

**Friday, January 24<sup>th</sup> 2025, 11.30am ET (4.30pm UTC)**  
Presentation in Zoom, accessible via the C-STAR website:  
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## **The Relationship between Age-Related Hearing Loss and Cognitive Decline**

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Age-related hearing loss (ARHL) is increasingly linked to cognitive decline through direct effects and structural brain changes. This study, using data from the Aging Brain Cohort at the University of South Carolina (ABC@USC), examined how ARHL impacts cognitive performance and gray matter volume. Key objectives were to explore the role of gray matter and regional brain age gap in mediating ARHL-related cognitive decline and identify its association with specific domains like memory, attention, and executive function.

In a sample of 231 participants aged 20–79, cognitive performance was assessed via the Montreal Cognitive Assessment (MoCA), and hearing was measured using pure-tone thresholds (PTT) and words-in-noise (WIN) perception. Correlation analyses were employed to identify brain regions associated with hearing scores, and mediation analyses were conducted to determine whether these brain structures mediated the relationship between hearing impairment and cognitive performance. Findings highlighted the involvement of both auditory-specific regions, such as Heschl's gyrus (HG) and the posterior superior temporal gyrus (pSTG), and non-auditory regions, including the cingulo-opercular (CO) network and domain-general (DG) areas, in mediating the link between hearing loss and cognitive impairment. The findings also revealed significant associations between hearing scores and general cognitive performance, with partial mediation through structural changes in both auditory and non-auditory regions. Furthermore, WIN scores were found to be more sensitive predictors of cognitive decline than PTT scores, particularly affecting executive control. The study concludes that ARHL is associated with cognitive decline, where structural changes in key brain regions, particularly in the right hemisphere, partially mediate this relationship.

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The live in-person lecture will be in Discovery, room #140 (915 Greene Street, Columbia, SC)

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