The Honors Program in Speech and Hearing Science

Brief Description of the Honors Program in Speech and Hearing Science

We strive to support our Honors students throughout their academic program from freshman year to their thesis defense. We encourage you to talk to our faculty members. They are conducting interesting research in a wide range of areas and would be happy to show you their labs and discuss possible projects with you. The Honors students in Speech and Hearing Science are expected to develop a research project with their Thesis director. Research projects may include observations in clinical settings or classrooms, direct collection of data from subjects, study or application of interventions with clinical groups or children, and/or surveys of patients or caregivers. Honors projects from previous years have been presented at national conferences and published in prestigious research journals. We hope that the completion of your Honors project will be an exciting and fulfilling time for you.

Thesis Requirements

1. Prior to enrolling for thesis credits **all** Honors students must complete a thesis/creative project information session. There are several ways that the student can complete this requirement, including taking an online workshop. Be sure to check the Barrett website regarding thesis workshop dates and options: Thesis workshop options.

2. The Honors thesis committee must be made up of **at least two members**: The thesis director and second committee member. More committee members may be added at the discretion of the thesis director. The thesis director must be an ASU tenure-track faculty member, full time ASU clinical faculty member, or full time ASU lecturer. The other committee member(s) may be an ASU faculty member, lecturer, or a professional in a related field.

3. Honors students completing a thesis project with a Speech and Hearing Science faculty member typically register for SHS 492 (for 3 credits) in the semester prior to their defense and must register for SHS 493 (for 3 credits) in the semester in which they defend their thesis.

Sophomore and Junior Years:

Talk to different faculty and discuss research interests and possible projects. If possible, work in the lab(s) of relevant faculty. You can earn upper-division research credit for working in a lab.

Consider applying for *SHS 498: Advanced Research Experience Seminar*. All honors students (regardless of major) are encouraged to apply for this seminar that allows students to conduct independent research projects under the supervision of SHS faculty. If you are interested in the program, email the SHS Honors Faculty Advisor (Dr. T. Azuma).

By the end of your junior year, identify the faculty member who will be the Director of your Honors thesis project.

Late Spring semester-early Fall semester: With your Director, decide on your research project and choose the other two members of your honors committee. Begin developing/writing your Honors prospectus. If you are ready, submit your prospectus by the priority deadline.

Complete the required Thesis workshop.

Senior year:

In the Fall, register for *SHS 492: Honors Directed Study.* Consider applying for Thesis funding through Barrett: https://barretthonors.asu.edu/academics/thesis-and-creative-project/funding

At the beginning of the Fall semester, submit your Honors prospectus by the final prospectus deadline (usually mid-September).

Fall through early Spring semester, conduct the research for your project. Throughout the project, work on sections of your thesis and give drafts to your Director for feedback.

In the Spring semester, register for *SHS 493: Honors Thesis.* When you are ready, set your thesis defense date (keep an eye on the deadlines)!

By March, you should be ready to schedule your thesis defense. The Honors college deadline for thesis defense is usually the end of March. You should give your committee the final copy of the thesis at least two weeks in advance of the defense.

Optional, but fun: Apply to present at the ***Barrett Honors Thesis Symposium*** (deadline is usually mid-March) and the symposium is in April.

You will need to submit your final thesis to the Honors College by the deadline in order to attend the Barrett Convocation. In May, you should happily attend the BHC honors convocation!

*This is a *suggested* timeline. Your Director may set different deadlines for drafts and meetings. You should discuss a specific timeline with your Director once you have decided on a project.

Note: This timeline is for students expecting to graduate in the Spring semester. Those students graduating in the Fall semester will have to shift each event approximately one semester earlier.

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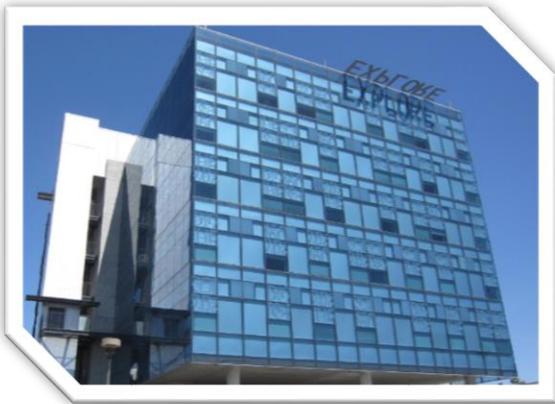
The following are Honors Research opportunities currently available in the area of Speech and Hearing Science. *Note: You do **not have** to be a student majoring in Speech and Hearing Science to complete an Honors Research Thesis with one of our faculty members.*

Tamiko Azuma, PhD

In the **Attention, Memory, and Language lab**, we are conducting several lines of research focused on attention, working memory, episodic memory, and language processing. Our current projects involve the study of healthy young adults, healthy older adults, bilingual speakers, military veterans, and adults with attention/memory impairments. We are particularly interested in how bilingualism, stress, attention deficits, and mild brain damage affect specific cognitive processes.

Additional Information for Honors Students: Honors students can pursue research projects related to most of the areas described above.

Related Departments/Schools/Areas: Speech and Hearing Science, Psychology

Visar Berisha, PhD

In the **Signal Analysis, Representation, and Perception (SARP) Laboratory,** the overarching goal of our lab is to use principles from machine learning and signal processing to better understand and model signal perception. With a focus on speech, we aim to develop reliable, data-driven models that can mimic aspects of human cognition. Sample projects include developing models of pathological speech perception, developing auditory perception models similar to those used in MP3, developing methods for combining tools from machine learning and human interaction

Additional Information for Honors Students: Honors students that have an interest in machine learning/signal processing/data science, and human cognition will find this work interesting. Possible projects include developing new models of pathological speech perception, identifying acoustic biomarkers for certain speech pathologies, among others.

Blair Braden, PhD

The population of aging adults with autism spectrum disorder (ASD) is rapidly growing; yet, little is known about the impact of aging on cognition and the brain. **The Autism and Brain Aging Laboratory** is among the first to study age-related changes in adults with ASD through neuropsychological evaluations and multi-modal neuroimaging. We aim to translate cognitive and brain findings into meaningful interventions for adults with ASD.

Ayoub Daliri, PhD

In the **Speech and Brain Research Laboratory,** we investigate neural mechanisms underlying normal speech production and stuttering, a speech fluency disorder. Our research is focused on understanding how different regions of the brain work together to produce speech, and what happens in the brain of people who stutter that results in speech disfluencies. To answer such questions, we examine (a) the behavior to characterize acoustic and kinematic features of the speech production system, and (b) the brain to characterize structural and functional features of brain regions that support the production of speech (using a combination of EEG, fMRI, DTI techniques). The long-term goal of our research is to develop novel effective treatments for stuttering.

Related Departments/Schools/Areas: Speech and Hearing Science, Neuroscience, Applied Linguistics, Psychology, Biomedical Engineering

Shelley Gray, PhD

Research conducted in the **Child Language and Literacy Lab** (CHILLL) focuses on how children learn to talk, read, and write. Our projects include investigations of working memory, word learning, and reading processes. We are involved in collaborative research in assessment development, curriculum development, and professional development for educators. ASU students are very important in the CHILLL lab. Many participate as volunteers, research assistants, or learn to design and conduct their own research. We are very proud of the work of our undergraduate, masters, and doctoral students. Our research is funded by the National Institutes of Health (NIDCD) and the U.S. Department of Education Institute for Education Sciences. We collaborate with labs at the University of Arizona, Massachusetts General Hospital, The Ohio State University, the University of Kansas, and Lancaster University in the UK.

Additional Information for Honors Students: Honors students can pursue topics in the area of early literacy, reading, and writing in preschool or school-age children. Students can also pursue topics in lexical acquisition, including methods for teaching new words to children. There are also opportunities to investigate research methods pertinent to these questions (e.g. memory and priming tasks).

Related Departments/Schools/Areas: Psychology, Education, School of Social and Family Dynamics

Julie Liss, PhD

The **Motor Speech Disorders Laboratory** is currently pursuing two lines of research in the area of motor speech disorders. The first line examines how listeners perceptually deal with different types and severities of dysarthria. The ultimate goal of this research is to develop a dysarthria-specific intervention model that takes into account the perceptual needs of the listener. The second line of research focuses more on the production aspects of speech. Our motor control studies include the effects of drugs and surgery (DBS) on speech in Parkinson's and other movement disorders; speech production deficits in hereditary diseases; and patterns of cortical-muscular coherence during speech and non-speech tasks.

Additional information for Honors Students: We welcome highly motivated volunteers to assist the research team in data collection and analysis. Students will gain valuable insight about research in communication disorders.

Xin Luo, PhD

In the **Auditory Implant Lab**, we investigate electric hearing with cochlear implants (CIs), compared to normal acoustic hearing. The long-term goal is to enhance the performance of CI patients in speech recognition in noise, music perception, and lexical tone recognition. To this end, we currently focus on the basic mechanisms of pitch perception in both acoustic and electric hearing, and use such knowledge to better encode spectral and temporal pitch cues with CIs. Our research involves speech and music perception using clinical CI devices and acoustic CI simulations, psychophysical and physiological measurements using CI research interface, and computational modeling of electric stimulation with CIs.

Beate Peter, PhD

In the **Speech/Language Genetics Lab**, we investigate genetic etiologies of communication disorders, with a special focus on speech sound disorders and reading disorders. We collect a wide variety of data including measures of speech, oral language, and written language and additionally, measures of motor function, family histories, and DNA. Future plans are to add EEG, auditory brainstem responses, and MRI data to this list. Our goals are to identify biomarkers and underlying deficits of communication disorders and to discover genetic etiologies. In the long term, we want to make it possible to identify infants at genetic risk for communication disorders and to set the stage for the development of super early intervention approaches.

Additional Information for Honors Students: Honors students can pursue research projects related to most of the areas described above.

Related Departments/Schools/Areas: Speech and Hearing Science, Life Sciences, Biodesign Institute

Andrea Pittman, PhD

In the **Pediatric Amplification Laboratory**, studies regarding the amplification needs of both children and adults are conducted as well as research to determine the development of speech perception in children with hearing loss. Three lines of research are currently underway. First, we are interested to see if a child's ability to learn new words improves when they receive a clearer speech signal provided by the extended high-frequency response. Second, we are studying hearing-impaired listeners' ability to bind (cohere) the parts of speech during perception relative to listeners with normal hearing. Third, we are studying the effort required by hearing-impaired children to perceive and comprehend speech compared to normal-hearing children.

Laida Restrepo, PhD

Research in the **Bilingual Language and Literacy Laboratory** is concerned with the development of best practices in assessment and intervention of children who speak Spanish as their native language or who are bilingual. The work on the identification of children with language disorders focuses on the use of language sampling, dynamic assessment, parent and teacher interviews, structured language tasks, and the characterization of specific language impairment in children. We are also developing interventions to improve oral language and reading comprehension in those at risk of academic difficulties in preschool and early school-age children.

Additional Information for Honors students: Possible honors projects may involve: a) measuring growth in Latino children's literacy, vocabulary, and oral language, b) language intervention, c)

studying the best ways to assess culturally diverse children so they are identified correctly, d) language proficiency assessment, and e) validity of different assessments.

Related Departments/Schools/Areas: Cognitive psychology, educational psychology, applied linguistics, early childhood education, computer sciences, elementary education, English as a second language, school of social and family dynamics, and program in Learning, Literacies and Technologies.

Corianne Rogalsky, PhD
The **Communication Neuroimaging and Neuroscience** (CoNi) Laboratory investigates the neural computations involved in speech and music perception, and how these processes interact with memory, control, and motor systems. We use functional MRI, high-resolution structural MRI, diffusion tensor imaging, and neuropsychological methods to study speech perception and recovery in a variety of populations, including patients with stroke, aphasia, and/or epilepsy. Our work has widespread clinical implications regarding treatment and diagnosis of speech disorders, as well as functional neuroimaging-guided rehabilitation methods.

Additional Information for Honors Students:
The CoNi lab offers several opportunities for Honors students, including in the areas of: (i) the relationship between speech and music perception in the healthy and damaged brain, (ii) neural basis of speech perception and speech perception recovery, (iii) the relationship between working memory and sentence comprehension, and (iv) MRI/lesion-mapping methodology. There are ongoing and archival datasets in which new questions can be investigated or new analysis techniques examined. In addition, there are opportunities to collect new datasets and develop new neuroimaging and/or neuropsychological studies.

Related departments/schools/areas: Speech and Hearing Science, Psychology, Biological Sciences, Linguistics, Biomedical Engineering

Nancy J. Scherer, PhD
The **Child Speech Disorders (Craniofacial & Cleft Palate) Laboratory** focuses on early development and intervention for children with cleft palate and other craniofacial conditions. The projects currently underway include assessing the effectiveness of early intervention on speech and language development, methods for training parents in early intervention, and evaluating models of delivery of speech and language interventions in rural and international contexts. We are just beginning a project with University of Sao Paulo Brazil and Centrino Hospital for Craniofacial Anomalies to adapt an evidence-based intervention for use there.

Additional Information for Honors Students: Honors students can pursue projects assessing the early speech and language development of children with craniofacial conditions, testing materials used to train parents in early intervention, or developing ipad applications for intervention and parent training.

Related Schools and Departments: Speech and Hearing Science, Special Education, Psychology, College of Technology and Innovation

Juliet Weinhold
The Late Speech Sounds Project is a line of research which examines late-acquired speech sounds in school aged children. We are specifically interested in examining whether current age-based normative placement criteria for late-acquired sounds are the most efficient way to determine eligibility for services. Current projects include evaluation of treatment outcomes for current /r/ and /s/ remediation, and development of speech sound stimulation materials for children with errors who do not yet qualify for remediation based on age norms. Future projects will address alternative screening,

placement and treatment approaches for at-risk children. A second line of research is investigation into semantic acquisition in monolingual and bilingual preschool and school aged children.

Yi Zhou, PhD

Auditory Neurophysiology & Computation Lab investigates the neural and cognitive basis of hearing. Current research focuses on the effect of multi-modal distractors on auditory perception. The goal of this research is to identify the cross-modal neural mechanisms that enhance speech perception and auditory object discriminiation in everyday tasks. Research opportunities include: analyzing acoustic signals, testing audio equipment, designing and simulating 3-D virtual listening environments, and assisting in data collection for audio-visual, audio-motor interaction experiments.

Related Departments/Schools/Areas: Neuroscience, Psychology, Biomedical Engineering, Arts, Media and Electrical Engineering.