Children Who are Hard of Hearing... A New Chapter

EHDI: Partnering for Progress
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Children who are "Hard of hearing"

- Inconsistent definition in the literature
 - Audiological criteria
 - Functional communication criteria
 - Cultural affiliation/Identity
- For our purposes today
 - Children in mild and moderately-severe range
 - Use hearing aids rather than Cls
 - Reliant primarily on speech and listening for functional communication (Jamieson, 2010)

Standing on the shoulders of giants...

3

We must maximize residual hearing & understand holistic developmental needs... Our terms lead to underestimation of children's needs....What does "mild" convey?

These are our "Forgotten Children."



Noel Matkin, Ph.D.



Julia Davis, Ph.D.

Mark Ross, Ph.D.

"Using the understanding gained by major thinkers who have gone before in order to make intellectual progress."

Why called "Forgotten Children?"

- Or Construction of needs
- Limited initial of classroom teachers, school personnel
- Little is known about C
 - educational achievements
 - problems faced in regular classroo/
 - acceptance or non acceptance by peer.
 - extent of support services & impact
- Poorly monitored amplification

Davis, J. (1977)

A New Generation...

This population is "on the move" due to:

early identification

improved auditory access

early and effective family-centered programs







⁶ New Chapters...

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Chapter 1: The path to discovery differs

- 7
- Information is unsolicited and may conflict with observation
- Delivered at a sensitive & potentially vulnerable time (ASHA, 2008)
- Family perception of a "timetable of development"
 - Service delays equated with harm (Young & Tattersall, 2007)
 - Families focus on later outcomes; limited understanding of preverbal stages/supports (McCraken, et al., 2008)
 - Developmental expectations (Young & Tattersall, 2007)

Supporting families on the path...

- 8
- Balance of informational and adjustment counseling (ASHA, 2008)
- Practical baby-focused supports for families
- Care about development discussions
- Sensitivity to affective dimensions



Chapter 2: We need more evidence to support best practice

- Most outcome studies focus on children who are deaf
- Reduced body of literature concerning children who are HH (Mild and moderately-severe degrees)
 - Sample sizes are small or mix D/HH children
 - Lack of control of amplification histories/audibility
 - Few studies attempted a population sample
 - Varied measurement strategies; earlier generation technologies

Longitudinal Study of Outcomes

University of NC-Chapel Hill University of Iowa Boys Town National Research Hospital

Pls: J. Bruce Tomblin, Ph.D. and Mary Pat Moeller, Ph.D.

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Study design

11



Accelerated Longitudinal Design

- Each child followed for 3 years+.
- Retrospective data prior to enrollment obtained by medical record history.

Participants

Centers	нн	ТН
Boys Town	117	40
lowa	85	48
North Carolina	104	24
Total	306	112



Ages 6 months – 6; 11
English spoken in the home
No major secondary disabilities
Permanent Mild to Severe Hearing Loss
PTA of 25-75 dB HL (500, 1k, 2k, 4 kHz)
Normally distributed by degree
Majority early identified; ~78% fit by 6 months

Age-appropriate vocabulary, on average at later ages



Mean at 60 months = 99.28Mean at 84 months = 98.47

Aided Hearing Matters for Vocabulary Development



Syntax appears to be more challenging



Reading Skills within Average Range at Age 6



6yr WRMT-R

Chapter 3: We need to identify & address areas of development that may be "at risk"

- The "complexities of developing spoken language are ameliorated, but not eliminated, by early amplification and interventions." (Blamey, et al., 2002)
- Impact of inconsistent access
 - Phonological learning
 - Morphological development
 - Advanced syntax

17

Social reasoning

Is phonology "at risk" in some HH children?



Bilateral mild-moderate hearing loss

Articulation at 3, 5, & 7 years: GFTA



Is morphology "at risk?"

20

We developed a DVD to probe 9 different morphological endings

Regular Plural



Irregular plural



Morphology Elicitation Task: Age 4



Mean BEPTA = 51.0 (SD = 14.9); Mean SII = .75 (SD = .16); Mean Age = 49.5 months

Advanced Skills: Social Reasoning

Theory of Mind Task





Theory of Mind Performance at Age 5 years



**Chi square = 22.260; *p* = .001

Correlated with CELF r = .546, p = .001Verbal reasoning r = .563, p = .001

Narrative: Candy Stealing Story 24 \bigcap (ē

Chapter 4: Maybe we need to ask some different questions...



"Acoustic Ecology" (McKellin, et al., 2007): Need for more focus on accessibility/inaccessibility

"In spite of the crucial role of hearing inaccessibility in the lives of children who are hard of hearing, there has been no interdisciplinary, systematic attempt from a developmental perspective to integrate what is known about the acoustic ecology of childcare and educational settings with the lived experience of the hard of hearing children who inhabit them."

Impact of Poor Classroom Acoustics on Hearing Students (McKellin et al., 2007)

- Acoustic Ecology Project
 - 36 students, grades 1-7, worked at their desks
 - wore ear-level microphones, so that a stereo recording of the noise and conversation at the wearer's ear could be recorded
 - the pragmatics were significantly altered as the level of background noise at ear level increased:
 - e.g., soliloquy and parallel talk, which reflected verbal and social isolation

Impact of Inconsistent Access on Socialization of HH Students

- Jamieson, Poon, Zaidman-Zait & Hodgson (2009)
 - Studied peer interactions of 11 HH elementary students
 - Classroom & playground observations, interviews of parents & classroom and resource teachers
 - Measured classroom acoustics

Language/Social Accessibility or Inaccessibility affected by interacting factors:



Developmental Patterns: K – 2nd Grade

For hard of hearing children:

- Most important relationship is between child and teacher
 - Does the teacher understand and accommodate hearing loss?
- Difficulty overhearing social cues; if social skills not explicitly taught, group entry skill often not developed
 - Child may withdraw socially
 - Intrude inappropriately

Jamieson, et al., 2009

Developmental Patterns: 2nd – 4th Grades

For hard of hearing children:

- Some difficulties with social skills when adults not present
- May establish pattern as "loner" or "follower"
- In the classroom, often follow lead of other students
- By 4th grade, classroom teacher expects self-reliance in terms of hearing aids

Jamieson, et al., 2009

From the Mother of a 4th Grade Girl:

"...a year or two ago, the children' s conversation was less complicated and less rapid-fire, less witty, less all those things. It was easier for her to keep up. And I'd say the more she ages, the more she's unable to stay a part of the conversation. So I'd say more and more her strategy is that she's just leaving and just not bothering."

Socialization matters for Learning

- Quality of social relationships tied to academic progress
- Learning with friend vs. classmate impacts:
 - Conflict management
 - Deductive reasoning
 - Problem solving
 - Exploration



Classroom Social Experiences



Bottom line: Promotion of positive relationships with peers contributes not only to social development, but emotional and cognitive (learning/academic)

Flook, Repetti & Ullman, 2005

A Resource for Families

Seven Essential Life Skills

- Focus and self control
- Perspective taking
- Communicating
- Making connections
- Critical thinking
- Taking on challenges
- Self-directed, engaged learner



Summary

- Need to recognize unique and ongoing family support needs
- Need for more research focused on children who are hard of hearing
 - Interdisciplinary input
 - In complex listening environments typical of real settings
- Understanding factors promoting positive psychosocial development
- Need for sensitive measures and an integrated view of language and social cognition

Longitudinal Study Team Members

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Thanks

