

# Soren Y. Lowell, Ph.D., CCC-SLP

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## EDUCATION

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<b>Ph.D.</b>	Speech and Hearing Sciences, <b>Minor:</b> Neuroscience <u>University of Arizona</u> , Department of Speech, Language and Hearing Sciences, Tucson, Arizona Doctoral Dissertation Director: Julie Barkmeier-Kraemer	<b>2005</b>
<b>M.S.</b>	Speech-Language Pathology <u>University of Arizona</u> , Department of Speech, Language and Hearing Sciences, Tucson, Arizona	<b>1994</b>
<b>B.A.</b>	Psychology <u>Columbia University</u> , New York, New York	<b>1989</b>

## WORK EXPERIENCE

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<b>Associate Professor</b> , Communication Sciences and Disorders Dept., Syracuse University, Syracuse, NY	<b>2014 – present</b>
<b>Assistant Professor</b> , Communication Sciences and Disorders Dept., Syracuse University, Syracuse, NY	<b>2008 – 2014</b>
<b>Adjunct Assistant Professor</b> , Dept. of Otolaryngology and Comm. Sciences, SUNY Upstate Medical University, Syracuse, NY	<b>2009 – present</b>
<b>Research Fellow</b> , National Institutes of Health, Laryngeal and Speech Section, Bethesda, MD	<b>2005 – 2008</b>
<b>Adjunct Instructor</b> for Voice Disorders class, George Washington University, Washington, DC	<b>2006</b>
<b>Graduate Teaching Associate</b> , Instructor for Voice Disorders class, University of Arizona, Tucson, AZ	<b>2004</b>
<b>Speech-Language Pathologist</b> , Carondelet St. Joseph's Hospital, Tucson, AZ	<b>2001 – 2005</b>
<b>Speech-Language Pathologist</b> , Robert Wood Johnson University Hospital, New Brunswick, NJ	<b>1998 – 2001</b>
<b>Speech-Language Pathologist</b> , Healthcare Providers Incorporated, multiple locations	<b>1997 – 1998</b>
<b>Speech-Language Pathologist</b> , Children's National Medical Center, Washington, D.C.	<b>1996 – 1997</b>
<b>Speech-Language Pathologist</b> , Carondelet St. Joseph's and St. Mary's Hospitals, Tucson, AZ	<b>1994 – 1996</b>
<b>Graduate Research Assistant</b> , University of Arizona, Tucson, AZ	<b>1991 – 1994</b>
<b>Assistant Social Worker</b> , Early Childhood Direction Center, New York Hospital, New York, NY	<b>1989 – 1991</b>

## COMPETITIVE FELLOWSHIPS, HONORS AND AWARDS

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- **The College of Arts and Sciences Award for Excellence in Master's Level Teaching** 2014
- **Conference Fellow** for ASHA's Clinical Practice Research Institute. Peer-reviewed, competitively selected trainee award for grant writing in clinically focused research. 2010
- **Conference Fellow** for ASHA's Lessons for Success workshop. Peer-reviewed, competitively selected trainee award for grant writing skills. 2010
- **ASHA Leadership Development Program.** Peer-reviewed, competitively selected award for a leadership training program. 2008
- **Grunewald-Blitz Fellowship** through the Speech and Hearing Sciences Department, University of Arizona 2002 – 2005
- Dissertation proposal selected for the **New Investigator's Research Forum**, The Voice Foundation's 33<sup>rd</sup> Annual Symposium, Philadelphia, PA 2004
- **Predoctoral Traineeship** through the National Center for Neurogenic Communication Disorders, University of Arizona 2001
- **Outstanding Student in Speech-Language Pathology**, awarded upon completion of M.S. program, University of Arizona 1994
- **Jacob Jacoby Scholar**, Columbia University 1987
- **Herbert Hawkes Scholar**, Columbia University 1986

## RESEARCH TRAINING / EXPERIENCE

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### **Post-Doctoral Training**, Mentor: Christy Ludlow, Ph.D.

- Acquired and analyzed neuroimaging data, including functional and anatomical MRI
- Implemented peripheral and cortical stimulation techniques for swallowing, including tDCS, air pulse and vibrotactile stimulation
- Analyzed temporal and biomechanical swallowing parameters from videofluoroscopy
- Implemented programs under Analysis of Functional Neuroimages (AFNI), Peak Motus, MatLab, Chart, and EPrime for data acquisition and analysis
- Contributed to the development and reliability testing of a swallowing safety scale
- Differentially diagnosed neurologic voice disorders such as spasmodic dysphonia and vocal tremor in team assessments
- Designed and conducted research studies to determine cortical control of swallowing-related tasks, differential effects of peripheral sensory stimulation on swallowing, and the efficacy of training and stimulation on improving dysphagia
- Mentored students in 2006 and 2007 student internship program

### **Doctoral Training and Dissertation**, Mentor: Julie Barkmeier-Kraemer, Ph.D.

Committee Members: Jeanette Hoit, Ph.D., Brad Story, Ph.D., Leslie Tolbert, Ph.D.

- Conducted videostroboscopic examinations
- Measured and analyzed electroglottography (EGG) recordings
- Developed novel analysis methods to assess EGG measures from continuous speech
- Measured and analyzed respiratory kinematic signals to assess changes in lung volume during speaking

- Developed and implemented a vocal symptoms rating scale to assess self-perceived symptoms and severity
- Implemented programs under Dataq, LabView and MatLab for data acquisition and analysis

**Doctoral Research Rotation**, Mentor: Brad Story, Ph.D., Speech and Hearing Sciences Department

- Implemented a three-mass model of vocal fold vibration (Titze & Story, 2002) to determine acoustic, aerodynamic and mechanical consequences of increasing laryngeal muscle activation
- Implemented programs under Praat and MatLab for data analysis

**Doctoral Research Rotation**, Mentor: Andrew Fuglevand, Ph.D., Physiology/Neurosciences Department

- Conducted electromyographic single motor unit recordings of hand muscles in humans
- Analyzed resulting action potential recordings, including cross-correlation analysis of synchronous motor unit firing to determine degree of common input to motor nuclei in functionally related and non-related hand muscles

## PEER-REVIEWED PUBLICATIONS

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1. **Lowell, SY** & \*Hylkema, JA (2016). The effect of speaking context on spectral- and cepstral-based acoustic features of normal voice. *Clinical Linguistics & Phonetics*, 30(1), 1-11.
2. \*Hosbach-Cannon, CJ, **Lowell, SY**, Kelley, RT, & Colton, RH (Epub ahead of print). A preliminary quantitative comparison of vibratory amplitude using rigid and flexible stroboscopic assessment. *Journal of Voice*.
3. \*Rosenthal, AL, **Lowell, SY**, & Colton, RH (2014). Acoustic and aerodynamic features of vocal effort. *Journal of Voice*, 28(2), 144-153.
4. **Lowell, SY**, Colton, RH, Kelley, R, & \*Mizia, SA (2013). Predictive value and discriminant capacity of cepstral and spectral-based measures during continuous speech. *Journal of Voice*, 27(4), 393-400.
5. **Lowell, SY**, Kelley, RT, Awan, SN, Colton, RH & \*Chan, NH (2012). Spectral and cepstral-based acoustic features of dysphonic, strained voice quality. *Annals of Otology, Rhinology & Laryngology*, 121(8), 539-548.
6. **Lowell, SY**, Reynolds, RC, Chen, G, Horwitz, B & Ludlow, CL (2012). Functional connectivity and laterality of the motor and sensory components within the volitional swallowing network. *Experimental Brain Research*, 219(1), 85-96.
7. **Lowell, SY**, Kelley, RT, Colton, RH, Smith, PB & Portnoy, JE (2012). Position of the hyoid and larynx in people with muscle tension dysphonia. *Laryngoscope*, 122, 370-377.
8. **Lowell, SY**, Colton, RH, Kelley, R, & \*Hahn, YC (2011). Spectral and cepstral-based measures during continuous speech: capacity to distinguish dysphonia and consistency within a speaker. *Journal of Voice*, 25(5), e223-232.
9. **Lowell, SY**, Poletto, CJ, Knorr-Chung, BR, Reynolds, RC, Simonyan, K, & Ludlow, CL (2008). Sensory stimulation activates both motor and sensory components of the swallowing system. *NeuroImage*, 42(1), 285-295.
10. **Lowell, SY**, Barkmeier-Kraemer, JM, Hoit, JD & Story, BH (2008). Respiratory and laryngeal function during spontaneous speaking in teachers with voice disorders. *Journal of Speech, Language and Hearing Research*, 51(2), 333-349.

11. **Lowell, SY**, & Story, BH (2006). Simulated effects of cricothyroid and thyroarytenoid muscle activation on adult-male vocal fold vibration. *Journal of the Acoustical Society of America*, *Jul*, *120*(1), 386-97.
12. Hockensmith, GB, **Lowell, SY**, & Fuglevand, AJ (2005). Common input across motor nuclei mediating precision grip in humans. *Journal of Neuroscience*, *25*(18), 4560-4564.
13. **Lowell, S**, Beeson, P, & Holland, A (1995). The efficacy of a semantic cueing procedure on naming performance in adults with aphasia. *American Journal of Speech-Language Pathology*, *4*, 109-114.
14. Swisher, L, Restrepo, MA, Plante, E, & **Lowell, S** (1995). Effects of implicit and explicit "rule" presentation on bound morpheme generalization in specific language impairment. *Journal of Speech and Hearing Research*, *38*, 168-173.
15. Swisher, L, Plante, E, & **Lowell, S** (1994). Nonlinguistic deficits of children with specific language disorders complicate the interpretation of their non-verbal IQ scores. *Language, Speech and Hearing Services in Schools*, *25*, 235-240.

\* Denotes manuscripts for Bachelor's, Master's or PhD students for whom I was the mentor.

## INVITED MANUSCRIPTS AND BOOK CHAPTERS

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1. **Lowell, SY** (2012). The acoustic assessment of voice in continuous speech. *Perspectives on Voice and Voice Disorders*, *22* (2), 57-63.  
<http://div3perspectives.asha.org/content/vol22/issue2/?etoc>
2. Ludlow, CL, Loucks, T, Simonyan, K, & **Lowell, SY** (2008). Brain imaging of voice, swallow, and other upper airway functions. In R. Ingham (Ed.), *Neuroimaging in Communication Sciences and Disorders* (pp. 87-128). San Diego: Plural Publishing.

## PEER REVIEWED AND PROFESSIONAL PRESENTATIONS

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1. **Lowell, SY** (October, 2015). Essential voice tremor: Characteristics and treatment. Invited speaker for a Philadelphia essential tremor support group. Philadelphia, PA.
2. **Lowell, SY**, Kelley, RT, Busekroos, L, Voleti, RV, \*Hosbach-Cannon, CJ, Colton, RH (May, 2015). Effects of training on visual-perceptual nasolaryngoscopy ratings of tremor. Oral platform presentation, 2015 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
3. \*Hosbach-Cannon, CJ, **Lowell, SY**, Kelley, RT, Colton, RH, \*Garrison, H (June, 2014). Amplitude of vibration in normal speakers: A preliminary quantitative analysis. Poster presentation, 2014 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
4. **Lowell, SY** (May, 2014). Essential Voice Tremor: Characteristics, treatment and current research. Invited speaker for a congressional briefing, organized by a patient support group for people affected by essential tremor. Washington, D.C.
5. **Lowell, SY** (October, 2013). Voice therapy: Current methods and evidence. Invited speaker for a continuing education seminar presented at Syracuse University. Attendees received ASHA CEU's and represented clinicians from Syracuse and the central NY region. Syracuse University, Syracuse, NY.
6. **Lowell, SY**, Colton, RC, Kelley, RT & \*Mizia, SA (May, 2013). *Predictive value and discriminant capacity of cepstral and spectral-based measures during continuous speech*. Oral platform

- presentation, 2013 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
7. **Lowell, SY** (February, 2013). *Evidence based practice*. Invited speaker for a continuing education seminar presented to the Central New York Speech, Language and Hearing Association, Syracuse, NY. Attendees received ASHA CEU's and represented clinicians from the central NY region.
  8. **Lowell, SY**, Kelley, RT, Colton, RC, Smith, PB & Portnoy, JE (June, 2012). *Hyoid and laryngeal position in people with muscle tension dysphonia*. Oral platform presentation, 2012 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
  9. **Lowell, SY**, Kelley, R, Awan, S, Colton, RH & \*Chan, N (June, 2012). *Spectral and cepstral-based features of dysphonic, strained voice quality*. Oral platform presentation, 2012 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
  10. French, CC, Kelley, R, **Lowell, SY**, Colton, RH (June, 2012). *Calcium hydroxylapatite vocal fold medialization for unilateral vocal fold paralysis: Comparing cepstral measures with CAPE-V and videostroboscopic ratings*. Poster presentation, 2012 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA. Presented by C. French (first author).
  11. **Lowell, SY**, Kelley, RT, Colton, RC, Smith, PB & Portnoy, JE (November, 2011). *Hyoid and laryngeal position in people with muscle tension dysphonia*. Oral platform presentation, American Speech-Language-Hearing Association Convention, San Diego, CA.
  12. **Lowell, SY**, Colton, RC, Kelley, R, & \*Hahn, YC (November, 2010). *Predictive value and discriminant capacity of cepstral and spectral measures*. Poster presentation, American Speech-Language-Hearing Association Convention, Philadelphia, PA.
  13. **Lowell, SY**, Colton, RC, Kelley, R, & \*Hahn, YC (June, 2010). *Spectral and cepstral-based measures during continuous speech: capacity to distinguish dysphonia and consistency within a speaker*. Oral platform presentation, 2010 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
  14. **Lowell, SY** (May, 2010). *Voice evaluation: Perceptual ratings and current methods*. Invited speaker for a continuing education seminar presented to the Central New York Speech, Language and Hearing Association, Syracuse, NY. Attendees received ASHA CEU's and represented clinicians from the central NY region.
  15. Kelley, R, Portnoy, JE, Colton, R., Paseman, A, **Lowell, SY** (June, 2009). *Efficient stroboscopic evaluation*. Oral platform presentation, 2009 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
  16. **Lowell, SY**, Dietrich-Burns, K, Griffith, C, Knorr-Chung, BR, & Ludlow, CL (March, 2008). *Effects of oral-sensory and vibrotactile stimulation on swallowing in humans*. Oral platform presentation, Dysphagia Research Society, Isle of Palms, SC.
  17. **Lowell, SY**, Poletto, CJ, Graybeal, C, Simonyan, K & Ludlow, CL (March, 2007). *Cerebral activation patterns during swallowing and related tasks using functional magnetic resonance imaging*. Poster presentation, Dysphagia Research Society, Vancouver, BC.
  18. Ludlow, CL, Sonies, BC, Humbert, IA, Crujido, L, Martin, SB, & **Lowell, SY** (March, 2007). *Validity and reliability of the swallowing safety scale*. Poster presentation, Dysphagia Research Society, Vancouver, BC.
  19. **Lowell, SY**, Barkmeier-Kraemer, JM, Hoit, JD & Story, BH (June, 2006). *Respiratory and laryngeal function during spontaneous speaking in teachers with a voice disorder*. Oral platform presentation, 2006 Voice Foundation's Annual Symposium for Care of the Professional Voice, Philadelphia, PA.
  20. **Lowell, SY**, Hoit, JD, Barkmeier-Kraemer, JM (November, 2004). *Speech breathing behavior in muscle tension dysphonia: Preliminary findings*. Poster presentation, American Speech-Language-Hearing Association Convention, Philadelphia, PA.

21. **Lowell, SY** (June, 2004). *Respiratory and laryngeal behavior during speech in teachers with vocal fatigue*. Dissertation proposal presented to a panel of voice experts in the New Investigator's Research Forum, The Voice Foundation's 33<sup>rd</sup> Annual Symposium, Philadelphia, PA.
22. **Lowell, S**, Kiernan, B, Winter, S, & Barkmeier, J (November, 2002). *Can we train children to use healthy vocal habits? A project proposal*. Tucson Continuing Education Forum for Speech-Language Pathologists, University of Arizona, Tucson, AZ.
23. **Lowell, S**, Beeson, P, & Holland, A (June, 1995). *The efficacy of a semantic cueing procedure on naming performance of adults with aphasia*. Oral platform presentation of thesis, Clinical Aphasia Conference, Sunriver, OR.

\* Denotes presentations by Master's or PhD students for whom I was the mentor.

## RESEARCH SUPPORT

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### **National Institute on Deafness and Other Communication Disorders (NIH/NIDCD) 2013 – 2016 R03 NIH Small Grant Program**

R03DC012429-01A1 Effects of Octanoic Acid for Treatment of Essential Voice Tremor

The purpose of this project is to determine the acoustic, perceptual and functional effects of octanoic acid for treatment of essential voice tremor.

*Role: Principal Investigator, Direct Costs: \$300,000.*

### **American Speech-Language-Hearing Foundation Research Grant for New Investigators**

**2009 – 2011**

Hyoid and Laryngeal Position in Individuals With and Without Muscle Tension Dysphonia

The purpose of this project was to determine radiographically measured differences in hyoid and laryngeal position during phonation for people with muscle tension dysphonia as compared to people with normal voice.

*Role: Principal Investigator, Total Costs: \$5,000.*

### **University of Arizona Intramural Funding**

**2001 – 2003**

AD020079-002 Program Enhancement for School-Age Child Care Grant Program,  
for Wings on Words child language disorders program.

*Role: Collaborator (PI: Barbara Kiernan), Total Costs: \$14,880*

## PATENTS

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Ludlow, CL, Morgan, N, Dold, G, **Lowell, S**, Dietrich-Burns. Systems and Methods for Recovery from Motor Control via Stimulation to a Substituted Site to an Affected Area. 03/5/2013. Patent # 8388561

Ludlow, CL, Morgan, N, Dold, G & **Lowell, S**. device for Volitional Swallowing with a Substitute Sensory System. 05/28/2013. Patent # 8449445

## TEACHING EXPERIENCE

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### Complete Courses

- Fundamentals of Speech Science (undergrad/graduate course) **2010 – 2013**  
*Role: Assistant Professor, Syracuse University*
- Anatomy & Physiology of the Speech & Hearing Mechanisms **2009 – 2014**  
(undergrad/graduate course)  
*Role: Assistant Professor, Syracuse University*
- Dysphagia (graduate course) **2009 – present**  
*Role: Assistant Professor, Syracuse University*
- Voice Disorders (graduate course) **2008 – present**  
*Role: Assistant Professor, Syracuse University*
- Voice, Articulation and Phonology (graduate course) **2006**  
*Role: Adjunct Instructor, George Washington University*
- Voice and Voice Disorders (graduate course) **2003 – 2004**  
*Role: Course Instructor, University of Arizona*

### Individual or Series Lectures

- Survey of Human Communication Disorders (undergraduate course) **2004**  
Management of Voice Disorders lecture.  
*Role: Guest Lecturer*
- Anatomy and Physiology of the Speech Mechanism (undergraduate course, 70 students). Phonatory Anatomy: 3 lecture series. **2003**  
*Role: Guest Lecturer*
- Anatomy and Physiology of the Speech Mechanism (undergraduate course, 70 students). Phonatory Physiology: 3 lecture series. **2003**  
*Role: Guest Lecturer*
- Survey of Human Communication Disorders (undergraduate course, 60 students). Introduction to Dysphagia lecture. **2002 – 2003**  
*Role: Guest Lecturer*
- Counseling in Communication Disorders (graduate course, 30 students). Multicultural Issues in Counseling lecture. **2002**  
*Role: Guest Lecturer*

## STUDENT MENTORING

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### **Doctoral and Master's Level**

- Carly Jo Hosbach, Doctoral Speech-Language Pathology student **2012 – present**
  - *Role: Primary mentor/Dissertation advisor*
- Amelia Kelly, Master's Speech Language Pathology student **2015**
  - *Role: Thesis Committee Member*
- Carly Maldonado, Doctoral Audiology student **2015 – present**
  - *Role: Doctoral Examination/Dissertation Committee Member*
- Hammam AlMakadma, Doctoral Audiology student **2012 – present**
  - *Role: Doctoral Examination/Dissertation Committee Member*
- Allison Rosenthal, Master's Speech Language Pathology student **2011 – 2013**

- *Role: Thesis advisor/Primary mentor. Thesis title: Aerodynamic and acoustic features of vocal effort.*
- Ashley Cukier, Master's Speech Language Pathology student **2010 – 2012**
  - *Role: Thesis Committee Member*
- Brooke Butler, Master's Speech Language Pathology student **2009 – 2011**
  - *Role: Thesis Committee Member*

## **PROFESSIONAL LICENSURES AND CERTIFICATIONS**

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- New York Licensure, The University of the State of New York, Education Department, License # 019508 **2009 – present**
- Maryland Licensure, The Maryland State Board of Audiology, HAD, and Speech-Language Pathologists, License # 03661 **2005 – 2009**
- Clinical Credentials, National Institutes of Health, Clinical Center **2005 – 2008**
- Certificate in College Teaching, University of Arizona **2003**
- Certificate of Clinical Competence in Speech-Language Pathology, American Speech, Language and Hearing Association, ASHA # 01116958 **1994**

## **PROFESSIONAL MEMBERSHIPS**

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- American Speech, Language and Hearing Association (ASHA)
- Special Interest Group 3: Voice and Voice Disorders, ASHA
- Special Interest Group 13: Swallowing and Swallowing Disorders, ASHA

## **INVITED PROFESSIONAL SERVICE AND TRAINING**

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- Member of the Multicultural Issues Board, ASHA **2016 –**
- Chair, Communication Sciences & Disorders Curriculum Committee Syracuse University **2015 –**
- Admissions Committee Member, Communication Sciences & Disorders Syracuse University **2013 – 2016**
- Committee Member and Reviewer, Voice, Resonance & Alaryngeal Committee, ASHA 2014/2015 Convention Conference. **2014, 2015**
- Member of Neuroscience Program Governance Committee, Syracuse University **2013**
- Member of Chair Search/Review Committee for College of Arts & Sciences **2013**
- Member of Advisory Committee on Evidence-Based Practice, ASHA **2010 – 2012**
- Member of Search Committee for endowed Neurosciences Professorship, Syracuse University **2009 – 2010**
- Member of the Search Committee within the Department of Communication Sciences and Disorders for new faculty hire **2011 – 2013**
- Reviewer for ASHA's Advancing Academic-Research Careers Award (AARC) **2015**
- Reviewer for ASHA Grant Applications, Mentored Grant Reviewer Program **2007, 2013, 2015**



- Reviewer for ASHA's Students Preparing for Academic-Research Careers (SPARC) award **2013**
- Reviewer for *Journal of Voice*
- Reviewer for *Transactions on Neural Systems and Rehabilitation Engineering*
- Reviewer for *Journal of Laryngology & Otology*
- Reviewer for *International Journal of Neuroscience*
- Reviewer for *International Journal of Speech-Language Pathology*
- Reviewer for *Journal of Speech, Language, and Hearing Research*
- Reviewer for *Neurobiology of Aging*
- Reviewer for *Journal of Communication Disorders*
- Reviewer for *American Journal of Speech-Language Pathology*

## **OTHER SKILLS AND SERVICE**

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- Initiated and led aphasia communication group for adults with aphasia, Robert Wood Johnson University Hospital, New Brunswick, NJ **2000 – 2001**
- Provided tutoring services to individuals enrolled in the American Indian Training Program in the Speech and Hearing Department, University of Arizona **1993 – 1994**
- Provided bilingual Spanish-English speech-language services in all job positions (bilingual Spanish-English speaking) **1994 – 2005**