Joe Toscano, Ph.D.

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Areas of Specialization

cognitive science, cognitive psychology; cognitive neuroscience; speech perception; language processing; hearing; computational modeling.

Education

2011   PH.D., Psychology—Cognition and Perception, University of Iowa

2005   B.S., Brain and Cognitive Sciences, Honors in Research, University of Rochester

Academic Appointments

2014-   Assistant Professor, Dept. of Psychological & Brain Sciences, Villanova Univ.
Affiliations: *Cognitive Science Program, Cognitive & Behavioral Neuroscience Program*

2011-2014   Postdoctoral Fellow, Beckman Inst. for Advanced Science & Technology
Univ. of Illinois at Urbana-Champaign

2005-2011   Graduate Research Assistant, Dept. of Psychology
Univ. of Iowa (Advisor: Dr. Bob McMurray)

2004   Research Assistant, Human Information Processing Branch
NASA Ames Research Center (Advisors: Drs. Lee Stone & Brent Beutter)

2003-2005   Research Assistant, Dept. of Brain & Cognitive Sciences
Univ. of Rochester (Advisor: Dr. Michael Tanenhaus)

Honors & Awards

2014   Select-Speaker Award, Psychonomic Society

2011   Beckman Fellowship, Beckman Inst. for Advanced Science & Technology

2011   Don Lewis Dissertation Year Award, Univ. of Iowa, Dept. of Psychology

2010   Graduate College Summer Fellowship, Univ. of Iowa

2008   Best Student Paper in Speech Communication—2nd Prize, Acoust. Soc. of America

2008   Computational Modeling Prize in Perception & Action, Cognitive Science Society

2007   J.R. Simon Early Scholarship Potential Award, Univ. of Iowa, Dept. of Psychology

2006   Best Student Paper in Speech Communication—1st Prize, Acoust. Soc. of America

2006-2010   Travel Funds Awards (4), Univ. of Iowa Graduate Student Senate

2006-2007   Scholarly Presentation Awards (2), Univ. of Iowa Student Government

2004   Undergraduate Student Research Program, NASA Ames Research Center

Professional Development

2017 Classification and Clustering Workshop, Center for Statistics Education, Villanova Univ.

2011 Fast Optical Imaging Summer Workshop, Univ. of Illinois at Urbana-Champaign

2006 ERP Boot Camp, Univ. of California, Davis

Professional Affiliations

2018 Auditory Perception and Cognition Society

2012 Psychonomic Society (Fellow: 2015)

2008 Cognitive Science Society

2006 Acoustical Society of America

Research

Publications (* Mentored student/trainee)

Journal Articles

in press *Getz LM, Toscano JC (in press). Electrophysiological evidence for top-down lexical influences on early speech perception. To appear in *Psychological Science*.

in press *Pereira O, *Gao YA, Toscano JC (in press). Perceptual encoding of natural speech sounds revealed by the N1 event-related potential response. To appear in *Auditory Perception & Cognition*.

in press Toscano JC, Lansing CR (in press). Age-related changes in temporal and spectral cue weights in speech. To appear in *Language and Speech*.

2019 *Gao YA, Toscano JC, Shih C, Tanner D (in press). Reassessing the electrophysiological evidence for categorical perception of Mandarin lexical tone: ERP evidence from native and nave non-native Mandarin listeners. *Attention, Perception, & Psychophysics, 81*, 543-557.

2018 *Tabachnick AR, Toscano JC (2018). Perceptual encoding in auditory brainstem responses: Effects of stimulus frequency. *Journal of Speech, Language, and Hearing Research, 61*, 2364-2375.

2018 Toscano JC, *Anderson ND, Fabiani M, Gratton G, Garnsey SM (2018). The time-course of cortical responses to speech revealed by fast optical imaging. *Brain and Language, 184*, 32-42.

2018 *Buxó-Lugo A, Toscano JC, Watson DG (2018). Effects of participant engagement on prosodic prominence. *Discourse Processes, 55*, 305-323.

2017 Brown-Schmidt S, Toscano JC (2017). Gradient acoustic information induces long-lasting referential uncertainty in short discourses. *Language, Cognition, & Neuroscience, 32*, 1211-1228.

2017 *Getz LM, *Nordeen ER, *Vrabic SC, Toscano JC (2017). Modeling the development of audiovisual cue integration in speech perception. *Brain Sciences, 7*, 32.

2015 Toscano JC, McMurray B (2015). The time-course of speaking rate compensation: Effects of sentential rate and vowel length on voicing judgments. *Language, Cognition, and Neuroscience, 30*, 529-543.

2014 Toscano JC, Allen JB (2014). Across and within consonant errors for isolated syllables in noise. *Journal of Speech, Language, and Hearing Research, 57*, 2293-2307.

2013 Toscano JC, *Anderson ND, McMurray B. (2013). Reconsidering the role of temporal order in spoken word recognition. *Psychonomic Bulletin and Review, 20*, 981-987.

2012 Toscano JC, McMurray B (2012). Cue integration and context effects in speech: Evidence against speaking rate normalization. *Attention, Perception, & Psychophysics, 76*, 1284-1301.

2010 Toscano JC, McMurray B, Dennhardt J, Luck SJ (2010). Continuous perception and graded categorization: Electrophysiological evidence for a linear relationship between the acoustic signal and perceptual encoding of speech. *Psychological Science, 21*, 1532-1540.

2010 Toscano JC, McMurray B (2010). Cue integration with categories: Weighting acoustic cues in speech using unsupervised learning and distributional statistics. *Cognitive Science, 34*, 434-64.

2009 McMurray B, Aslin RN, Toscano JC (2009). Statistical learning of phonetic categories: Insights from a computational approach. *Developmental Science, 12*, 369-378.

2008 Toscano JC, Perry LK, Mueller KL, Bean AF, Galle ME, Samuelson LK (2008). Language as shaped by the brain; the brain as shaped by development. Commentary on Christiansen & Chater, "Language as shaped by the brain", *Behavioral and Brain Sciences, 31*, 535-536.

Book Chapters

2015 Toscano JC, *Buxó-Lugo A, Watson DG (2015). Using game-based approaches to increase level of engagement in research and education. In S. Dikkers (Ed.), *TeacherCraft: Using Minecraft for Teaching and Learning*. Pittsburgh: ETC Press.

2009 McMurray B, Horst, J, Toscano JC, Samuelson, LK (2009). Towards an integration of connectionist learning and dynamical systems processing: Case studies in speech perception and lexical development. In J.P. Spencer, M. Thomas, & J. McClelland (Eds.), *Toward a Unified Theory of Development: Connectionism and Dynamic Systems Theory Re-Considered* (pp. 218-249). New York: Oxford University Press.

Refereed Proceedings Papers

2010 Toscano JC, Mueller, K.L., McMurray B, & Tomblin, J.B. (2010). Simulating individual differences in language ability and genetic differences in FOXP2 using a neural network model of the SRT task. In S. Ohlsson & R. Catrambone (Eds.), *Proceedings of the 32nd Annual Conference of the Cognitive Science Society* (pp. 2230-2235). Austin, TX: Cognitive Science Society.

2008 Toscano JC, McMurray B (2008). Using the distributional statistics of speech sounds for weighting and integrating acoustic cues. In B.C. Love, K. McRae, & V.M. Sloutsky (Eds.), *Proceedings of the 30th Annual Conference of the Cognitive Science Society* (pp. 433-438). Austin, TX: Cognitive Science Society.

Technical Reports & Other Manuscripts

2011 Toscano JC (2011). Perceiving speech in context: Compensation for contextual variability during acoustic cue encoding and categorization. Doctoral dissertation, University of Iowa.

2005   Toscano JC (2005). Effect of object salience on eye movements in a visual-linguistic task. Honors thesis for the B.S. in Brain and Cognitive Sciences, University of Rochester.

2005   Toscano JC, & Beutter, B.R. (2005). Performance during visual search: Designing spacecraft with humans in mind. *University of Rochester Journal of Undergraduate Research, 3*, 8-12.

2004   Toscano JC (2004). Effect of salience on saccadic performance during visual search. NASA Undergraduate Student Research Program Technical Report.

Presentations   (* Mentored student/trainee)

Invited Talks and Colloquia

2017   Toscano JC (2017, May). What does the speech system know and when does it know it? Invited talk presented at Dept. of Psychological & Brain Sciences, University of Iowa, Iowa City, IA.

2015   Toscano JC (2015, November). Encoding continuous acoustic cues in speech: An approach for understanding speech perception and development. Invited talk presented at Nemours duPont Hospital for Children, Translational Science Seminar, Wilmington, DE.

2014   Toscano JC (2014, October). The time-course of spoken word recognition: Continuous cues operating continuously in time. Invited talk presented at the Department of Communication Sciences and Disorders, Northwestern University, Evanston, IL.

2014   Toscano JC (2014, October). The neural organization of speech perception. Invited talk presented at the *Beckman Institute 25th Anniversary Symposium*.

2014   Toscano JC (2014, October). Continuity in spoken word recognition revealed in the time-course of processing. Invited talk presented at the Institute for Research in Cognitive Science, University of Pennsylvania, Philadelphia, PA.

2014   Toscano JC (2014, April). The time-course of spoken word recognition. Invited talk presented at the Volen National Center for Complex Systems, Brandeis University, Waltham, MA.

2013   Toscano JC (2013, May). Computing the reliability of acoustic information in speech. Invited talk presented at the Dept. of Linguistics, Northwestern Univ., Evanston, IL.

2013   Toscano JC (2013, April). Computational approaches to speaker adaptation and perceptual learning. Invited paper presented at the *Workshop on Current Issues and Methods in Speaker Adaptation*, Department of Linguistics, Ohio State University, Columbus, OH.

2013   Toscano JC (2013, February). Acquiring and adapting phonological categories: Insights from computational modeling approaches. Invited talk presented at the Department of Linguistics, University of Illinois at Urbana-Champaign, Urbana, IL.

2005   Toscano JC (2005, November). Category acquisition through statistical learning using a mixture of Gaussians model. Invited talk presented at the University of Rochester Speech Group, Rochester, NY.

Conference Symposia

2017   Toscano JC (2017, August). Using statistical learning to acquire speech categories: A computational framework for studying phonological development. Invited talk presented at the *13th International Conference for*

Cognitive Neuroscience, Amsterdam, Netherlands.

2016   Toscano JC, Allen JB. Idiosyncratic effects in speech-based hearing tests. In J. Toscano, B. McMurray, E. Myers, & M. Goldrick, Unifying principles and individual differences: What should we focus on to understand speech? *15th Annual Auditory Perception, Cognition, and Action Meeting*, Boston, MA.

2012   McMurray B, Toscano JC (2012, October). The consequences of lexical sensitivity to fine grained detail: Solving the problems of integrating cues and processing speech in time. In A. Jongman & J. Sereno (Chairs), The nature of lexical representations in the perception and production of speech. Symposium presented at the *164th Meeting of the Acoustical Society of America*, Kansas City, MO.

2010   McMurray B, Apfelbaum KS, Toscano JC, Samuelson, LK (2010, March). Something old and something new: Word learning as the interaction of statistical association and dynamic competition. In C. Yu (Chair), Modeling statistical word learning. Symposium presented at the *International Conference on Infant Studies*, Baltimore, MD.

Conference Presentations

2018   *Gao YA, *Pereira O, Toscano JC. (2018, November). Sensitivity to continuous acoustic cues across spectral and temporal dimensions in speech. Poster presented at the *59th Annual Meeting of the Psychonomic Society*, New Orleans, LA.

2018   *Getz LM, Toscano JC. (2018, NovembeR). McGurk doesnt work: Evidence against the McGurk effect as a perceptual illusion. Poster presented at the *59th Annual Meeting of the Psychonomic Society*, New Orleans, LA.

2018   Toscano JC, *Saccocia G. (2018, November). Differences in intensity discrimination predicted by self-reported speech recognition difficulty. Paper presented at the *17th Annual Auditory Perception, Cognition, and Action Meeting*, New Orleans, LA.

2018   *Getz LM, Toscano JC (2018, November). Top-down lexical knowledge directly influences early speech perception. Paper presented at the *17th Annual Auditory Perception, Cognition, and Action Meeting*, New Orleans, LA.

2018   *Falandays JB, Spivey MB, Toscano JC (2018, July). Phonological representations in Spanish-English bilinguals: Unitary or dual sets? Poster presented at the *40th Annual Meeting of the Cognitive Science Society*, Madison, WI.

2018   *Thomas C, Morlet T, Toscano JC (2018, April). The Effects of Hearing Loss on Speech Sound Processing: Is the N100 Measure a More Sensitive Tool? Poster presented at the *2018 Linguistics and Cognitive Science Student Conference*, University of Delaware, Newark DE.

2018   *Falandays JB, Spivey MJ, Toscano JC (2018, March). Investigating phonemic representations in Spanish-English bilinguals using mouse-tracking: A laboratory/MTurk comparative study. Paper presented at the *60th Conference of Experimental Psychologists (TeaP 2018)*, Marburg, Germany.

2018   *Getz LM, Toscano JC (2018, March). Top-down semantic information influences early speech sound encoding. Talk presented at the *Annual Meeting of the Eastern Psychological Association*, Philadelphia PA.

2018   *Gao YA, *Pereira O, Toscano JC (2018, March). Acoustic cue encoding in speech revealed by event-related potentials. Poster presented at the *Annual Meeting of the Eastern Psychological Association*, Philadelphia PA.

2018   *Thomas C, Morlet T, Toscano JC (2018, March). Electrophysiological measures of speech sound encoding

and the effects of hearing loss. Poster presented at the *Annual Meeting of the Eastern Psychological Association*, Philadelphia PA.

2018   *Benecke A, Toscano JC (2018, January). How far can VOT take us? Voicing categorization with and without the use of VOT. Poster presented at *Society for Computation in Linguistics*, Salt Lake City, UT.

2018   *Crinnion AM, Malmskog B, Toscano JC (2018, January). A graph theoretic approach for generating hypotheses about phonetic cues in speech. Talk presented at *Society for Computation in Linguistics*, Salt Lake City, UT.

2017   *Gao YA, Pereira O, Toscano, JC (2017, November). Encoding acoustic cues in speech: Electrophysiological measurements. Poster presented at the *16th Auditory Perception, Cognition, and Action Meeting*, Vancouver, BC.

2017   Toscano, JC, *Folk E (2017, November). From Sounds to Words in 90 Milliseconds: The Time-Course of Spoken Word Recognition. Talk presented at *58th Annual Meeting of the Psychonomic Society*, Vancouver, BC.

2017   Fischer-Baum S, Toscano JC (2017, November). Dissociation between lexical and indexical processing during speech perception. Poster presented at the *55th Annual Meeting of the Academy of Aphasia*, Baltimore, MD.

2017   *Benecke A, Toscano JC (2017, November). Classification of English Stop Consonants: A Comparison of Multiple Models of Speech Perception. Poster presented at the *58th Annual Meeting of the Psychonomic Society*, Vancouver, BC. (Recipient of Psychonomic Society Graduate Travel Award).

2017   *Falandays JB, Brown-Schmidt S, Toscano JC (2017, November). Long-Lasting gradient activation of referents during spoken sentence processing. Poster presented at the *58th Annual Meeting of the Psychonomic Society*, Vancouver, BC.

2017   *Biro T, Viswanathan N, Toscano JC (2017, November). How Task Engagement Influences Speech Production: A Look at Phonetic Convergence, Poster presented at the *58th Annual Meeting of the Psychonomic Society*, Vancouver, BC.

2017   *Getz L, Toscano JC (2017, November). Marching Bands and Butter Bombs: Semantic Association Modulates the Auditory N100 Response to Speech Sounds. Poster presented at the *58th Annual Meeting of the Psychonomic Society*, Vancouver, BC.

2016   *Biro T, Toscano JC, Viswanathan N (2016, November). Phonetic convergence in an immersive game-based task. Poster presented at the *5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan*, Honolulu, HI.

2016   *Crinnon AM, Malmskog B, Toscano JC (2016, October). Which cues do listeners use? Discovering networks of phonetic cues for speech sound categorization using a graph theoretic approach. Poster presented at the *15th Auditory Perception, Cognition, and Action Meeting*, Boston, MA.

2016   *Falandays JB, Brown-Schmidt S, Toscano JC (2016, November). Time Course of Maintenance and Use of Gradient Acoustic Information During Pronoun Referent Interpretation. Poster presented at the *5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan*, Honolulu, HI.

2016   *Folk E, Toscano JC (2016, November). Event-related potential responses reveal simultaneous processing

across multiple levels of representation in spoken word recognition. Poster presented at the *5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan*, Honolulu, HI.

2016   *Getz LM, *Nordeen E, *Vrabic S, Toscano JC (2016, October). Modeling Audiovisual Cue Integration in Speech Perception. Poster presented at the *15th Auditory Perception, Cognition, and Action Meeting*, Boston, MA.

2016   *Pereira O, Toscano JC (2016, November). The N1 Event-Related Potential Component as an Index of Speech Sound Encoding for Multiple Phonetic Contrasts. Poster presented at the *5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan*, Honolulu, HI.

2016   *Saltzman D, Rhone A, McMurray B, Toscano JC (2016, October). Listeners use sentential rate, but not envelope information, to compensate for speaking rate during spoken word recognition. Poster presented at the *57th Meeting of the Psychonomic Society*, Boston, MA.

2016   *Tabachnick AR, Toscano JC (2016, November). High-pass filtering distorts auditory brainstem responses: Evidence from click and tone stimuli. Poster presented at the *5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan*, Honolulu, HI.

2016   *Pereira O, Toscano, JC (2016, August). Auditory N1 Amplitude varies across multiple acoustic and phonological dimensions in speech. Poster presented at the *38th Annual Meeting of the Cognitive Science Society*, Philadelphia, PA.

2016   *Vrabic S, *Nordeen E, & Toscano JC. (2016, August). Speech perception across the lifespan: Using a Gaussian mixture model to understand changes in cue weighting between younger and older adults. Poster presented at the *38th Annual Meeting of the Cognitive Science Society*, Philadelphia, PA.

2016   *Biro T, Viswanathan N, Toscano JC (2016, March). Using naturalistic and engaging tasks to measure phonetic convergence. Poster presented at the *Sociolinguistic Variation and Language Processing Conference*, Virginia Tech, Blacksburg, VA.

2015   *Biro T, Toscano JC, Viswanathan N. (2015, November). Measuring phonetic convergence and acoustic properties of speech with engaging, naturalistic tasks. Poster presented at the *14th Annual Auditory Perception, Cognition, & Action Meeting*, Chicago, IL.

2015   *Curley T, Toscano JC (2015, November). Overcoming talker variability when learning speech sound categories: A computational approach. Poster presented at the *56th Annual Meeting of the Psychonomic Society*, Chicago, IL. (Recipient of Psychonomic Society Graduate Travel Award).

2015   *Folk E, Toscano JC (2015, November). Rapid lexical processing revealed by the timecourse of ERP responses. Poster presented at the *56th Annual Meeting of the Psychonomic Society*, Chicago, IL.

2015   *Saltzman D, Rhone A, McMurray B, Toscano JC (2015, November). Artificially natural: Creating carefully-controlled acoustic cue continua from natural speech. Poster presented at the *14th Annual Auditory Perception, Cognition, and Action Meeting*, Chicago, IL.

2015   *Tabachnick A, *Brooks B, Allen JB, & Toscano JC (2015, November). Speech testing using token-level error thresholds: Comparison with pure-tone audiograms. Poster presented at the *14th Annual Auditory Perception, Cognition, and Action Meeting*, Chicago, IL.

2015   Zhou P, Toscano JC, Garnsey SM, Christianson K (2015, March). Structural complexity modulates semantic

P600 in sentence processing. Poster presented at the *Annual Meeting of the Cognitive Neuroscience Society*, San Francisco, CA.

2014   Toscano JC, Anderson ND, Garnsey SM, Fabiani M, Gratton G (2014, November). Speech sound encoding in the brain measured using fast diffuse optical imaging. Paper presented at the *55th Annual Meeting of the Psychonomic Society*, Long Beach, CA. (Recipient of Psychonomic Society Select Speaker Award).

2014   Toscano JC (2014, May). Unsupervised learning of phonetic cues in speech. Paper presented at the *2014 Midwest Speech and Language Days*, Urbana, IL.

2014   Anderson, ND, Toscano JC, Garnsey SM, Fabiani M, Gratton G (2014, May). Gradient coding of voice onset time in posterior temporal cortex. Poster presented at the *167th Meeting of the Acoustical Society of America*, Providence, RI.

2014   Anderson, N.D., Toscano JC, Garnsey SM, Fabiani M, Gratton G (2014, April). Graded representations of voice onset time: Evidence from optical imaging. Poster presented at the *Annual Meeting of the Cognitive Neuroscience Society*, Boston, MA.

2014   Brown-Schmidt S, Toscano JC (2014, March). Continuous acoustic information trickles up; discourse information trickles down. Poster presented at the *27th Annual CUNY Conference on Human Sentence Processing*, Columbus, OH.

2013   Toscano JC, Trevino A, Allen JB (2013, October). Assessing the assessment: Measuring listeners speech recognition errors for specific consonants and tokens. Poster presented at the *2013 Aging and Speech Communication Conference*, Indiana University, Bloomington, IN.

2013   Bux-Lugo, A., Toscano JC, & Watson DG (2013, March). Task effects on prosodic prominence. Paper presented at the *26th Annual CUNY Conference on Human Sentence Processing*, Columbia, SC.

2012   Toscano JC, McMurray B (2012, November). Combining cues to recognize speech: Acoustic measurements of phonetic cues to word-medial voicing. Poster presented at the *53rd Annual Meeting of the Psychonomic Society*, Minneapolis, MN.

2012   Toscano JC, McMurray B (2012, November). An approach for manipulating the perceived gender of a talkers voice for studies of indexical effects in speech perception. Paper presented at the *11th Auditory Perception, Cognition, & Action Meeting*, Minn., MN.

2012   Toscano JC, McMurray B (2012, October). Voicing in English revisited: Measurement of acoustic features signaling word-medial voicing in trochees. Poster presented at the *164th Meeting of the Acoustical Society of America*, Kansas City, MO.

2012   Toscano JC, McMurray B (2012, October). Perception of continuous acoustic cues in speech revealed by the auditory N1 and P3 ERP components. Poster presented at the *2012 Neurobiology of Language Conference*, San Sebastian, Spain.

2012   Toscano JC, McMurray B (2012, January). Measuring perceptual encoding and categorization of speech sounds using an ERP approach. Poster presented at the *6th Annual Conference of the Auditory Cognitive Neuroscience Society*, Tucson, AZ.

2011   Toscano JC, Anderson, N.D., & McMurray B (2011, November). The role of time in spoken word recognition: Evidence against temporal order in lexical representations. Poster presented at the *52nd Annual Meeting*

of the Psychonomic Society, Seattle, WA.

2011   Toscano JC, & McMurray B (2011, November). Measuring acoustic cue encoding and categorization during speech processing using the auditory N1 and P3 ERP components. Paper presented at the *10th Auditory Perception, Cognition, and Action Meeting*, Seattle, WA.

2011   Toscano JC, Anderson ND, McMurray B (2011, October). The role of phoneme order and phonetic detail in spoken word recognition. Paper presented at the *17th Mid-Continental Workshop on Phonetics and Phonology*, Urbana, IL.

2010   Clayards M, Toscano JC (2010, August). Modeling age of exposure in L2 learning of vowel categories. Poster presented at the *32nd Annual Conference of the Cognitive Science Society*, Portland, OR.

2009   Toscano JC, McMurray B, Luck, SJ, Dennhardt J. (2009, April). Listeners sensitivity to acoustic detail in speech at the level of both early encoding and categorization. Poster presented at the *15th International Congress on Event-Related Potentials of the Brain*, Indiana University, Bloomington, IN.

2008   Toscano JC, & McMurray B (2008, November). Online processing of acoustic cues in speech perception: Comparing statistical and neural network models. Poster presented at the *156th Meeting of the Acoustical Society of America*, Miami, FL.(Winner of Best Student Paper in Speech Communication—2nd Prize).

2008   Toscano JC, McMurray B (2008, October). Perception of voicing is graded all the way down: Evidence from electrophysiology. Paper presented at the *14th Mid-Continental Workshop on Phonology*, University of Minnesota, Minneapolis, MN.

2007   Toscano JC, Galle ME, & McMurray B (2007, October). Learning positional variation and place of articulation in stop consonants from the distributional statistics of acoustic cues. Poster presented at the *13th Mid-Continental Workshop on Phonology*, Ohio State University, Columbus, OH.

2007   Toscano JC, McMurray B (2007, October). Integrating acoustic cues to phonetic features: A computational approach to cue weighting. Poster presented at *Where Do Features Come From? Phonological Primitives in the Brain, the Mouth, and the Ear.* Paris, France.

2007   Toscano JC, McMurray B (2007, March). Taking statistical learning to the next level: A computational approach to the acquisition of multi-dimensional categories. Poster presented at the *2007 Biennial Meeting of the Society for Research in Child Development*, Boston, MA.

2006   Toscano JC, McMurray B (2006, October). Acoustic cue integration in natural speech: Empirical and computational results. Paper presented at the *12th Mid-Continental Workshop on Phonology*, University of Iowa, Iowa City, IA.

2006   Toscano JC, McMurray B (2006, June). A lexical locus for the integration of asynchronous cues to voicing: An investigation with natural stimuli. Poster presented at the *151st Meeting of the Acoustical Society of America*, Providence, RI. (Winner of Best Student Paper in Speech Communication—1st Prize).

2006   Dennhardt J, McMurray B, Luck, SJ, Toscano JC (2006, June). Gradient effects of continuous acoustic detail revealed in event-related potentials. Poster presented at the *151st Meeting of the Acoustical Society of America*, Providence, RI.

2005   Toscano JC, McMurray B (2005, November). Statistical learning, cross-linguistic constraints, and the acquisition of speech categories: a computational approach. Paper presented at the *11th Mid-Continental Workshop*

on Phonology, University of Michigan, Ann Arbor, MI.

2005   Beutter BR, Toscano JC, Stone LS (2005, May). Top-down and bottom-up influences on saccades in a visual search task. Poster presented at the *Annual Meeting of the Vision Sciences Society*, Sarasota, FL.

Research Support

Ongoing

2018-2019   *Cortical EEG measures of speech sound encoding for hearing assessment*. Emerging Research Grant, Hearing Health Foundation. Role: PI.

2016-2019   *The Sounds of Human Language*. Mendel Science Experience Postdoctoral Fellows Program, Villanova University. Role: Postdoc Supervisor (Laura Getz).

Completed

2018   *Psychophysical methods for assessing auditory neuropathy*. University Summer Grant, Villanova University. Amount: $12,203. Role: PI.

2017   *Using statistical learning to acquire speech categories: A computational framework for studying phonological development.* Faculty Research & Development Grant, College of Liberal Arts & Sciences, Villanova Univ. Role: PI. Amount: $2,500.

2017   *Using statistical learning to acquire speech categories: A computational framework for studying phonological development.* University Conference Travel Grant, Office of the Provost, Villanova Univ. Role: PI. Amount: $3,741.

2016-2017   *Phonetic competition in English-Spanish bilinguals as a function of language context and age of onset*. Center for Marketing & Consumer Insights Mini-Grant, Villanova Univ. Role: PI. Amount: $295.

2017   *Speech-based tests for diagnosis and treatment of hearing loss.* Center for Undergraduate Research and Fellowships. Role: PI. Supported students: Martina Vega. Amount: $1,000.

2016   *Unifying principles and individual differences: What should we focus on to understand speech?* University Conference Travel Grant, Office of the Provost, Villanova Univ. Role: PI. Amount: $857.

2015-2017   *Mechanisms of speech perception and effects of hearing loss.* NIH Loan Repayment Program—Clinical Research, NIDCD. Role: PI. Amount: $49,674.

2015   *Continuous acoustic cues in speech: Implications for language processing models and hearing tests.* Villanova Univ. Summer Research Fellowship and Research Support Grant. Role: PI. Amount: $12,200.

2012-2013   *Neural representation of speech sounds in auditory cortex.* Campus Research Board Award, University of Illinois at Urbana-Champaign. Role: Co-PI. Amount: $28,960.

2011-2014   Beckman Fellowship Research Funding, Beckman Institute for Advanced Science and Technology. Role: PI. Amount: $25,000.

2006-2007   *Listeners use of multiple acoustic cues in speech*. Research Grant, University of Iowa Student Government. Role: PI. Amount: $660.

Mentored Student Support

2018   *Influence of dialect region on vowel perception and production.* Villanova Undergraduate Research Fellowship. Student: Nicole Feeley.

2018   *Effects of semantic similarity on speech perception during sentence processing.* Villanova Graduate Student Summer Fellowship. Student: Agnes Gao.

2017   *Discovering networks of phonetic cues for speech sound categorization using graph theory.* Herschel-Smith Summer Undergraduate Research Fellowship, Harvard University. Student: Anne Marie Crinnion.

2017   *Redundancy and variability in speech: Listeners' use of token-level phonetic cues.* Villanova Graduate Student Summer Fellowship. Student: Abigail Benecke.

2016   *How long can listeners maintain gradient acoustic information?* Villanova Graduate Student Summer Fellowship. Student: J. Benjamin Falandays.

2016   *The role of theta waves in speaking rate compensation.* Villanova Graduate Student Summer Fellowship. Student: David Saltzman.

2015   *Enhancing tools for measuring phonetic convergence.* Villanova Graduate Student Summer Fellowship. Student: Tifani Biro.

2015   *Bottom-up perceptual processes and short-term chord expectancy.* Villanova Graduate Student Summer Fellowship. Student: Beach Brooks.

2015   *Parallel vs. serial processing in language comprehension.* Villanova Graduate Student Summer Fellowship. Student: Emma Folk.

Media and Outreach

2018   Interviewed for *The Atlantic* article, "What's Up With All These Viral Illusions?" by Julie Beck.

2018   Interviewed for CBS3 news segment, "The Science Of Hearing Yanny Or Laurel."

2018   Interviewed for NBC 10 news segment, "Locals React to Laurel vs. Yanny Debate."

2016   Flame Challenge Top 25 Submission, *What is Sound?* Alan Alda Center for Communicating Science. Entry submitted with Neil Bardhan and Alexandra Tabachnick.

2016   USA Science & Engineering Festival, American Institute of Physics/Acoustical Society of America exhibit.

2015   *Speech recognition in a noisy world.* Presentation for Villanova Psi Chi.

2015   Quoted in *New York Times* article, "The white and gold (no, blue and black!) dress that melted the Internet."

2012   *Understanding speech: Human perception and machine recognition.* Presentation for Chambana Science Café.

Teaching

Instructor (Villanova Univ.)

	Course	Students	Advisees (UG)	Research advisees (Grad)
Sp 2019	*Sabbatical*		25	3
Fa 2018	CGS 5910: Psychology of Language	20	25	3
	PSY 3300: Perception	36		
	PSY 8200: Perception	11		
Sp 2018	MSE 2701: Sounds of Human Language	41	26	4
	PSY 5250: Contemporary Issues in Psych	14		
Fa 2017	*Parental leave*		26	4
Sp 2017	CBN 5000: Advanced Lab in Neuroscience	23	30	5
	PSY 8150: Cognition (Graduate)	19		
Fa 2016	MSE 2701: Sounds of Human Lang (Lab)	20	30	5
	PSY 5250: Contemporary Issues in Psych	12		
Sp 2016	PSY 3300: Perception	35	29	4
	PSY 5250: Contemporary Issues in Psych	15		
Fa 2015	MSE 2701: Sounds of Human Lang (Lab)	21	21	4
	PSY 5250: Contemporary Issues in Psych	9		
Sp 2015	PSY 1000: General Psychology	63	7	0
	PSY 8200: Perception (Graduate)	11		
Fa 2014	PSY 1000: General Psychology	70	0	0

Instructor (Univ. of Iowa)

	Course	Students
Fa 2008	031:014 Intro to Developmental Science	25
Su 2008	031:043 Evaluating Psych Research (Methods course)	30
Su 2006	031:043 Evaluating Psych Research (Methods course)	33

Graduate Teaching Assistant (Univ. of Iowa)

	Course	Students
Sp 2011	031:010 Research Methods	44
Fa 2010	031:016 Introduction to Cognitive Psychology	123
Sp 2010	031:010 Research Methods	58
Fa 2007	031:001 Elementary Psychology	120
Fa 2006	031:121 Experimental Psychology II (Lab)	23

Guest Lectures (Villanova Univ.)

Fa 2018	PSY 5250 Contemporary Issues in Psychology
Fa 2018	PSY 8000 Seminar (Graduate)
Sp 2018	PSY 5250 Contemporary Issues in Psychology
Fa 2017	PSY 8000 Seminar (Graduate)
Fa 2017	MSE 2701 Sounds of Human Language (two class sessions)
Sp 2017	PSY 5250 Contemporary Issues in Psychology (two class sessions)
Fa 2016	PSY 8000 Seminar (Graduate)
Fa 2016	CGS 5910 Language Processes
Sp 2016	PSY 8150 Cognitive Psychology (Graduate)
Fa 2015	PSY 8000 Seminar (Graduate)
Sp 2015	PSY 5250 Contemporary Issues in Psychology
Fa 2014	PSY 8000 Seminar (Graduate)
Fa 2014	PSY 5250 Contemporary Issues in Psychology

Guest Lectures (Univ. of Illinois)

Sp 2013	Psych 593SG Language Comprehension (Graduate)
Fa 2012	Psych 593SG Language Comprehension (Graduate)

Guest Lectures (Univ. of Iowa)

2009	031:014 Intro to Developmental Science
2005	031:118 Infant Development

Formal Student/Trainee Supervision

	Student	Project
2016-	Laura M. Getz	Postdoctoral Fellow
2018-	Emily Martinez	M.S. Thesis
2018-	Andrea Ruggiero	M.S. Thesis
2017-	Yang Agnes Gao	M.S. Thesis, "Effects of semantic similarity on speech perception during sentence processing"
2017-	Zachary Oxford	M.S. Thesis (Co-supervised with Katina Sawyer, Psychological & Brain Sciences), "Nationalism's effect on early perceptual processing of faces."
2018-	Anne Mozel	M.S. Thesis Committee Member, "Distraction and top-down attentional control after adolescent concussion"
2018-	Adam Dávila	M.S. Thesis Committee Member, "Same/different abstract concept learning in archerfish (*Toxotes chatareus*)"
2017-	Sarah Vrabic	M.S. Thesis Committee Member, "Shelter environment and parent functioning among families experiencing homelessness"

2017-	Elke Nordeen	M.S. Thesis Committee Member, "Parenting measurement: Association between self-report and observational methods in the context of family homelessness"
2017-	Courtney Thomas	M.S. Thesis Committee Member, "Determinants of expressed emotion in African American mothers experiencing homelessness"
2016-2018	Abigail Benecke	M.S. Thesis, "Redundancy and variability in speech: Listeners use of token-level phonetic cues"
2018	Nicole Feeley	Undergraduate Independent Research, "Dialect differences in vowel perception and production"
2018	Tess Heinrichs	Undergraduate Independent Research, "Improving speech recognition using filtered intensity contours"
2018	Ani Javardian	Undergraduate Independent Research, "Event-related potential responses to sounds presented in speech-weighted-noise"
2017-2018	Daniel Cordero	M.S. Thesis (Software Engineering; Co-supervised with Edward Kim, Computing Sciences), "Deep neural nets for analysis of individual differences in event-related brain potentials"
2017	Courtney Thomas	Graduate Independent Research, "Fidelity of temporal and spectral cue encoding as an index of hearing function"
2017	Abigail Benecke	Graduate Independent Research, "Syllable-level recognition in a large-scale cue-integration classifier"
2017	Yang Agnes Gao	Graduate Independent Research, "Fine-grained temporal and spectral cue encoding indexed by the auditory N100"
2017	Rakshana Selvarajan	Undergraduate Independent Research, "Individual differences in top-down effects during speech perception: Computational and behavioral results"
2017	Mackenzie Jorgensen	Undergraduate Independent Research, "Combining deep neural nets and normalized recurrence for word learning." (Co-supervised with Edward Kim, Computing Sciences)
2017	Sarah Vrabic	Graduate Independent Research, "Mechanisms of phonetic cue weighting across the lifespan: Effects of temporal acuity deficits on speech categorization"
2017	Jordan Rast	Graduate Independent Research, "Mondegreen: Validation of a newly developed word recognition test"
2016	Sarah Welch	Undergraduate Independent Research, "Phonetic competition in English-Spanish bilinguals as a function of language context and age of onset"
2016	Emily Tenuta	Undergraduate Independent Research, "Dialect-dependent overlap between speech perception and production"

2015-2017	Benjamin Falandays	M.S. Thesis, "How long can listeners maintain gradient acoustic information?"
2014-2016	Tifani Biro	M.S. Thesis, "Enhancing tools for measuring phonetic convergence"
2014-2016	Emma Folk	M.S. Thesis, "Parallel vs. serial processing in language comprehension"
2014-2016	David Saltzman	M.S. Thesis, "The role of the speech envelope in speaking rate compensation"
2014-2016	Alexandra Tabachnick	Graduate Independent Research, "Frequency sensitivity of auditory brainstem responses"
2014-2015	Taylor Curley	Graduate Independent Research, "Statistical learning of English vowel categories"
2013-2014	Michael Hudgins	Senior Thesis (UIUC), "Effects of disfluent speech on attention to subsequent speech: Evidence from event-related potentials"
2012-2014	Alexander Senetar	Senior Thesis (UIUC), "Electrophysiological responses to differences in speaking rate"; poster presented at *2014 American Medical Student Association Annual Convention*
2012-2014	Paoula Dyanova	Senior Thesis (UIUC), "Comparison of category boundaries of speech and non-speech sounds"
2012-2013	Bhavika Patel	Senior Thesis (UIUC), "Disfluencies in speech: Effects of fillers on attention"
2012	Stephanie Lutz	Senior Thesis (UIUC), "Listening to the silence: Effects of variation in silent intervals on listeners perception of speech"
2010-2011	Lisa Vangsness	Independent Research (Iowa), "Neural evidence for gradient speech perception: Auditory N1 and P3 responses to stop consonants and vowels"

Laboratory Research Supervision

Graduate (excluding students formally supervised above): 2 total; Olivia Pereira, Stephanie Vicari.

Undergraduate (excluding students formally supervised above): 28 total; Jesse Zimmermann, Ryan Henderson, Julie Capece, Thea Callen, Jocelyn Rego, Olivia Hacker, Cara Colao, Caroline Lee, Gwen Saccocia, Pankhuri Walia, Anne Marie Crinnion, Elizabeth Day, Janice Puder, Katherine French, Carlin Welter, Christina Nashed, Claire McCann, Marissa Pharel, Sarah Welch, Nicole Johnson, Marissa Osowski, Jacklyn Coelho, Jesse Pazdera, John Kay, Christopher Burley, Brandon Henken, Grace Kerrigan, Tyler Re.

Service

University (Villanova Univ.)

2017	Villanova Undergraduate Research Fellowship Review Committee, Center for Undergraduate Research

College (Villanova Univ.)

2018-	Graduate Summer Research Fellowship Committee

| 2015- | Faculty Committee, Cognitive Science Program |
| 2014-2015 | Cluster Computing Task Force |

Department (Villanova Univ.)

2017-	Cognitive Brown Bag, Organizer
2015-	Committee Member, Ph.D. Proposal Task Force
2015-	Faculty Advisor, Undergraduate Psychology/CBN Club
2015-	Committee Member, Cognitive & Behavioral Neuroscience Undergraduate Advisory Committee
2015-	Committee Member, Psychology Undergraduate Advisory Committee
various	Colloquium Committee (2014, 2016)
2014-2015	Committee Member, Website Revision Committee

Department (Univ. of Iowa)

| 2007-2009 | Graduate Resources Committee |
| 2006-2007 | Faculty Meeting Representative |

Editorial Positions

| 2018- | Associate Editor, *Auditory Perception and Cognition* |
| 2017- | Editorial Board Member, *Journal of Speech, Language, and Hearing Research* |

Grant Panels

| 2016 | NSF Panelist |

Ad-hoc Reviews (Journals; various years)

Attention, Perception, & Psychophysics
Brain & Language
Clinical Neurophysiology
Cognition
Cognitive Science
Journal of the Acoustical Society of America
Journal of Experimental Psychology: General
Journal of Experimental Psychology: Learning, Memory, & Cognition
Journal of Memory & Language
Journal of Phonetics
Language Learning
Laboratory Phonology
Language, Cognition, & Neuroscience/Language & Cognitive Processes
Language & Speech
Psychonomic Bulletin & Review
Quarterly Journal of Experimental Psychology

Ad-hoc Reviews (Funding Agencies)

| 2017 | NSF, Division of Behavioral and Cognitive Sciences (Perception, Action, and Cognition) |
| 2016 | NSF, Division of Behavioral and Cognitive Sciences (Linguistics) |

2013	NSF, Division of Behavioral and Cognitive Sciences (Linguistics)
2012	NSF, Division of Behavioral and Cognitive Sciences (Linguistics)
2011	NSF, Division of Behavioral and Cognitive Sciences (Cognitive Neuroscience)

Ad-hoc Reviews (Conferences)

2016	CogSci 2016 (3)
2013	CogSci 2013 (3)
2011	CogSci 2011 (3)

Ad-hoc Reviews (Book Chapters)

| 2006 | Chapter in J.P. Spencer, M. Thomas, & J. McClelland (Eds.), *Toward a Unified Theory of Development: Connectionism and Dynamic Systems Theory Re-Considered*. |

Conference Organization

2016	Panel Discussion Organizer, "Unifying principles and individual differences: What should we focus on to understand speech?" *15th Annual Auditory Perception, Cognition, and Action Meeting*, Boston, MA.
2015	Program Committee, Graduate Student Symposium on Literature and Psychology, Department of Romance Languages and Literatures, Villanova Univ.
2015	Program Committee, CogSci 2015
2006	Co-organizer, 12th Midcontinental Workshop on Phonology, University of Iowa

Other Professional Service

2012-2014	Co-founder and Organizer, Chambana Science Café
2006-	Webmaster, Praat Script Archives (https://sites.google.com/site/praatscripts/)
2017-	Webmaster, Auditory Perception and Cognition Society