JASON A. TOURVILLE

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RESEARCH PROFILE

I am a cognitive and computational neuroscientist primarily focused on mapping the brain regions involved in speech motor control. My research combines mathematical modeling with functional and structural brain imaging to study the neural mechanisms underlying normal and disordered speech, including persistent developmental stuttering, apraxia of speech, spasmodic dysphonia, and autism. I also have an extensive background in human neuroanatomy and MRI-based brain morphometry that I use to develop expert-guided semi-automated brain region labeling methods.

EDUCATION

Ph.D., Cognitive and Neural Systems, Boston University (May, 2008)

Thesis: *Neural Mechanisms Underlying Auditory Feedback Control of Speech*. Research focused on mapping components the DIVA model of speech motor control to neural substrates using functional magnetic resonance imaging (fMRI) with an emphasis on the auditory feedback control system. Coursework covered mathematical modeling of motor control, speech, vision, and reinforcement learning neural systems and computational neuroscience methods.

B.A., Neuroscience, Oberlin College (May, 1996)

Advanced undergraduate coursework in neuroanatomy, neurophysiology, neuropharmacology, and biochemistry.

POST-GRADUATE APPOINTMENTS

Research Assistant Professor, Department of Speech, Language, and Hearing Sciences, Boston University, Boston, MA (2011– present)

Co-investigator for two National Institutes of Health R01 projects (PI, Frank Guenther) that study the sensorimotor interactions involved in normal and disordered speech production by combining neuroimaging and computational modeling; supervise and mentor graduate students and postdoctoral fellows in their research projects; participate in Ph.D. dissertation committees.

Associate Director, Speech Lab, Boston University (2011 – present)

Oversee the Speech Lab neuroimaging research program, train undergraduate and graduate students and postdocs on brain imaging and computational modeling methods, and assist in the preparation of journal manuscripts and grant proposals.

Faculty Member, Graduate Program for Neuroscience, Boston University (2011 – present)

Faculty Member, Center for Research in Sensory Communications and Neural Technology (CReSCNT), Boston University (2016 – present)

Faculty Member, Center for Computational Neuroscience and Neural Technologies, Boston University (2011 – 2016)

Research Assistant Professor, Department of Cognitive and Neural Systems, Boston University (2010 – 2011)

Research Associate, Boston University (2008 –2009)

Served as neuroanatomist in the Speech Lab at the Department of Cognitive and Neural Systems. In this capacity, I contributed to the design, conduct, and interpretation of functional imaging experiments and oversaw anatomical region of interest-based (ROI) analyses of imaging data. Responsibilities also included refinement of the DIVA model of speech motor control.

OTHER EMPLOYMENT

Neuroanatomical Consultant, Neuromorphometrics, Inc., Somerville, MA (2008 – present)
Oversee manual labeling of cortical and subcortical MRI brain images from normal and disordered adults and infants; train technicians to apply volume and surface-based anatomical labeling protocols; explore neuroanatomical variability for the purpose of developing improved automated labeling methods.

Graduate Research Assistant, Boston University (1999 –2008)
Worked as a research assistant under Prof. Frank Guenther while pursuing a doctoral degree. My responsibilities included designing and conducting fMRI studies of speech processing, contributing to the development of the DIVA model, and the development of a system of anatomical ROIs tailored for imaging studies of speech; also contributed to the preparation of several NIH and NSF grants, journal and conference submissions, and oversight of adherence to human subjects and institutional review board regulations.

Teaching Fellow, Boston University (Fall 2001)
Acted as teaching assistant in the Department of Cognitive and Neural Systems for the course titled Principles and Methods of Cognitive and Neural Modeling I; provided individual and group tutoring, graded modeling assignments and exams.

Research Assistant, Massachusetts General Hospital, Boston, MA (1999 – 2000)
Worked under Dr. Nikos Makris at the Center for Morphometric Analysis on a study of attentional network pathology in persons diagnosed with schizophrenia. Responsibilities included recruitment and neuropsychological testing of participants, conducting fMRI experiments, analysis of functional and structural data MRI, refinement of structural MRI analysis methods developed at the Center for Morphometric Analysis.

Research Assistant, Harvard Medical School, Boston, MA (1996 – 1999)
Worked under Dr. Larry Seidman and Dr. Jill Goldstein at the Center for Morphometric Analysis at Massachusetts General Hospital on comparative morphometry studies of schizophrenia. Responsibilities included the delineation of cortical and subcortical ROIs in individual structural MRI data based on anatomical landmarks.

Research Assistant, Oberlin College, Oberlin, OH (1995 – 1996)
Worked under Prof. Mark Braford using immunocytochemical methods to study non-mammalian vertebrate (knifefish) neuroanatomy. My responsibilities included tracer injections, brain extraction, and histological preparations and analyses.

Teaching Assistant, Oberlin College, Oberlin, OH (1993 – 1994)
Acted as a lab assistant (Fall, 1993) and course consultant/tutor (Spring, 1994) for the Biology Department introductory biology courses.

AWARDS AND HONORS

American Speech and Hearing Association (ASHA) Convention Trailblazer Presenter (November, 2015)

Organization for Human Brain Mapping Hackathon Winner ("MNI Mashup" Challenge, member of team Mindboggle-102 (June, 2013)

Best Student Paper in Speech Communication, 148th Meeting of the Acoustical Society of America, San Diego, CA (November, 2004)

Boston University Outstanding Teaching Fellow Award (2001 – 2002)

Boston University Graduate Research Fellowship (2000 – 2008)

PROFESSIONAL MEMBERSHIPS AND SERVICE

Member, Human Atlasing Working Group, International Neuroinformatics Coordinating Facility (2015 – present)

Member, American Speech and Hearing Association (ASHA), Society for Neuroscience (SFN), Organization for Human Brain Mapping, Cognitive Neuroscience Society

Ad-Hoc Reviewer, *Neural Networks, Neuroimage, Brain and Language, PloS ONE, Journal of Neuroscience, Aphasiology, Brain, Journal of Neurophysiology*

TECHNICAL SKILLS

Familiarity with Windows, Linux and Macintosh operating systems, MATLAB programming language, SPM, FSL, and FreeSurfer neuroimage analysis software, multivariate statistics, neural networks, structural equation modeling

REFEREED JOURNAL PUBLICATIONS

Walsh, B., Tian, F., Tourville, J.A., Yücel, M.A., Kuczek, T., and Bostian, A.J. (under review). Illuminating the speaking brain: An fNIRS investigation of speech production in children who stutter.

Segawa, J.A., Tourville, J.A., Beal, D.S., and Guenther, F.H. (2015). The neural correlates of speech motor sequence learning. *Journal of Cognitive Neuroscience*. 27(4):819-831.

Ballard, K.J., Tourville, J.A., Robin, D.A. (2014). Behavioral, computational, and neuroimaging studies of acquired apraxia of speech. *Frontiers in Human Neuroscience*. 8:892. doi: 10.3389/fnhum.2014.00892. PMCID: PMC4217373.

Cai, S., Tourville, J.A., Beal, D.S., Perkell, J.S., Guenther, F.H., Ghosh, S.S. (2014). Diffusion imaging of cerebral white matter in persons who stutter: evidence for network-level anomalies. *Frontiers in Human Neuroscience*. 8:54. doi: 10.3389/fnhum.2014.00054

Peeva, M.G., Tourville, J.A., Agam, Y., Holland, B., Manoach, D.S., Guenther, F.H. (2013). White matter impairment in the speech network of Individuals with autism spectrum disorder. *NeuroImage: Clinical*. 3:234-241. PMCID: PMC3815014

Klein, A. and Tourville, J.A. (2012). 101 labeled brain images and a consistent human cortical labeling protocol. *Frontiers in Neuroscience.* 6:171. PMCID: PMC3514540.

Tourville, J.T. and Guenther, F.H. (2011). The DIVA model: A neural theory of speech acquisition and production. *Language and Cognitive Processes.* 25(7):952-981. PMCID: PMC3650855.

Golfinopoulos, E., Tourville, J.A., Bohland, J.W., Ghosh, S.S., Nieto-Castanon, A., Guenther, F.H. (2011). MRI investigation of unexpected somatosensory feedback perturbation during speech. *Neuroimage*. 55(3):1324-1328. PMCID: PMC3065208

Golfinopolous, E., Tourville, J.T. and Guenther, F.H. (2010). The integration of large-scale neural network modeling and functional brain imaging in speech motor control. *Neuroimage.* 52(3):862-874. PMCID: PMC3065208.

Peeva, P.G., Guenther, F.H., Tourville, J.A., Nieto-Castanon, A., Anton, J., Nazarian, B., Alario, F. (2010). Distinct representations of phonemes, syllables, and supra-syllabic sequences in the speech production network. *Neuroimage.* 50(2):626-638. PMCID: PMC2840383.

Guenther, F.H., Brumberg, J.S., Wright, E.J., Nieto-Castanon, A., Tourville, J.A., Panko, M., Law, R., Siebert, S.A., Bartels, J.L., Andreasen, D.S., Ehirim, P., Mao, H., and Kennedy, P.R. (2009). A wireless brain-machine interface for real-time speech synthesis. *PLos ONE.* 4(12):e8218. PMCID: PMC2784218.

Ghosh S.S., Tourville, J.A., and Guenther F.H. (2008). A neuroimaging study of premotor lateralization and cerebellar involvement in the production of phonemes and syllables. *Journal of Speech, Language, and Hearing Research*. 51:1183-1202. PMCID: PMC2652040.

Tourville, J.A., Reilly, K.J., and Guenther, F.H. (2008). Neural mechanisms underlying auditory feedback control of speech. *NeuroImage*, 39(3):1429-1443. PMCID: PMC3658624.

Guenther, F.H., Ghosh, S.S., and Tourville, J.A. (2006). Neural modeling and imaging of the cortical interactions underlying syllable production. *Brain and Language*, 96(3):280-301. PMCID: PMC1473986.

Klein, A., Mensh, B., Ghosh, S., Tourville, J., and Hirsch, J. (2005). Mindboggle: automated brain labeling with multiple atlases. *BMC Medical Imaging*, 5:7. PMCID: PMC1283974.

Guenther, F.H., Nieto-Castanon, A., Ghosh, S.S., and Tourville, J.A. (2004). Representation of sound categories in auditory cortical maps. *Journal of Speech, Language, and Hearing Research*, 47(1):46-57.

Nieto-Castanon, A., Ghosh, S.S., Tourville, J.A., and Guenther, F.H. (2003). Region-of-interest based analysis of functional imaging data. *NeuroImage*, 19:1303-1316.

Ghosh, S., Nieto-Castanon, A., Tourville, J., and Guenther, F. (2001). ROI-based analysis of fMRI data incorporating individual differences in brain anatomy. *NeuroImage*, 13(6, part2):125.

Seidman, L.J., Faraone, S.V., Goldstein, J.M., Goodman, J.M., Kremen, W.S., Toomey, R., Tourville, J., Kennedy, D., Makris, N., Caviness, V.S., and Tsuang, M.T. (1999). Thalamic and amygdala-hippocampal volume reductions in first degree relatives of schizophrenic patients: An MRI-based morphometric analysis. *Biological Psychiatry*, 46:941-954.

Goldstein, J.M., Goodman, J.M., Seidman, L.J., Kennedy, D., Makris, N., Hang, L., Tourville, J., Caviness, V.S., Faraone, S.V., and Tsuang, M.T. (1999). Cortical abnormalities in schizophrenia identified by structural magnetic resonance imaging. *Archives of General Psychiatry*, 56:537-547.

BOOK CHAPTERS

Guenther, F.H., Tourville, J.A., and Bohland, J.W. (2015). Speech production. In A.W. Toga and R.A. Poldrack (eds.), *Brain Mapping: An Encyclopedic Reference*. Oxford: Elsevier.

Tourville, J.T., Peeva, M.G., and Guenther, F.H. (2014). Perception-production interactions and their neural bases. In: Goldrick, M., Ferreira, V., and Miozzo, M. (eds.), *Oxford Handbook of Language Production.* Oxford University Press.

Guenther, F.H, Ghosh, S.S., Nieto-Castanon, A., and Tourville, J.A. (2006). A neural model of speech production. In: J. Harrington and M. Tabain (eds.), *Speech Production: Models, Phonetic Processes, and Techniques.* London: Psychology Press.

CONFERENCE PUBLICATIONS

Tourville, J.A., Nieto-Castanon, A., and Guenther, F.H. (2017). Identifying functional regions of interest within the speech motor control neural network. 7th International Conference on Speech Motor Control, Groningen, the Netherlands, July 5-8.

Daliri, A., Tourville, J.A., Nieto-Castanon, A., and Guenther, F.H. (2016). A general framework for quantitatively assessing neurocomputational models with functional neuroimaging data. *Meeting Planner, 46th Annual Meeting for the Society for Neuroscience*. San Diego, CA. Program No. 437.10.

Segawa, J.A., Tourville, J.A., Nguyen, Q.T.H., Farahanoglu, F.I., Wighton, P., Van Der Kouwe, A., Tisdall, M.D., Fowler, R.A., Small, J., Manoach, D.S., and Guenther, F.H. (2016). Neural correlates of language phenotypes in autism spectrum disorder. *Meeting Planner, 46th Annual Meeting for the Society for Neuroscience*. San Diego, CA. Program No. 289.06.

Worth, A.J. and Tourville, J.A. (2016). Anatomical evaluation of Colin27 against a database of labeled brain scans. *Meeting Planner, 46th Annual Meeting for the Society for Neuroscience*. San Diego, CA. Program No. 271.15

Poline, J-B, Bohland, J., Evans, A., Feng, D., Flandin, G., Fonov, V., Ghosh, S., Janke, A., Jenkinson, M., Kennedy, D., Lerch, F., Ng, L., Tourville, J., Vincent, R., Zollei, L. (2016). Standardizing neuromimaging atlas formats. 22nd Annual Meeting of the Organization for Human Brain Mapping, Geneva, Switzerland. Program No. 1845

Tourville, J.A. (2015). A computational framework for studying the neuroanatomical correlates of stuttering in children. *American Speech and Hearing Association (ASHA) Convention*, Denver, CO. Session Code 1411.

Jason Tourville | Curriculum Vitae | April, 2017																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				5

Worth, A.J. and Tourville, J.A. (2015). Acceptable values of similarity coefficients in neuroanatomical labeling of MRI. *Meeting Planner, 45th Annual Meeting for the Society for Neuroscience*. Chicago, IL. Program No. 829.21.

Daliri, A., Golfinopoulos, E., Tourville, J.A., and Guenther, F.H. (2015). Neuroanatomical differences between adults who stutter and adults who do not stutter. *Meeting Planner, 45th Annual Meeting for the Society for Neuroscience.* Chicago, IL. Program No. 753.25.

Turkes, E., Golfinopoulos, E, Guenther, F.H., and Tourville, J.A. (2015). Investigating intrinsic functional connectivity within the speech production network*. NeuroHAM Conference*. Boston, MA.

Worth, A., and Tourville, J.A. (2014). Exploring neuroanatomical variation in a large database of manually-labeled human MRI scans. *Meeting Planner, 44th Annual Meeting for the Society for Neuroscience.* Washington, D.C. Program No. 184.09.

Tourville, J.A., Nieto-Castanon, A., and Guenther, F.H. (2014). Functional parcellation of cortical regions that contribute to speech motor control. Program of the 21st Annual Meeting of the Cognitive Neuroscience Society. Boston MA. Supplement of the *Journal of Cognitive Neuroscience.* p. 219:F118.

Segawa, J.A., Tourville, J.A., Beal, D.S., and Guenther, F.H. (2014). Neural and behavioral correlates of speech motor sequence learning. *Program of the 21st Annual Meeting of the Cognitive Neuroscience Society*. Boston MA. Supplement of the *Journal of Cognitive Neuroscience.* p. 145:D73.

Klein, A., Giard, J., Bao, F., Häme, Y., Reuter, M., Tourville, J., Tustison, N., Avants, B., Nichols, N., and Ghosh, S. (2014). Shape analysis of 101 healthy human brains. *Neuroimage.* 20th Annual Meeting of the Organization for Human Brain Mapping, Hamburg, Germany.

Worth, A., and Tourville, J. (2013). Mining reliable landmarks for automated understanding of brain structure in MRI. *Meeting Planner, 43rd Annual Meeting for the Society for Neuroscience.* San Diego, CA. Program No. 100.28.

Tourville, J.A., Nieto-Castanon, A., and Guenther, F.H. (2013). Large N analyses of neuroimaging data on speech production. *Neuroimage.* 19th Annual Meeting of the Organization for Human Brain Mapping, Seattle, WA.

Segawa, J.A., Tourville, J.A., Beal, D.S., and Guenther, F.H. (2013). The representation of syllabic frame structures and phonological content in the brain. *Neuroimage.* 19th Annual Meeting of the Organization for Human Brain Mapping, Seattle, WA.

Tourville, J.A., Cai, S., and Guenther, F.H. (2013). Exploring auditory-motor interactions in normal and disordered speech. *Proceedings of Meetings on Acoustics*. 9:060180. *165th Meeting of the Acoustical Society of America*, Montreal, Quebec.

Tourville, J.T. and Guenther, F.H. (2012). Automatic cortical labeling system for neuroimaging studies of normal and disordered speech. *Meeting Planner, 42nd Annual Meeting for the Society for Neuroscience.* New Orleans, LA. Program No. 681.06.

Worth, A.J., and Tourville, J.A. (2012). Bootstrapping neuroanatomical labeling in MRI. *Meeting Planner, 42nd Annual Meeting for the Society for Neuroscience.* New Orleans, LA. Program No. 709.17.

Beal, D.S., Segawa, J., Tourville, J.A., Cai, S., and Guenther, F.H. (2012) Speech motor sequence learning difficulties in persistent developmental stuttering: an fMRI study. *Meeting Planner, 42nd Annual Meeting for the Society for Neuroscience.* New Orleans, LA. Program No. 681.07.

Segawa, J.A., Tourville, J.A., Beal, D.S., and Guenther, F.H. (2012). Dissociated neural representations of phonological content and syllabic frame structure. *Meeting Planner, 42nd Annual Meeting for the Society for Neuroscience.* New Orleans, LA. Program No. 681.01.

Tourville, J.T. and Klein, A. (2012). 101 labeled brains and a new human cortical labeling protocol. *5th Annual INCF Neuroinformatics Congress*. Munich, Germany.

Bao, F.S., Joachim Giard, J., Tourville, J.A., and Klein, A. (2012). Automated extraction of nested sulcus features from human brain MRI data. *34th Annual International IEEE Engineering in Medicine and Biology Conference.* San Diego, CA.

Beal, D., Tourville, J.A., Segawa, J.A., Cai, S. and Guenther, F.H. (2011). An fMRI study of speech-sequence learning in people who stutter. *Program of the American Speech-Language-Hearing Association Convention*. San Diego, CA.

Tourville, J.A., and Worth, A.J. (2011). Interactive digital atlas of the human cerebral sulci. *Meeting Planner*, *41st Annual Meeting of the Society for Neuroscience.* Washington, D.C. Program No. 619.25.

Segawa, J.A., Tourville, J.A., and Guenther, F.H. (2011). Neuroimaging evidence of phonological and structural frame representations in subsyllabic speech motor sequence learning. *9th International Seminar on Speech Production*. Montreal, Canada.

Segawa, J.A., Tourville, J.A., and Guenther, F.H. (2011). Neural correlates of speech motor sequence learning. *17th Annual Meeting of the Organization for Human Brain Mapping*. Quebec City, Canada.

Worth, A., Millington, G., and Tourville, J.A. (2011). NeuroMorphoNaut: An open source tool to make anatomy less tedious. *17th Annual Meeting of the Organization for Human Brain Mapping*. Quebec City, Canada.

Klein, A., Worth, A.J., Tourville, J.T., Landman, B.A., Dal Canton, T., Ghosh, S.S., and Shattuck, D.W. (2010). An interactive tool for constructing optimal brain colormaps. *Meeting Planner, 40th Annual Meeting for the Society for Neuroscience.* San Diego, CA. Program No. 714.29.

Worth, A.J., Millington, G.L., Tourville, J.A., Carper, R.A., Kennedy, D.N., and Salamon, G. (2009). Creating a large-scale morphometric baseline from MRI brain scans. *Meeting Planner*, *39th Annual Meeting of the Society for Neuroscience.* Chicago, Illinois. Program No. 198.16.

Robin, D.A., Guenther, F.H., Narayana, S., Jacks, A., Tourville, J.A., Ramage, A.E., Lancaster, J.L., Franklin, C., Ghosh, S., and Fox, P.T. (2008). A transcranial magnetic stimulation virtual lesion study of speech. *Proceedings of the Conference on Motor Speech, Monterey, California*.

Tourville, J.A., and Guenther, F.H. (2007). Neural mechanisms underlying sensory feedback control of speech. *Program of the 154th Meeting of the Acoustical Society of America, Journal of the Acoustical Society of America*, 122(5, Pt. 2):3087.

Reilly, K.J., Guenther, F.H., and Tourville, J.A. (2007). A neuroimaging investigation of auditory-motor learning. Program of the 154th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, 122(5, Pt. 2):3087.

Reilly, K.J., Guenther, F.H., Tourville, J.A., and Bohland, J.W. (2006). Brain activations during learning of a novel speech sensorimotor mapping. *Conference on Motor Speech: Motor Speech Disorders*. Austin, Texas.

Tourville, J.A., Guenther, F.H., Ghosh, S.S., Reilly, K.J., Bohland, J.W., and Nieto-Castanon, A. (2005). Effects of acoustic and articulatory perturbation on cortical activity during speech production. *Neuroimage (11th Annual Meeting of the Organization for Human Brain Mapping, Toronto),* 26(S1):S49.

Tourville, J.A., Guenther, F.H., Ghosh, S.S., and Bohland, J.W. (2004). Effects of jaw perturbation on cortical activity during speech production. *Journal of the Acoustical Society of America (148th Meeting of the Acoustical Society of America, San Diego)*, 116(4):2631.

Guenther, F.H., Tourville, J.A., and Bohland, J. (2003). Modeling the representation of speech sounds in auditory cortical areas. Program of the 145th Meeting of the Acoustical Society of America, *Journal of the Acoustical Society of America*, 113(4, Pt. 2):2210.

Guenther, F.H., Nieto-Castanon, A., Tourville, J.A., and Ghosh, S.S. (2001). The effects of categorization training on auditory perception and cortical representations. *Proceedings of the Speech Recognition as Pattern Classification (SPRAAC) Workshop*, Nijmegen, The Netherlands, July 11-13.

Guenther, F.H., Nieto-Castanon, A., Tourville, J.A., and Ghosh, S.S. (2000). The representation of prototypical and non-prototypical vowels in peri-sylvian cortical areas. *Society for Neuroscience Abstracts*, 26(2):1971.

OTHER PUBLICATIONS

Tourville, J.A. and Guenther, F.H. (2003). A cortical and cerebellar parcellation system for speech studies. Boston University Technical Report CAS/CNS-03-022. Boston, MA: Boston University.

Tourville, J.A. (2008). *Neural Mechanisms Underlying Auditory Feedback Control of Speech*. Boston University Ph.D. Dissertation. Boston, MA.

INVITED LECTURES

"Neural Modeling and Imaging of Speech Production." University of Connecticut Communication Disorders Research Colloquium Series. Storrs, Connecticut, April 6, 2005.