**INTRODUCTION**

- Modern hearing aids implement automatic directional microphone technology, which switches between omnidirectional microphone (OMNI) with all-around sensitivity and directional microphone (DIR) with spatial sensitivity.
- Although laboratory studies have consistently shown that DIR improves signal-to-noise ratio (SNR), evidence supporting DIR benefit in the real world is limited. Because the extent to which DIR can provide its benefit is highly dependent on noise ratio (SNR), evidence supporting DIR benefit in the real world is limited. Although laboratory studies have consistently shown that DIR improves signal-to-noise ratio (SNR), evidence supporting DIR benefit in the real world is limited.
- This study explores the relationship between the automatic behavior of DIR and the hearing aid users' perceived communication difficulty in the real world.

**METHODS**

- Eighteen participants:
  - One week long field trial
  - 46-79 years, eight females
  - Experienced hearing aid users
  - Bilaterally symmetrical sensorineural hearing loss with pure-tone thresholds not exceeding 75 dB HL from 250 to 4000 Hz
- Subjects were fit with behind-the-ear style hearing aids bilaterally.
- Hearing aid smartphone-based Ecological Momentary Assessment (EMA) was used to collect data. Subjects completed electronic surveys delivered through a smartphone. Via wireless streaming, real-time data-logging information of the hearing aids was saved to the smartphone.

**RESULTS**

**Listening Effort vs. Microphone Directionality**

**DISCUSSION & CONCLUSION**

- Q-II & Q-IV: DIR was activated about 12.2% of the time during conversational situations, which is consistent with previous literature findings (Banerjee, 2011).
- Q-E: Listening was not effortful, even with OMNI (68.5%).
- Q-II: Hearing aid users might obtain benefit from DIR in these situations. However, Q-II situations did not occur very often (6%).
- Q-III: When hearing aid users needed help to reduce listening effort (19.3%), DIR was not available to them.
- Q-IV: DIR was activated, but the listening was still effortful (6.2%).
- The results of this study may explain why hearing aid users often do not notice the benefit of DIR in the real world.
- Clinical Implication: It could be beneficial to provide a manual directional program and train patients to use this program in appropriate situations.

**Future Research Questions:**

- What are the characteristics of the situations in which users have difficulty understanding speech (Q-III and Q-IV)? Why is DIR not activated in most of these situations (Q-III)?
- If DIR is activated in these difficult situations, would users perceive benefit or notice any difference? What are the characteristics of the situations wherein DIR should be, but actually is not, activated (Q-III)?

**REFERENCES**
