**Presbycusis: Can You Hear the Music of Life?**

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### Introduction

- **Presbycusis** is age-related hearing loss. The魔术 of the ear is the union of rhythms, melodies, and harmonies in the environment that causes these vibrations to be translated into electrical impulses.

- Hearing is important because it fuels positive emotions and affects balance in patients suffering from hearing loss.

- Hearing aids and hearing loss are important because sound waves stimulate brain activity and thus engage the auditory and emotional circuits.

- We used a novel approach allowing participants in this exploratory study to self-monitor their hearing sensitivity to familiar sounds in their environment.

- Despite decades of research evidencing the need for treatment of hearing loss, primary care physicians and geriatricians do not make audiology referrals a standard practice in the medical practice for the health and wellness of older adults.

### Anatomy of the Ear

- **The outer ear** is oval-shaped, with the top (antihelix) being larger than the bottom (pinnacle), and a canal (external auditory meatus) that allows sound to enter the ear (Figure 1). When sound strikes the flexible ear canal (tympanic membrane), vibrations begin.

- The middle ear is an air-filled cavity, containing three small bones (malleus, incus, and stapes) called the oval window. These connected to the ear canal on one side, and the eardrum on the other side leads to the inner ear.

- The middle ear contains three fragile mechanisms that interact with the brain: the ossicles, cilia, and the cochlea. When damage occurs, the ear canal, tympanic membrane, oval window, and stapes can cause a disruption in the flow of sound.

- The inner ear is a fluid-filled cavity supporting a spiral-shaped organ (cochlea) filled with electrochemical fluid and filled with hair cells. These hair cells are responsible for translating sound waves into electrical impulses.

- The auditory system relies on both ears to localize sound. When sound waves enter the left ear, they are processed by the right ear, and vice versa. This bilateral processing allows for accurate spatial localization and sound clarity.

### Audiology Screening

- Many people rely on amplified sound to gauge their hearing status. We believe speech and sounds in the natural environment are safer and quicker for gauging hearing loss.

- Audiologists and treatment is important because hearing loss can affect speech, hearing, and cognitive abilities, reducing quality of life.

### Research Questions

1. (a) Is it possible to test presbycusis when combined with dementia in a manner that participants will be able to comply with treatment requirements?

2. (b) How can caregivers tend to presbycusis when faced with dementia and hearing loss in a person with presbycusis? Do caregivers tend to presbycusis in a person with presbycusis and dementia in a manner that participants will be able to comply with treatment requirements?

3. (c) Does hearing preserve in participants with and without dementia as indicated by their caregivers? Is a participant in presbycusis and dementia treated for presbycusis with Behind-The-Ear (ITE) hearing aids, does the individual report greater lifetime satisfaction?

4. (d) Does the available hearing technology for hearing presbycusis in participants with dementia improve their quality of life? Do participants with presbycusis think aids are affordable?

### Methods

The pilot study was conducted during one academic semester. Researchers selected a research method of grounded theory with a principle focus on theory development. Interviews were conducted with participants and audiological and otological audiologists.

### Data Collection (pre- and post-data collection)

**Audition:** Perceived interpersonal relationships.  
**Phonetic:** 7 administered scales that measured hearing sensitivity, cognitive ability, morale, life satisfaction, social support, caregiver scale, and caregiver tracking log of problem behaviors.

### Discussion

- **Presbycusis and dementia** are separated by the commonality of problem behaviors that both share. Researchers used these conditions diagnosed and treated with medications.

- **Hearing aid** is still too difficult for the old-old and frail-old patient population to manage independent of other factors, functional impairments, and disabilities (e.g., vision, motor dexterity, mobility, dementia).  

- **We highly advocate that** physicians communicate the benefits of treating hearing loss with medications to improve cognitive function and reduce the risk of developing dementia.

### Limitations

- Participants are not successfully aging well because they experience numerous psychological and physiological problems: partial or total loss of vision and hearing, inability to find a meal, skin blemishes, impaired mobility, incontinence, consumption of multiple pharmaceutical drugs to manage chronic diseases, and an inability to perform Activities of Daily Living (ADLs).  

- It is reasonable the aging process causes older adults to become depressed and disoriented.

- Although participants enjoyed the study with hearing loss, communication difficulties, and were positive about the study, there were some pre- and post-measurement scores of hearing loss and dementia.

### Conclusion

- We believe people from 18 years of age and through the Wechsler scale and the natural sounds in the environment as a quick and safe way of checking understanding.

- We invite students and researchers to replicate, validate, and expand this study to improve the quality of hearing technology and participant satisfaction.

- Researchers identified potential barriers to hearing technology treatment and their caregivers to help the pilot study at their respective locations.

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