INTRODUCTION

• Age-related hearing loss (ARHL) is a common chronic condition in older adults
• Recent studies suggest cognitive alterations in individuals with ARHL, with earliest changes seen in cognitive control
• Cognitive control allows performance of goal-related activities and includes processes such as strategic attention and inhibition
  - Strategic attention – The ability to selectively process relevant information
  - Inhibition – The ability to suppress irrelevant information and responses
• Few have examined how varying hearing ability impacts attention and inhibition between strategic attention and inhibition in older adults with varying hearing ability.

PURPOSE

The current study aims to examine the relationship between strategic attention and inhibition in older adults with varying hearing ability.

METHOD

Participants

• Older adults with age-related hearing loss (HL) and normal hearing (NH)

<table>
<thead>
<tr>
<th>Table 1</th>
<th>HL (n = 21)</th>
<th>NH (n = 26)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td>71.3 (7.9)</td>
<td>64.5 (6.0)</td>
</tr>
<tr>
<td>Sex</td>
<td>12F / 9M</td>
<td>17F / 9M</td>
</tr>
<tr>
<td>Education (yrs)</td>
<td>17.7 (3.4)</td>
<td>17.8 (1.62)</td>
</tr>
<tr>
<td>Pure-tone average (PTA) dB HL</td>
<td>31.65 (4.06)</td>
<td>16.05 (6.74)</td>
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<table>
<thead>
<tr>
<th>Table 2</th>
<th>Inclusion Criteria</th>
<th>Exclusion Criteria</th>
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<tbody>
<tr>
<td>&gt; 55 years of age</td>
<td>History of:</td>
<td></td>
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<tr>
<td>Native English speakers</td>
<td>Communication disorders</td>
<td></td>
</tr>
<tr>
<td>Right-handed</td>
<td>Neurological diseases</td>
<td></td>
</tr>
<tr>
<td>Minimum of high school education</td>
<td>Major medical illness</td>
<td></td>
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<tr>
<td>Both sexes</td>
<td>Major psychiatric disturbance in past year</td>
<td></td>
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<tr>
<td></td>
<td>Alcohol or substance abuse</td>
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<td></td>
<td>Learning disabilities</td>
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<tr>
<td></td>
<td>Other known etiologies of hearing loss</td>
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<tr>
<td></td>
<td>Unilateral, bilateral continuous tinnitus</td>
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<td></td>
<td>Major vision problems</td>
<td></td>
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<tr>
<td></td>
<td>Geriatric Depression Score &gt; 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Montreal Cognitive Assessment score &lt; 26</td>
<td></td>
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</tbody>
</table>

METHOD (cont’d.)

Audiological assessment

• All participants underwent a comprehensive audiological assessment
  - External ear examination using otoscopy
  - Middle ear examination using tympanometry and reflexometry
  - Pure tone audiometry to establish hearing thresholds
  - Speech audiometry, including speech reception thresholds and word recognition scores
  - Speech-in-noise evaluation using Quick Speech-in-Noise test (Quick SIN)

Cognitive Control Assessment

• Strategic Attention Task: Value-directed word-list learning task
  - Five word lists containing 40 words total
    - Consisted of 20 high value (worth 10 points) and 20 low value (worth 1 point) words
    - Words presented one at a time for 1900 milliseconds each
  - Participants asked to recall as many words as possible to maximize their score at the end of each list
  - Measures: Average high-, low-value, and total words recalled

• Inhibition Task: Go/NoGo task
  - Push a button in response to pictures of objects (Go trials) and withhold responses to pictures of animals (NoGo trials)
    - 200 total number of trials comprised of 80% (160) Go trials and 20% (40) NoGo trials
    - Stimuli presented for 300 milliseconds followed by a 1700 milliseconds fixation period
  - Measures: Reaction time (Go trials), accuracy (Go and NoGo trials)

Inhibition Task: Go/NoGo task

- Words presented one at a time for 1900 milliseconds
- Average high-value words | 6.236 ± 1.560 |
- Average low-value words | 5.589 ± 1.299 |
- Average total words | 5.889 ± 1.299 |

- Average high-value words | 10.00 ± 1.560 |
- Average low-value words | 9.589 ± 1.299 |
- Average total words | 9.889 ± 1.299 |

- NH | 1.00 ± 1.560 |
- Average high-value words | 0.882 ± 0.094 |
- Average low-value words | 0.858 ± 0.109 |
- Average total words | 0.882 ± 0.094 |

- Whole Group Mean | 5.168 ± 1.493 |
- Average high-value words | 10.00 ± 1.560 |
- Average low-value words | 9.589 ± 1.299 |
- Average total words | 9.889 ± 1.299 |

RESULTS

Cognitive Control Assessment

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CONCLUSION

• In older adults with ARHL, better strategic attention is associated with better inhibition
• Findings in ARHL group could have driven the finding in the whole group
• In NH group, better strategic attention is related to the ability to better attend to relevant information
• Hearing ability affects the relationship between strategic attention and inhibitory control

ACKNOWLEDGEMENTS

• Thank you to our mentor, Dr. Raksha Mudar, for her guidance and generous help.
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