



Subjective Comprehensibility and Accentedness Ratings of Foreign-Accented Speech by Older and Younger Adults



Anne Hunter Baldwin Sarah Hargus Ferguson
Intercampus Program in Communication Disorders, University of Kansas

Kristine N. Williams
School of Nursing, University of Kansas

Background

- It is estimated that as many as 2,000,000 elders will require **long-term care** by 2030
- Long-term care settings include numerous conditions that act as **barriers to successful communication**:
 - Listeners** who have hearing loss
 - Environments** featuring background noise
 - Talkers** who speak with a **foreign accent**
 - Certified nursing assistants** provide the majority of direct care in the long-term care setting.
 - In 2005, **20%** of certified nursing assistants were **foreign-born**.
- Anecdotal evidence suggests that the proportion of staff who speak with a foreign accent **varies widely** among facilities as well as regions of the country.
- Just three studies (Burda et al. 2003, Shah et al. 2005, Ferguson et al. in press) have examined the **intelligibility** of foreign-accented speech for older adults. In all three, **the effect of foreign accent was roughly equal for younger and older adults**, in contrast with previous findings of speech understanding in noise or reverberation. However, older adults' speech identification performance was **very poor** for foreign-accented speech.
- The present study compared younger and older adults on two **subjective** measures of native-produced and foreign-accented speech: **comprehensibility** and **accentedness**.
 - Comprehensibility: The **ease** with which a listener **understands** a talker's speech
 - Accentedness: The **strength** of the talker's **foreign accent**

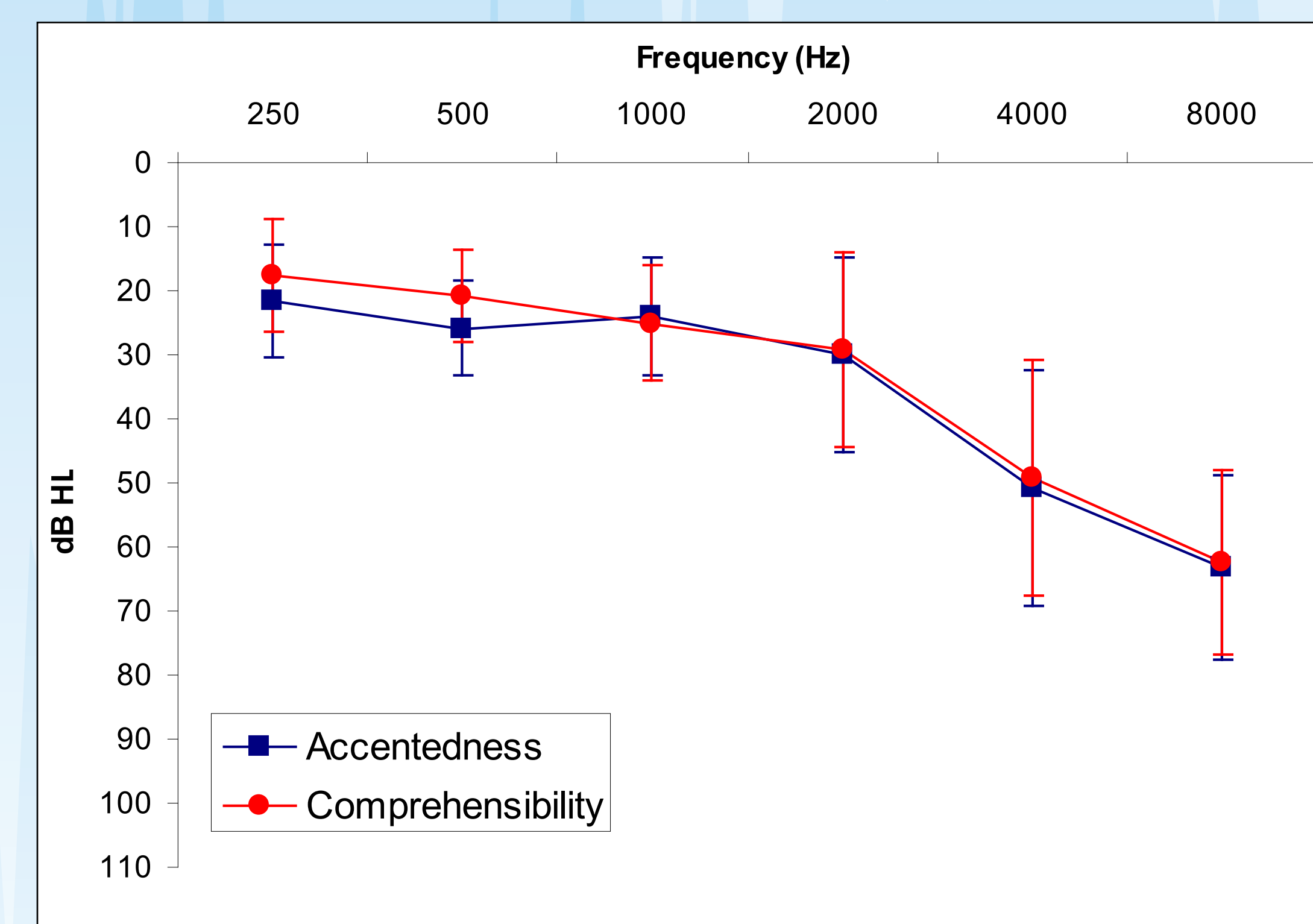
Methods

Materials

- Short phrases and sentences** extracted from **lapel microphone recordings** of staff-resident interactions in a long-term care facility (Williams & Warren, 2008).
- Four female caregivers** selected from these recordings: **Two native speakers of American English** and **two non-native English speakers** (one immigrant from an African country, and one immigrant from a Spanish-speaking country)
- Twenty utterances** extracted for each talker for a total of **80 stimuli**: Since recordings were of **spontaneous speech**, utterances varied among talkers

Listeners

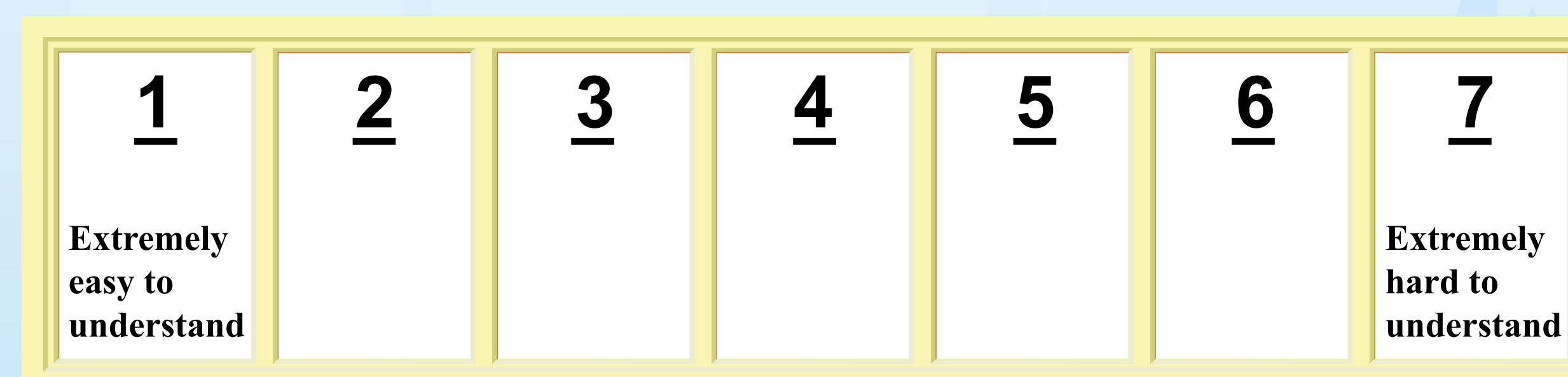
- Native speakers of American English with no history of speech or language disorders
 - YNH listeners, (n=10): Adults aged 18-26 years who **passed a hearing screening** at 20 dB HL for 250-8000 Hz.
 - EHI listeners, (n=10): Adults aged 65-85 years with **mild-to-moderate sloping sensorineural hearing loss** (see mean audiogram below)
- Listeners were **randomly** assigned to perform either **comprehensibility** or **accentedness** ratings



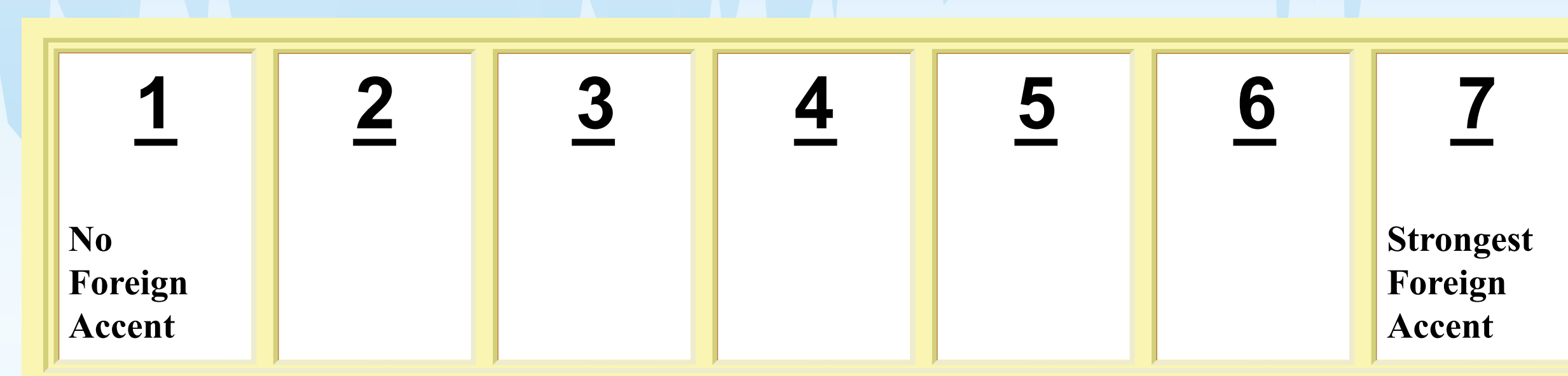
Procedures

- Utterances were presented **monaurally** via **insert earphones** at **70 dB SPL**.
- Listeners rated each utterance by clicking one of **seven boxes**

Comprehensibility:



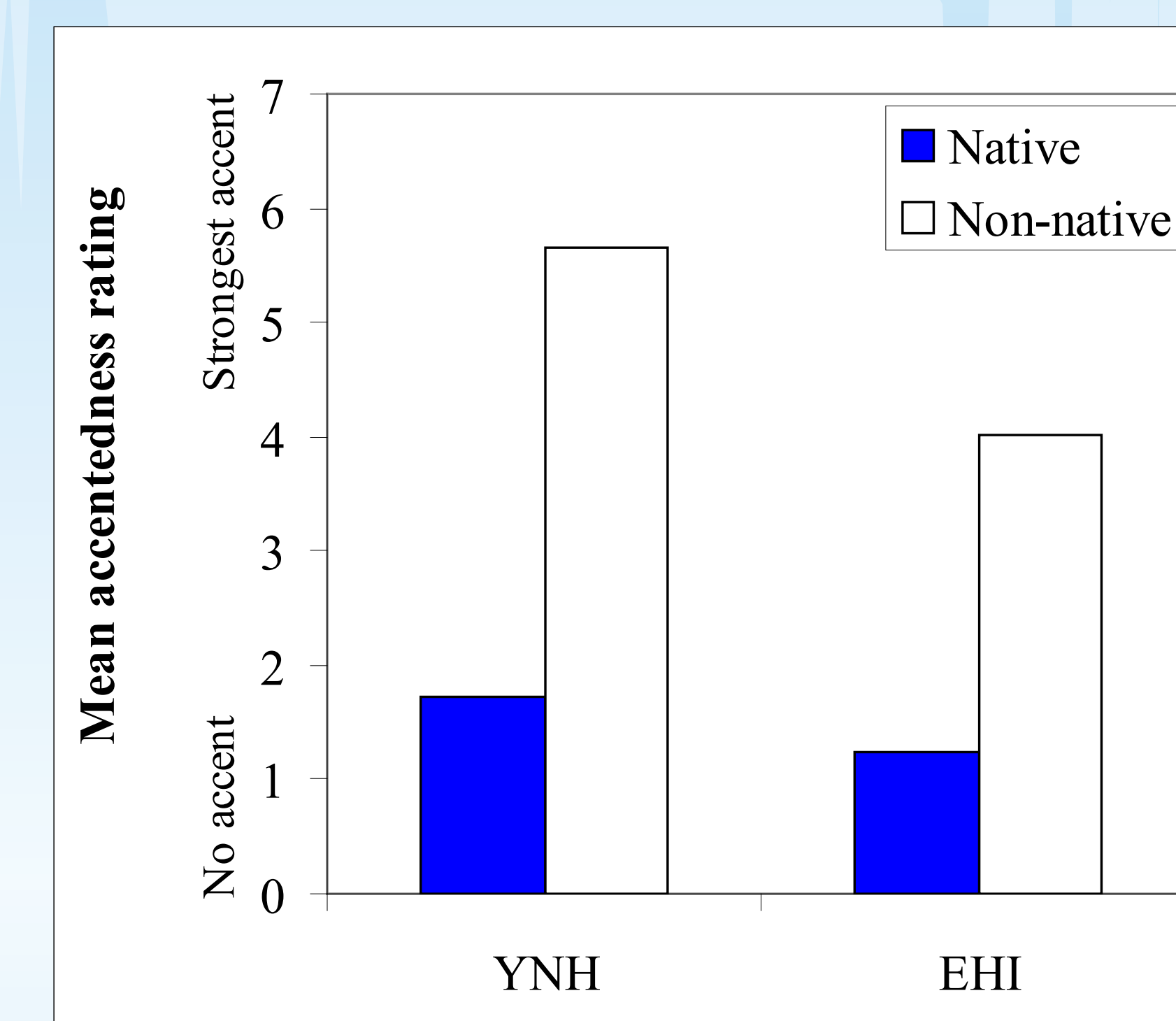
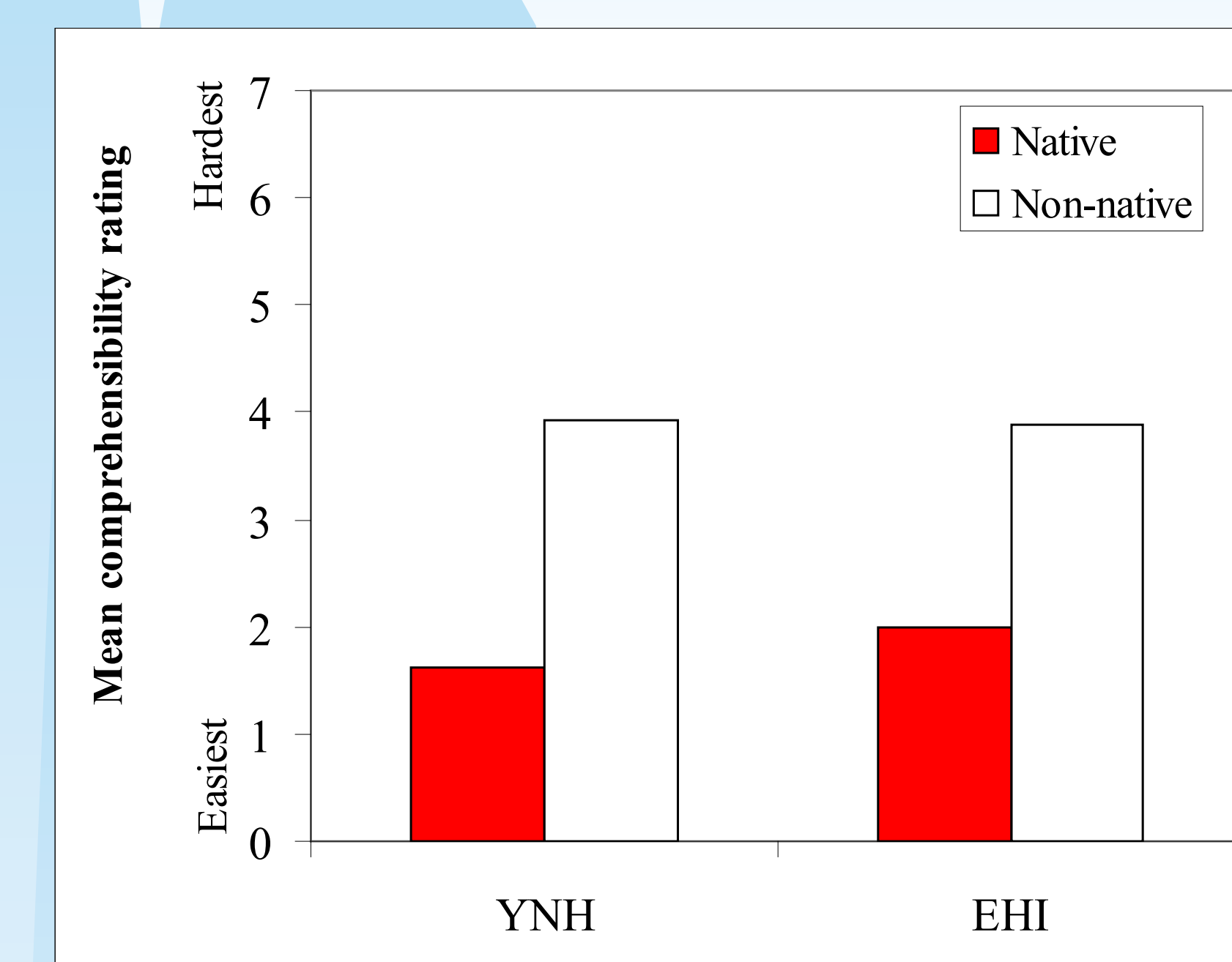
Accentedness:



- Listeners were **familiarized** with test procedures using 20 items produced by the same talkers but not used in the main test block
- The 80 test utterances were presented in random order in a single test block

Results and Discussion

- For each talker, average comprehensibility and accentedness ratings were calculated for each listener by averaging across the 20 utterances. Average ratings were then submitted to a **two-way repeated-measures ANOVA** with one within-subjects factor (talker group, native or non-native) and one between subjects factor (listener group).



- Significant main effect of **talker group** for both tasks
 - Utterances produced by **native** English speakers were rated **easier to understand** than those produced by non-native speakers [$F(1, 8) = 61.6, p < 0.001$]
 - Utterances produced by **non-native** English speakers were rated as having a **stronger foreign accent** than those produced by native speakers of English [$F(1, 8) = 178.94, p < 0.001$]
- Main effect of **listener group** significant only for **accentedness**: EHI listeners assigned lower accentedness ratings than the YNH listeners [$F(1,8) = 12.4, p < .01$]
 - While YNH and EHI listeners gave similar accentedness ratings to the native English speakers, **EHI listeners assigned lower accentedness ratings to the non-native speakers** than the YNH listeners
 - Surprising result given general assumption that older adults complain more about foreign-accented speech than younger adults
- No listener group difference** was observed for the **comprehensibility** task – a surprising result in light of
 - poor performance** observed for EHI listeners in identification studies of native-produced and foreign-accented speech
 - data from Cox, Alexander, & Rivera (1991) showing EHI listeners **underestimate** their ability to understand speech

Conclusions

- The **relationship** between the **measured intelligibility** of foreign-accented speech and listener's **subjective ratings** of this speech may **vary among listener groups** differing in hearing status and/or age.
- As the elderly and immigrant populations grow, older adults can be expected to **come into increasing contact** with non-native English speakers, particularly in **healthcare** settings. It is thus essential that audiologists and others understand **how older adults are affected by foreign-accented speech** and **how negative effects may be ameliorated**.
- Avenues for **future research** include
 - Exploring the degree to which factors such as **background noise, amplification, the presence of visual cues, and talker English proficiency** moderate the impact of foreign accent on older adults' speech understanding
 - Determining whether the **rapid adaptation to foreign accent** observed in younger adults also occurs in older adults

References

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Acknowledgements

The authors are grateful to the young adult listeners who volunteered their time to participate in this study, and to Chris Lorenzen for producing the poster. This research was supported in part by the University of Kansas and the University of Kansas General Research Fund. Recording of long-term caregivers was supported by the Building Interdisciplinary Research Careers in Women's Health (BIRC-WH) K-12 Program (P. Thomas, PI, HD052027) at the Kansas University Medical Center, School of Medicine.

