Benefits of high-frequency amplification in children and adults

Andrea Pittman, PhD CCC-A
Arizona State University
OSSEO 2015
Statement of Support

This work was supported by grants from the

Hearing Industry Research Consortium

Arizona Community Foundation

Oticon Medical

And by the generous help of

Colleagues:
Joshua Alexander, Purdue University
Visar Berisha, Arizona State University
Susan Scollie, Western University
Peter Derleth, Oticon

Research Assistants (The Pitt Crew):
Elizabeth Stewart
Amanda Willman
Ashley Wright
Ian Odgear

© 2015 Andrea Pittman All Rights Reserved
High-frequency audibility: Benefits for hearing-impaired listeners

Cynthia A. Hogan
Otolaryngology Division, Department of Surgery, University of Rochester, Rochester, New York 14642

Christopher W. Turner
Department of Speech Pathology and Audiology, Wendall Johnson Center, University of Iowa, Iowa City, Iowa 52242


nition performance (Fig. 7). In addition, the results point to a dependence on frequency of hearing loss, in that the hearing-impaired listeners were not using the high-frequency information (particularly in the 4000- and 8000-Hz bands) to improve their score, in some cases when the hearing loss was less than 55 dB HL (Fig. 9).
Participants

19 children with normal hearing
18 children with hearing loss
8 to 12 years of age
Mainstreamed at grade level
Native speakers of English
Participants

15 adults with normal hearing
11 adults with hearing loss
50 to 78 years of age
Hearing aid users or candidates
Methodology

Testing
- 52 dB SPL in quiet
- 0° azimuth

Data collection
- Computer interface
- Digital audio recordings

Two visits
- 1 Unaided session
- 1 Aided session
Word Recognition

Children

Task

Adults

Performance (% Correct)

Word Recognition

0 100

\* Aided-WB

\* Aided-NB

\* Unaided

© 2015 Andrea Pittman All Rights Reserved
Auditory Lexical Decision
Auditory Lexical Decision

Children

Adults

Performance (% Correct)

Word Recognition

Lexical Decision

Task

© 2015 Andrea Pittman All Rights Reserved
Rapid Word Learning
Rapid Word Learning

\[ P_c = 1 - 0.8e^{-n/c} \]
Summary...

Word Recognition
Lexical Decision

Task

Children

Adults

Aided-WB
Aided-NB
Unaided

Performance (% Correct)

Speed (log 1000/n)

© 2015 Andrea Pittman All Rights Reserved
1. The benefit of amplification decreased as the difficulty of the task increased.
2. The benefit of bandwidth increased as the difficulty of the task increased.
3. Potential for benefit can go undetected if judged by word recognition alone
Thanks for listening!
(and learning)