

# Nathan C. Higgins, Ph.D.

Tampa, FL 33620  
Phone: 860-301-9112  
higgins1@usf.edu  
natehiggins@outlook.com

## Education

- 2012 *Ph.D.*, Psychology, University of Connecticut, Storrs, CT  
Advisor: Heather L. Read, Ph.D  
Dissertation: *Representation of the Interaural Level Difference Cue in Auditory Cortex of the Rat*
- 2007 *M.A.*, Psychology, University of Connecticut, Storrs, CT  
Advisor: Heather L. Read, Ph.D  
Thesis: *Early Postnatal Somatosensory Cortical Lesions Alter Acoustic Responses in Primary and Belt Auditory Cortices*
- 2004 *B.S.*, Psychology, University of Connecticut, Storrs, CT

## Research Experience

- 2020- Research Assistant Professor; University of South Florida, Tampa, FL  
Auditory and Speech Sciences Laboratory
- 2017-20 Postdoctoral Fellow; University of Nevada Las Vegas, Psychology Department, Las Vegas, NV  
Principal Investigator: Joel S. Snyder, Ph.D
- 2013-17 Postdoctoral Fellow; Vanderbilt University, Department of Hearing and Speech Sciences,  
Nashville, TN  
Principal Investigator: G. Christopher Stecker, Ph.D
- 2012-13 Postdoctoral Fellow; University of Washington, Department of Speech and Hearing Sciences,  
Seattle, WA  
Principal Investigator: G. Christopher Stecker, Ph.D
- 2004-05 Laboratory Technician, University of Connecticut, Storrs, CT

## Grants

- 2016 Hearing Health Foundation, Emerging Research Grant  
Central Auditory Processing Disorders: *Biomarkers of spatial processing in auditory cortex measured with functional near-infrared spectroscopy.* <https://hearinghealthfoundation.org/capd/>

## Technical Skills and Analytical Expertise

- 2004-17 Programming Languages
- Matlab (+ PsychToolBox)
  - Unix, shell scripts
- 2004-12 Animal preparations
- Surgical procedures (anesthesia, tracheotomy, craniotomy)
  - Intrinsic optical imaging
  - Extracellular single/multi unit recording
- 2012-18 Human Neuroimaging: fMRI, fNIRS, EEG

- Software: FSL, FreeSurfer, SPM, EEGlab

### Professional Memberships and Activities

Member, *Society for Neuroscience*, 2004-05, 2009-

Member, *Association for Research in Otolaryngology*, 2005-2007, 2011, 2013-

Member, *Organization for Human Brain Mapping*, 2013-14, 2016

Member, *Society for Functional Near-Infrared Spectroscopy*, 2015

Peer Reviewer: *Cereb. Cortex*, *J. Neurosci.*, *Fr. Neurosci.*, *Neuroimage*, *J. Neurophys.*, *Hear. Res.*, *Trends in Hear. Res.*, *J. Adv. Res.*, *Psychophysiology*.

### Awards

2014 Vanderbilt University Medical Center, Shared Resources Symposium: Best Poster in the field of Neuroscience, Nashville, TN

2009-10 University of Connecticut, Travel Award, Storrs, CT

2008-10 Neuroscience Fellow; University of Connecticut, Storrs, CT

### Teaching Experience

2006-11 Teaching Assistant, Department of Psychology, University of Connecticut, Storrs, CT  
Introduction to Psychology Lab, approx. 10 sections, 20 students per section

2011 Teaching Assistant, Department of Psychology, University of Connecticut, Storrs, CT  
Sensory Neuroscience Lab, 1 section, 20 students

### Peer Reviewed Publications

**Higgins NC**, Little DF, Kuruvilla-Mathew A, Nave KM, Yerkes BD, Elhilali M, Snyder JS. Neural correlates of perceptual switching while listening to bistable auditory streaming stimuli. *Neuroimage*. 204 (1). 2020

**Higgins NC**, McLaughlin SA, Rinne T, Stecker GC. Evidence for cue-independent spatial representation in the human auditory cortex during active listening. *Proc. Natl. Acad. Sci.* 5(11): E7602-E7611. 2017

**Higgins NC**, McLaughlin SA, Da Costa S, Stecker GC. Sensitivity to an illusion of sound location in human auditory cortex. *Front Syst Neurosci.* 11(35). 2017

McLaughlin SA, **Higgins NC**, Stecker GC. Tuning to binaural cues in human auditory cortex. *J. Assoc. Res. Otolaryngol.* 17(1): 37-53. 2016

Stecker GC, McLaughlin SA, **Higgins NC**. Monaural and binaural contribution to interaural-level-difference sensitivity in human auditory cortex. *Neuroimage*. 120: 456-466. 2015

Escabi MA, Read HL, Viventi J, Kim DH, **Higgins NC**, Storace DA, Liu AS, Gifford AM, Burke JF, Campisi M, Kim YS, Avrin AE, Van der Spiegel J, Huang Y, Li M, Rogers JA, Litt B, Cohen YE. A high-density, high-channel count, multiplexed  $\mu$ ECoG array for auditory-cortex recordings. *J. Neurophysiol.* Sep 15; 112(6): 1566-83. 2014

Storace DA, **Higgins NC**, Chikar JA, Oliver DL, Read HL. Gene expression identifies distinct ascending glutamatergic pathways to frequency-organized auditory cortex in the rat brain. *J. Neurosci.* Nov 7; 32(45): 15759-68. 2012

Higgins NC, 2019

Storage DA, **Higgins NC**, Read HL. Thalamocortical pathway specialization for sound frequency resolution. *J Comp Neurol*. Feb 1; 519(2): 177-93. \*Cover art selected for this issue of the journal. 2011

**Higgins NC**, Storage DA, Escabi MA, Read HL. Specialization of binaural responses in ventral auditory cortices. *J Neurosci*. Oct 27; 30(43): 14522-32. \*Cover art selected for this issue of the journal. 2010

Storage DA, **Higgins NC**, Read HL. Thalamic label patterns suggest primary and ventral auditory fields are distinct core regions. *J Comp Neurol*. May 15; 518(10): 1630-46. \*Cover art selected for this issue of the journal. 2010

**Higgins NC**, Escabi MA, Rosen GD, Galaburda AM, Read HL. Spectral processing deficits in belt auditory cortex following early postnatal lesions of somatosensory cortex. *Neurosci*. May2; 153(2): 535-49. \*Cover art selected for this issue of the journal. 2008

Escabi MA, **Higgins NC**, Galaburda AM, Rosen GD, Read HL. Early cortical damage in rat somatosensory cortex alters acoustic feature representation in primary auditory cortex. *Neurosci*. Dec 19; 150(4): 970-83. 2007

## Presentations

**Higgins NC**. Spatial cues and stream segregation in the auditory cortex. University of Florida, Speech, Language, and Hearing Department, Gainesville, FL, 2019

**Higgins NC**. Binaural cue representation in the human auditory cortex. *Vanderbilt Bill Wilkerson Center*, Vanderbilt University, Nashville, TN, 2017

**Higgins NC**. Neuroimaging of binaural processing in the human auditory cortex. *Hearing and Speech Sciences Research Seminar*, Vanderbilt University, Nashville, TN, 2015

**Higgins NC**. The effect of task on cortical processing of auditory spatial cues. *Hearing and Speech Sciences Research Seminar*, Vanderbilt University, Nashville, TN, 2014

Read HL, **Higgins NC**, Storage DA. Specialization of auditory cortices for sound localization cues. Symposium presentation at *Annual meeting for the Association for Research in Otolaryngology*, Baltimore, MD, 2011

**Higgins NC**, Read HL, Escabi MA. Enhanced binaural spike rate tuning to midline sound positions in ventral belt cortex. Symposium presented at the *Society for Neuroscience Annual Meeting*, San Diego, CA, 2010

Storage DA, **Higgins NC**. Subregional specialization for resolution of spectral and horizontal sound position cues in auditory cortex. Symposium presented at the *Society for Neuroscience Annual Meeting*, San Diego, CA, 2010

**Higgins NC**, Read HL. Representing Sound Location in Auditory Cortex. University of Connecticut Communications Department. Invited presentation University of Connecticut Communications Department (Dr. Frank Musiek), Storrs, CT, 2010

## Posters

Higgins NC, 2019

**Higgins NC**, Yerkes BD, Little DF, Nave-Blodgett JE, Elhilali M, Snyder JS. Modality-specific resetting of segregation during bistable perception of auditory streams. Poster presented at the annual meeting of the *Association for Research in Otolaryngology*, Baltimore, MD, 2019

**Higgins NC**, Little DF, Kuruvilla-Mathew A, Nave KM, Yerkes BD, Elhilali M, Snyder JS. Neural correlates of perceptual switching during auditory streaming of bistable stimuli. Poster presented at the annual meeting of the *Association for Research in Otolaryngology*, San Diego, CA, 2018

Da Costa S, **Higgins NC\***, Stecker GC. Combined effects of interaural time and level differences in human auditory cortex. Poster presentation: *Association for Research in Otolaryngology*, Baltimore, MD, 2017  
\*presenting author

**Higgins NC**, Stecker GC. Multi-voxel pattern representation of binaural cues in human auditory cortex. Poster presentation: *Organization for Human Brain Mapping*, Geneva, Switzerland, 2016

**Higgins NC**, Stecker GC. Multi-voxel pattern representation of interaural time and level difference cues in human auditory cortex. Poster presentation: *Association for Research in Otolaryngology*, San Diego, CA, 2016

**Higgins NC**, McLaughlin SA, Stecker GC. Temporal weighting of binaural cues in human auditory cortex: an fMRI study. Poster presentation: *Society for Neuroscience*, Chicago, IL, 2015

**Higgins NC**, Stecker GC. The effect of “awake and behaving” on cortical processing of binaural spatial cues. Poster presentation: *Association for Research in Otolaryngology*, Baltimore, MD, 2015

**Higgins NC**, Stecker GC. Task-related attention affects the cortical processing of auditory spatial cues. Poster presentation: *Society for Neuroscience*, Washington, DC, 2014

**Higgins NC**, Rinne T, Stecker GC. The influence of feature-based task effects on binaural cue representation in human auditory cortex. Poster presentation: *Organization for Human Brain Mapping*, Hamburg, Germany, 2014

**Higgins NC**, Stecker GC. The Effect of task on localization cues in human auditory cortex. Poster presentation: *Association for Research in Otolaryngology*, Baltimore, MD, 2014

**Higgins NC**, McLaughlin SA, G. C. Stecker. Regional tuning to interaural time and level difference in human auditory cortex. Poster presentation: *Society for Neuroscience*, San Diego, CA, 2013

McLaughlin SA, **Higgins NC**, Stecker GC. BOLD signal tuning to interaural level and time differences in human auditory cortex. Poster presentation: *Organization for Human Brain Mapping*, Seattle, WA, 2013

Stecker GC, McLaughlin SA, **Higgins NC**. Binaural sensitivity in human auditory cortex: analyzing the time course and spatial pattern of activity in fMRI. Poster presentation: *Association for Research in Otolaryngology*, Baltimore, MD, 2013

**Higgins NC**, Storage DA, McLaughlin SA, Stecker GC, Escabi MA, Read HL (2012) Interaural level difference tuning in auditory cortex of the human and the rat. Poster presentation: *Society for Neuroscience*, New Orleans, LA, 2012

**Higgins NC**, Storage DA, Escabi MA, Read HL. An interaural level difference code for discriminating sound position. Poster presentation: *Society for Neuroscience*, Washington, DC, 2011

Storace DA, Chikar JA, **Higgins NC**, Oliver DL, Read HL. Gene expression differences for glutamatergic pathways to primary and ventral auditory cortical fields. Poster presentation: *Society for Neuroscience*, Washington, DC, 2011

**Higgins NC**, Storace DA, Escabi MA, Read HL. Representation of sound level cues in two ventral belt auditory cortices of the rat. Poster presentation: *Society for Neuroscience*, Chicago, IL, 2009

Storace DA, **Higgins NC**, Read HL. Thalamocortical specialization for frequency resolution input to primary versus belt auditory cortex. Poster presentation: *Society for Neuroscience*, Chicago, IL, 2009

**Higgins NC**, Read HL. Correlations between intrinsic optical signals and unit response properties in rat auditory cortex following altered developmental trajectories. Poster presentation: *Association for Research in Otolaryngology*, Denver, CO, 2007

Read HL, **Higgins NC**, Escabi MA. Organization of level dependent intrinsic activity in rat auditory cortex. Poster presentation: *Association for Research in Otolaryngology*, Baltimore, MD, 2006

Read HL, **Higgins NC**, Escabi MA. Auditory cortical feature representation changes with neonatal somatosensory cortical lesions: optical imaging. Poster presentation: *Society for Neuroscience*, Washington, DC, 2005

Escabi MA, **Higgins NC**, Galaburda AM, Rosen GD, Read HL. Auditory cortical feature representation changes with neonatal somatosensory cortical lesions: electrophysiology. Poster presentation: *Society for Neuroscience*, Washington, DC, 2005

Read HL, **Higgins NC**, Escabi MA. Altered intrinsic optical responses in auditory cortex with early induction of cortical microgyri. Poster presentation: *Association for Research in Otolaryngology*, New Orleans, LA, 2005

Escabi MA, **Higgins NC**, Read HL. Spectro-temporal processing in the auditory cortex of a microgyric rat model. Poster presentation: *Association for Research in Otolaryngology*, New Orleans, LA, 2005