pre- and post-therapy vocal acoustic protocols

REFEREED OR PEER-REVIEWED PUBLICATIONS (*PREVIOUS FIVE YEARS*)

1. **Hunter EJ**, Brown W, Pead P, Engar M, Fredrickson SD, and Titze IR. (*in preparation*). The effects of age on voice production in a non-pathological voice: A case study of 48 years. J. Acoust. Soc. Am.
2. **Hunter EJ**, Palaparthi A, Chan RW. (*in preparation*). Comparison of two laryngeal tissue fiber models. J. Acoust. Soc. Am.
3. **Hunter EJ**, Siegmund T, Reide T, and Chan RW. (*in preparation*). Potential benefits for vocal health of vibrato and other pitch modulations. Int. J. Biol. Sci.
4. **Hunter EJ**, and Titze IR. (*in preparation*). Modeling vocal fold tissue fatigue and recovery from vocal vibration dose over 2 weeks. J. Acoust. Soc. Am.
5. Titze IR, and **Hunter EJ**. (*in preparation*). Vocal vibration doses in school teachers. JSLHR.
6. **Hunter EJ**, Spielman JL, and Halpern AE. (*in review*). Tracking of a child's fundamental frequencies during daily activities: A case study. LSHSS.
7. Popolo PP, Titze IR, and **Hunter EJ**. (*in review*). Quantification of inability to produce soft voice (IPSV) with nonlinear dynamic (bifurcation) analysis. Acta Acoustica.
8. **Hunter EJ**, Smith M, and Tanner K. (*in press*). Gender differences affecting vocal health of women in vocally demanding careers. Logoped Phoniatr Vocol.
9. Titze IR, and **Hunter EJ**. (*in press*). Measurement of a voice range profile with a semi-occluded vocal tract. Logoped Phoniatr Vocol.

10. Titze IR, and **Hunter EJ**. (*in press*). Feasibility of measurement of a voice range profile with a semi-occluded vocal tract. Logoped Phoniatr Vocol.
11. **Hunter EJ**, and Titze IR. (2010). Variations in intensity, fundamental frequency, and voicing for teachers in occupational versus non-occupational settings. J. Sp. Lang. Hear. Res. 53(4):862-75.
12. Riede T, Lingle S, **Hunter EJ**, and Titze IR. (2010). Cervids with different vocal behavior demonstrate different visco-elastic properties of their vocal folds. J. Morphology. 271(1):1-11.
13. Titze IR, Fitch WT, **Hunter EJ**, Alipour F, Montequin D, Armstrong DL, McGee J, and Walsh EJ. (2010). Vocal power and pressure–flow relationships in excised tiger larynges. The Journal of Experimental Biology 213, 3866-3873.
14. Halpern AE, Spielman J, **Hunter EJ**, and Titze IR. (2009). The inability to produce soft phonation (IPSV): A tool to detect vocal change in school teachers. Logoped Phoniatr Vocol. 28:1-11.
15. **Hunter EJ.** (2009). A comparison of a child's fundamental frequencies in structured elicited vocalizations versus unstructured natural vocalizations: A case study. Int. J. Pediatr. Otorhinolaryngol. 73(4):561-71.
16. **Hunter EJ,** and Titze, IR. (2009). Quantifying vocal fatigue recovery: Dynamic vocal dermal recovery trajectories after a vocal loading exercise. Ann. Otol. Rhinol. Laryngol. 118(6):449-460.
17. Little MA, McSharry PE, **Hunter EJ**, Spielman J, and Ramig LO. (2009). Suitability of dysphonia measurements for telemonitoring of Parkinson's disease. Biomedical Engineering, IEEE Transactions on. 56(4):1015-1022.
18. **Hunter EJ**, Alipour F., and Titze IR, (2007). Sensitivity of elastic properties to measurement uncertainties in laryngeal muscles with implications for voice fundamental frequency prediction. J. Voice. 21(6):641-50.
19. **Hunter EJ**, and Titze IR. (2007) Refinements in Modeling the Passive Properties of Laryngeal Soft Tissue. J. Appl. Physiol. 103(1):206-19.
20. Titze IR, and **Hunter EJ**. (2007) A two-dimensional biomechanical model of vocal fold posturing. J. Acoust. Soc. Am. 121(4):2254-60.
21. Titze IR, **Hunter EJ**, and Svec JG. (2007). Voicing and silence periods in daily and weekly vocalizations of teachers. J. Acoust. Soc. Am. 121(1):469-78.
22. Carroll T, Nix J, **Hunter E**, Emerich K, Titze I, and Abaza, M. (2006) Objective measurement of vocal fatigue in classical singers: A vocal dosimetry pilot study. Otolaryngol. Head Neck Surg. 135 (4):595-602.
23. **Hunter EJ**, Svec JG, Titze IR. (2006) Comparison of the produced and perceived voice range profiles in untrained and trained classical singers. J Voice. 20(4):513-26.
24. Alipour F, Titze IR, **Hunter E**, and Tayama N. (2005). Active and passive properties of canine abduction/adduction laryngeal muscles. J. Voice. 19(3) 350-359.
25. **Hunter EJ**, and Titze IR. (2005). A technical report. Individual subject laryngeal dimensions of multiple mammalian species for biomechanical models. Ann. Otol. Rhinol. Laryngol. 114(10) 809-18.

26. **Hunter EJ**, and Titze IR. (2005) Review of range of arytenoid cartilage motion. Acoustic Res Lett Online. 6(3), 112-117.

INVITED BOOK CHAPTERS OR SHORT ARTICLES (*PREVIOUS FIVE YEARS*)

1. **Hunter EJ**, Monson BB, and Montequin DW. (2010). Relations Between the Voice and the Ear With Clinical Implications Perspectives on Voice and Voice Disorders. 20(3):96-104.
2. **Hunter, EJ**. (2010). Vocal Dose Measures: General Rationale and Recent Efforts Made by the National Center for Voice and Speech. Rivista Italiana di Acustica. (34)2:37-42.
3. **Hunter EJ**. (2009). NCVS Database Uncovers Key Gender-Related & Occupational Characteristics in Teachers' Voice Use. Lay Paper: 158th Meeting of the Acoustical Society of America. San Antonio, TX (http://www.acoustics.org/press/158th/hunter.htm).
4. Titze IR, and **Hunter EJ**. (2009). Talk is Not Cheap. *Voice and Speech Review*. Rena Cook, Ed. pp. 21-24.
5. **Hunter EJ**. (2008). Little children's voices: A new tool for measuring children's voices could improve diagnosis and treatment. Lay Paper: 156th Meeting of the Acoustical Society of America. Miami, FL (http://www.acoustics.org/press/156th/hunter.html).
6. **Hunter EJ**, Spielman J, Starr A, and Popolo P. (2007). Acoustic Voice Recording, "I Am Seeking Recommendations for Voice Recording Hardware …". Perspectives on Voice & Voice Disorders. 17(3):7-14.
7. Titze IR, **Hunter EJ**, and Švec JG. (2007) How Much Do Teachers Talk? Do They Ever Get a Break? Lay Paper: 153rd Meeting of the Acoustical Society of America Meeting. Salt Lake City, UT (http://www.acoustics.org/press/153rd/lay_lang.html).

OTHER PUBLICATIONS (*PREVIOUS FIVE YEARS*)

1. **Hunter EJ**, and Hunter LM. (2005). Statement on the need for an arytenoid motion knowledge base. NCVS Online Technical Memo No.8. http://www.ncvs.org/ncvs/library/tech.
2. **Hunter EJ**, Hunter LM, and Titze IR. (2005). Individual Subject Laryngeal Dimensions of Multiple Mammalian Species for Biomechanical Models: A Supplement. NCVS Online Technical Memo No.9. http://www.ncvs.org/ncvs/library/tech.
3. **Hunter EJ**. (2006). Optimization of Passive Tissue Model Parameters of Intrinsic Laryngeal Tissues. NCVS Online Technical Memo No.6. http://www.ncvs.org/ncvs/library/tech.
4. Spielman J, Starr AC, Popolo PP, and **Hunter EJ**. (2007). Recommendations for the Creation of a Voice Acoustics Laboratory. NCVS Online Technical Memo No.7. http://www.ncvs.org/ncvs/library/tech.
5. **Hunter EJ**. (2008). General Statistics of the NCVS Self-Administered Vocal Rating (SAVRa). NCVS Online Technical Memo. No.11. http://www.ncvs.org/ncvs/library/tech.
6. Palaparthi AK, and **Hunter EJ**. (2010). Modeling Vocal Fold Tissue: 2- and 3-Network Ogden Models. NCVS Online Technical Memo No.12. http://www.ncvs.org/ncvs/library/tech.

CONFERENCE PRESENTATIONS (*PREVIOUS FIVE YEARS*)

1. Titze IR., Alipour F., Fitch WT, **Hunter EJ**, and Walsh EJ. (2006). "Simulation of Siberian tiger vocalization." J. Acoust. Soc. Am. 120(5). 3189.
2. Titze IR, **Hunter EJ**, and Švec JG. (June 2007). "Voicing and Silence Periods in Daily and Weekly Vocalizations of Teachers." Acoustical Society of America Meeting: Salt Lake City, UT.
3. **Hunter EJ**, and Titze IR. (June 2007). "The Voice Use Profile: Illustrating Actual Voice Use from Long Term Monitoring Using the NCVS Dosimeter." Acoustical Society of America Meeting: Salt Lake City, UT.
4. **Hunter EJ**, and Titze IR. (Aug. 2007) "Refinements in modeling the mechanical properties of laryngeal soft tissue." American Society of Biomechanics: Stanford University, Palo Alto, CA.
5. Austin S, and **Hunter EJ**. (May 2008). "Vocal dose in vocal performance majors." Voice Foundation: Philadelphia, PA.
6. **Hunter EJ**, and Titze IR. (Oct. 2008). "Refinements in modeling the mechanical properties of laryngeal soft tissue" USCF Voice Conference: San Francisco, CA.
7. **Hunter EJ**, and Titze IR. (Oct. 2008). "Vocal fatigue dynamic recovery trajectories as measured by 3 vocal fatigue measures" UCSF Voice Conference: San Francisco, CA.
8. **Hunter EJ**. (Nov. 2008). "An acoustical comparison of a child's fundamental frequencies during structured tasks and unstructured daily activities: A case study." 156th Meeting of Acoustical Society of America: Miami, FL.
9. **Hunter EJ** (Nov. 2009). "NCVS Database Uncovers Key Gender-Related & Occupational Characteristics in Teachers' Voice Use". 158th Meeting of Acoustical Society of America: San Antonio, TX.
10. **Hunter EJ**, and Titze I. (Jul. 2010). Modeling and predicting vocal recovery. International Conference on Advances in Laryngeal Biophysiology & International Conference on Voice Physiology and Biomechanics: Madison, WI.
11. **Hunter EJ**, and Titze IR. (Jul. 2010). "Variations in intensity, fundamental frequency, and voicing for teachers in occupational versus non-occupational settings." International Conference on Advances in Laryngeal Biophysiology & International Conference on Voice Physiology and Biomechanics: Madison, WI.

INVITED LECTURES *(PREVIOUS FIVE YEARS)*

1. "Research toward Occupational Safety in Vocalization." (2006). Acoustics Colloquium: Brigham Young University, Provo, UT.
2. "The Dosimeter: A Tool Used to Record and Quantify Long-term Voice Use." (2007). Computational Mathematics Colloquium. University of Colorado-Denver, Denver, CO.
3. "Acoustics of Voice and Speech." (Aug. 2007). Voice and Speech Trainers Association Meeting: Denver, CO.
4. "Sound Technology and Voice." (Aug. 2007). Voice and Speech Trainers Association Meeting: Denver, CO.
5. "Acoustics of Voice and Speech." (June 2008). National Performing Arts Convention: Denver, CO.

6. "Measuring and Modeling Vocal Vibration Dose." (October 2008). Acoustics Colloquium: Brigham Young University, Provo, UT.
7. "Voice Dosimetry: How to measure how much people talk and how much is too much?" (March 2009). The Occupational Voice Symposium 2009: Protecting the voice in the workplace. (Sponsored by University College London and Royal National Throat Nose and Ear Hospital, given with Svec J et al.)
8. "Theory, Measurement, and Modeling of Vocal Vibration Dose" (Nov. 2009). Dept. of Bioengineering Seminar Series. University of Utah.
9. "Vocal dose measures: safety limits for vocalization". (Sept. 2010). International Scientific Conference 2010 of International Occupational Hygiene Association, Rome.

MEDIA INTERVIEWS *(PREVIOUS FIVE YEARS)*

1. Bergin, M. (31 Oct. 2005). "Therapist Helps Get Vocal Cords in Shape for Power Yelling" *The Capital Times*.
2. Fallik, D. (8 Jul. 2006). "Striking a Cord" Philadelphia Inquirer. (Story also carried in *San Jose Mercury*, *Miami Herald*, and *Akron Beacon Journal*)
3. Mosher, D. (30 May 2007). "Blah, Blah, Blah: Teachers Top Talking Tests." *LiveScience*. <http://www.livescience.com/health/070530_teacher_voices.html>
4. Hollenhorst, J. (7 June 2007). "New Study Shows Teachers Talk Too Much." KSL-TV (NBC affiliate). Salt Lake City, UT. (Story also in PDA-PPC.com)
5. Meyer, JP. (15 Nov. 2007). "Teachers fail to get vocal rest" *The Denver Post*. (Story also in SpeechPathology.com)
6. Avril, T. (23 Jun. 2008). "Classroom woe: Working hoarse" *Philadelphia Inquirer*. (Story also carried in *The Pantagraph*, *The Oklahoman*, and *Oman Tribune*)
7. Avril, T. (12 Aug. 2008). "Teachers more likely to suffer voice-related problems." *The Oklahoman*.
8. Staff writer. (Oct. 25, 2009). "Teachers, especially women, strain voices." UPI.com (United Press International).
9. Powell, D. (Oct. 27, 2009). "Why teacher talk strains voices, especially for women." Science Daily (Story also in Genengnews.com, EurekAlert.com, Physorg.com).
10. Staff Writer. (Oct. 27, 2009). "It Is Female And Not Male Teachers Who Face Increased Voice Problems!" Asian News International. (Story also carried in Yahoo News India, Andhranews.net, *The Hindu*, MedIndia.net)
11. Staff Writer. (Oct. 27, 2009). "Voice strain in teachers, especially females." http://www.medicalnewstoday.com.
12. Taylor, LC. (Nov. 6, 2009). "Giving voice to a neglected teachers' ailment." http://www.parentcentral.ca. (Story also carried on http://www.parentcentral.ca).