**SLHS Weekly Seminar**

**Date: January 8, 2024**
**Place: LYLE 1160**
**Time: 12:30-1:20 PM EST**

**Title:  “Neurodevelopmental markers of stuttering persistence and recovery”**

**Speaker:  Soo-Eun Chang, PhD**



**Bio:**
Soo-Eun Chang, Ph.D., CCC-SLP, is an Associate Professor of Psychiatry at the University of Michigan. Dr. Chang received her MS degree in Speech and Hearing Sciences at Vanderbilt University, Ph.D. from the University of Illinois at Urbana-Champaign, and postdoctoral training in Clinical Neurosciences at the National Institutes of Health (NINDS/NIH). Dr. Chang's research combines multimodal neuroimaging and behavioral experiments to examine the neural bases of stuttering persistence and recovery.

**Abstract:**
Stuttering is a complex neurodevelopmental disorder affecting 5-8% of preschool-age children, continuing into adulthood in 1% of the population. The neural mechanisms underlying stuttering remain unclear, yet there is accumulating empirical and theoretical support for functional neuroanatomical deficits within the basal ganglia thalamocortical (BGTC) network. There is a dearth of information, however, on possible neurodevelopmental anomalies in stuttering during preschool age, when symptoms typically first emerge. In this presentation, I will discuss recent findings from a longitudinal study of childhood stuttering, in which children with persistent stuttering (pCWS) and those who recovered from stuttering (rCWS) were compared with their fluent age-matched peers, to examine the developmental trajectories of both gray matter volume (GMV) and white matter volume (WMV) during preschool- and school-age years using voxel-based morphometry. A total of 470 MRI scans were analyzed from 95 CWS (72 pCWS and 23 rCWS) and 95 fluent peers between 3-12 years of age. Each participant was scanned up to four times, with an average inter-scan interval of one year. We examined overall group and group by age interactions (growth rate differences) in GMV and WMV in preschool age (3-5 years old) and school age (6-12 years old) children, controlling for sex, IQ, intracranial volume, and socioeconomic status. The results provided broad support for a possible BGTC network deficit starting in the earliest phases of the disorder. Natural recovery from stuttering involved normalization or compensation of earlier occurring structural changes affecting BGTC structures and connectivity among them. I will discuss how these results inform neural bases of stuttering and how earlier occurring differences in neurostructural development may be associated with chronicity of or recovery from stuttering in later years. Future directions will also be discussed, including a research program that seeks to delve into the physiological bases and the temporal dynamics of BGTC function in children who stutter.