

# 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)

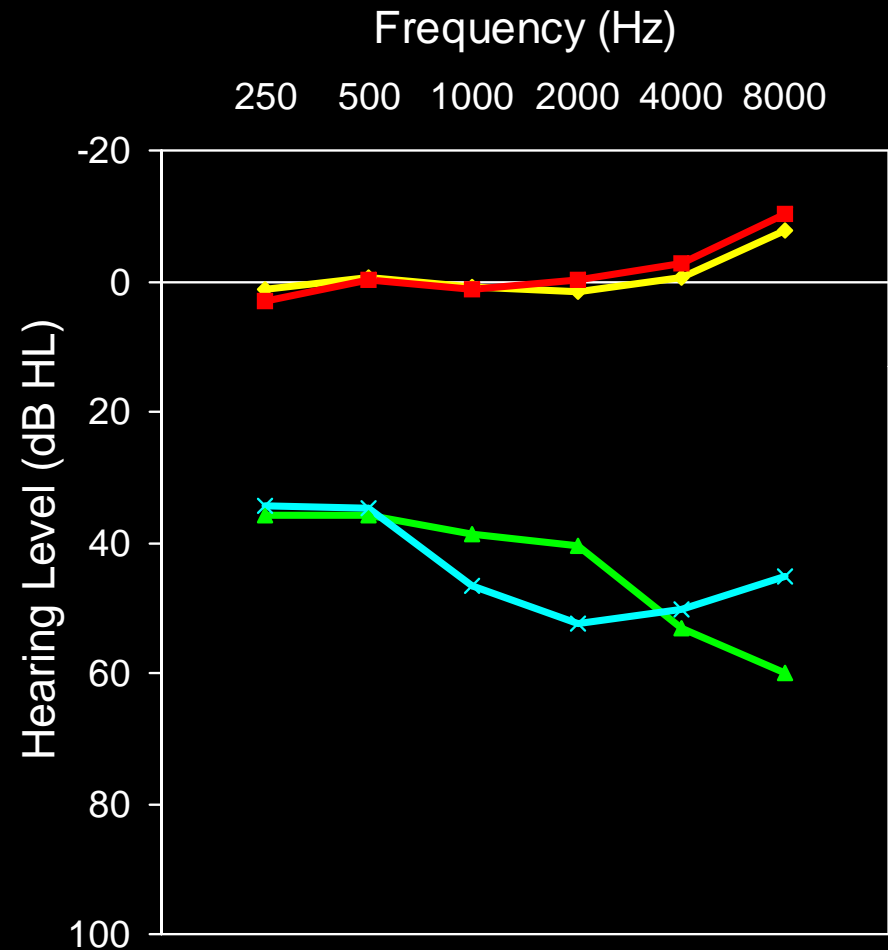
## Hearing Impaired

— 11 Adults

mean = 61:11 yrs. (54-69)

— 11 Children

mean = 10:3 yrs. (8-11)



# Stimuli

Four nonsense syllables

*/us/, /uʃ/, /uf/, and /uθ/*

Three speakers

an adult male

an adult female

a child

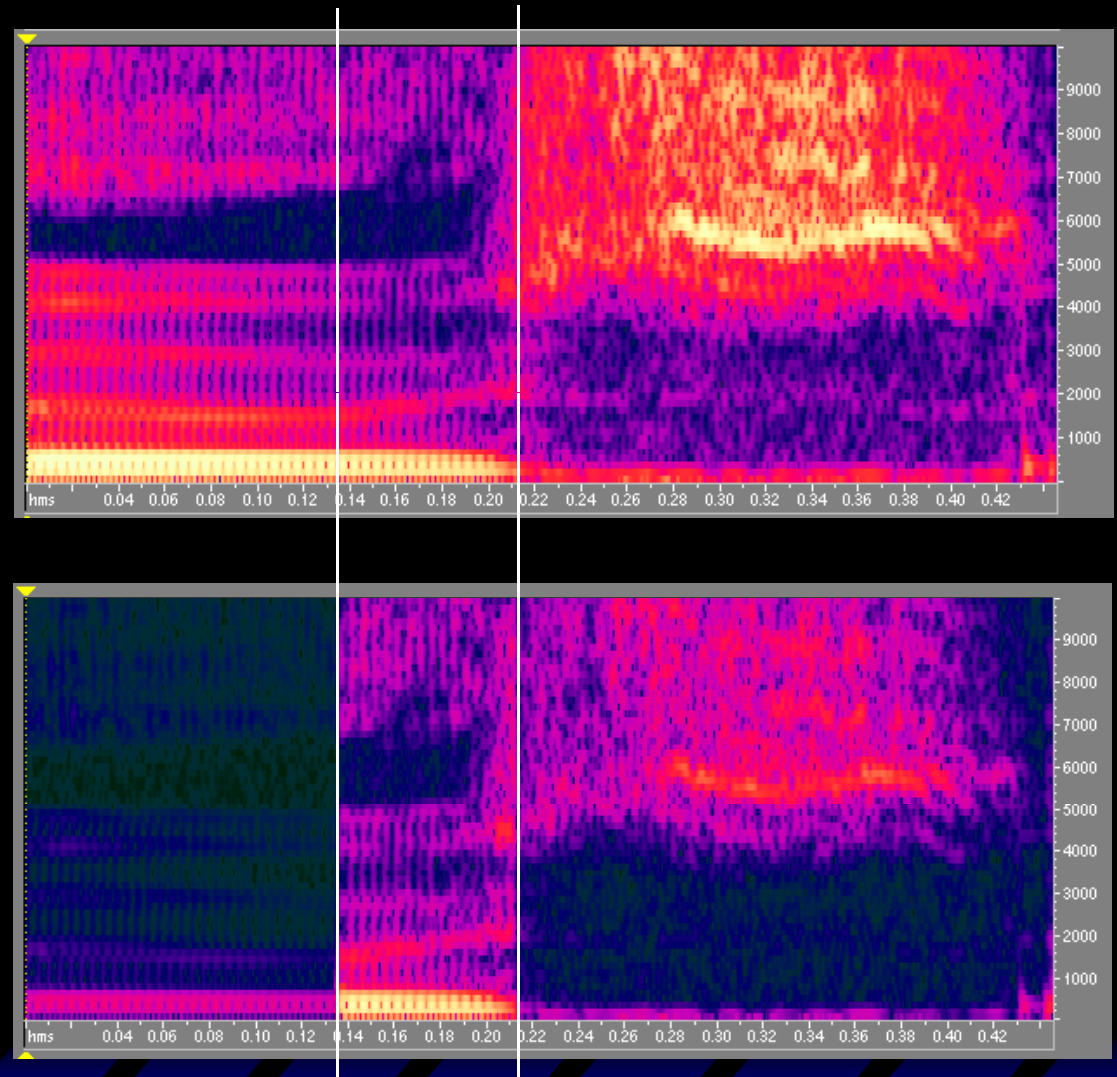
Three segments

vowel

transition

fricative

Random attenuation



# Stimuli

Four nonsense syllables

*/us/, /uʃ/, /uf/, and /uθ/*

Three speakers

an adult male

an adult female

a child

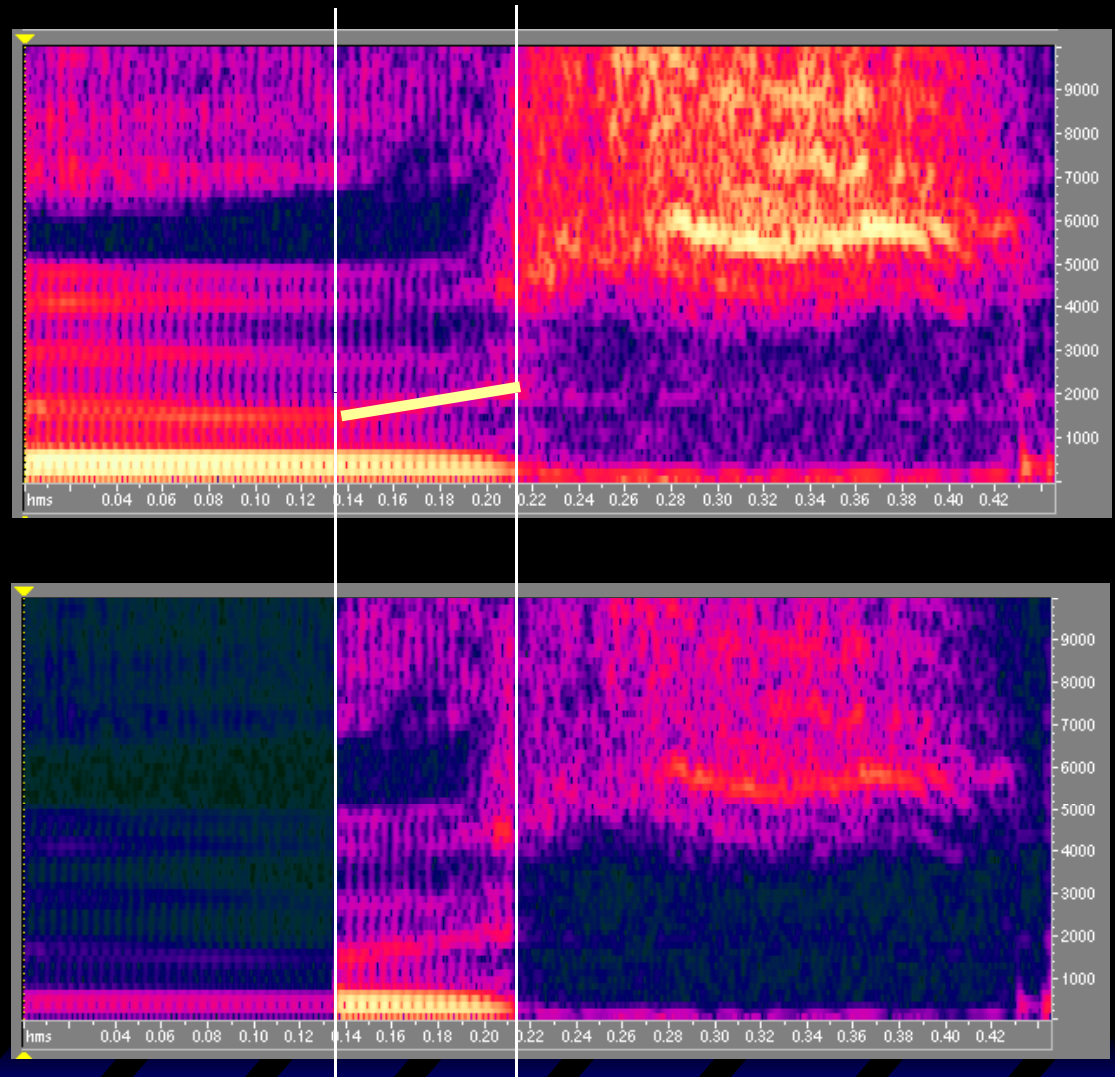
Three segments

vowel

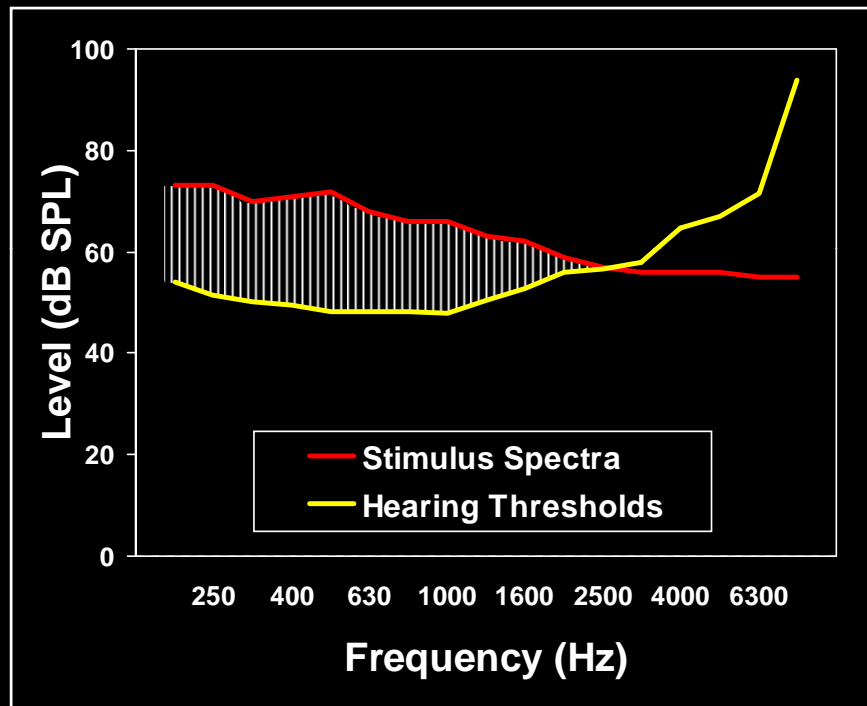
transition

fricative

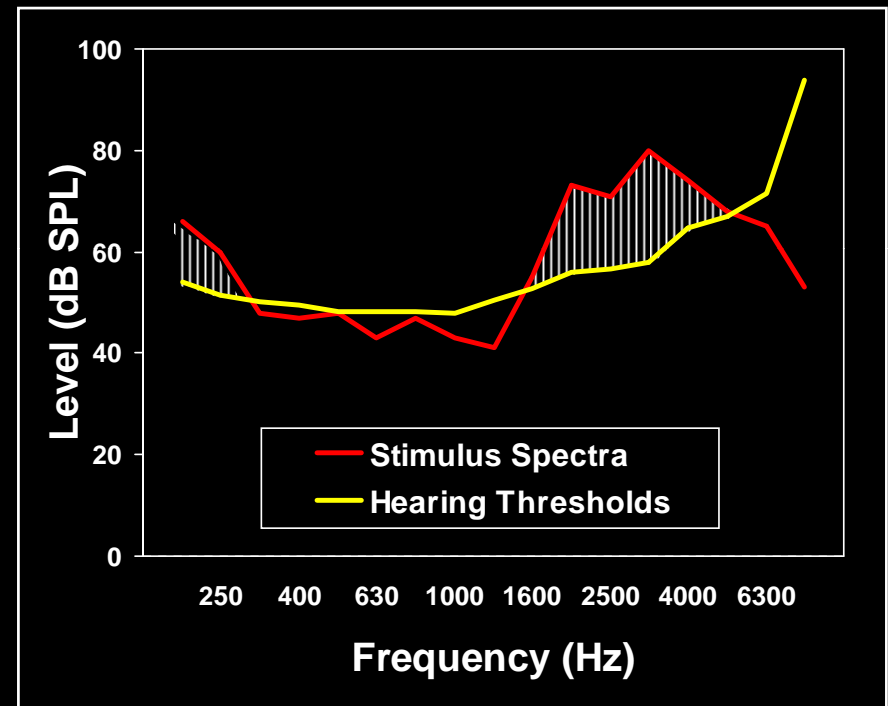
Random attenuation



## Audibility Index



## Short Term Audibility Index



# /us/

## Adults

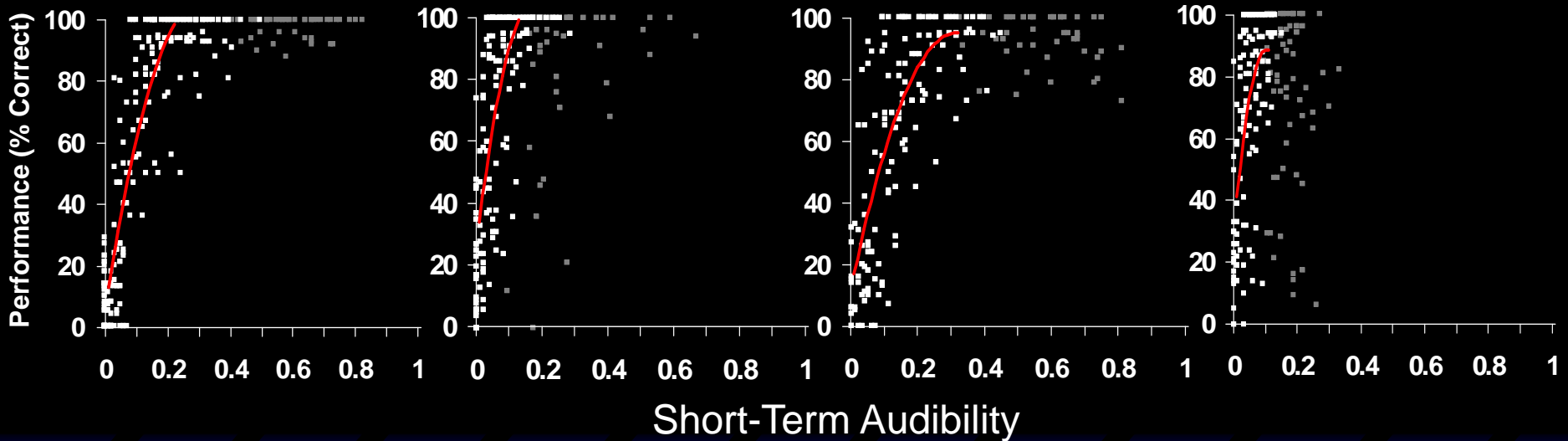
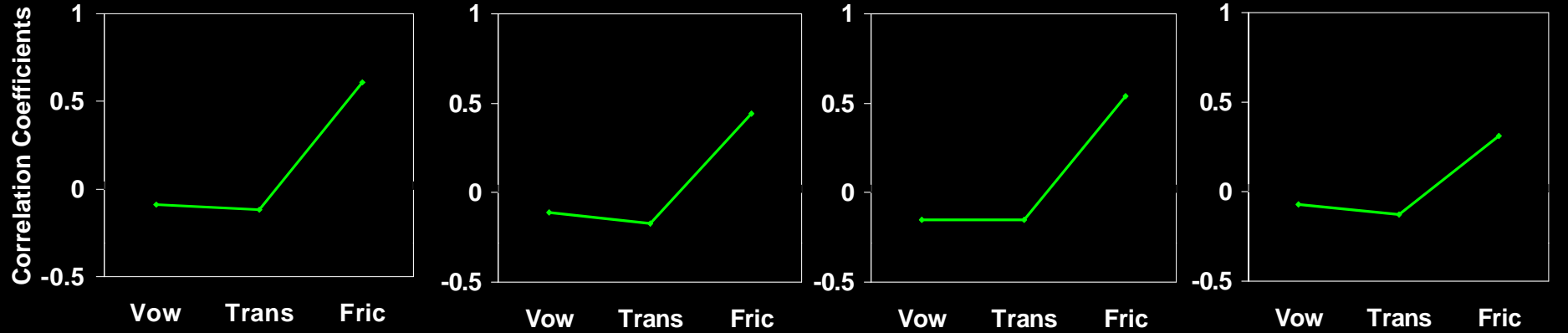
## Children

Normal Hearing

Hearing Impaired

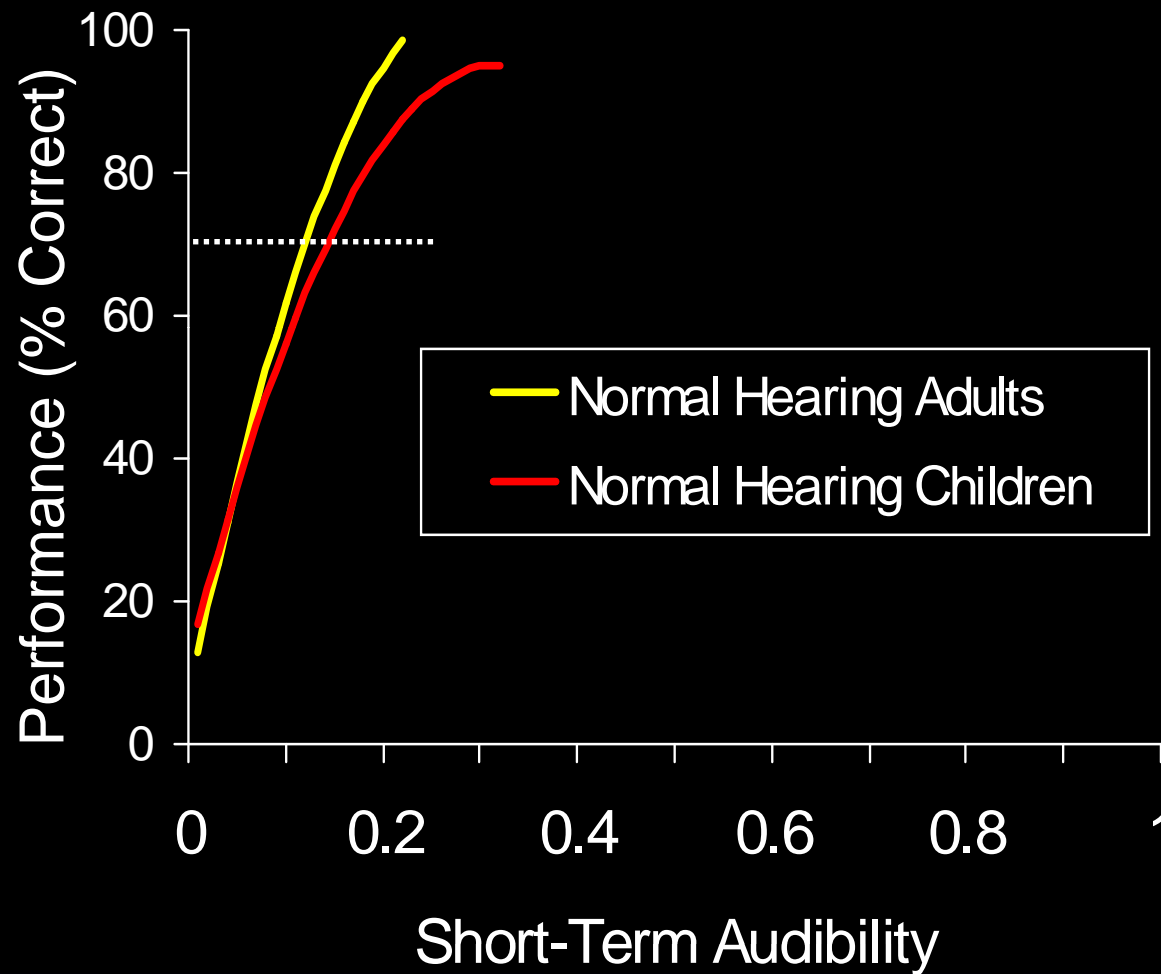
Normal Hearing

Hearing Impaired



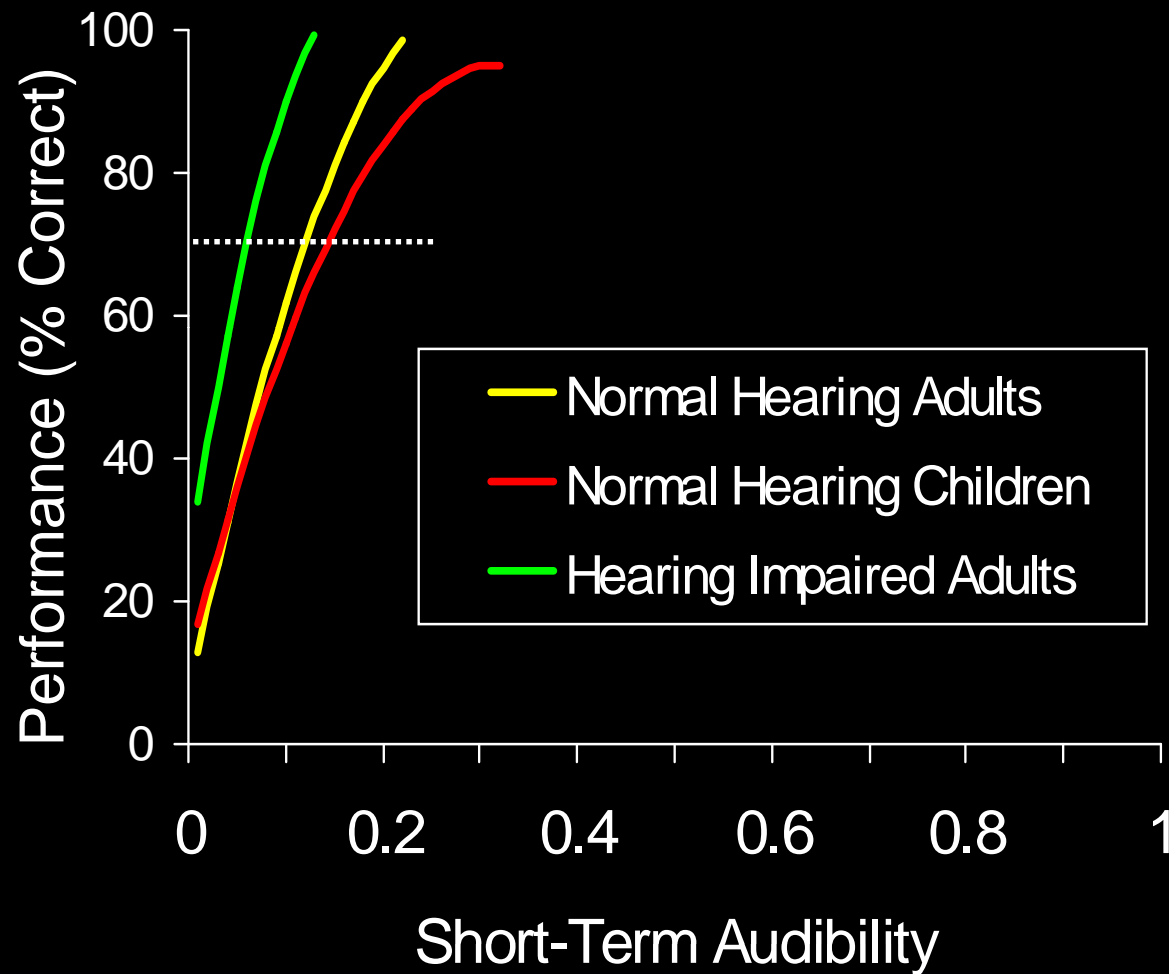
# Performance-STA Functions

Fricative of /us/



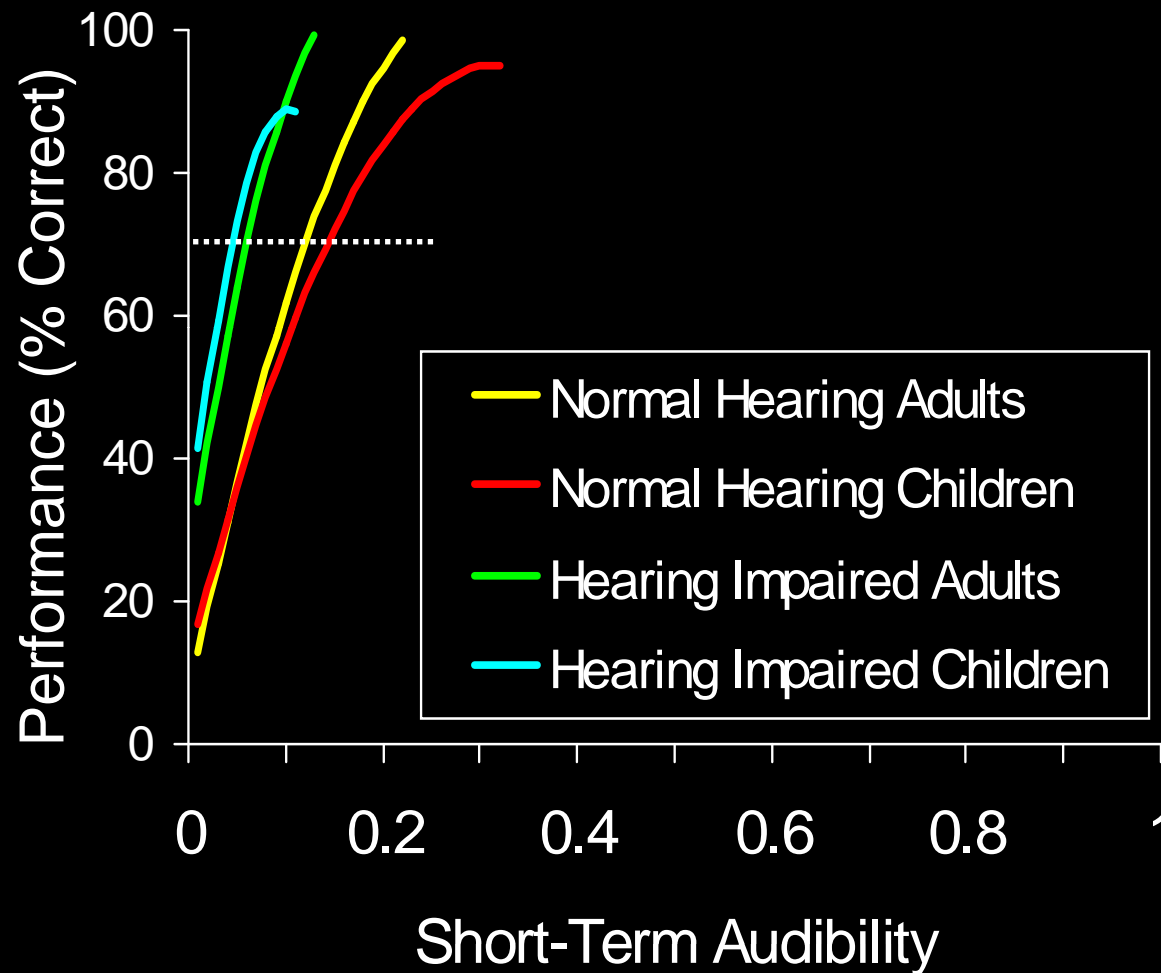
# Performance-STA Functions

Fricative of /us/



# Performance-STA Functions

Fricative of /us/



/uʃ/

Adults

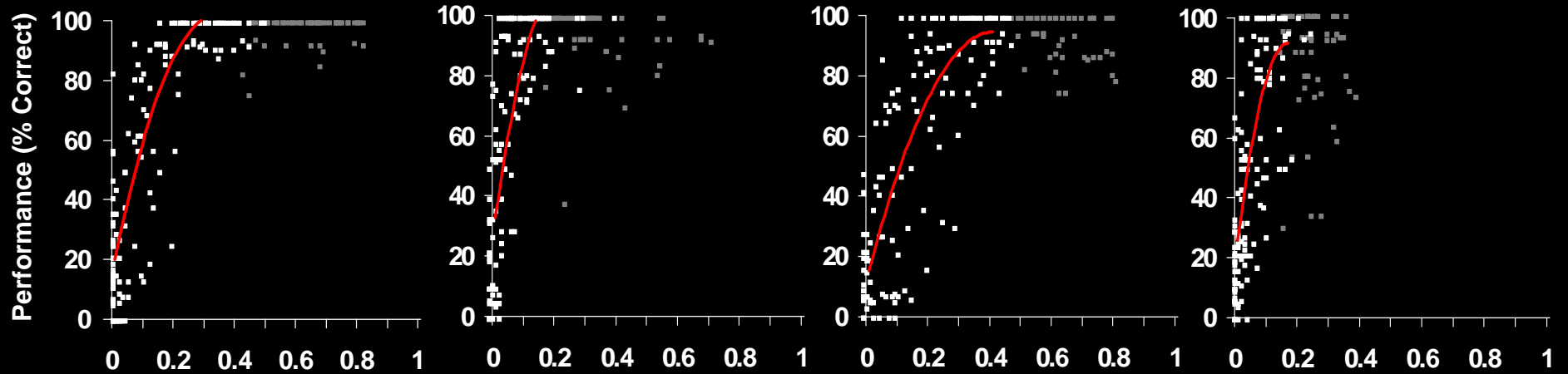
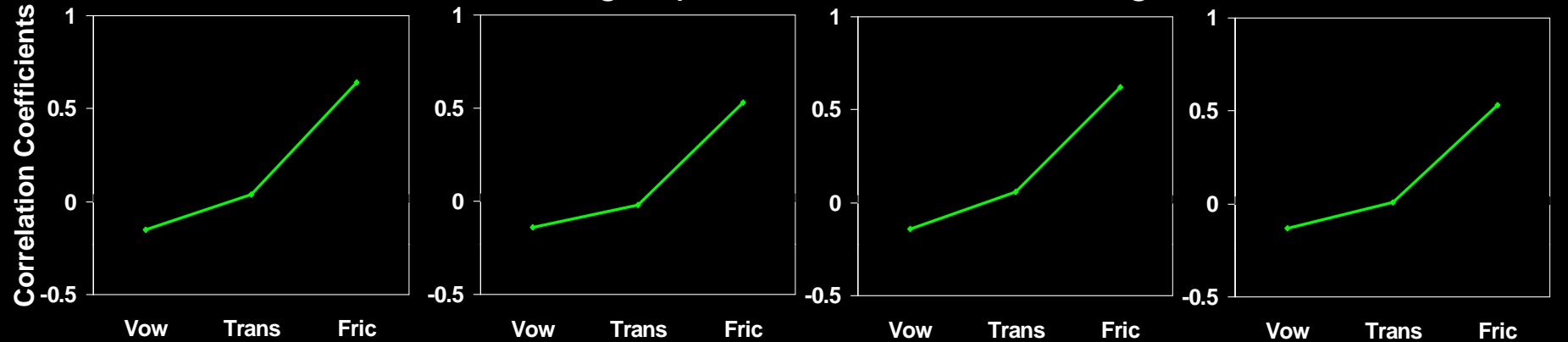
Children

Normal Hearing

Hearing Impaired

Normal Hearing

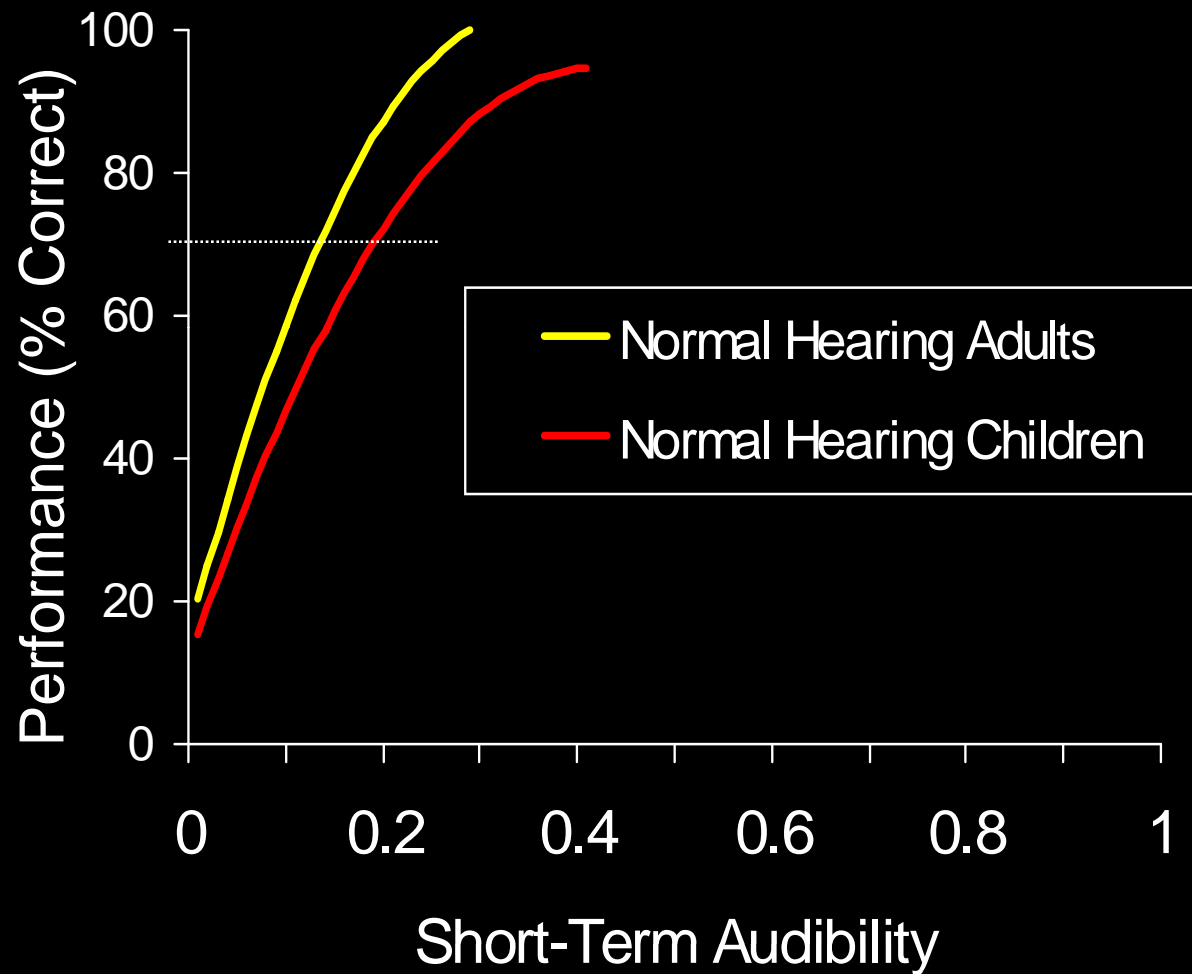
Hearing Impaired



Short-Term Audibility

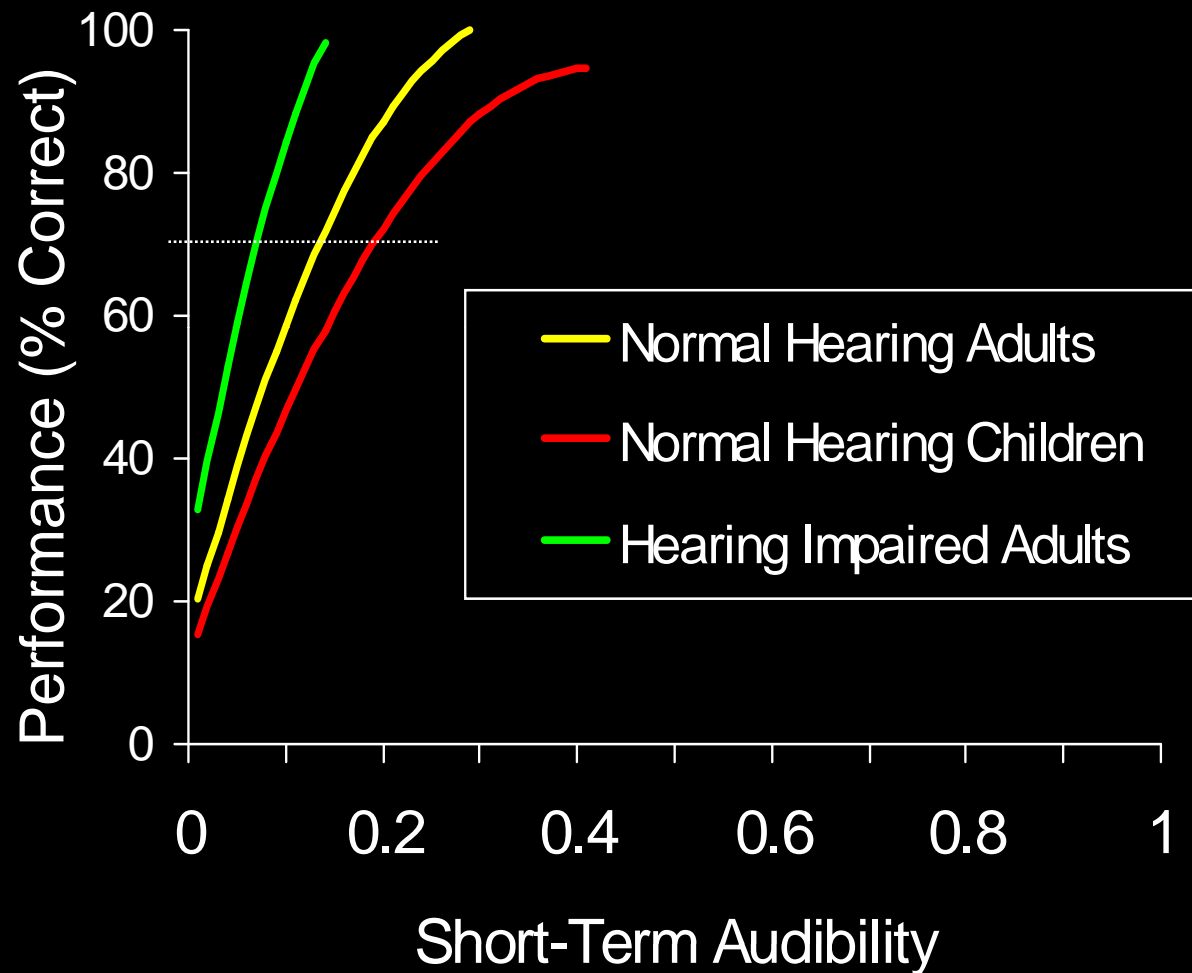
# Performance-STA Functions

Fricative of /uʃ/



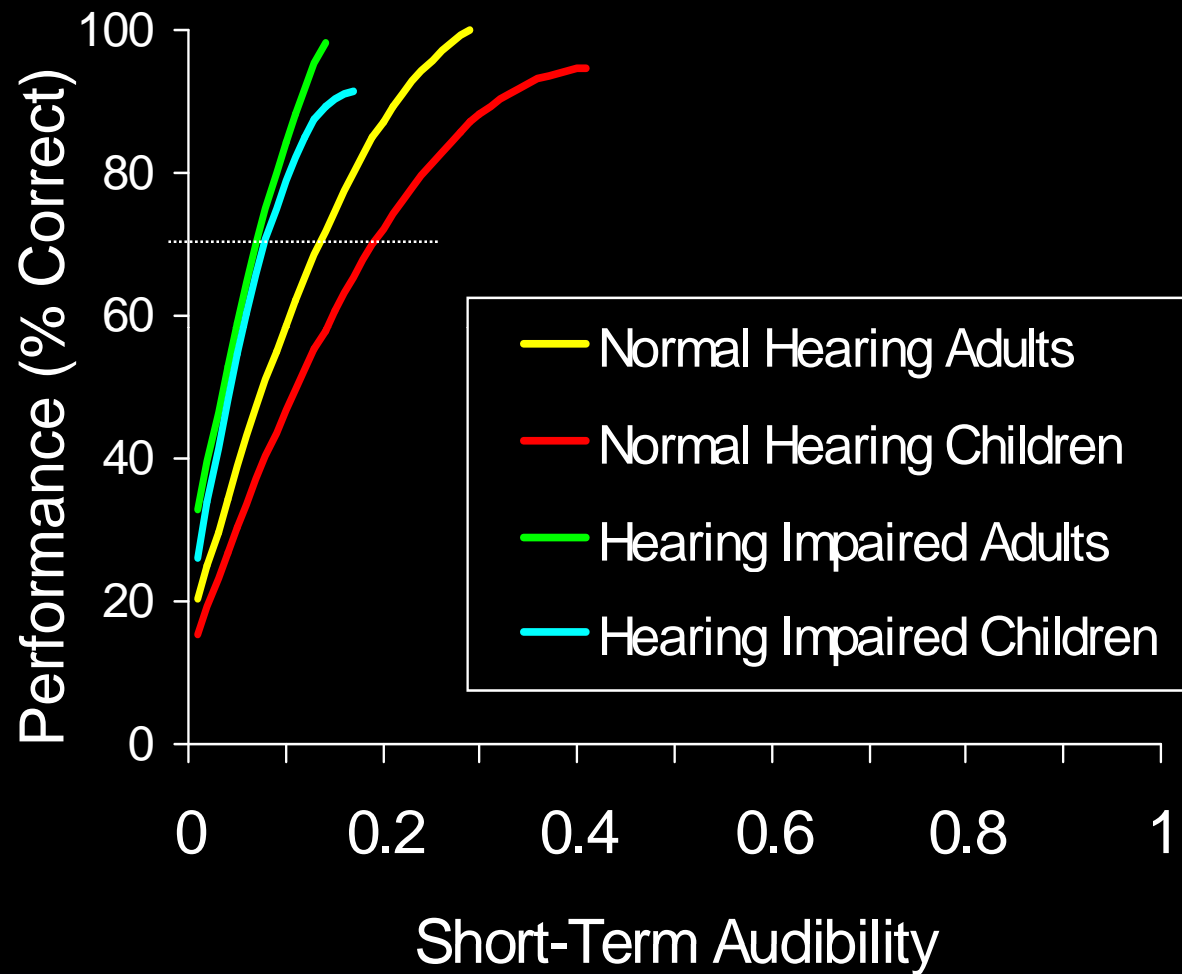
# Performance-STA Functions

Fricative of /uʃ/



# Performance-STA Functions

Fricative of /uʃ/



# 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