Fricative Perception in Normal-Hearing and Hearing-Impaired Children and Adults

Andrea Pittman, Ph.D.
Patricia Stelmachowicz, Ph.D.
Boys Town National Research Hospital

Funded by a grant from NIH
Experience & Hearing Loss

- Normal-Hearing Adults
- Hearing-Impaired Adults
- Normal-Hearing Children
- Hearing-Impaired Children
Methods

Normal Hearing
- **11 Adults**
  mean = 32.5 yrs. (22-42)
- **11 Children**
  mean = 10.1 yrs. (8-11)

Hearing Impaired
- **11 Adults**
  mean = 61.11 yrs. (54-69)
- **11 Children**
  mean = 10.3 yrs. (8-11)
Stimuli

Four nonsense syllables
\(/us/, /u\,/, /uf/, and /u\,/

Three speakers
an adult male
an adult female
a child

Three segments
vowel
transition
fricative

Random attenuation
Stimuli

Four nonsense syllables
/us/, /uʃ/, /uf/, and /uθ/

Three speakers
an adult male
an adult female
a child

Three segments
vowel
transition
fricative

Random attenuation
Performance-STA Functions

Fricative of /us/

Performance (% Correct)

Normal Hearing Adults
Normal Hearing Children

Short-Term Audibility
Performance-STA Functions

Fricative of /us/

- Performance (% Correct)
- Short-Term Audibility

- Yellow: Normal Hearing Adults
- Red: Normal Hearing Children
- Green: Hearing Impaired Adults
Performance-STA Functions

Fricative of /us/

- Normal Hearing Adults
- Normal Hearing Children
- Hearing Impaired Adults
- Hearing Impaired Children

Performance (% Correct)

Short-Term Audibility
/ʊʃ/
Performance-STA Functions

Fricative of /uʃ/

Performance (% Correct)

Short-Term Audibility

- Normal Hearing Adults
- Normal Hearing Children
Performance-STA Functions

Fricative of /uʃ/

Performance (% Correct)

Short-Term Audibility

- Yellow: Normal Hearing Adults
- Red: Normal Hearing Children
- Green: Hearing Impaired Adults
- Cyan: Hearing Impaired Children
Conclusions

- The hearing-impaired groups required lower audibility than the normal-hearing groups to achieve the same level of performance.
  - short term vs. long term audibility
  - abnormal growth of response

- An age effect was observed for /uS/ for the NH groups but not for the HI groups.
  - 8-year olds vs. younger children
  - influence of rehabilitative services