Academy of Rehabilitative Audiology
Summer Institute 1999

Mission Inn
Howey-in-the-Hills, Florida
June 10-13, 1999

FRIDAY, JUNE 11

8:00 - 9:15 *POSTER SESSION*

1. Anticipatory Strategy Training: Implications for the Post-lingually Hearing Impaired Adult

Perri S. Hecht, Adrienne Rubinstein, and Rochelle Cherry; *Brooklyn College, City University of New York, Brooklyn, New York*

The present study was designed to determine if speech recognition performance will improve after subjects prepare for an unfamiliar communication situation as opposed to a familiar one. Forty-five normal-hearing subjects were divided into three groups: one trained using a well-known fairy tale, one trained using an obscure fable, and one without training. Post-training, all groups performed similarly when tested on the familiar tale. When test material involved the unfamiliar fable, only the group trained on that material obtained significantly better scores than the other groups. Results support teaching clients that increasing their knowledge of upcoming unfamiliar events can improve subsequent speech recognition.

2. Looking Beyond Traditional Audiology Services: Procedure and Outcome for Creating an Assistive Listening Device (ALD) Room

Mona C. Coan and Lois Sutton; *The Methodist Hospital, Houston, Texas*

In 1998, The Methodist Hospital Audiology Service decided to increase patient services with the addition of a room dedicated to demonstrating Assistive Listening Devices (ALD). A proposal was formatted to operate this room within the structure of the hospital and clinic. Within its scope, the staff determined it would house demonstrating materials, informational pamphlets, and community news for patients and staff members. The following paper describes how the audiology service created this ALD Room and highlights the research and problems encountered during this process. The Methodist Hospital Audiology Service feels that this information will be useful to show other practices that it is possible to dedicate a part of their service to a sales industry while maintaining a high standard of professional quality.

3. Adaptations in Teaching Speech Communication: Speech Impairment & Developmental Delay With Congenital Hearing Loss

Orrin Korn; *Child Development Centre, Hotel Dieu Hospital, Kingston, Ontario, Canada*

Mary Beth Jennings; *Aural Rehabilitation Service, Guelph and Toronto Hearing Society, Toronto, Ontario, Canada*

This poster describes a program designed to facilitate the speech communication of an adult client with cerebral palsy, impaired speech, developmental delay, and congenital hearing loss. The client was originally referred to the first author, a speech-language pathologist, for prescription of augmentative communication system. As electronic aids appeared of limited value, an illustrated program and role-play aimed at teaching the client to modify his own behavior and to request change in the behavior of communication partners was initiated. Results of the program and recommendations will be described.

4. Emotional Responses Resulting from Meniere Disease

Laura J. Kelly; *Miami University, Oxford, Ohio*

The audiometric and symptomatic profiles of individuals with Meniere Disease are familiar to most audiologists. Professionals are less likely to be familiar with its emotional impact. The range of emotions is similar to that experienced by other individuals with hearing loss. However, adjustment is

complicated by the unique combination of symptoms presented by the disorder. Emotional responses will be summarized as well as the factors which contribute to the emotional state of Meniere patients and their families. Some suggestions for counseling and providing support will also be discussed.

5. Phonological Analysis of Speech Production Skills of Children Using Multichannel Cochlear Implants

Jan Moore and Elizabeth Collison; *University of Iowa, Iowa City, Iowa*

Hodson Phonological Processes analysis was performed on data from 14 children with multichannel cochlear implants (CI) representing two outcome groups in terms of intelligibility. This analysis was performed at pre-implant and at annual visits up to 48 months post-implant. Fifty words were used in the analysis at each visit and the speech was gathered in a story re-telling task. Preliminary results indicated that the children who are highly intelligible at 48 months post-implant showed accurate production of the following classes of speech sounds: stridents, nasals, glides, and the production of final consonants. Glides were also produced accurately for the intelligible speakers at 12 months post-implant. A positive outcome of the analysis is that goals are provided for each child.

6. Quantifying a Gain Algorithm Which is Dependent of Temporal Amplitude Modulations

John A. Nelson and Amy L. Zebedo; *University of Texas at Austin, Austin, Texas*

Advanced signal processing algorithms have been incorporated into many digital signal processing hearing aids. Many hearing aids use common techniques like gain, output, multi-band processing, and compression. One new algorithm incorporates an analysis of the temporal amplitude characteristics of the signal. This analysis is then compared to the characteristics of speech and the gain applied is reduced if the signal is not "speech-like." To accurately fit these devices and counsel the client, it is important to understand how the system works for different input signals and signal-to-noise ratios. This presentation will quantify these relationships.

7. Analysis of Structural and Linguistic Elements in Narratives of Young Cochlear Implant Users

Jillian Crosson and Ann E. Geers; *Central Institute for the Deaf, St. Louis, Missouri*

Narrative productions, prompted from an eight-picture sequence story were elicited on videotape from 87 children between the ages of 8;0 and 9;11

years. All the children had at least 4 years of implant experience. Of the 87 children, 43 had been orally educated and 44 received total communication (TC) in school. A group of normal hearing (NH) 8- and 9-year-olds served as controls. The oral and signed narrative productions were transcribed and coded. The purpose of this study was to (a) identify the types of narrative structures used, (b) examine how semantic relationships between events were linked, (c) identify whether speech perception ability influenced narrative production performance, (d) evaluate the relation between narrative production and communication mode, and (f) compare and contrast the narratives produced by cochlear implant (CI) users with age matched NH peers.

Stories were analyzed for different narrative structures (orientations, complicating actions, evaluations, and resolutions). The CI users used significantly more orientations and significantly fewer resolutions than their NH age mates. In addition, the NH children used significantly more conjunctions to link semantic relations than the CI users.

For each of the narrative structures, there was no significant difference between the children in the oral and TC programs. In analyzing the conjunctions used to link semantic relations, it was found that children from TC settings used significantly fewer conjunctions than those from oral settings.

An overall narrative ability score was calculated and correlated with speech perception and reading measures. Significant correlations were found between narrative ability score and each of the speech perception measures, WIPI, $r = .31$ ($p < .01$), LNT, $r = .27$ ($p < .01$), and BKB sentences, $r = .34$ ($p < .001$). Reading recognition and reading comprehension (subtests of the Peabody Individual Achievement Test) were also found to correlate significantly with narrative ability score, $r = .37$ and .31, respectively.

9:30 - 10:30 *1999 KEYNOTE ADDRESS*

Hearing Aids: Gateway to A/R

Mark Ross, 1999 Invited Keynote Speaker; *Professor Emeritus, University of Connecticut, Storrs, Connecticut*

Technical progress aside, the basic model for hearing aid selections have not changed much in 50 years. We still test, select an aid, fit the aid, follow-up several times in the first 30 days, and ask people to "call us if there are any problems." This model does not permit audiologists to fully respond not only to the adjustment problems frequently encountered when people wear hearing aids for the first time, but also virtually ignores the communicative and psychosocial implications of the hearing loss. This presentation will recommend and support a different model for hearing aid selections, one that incorporates a 4 week short term A/R program as a routine component of the hearing aid selection process.

10:45 - 11:30 Advanced Technology for Children

Pat Robertson, 1999 Invited Speaker; *Oticon, Inc., Somerset, New Jersey*

Advanced, non-linear, digital technology in hearing aids has been proven to provide audibility and comfort, automatically, in the wide range of auditory environments in which children must function. FM technology improves the signal-to-noise (S/N) ratio for better speech recognition in challenging environments. The Oticon DigiFocus and the Phonic Ear Solaris FM with TMX technology use digital signal processing to provide audibility, comfort, and enhanced S/N ratio in a wireless FM solution.

11:30 - 12:00 Development of a Screening Version of the CPHI

David J. Wark; *University of Memphis, Memphis, Tennessee*
Marilyn E. Demorest and Sue Ann Erdman; *University of Maryland, Baltimore, Maryland*

The 163-item CPHI (Erdman & Demorest, 1998) provides a diagnostic profile of scores on 25 scales that describe a client's adjustment to hearing impairment. Factor structure of the CPHI in a heterogeneous clinical population (Demorest & Erdman, 1997) shows that two important factors assessed by the CPHI are Communication Performance (an aspect of hearing disability) and Psychosocial Adjustment to Hearing Impairment (an aspect of handicap). Item response theory was used to develop a 20-item instrument that screens for disability and handicap. Sensitivity and specificity was evaluated in a cross-validation sample ($N = 319$).

1:30 - 2:00 Speech Perception Results for Adults with a Substantial Hearing Impairment Using an Adjacency Pairs Paradigm

Mark C. Flynn; *University of Canterbury, Christchurch, New Zealand*
Richard C. Dowell; *University of Melbourne, Victoria, Australia*

This paper will present recent speech perception results from a group of 31 participants with a substantial hearing impairment (61-98 dB HL) using an adjacency pairs paradigm. Four conditions were included: (a) no initiating question, (b) neutral initiating question, (c) disruptive initiating question, and (d) a strong contextual relationship. The time delay between the question and answer also varied (2 s, 5 s, or 10 s). Statistical analysis found that for all conditions with a preceding question and speech perception significantly improved ($p < .001$) compared with the no initiating question presentation, and

that the amount of cohesion between the question and the answer significantly affected speech perception scores ($p < .001$). Additionally, there was a significant ($p < .001$) interaction effect between time delay and relatedness.

2:00 - 2:30 The COSI: An Easy-to-Implement Outcome Measure

Pat Robertson, 1999 Invited Speaker; *Oticon, Inc., Somerset, New Jersey*

Since the 1970s, there has been a shift in emphasis from "quality assurance" (standards of care), to outcome measures focusing on the changes the client experiences as a result of care. We assess our effectiveness based on how well we meet the clients' needs. The COSI is an easy-to-implement, client-focused outcome measure that can help to define treatment goals, quantify success in client-oriented terms, define an ending of the immediate rehabilitation process, and provide proof of treatment efficacy.

2:30 - 3:30 Personality Based Adult Aural Rehabilitation

Robert Traynor; *Audiology Associates of Greeley, Inc., Greeley, Colorado*

This presentation discusses the importance of the use of personal style in the aural rehabilitation of hearing impaired patients. For 50 years we have considered our patients all the same with but a different hearing impairment. This presentation discusses the importance to see the patient as a person first and with a hearing loss as an important secondary variable. It further describes reasons why some two patients with the same hearing loss fit with the same hearing aid are often quite different successes in their treatment programs. It describes a method that audiologists can use to offset these differences and how these differences can be utilized to maximize time with clients.

3:45 - 4:00 An Analysis of Older Couples' Conversations With and Without the Stress of Hearing Loss

Susan K. Harned, Alice E. Holmes, and Norman Markel; *University of Florida, Gainesville, Florida*

Speech samples of 40 older adult couples were audiotaped in quiet and noise-simulated environments to determine differences in interactive strategies related to coping with hearing loss. Hearing acuity was screened. Those indicating deficits obtained audiograms. Participants completed demographic and HHIE forms. Episodes were analyzed by percent of subject talking time versus number of idea units generated, establishing participation levels within each couple. Topic patterns, breaks, clarifications, and congruent talking occurrences were tabulated measuring interactive efficiency. Content

was coded into 12 categories by communication intent. Results indicated altered communication patterns in all areas of measurement for couples contending with hearing impairment.

4:00 - 4:15 Effect of Hearing Status and Disruption Type on Repair Strategy Usage by Older Adults

Teresa Hnath-Chisolm and Elaine Silliman; *University of South Florida, Tampa, Florida*

This study systematically examined differences in repair strategy usage by older adults as a function of (a) hearing status (normal vs. impaired), and (b) mechanism for elicitation of the repair (i.e., linguistic vs. auditory disruptions). To examine these factors, a "map-reading task" was developed which allowed for the incorporation of both types of disruptions which elicited a variety of repairs. Results indicated, for both disruption types, that individuals with hearing loss primarily used nonspecific repairs, while those with normal hearing used specific requests. These data provide evidence that hearing loss in older adults changes the nature of the communication interchange.

4:15 - 4:30 A Joint Professional-Community Vision for Hearing Accessibility: Process and Outcomes of a One-Day Participatory Research Planning Event

M. Kathleen Pichora-Fuller and Bill McKellin; *University of British Columbia, Vancouver, British Columbia, Canada*

Participatory research is characterized by equal involvement of professional researchers and community stakeholders in designing, conducting, interpreting, and using the research. In Fall 1998, "Meeting the Needs of Hard-of-Hearing Persons: Towards a Common Vision," a joint meeting of members of the B.C. Association of Speech-Language Pathologists and Audiologists and hard-of-hearing members of the B.C. Chapter of the Canadian Hard of Hearing Association, was organized by the Institute for Hearing Accessibility Research at the UBC. About 20 members of each group attended the meeting. A medical anthropologist facilitated the discussion. The central theme of the discussion concerned how audiologists and hard-of-hearing people should cooperate to develop new community-oriented initiatives.

4:30 - 4:45 Targeting Academic Success: An Interdisciplinary Assessment and Intervention Approach for Children With Auditory Processing Problems

Kathleen M. Hutchinson; *Miami University of Ohio, Oxford, Ohio*

This workshop will identify techniques that can be used in the classroom

for children with difficulties in processing auditory information by: identifying the stages of development of listening skills, showing the linkage between listening skills and language learning, and providing specific interventions professionals can use to remediate auditory processing difficulties.

4:45 - 5:15 Cochlear Implantation in a Pre-lingually Deaf Oral Adolescent: Case History, Training, and Performance

Perri S. Hecht; *Brooklyn College, City University of New York, Brooklyn, New York*

Sara is a congenitally deaf 15-year-old who was originally diagnosed with an absent auditory nerve bilaterally. Despite her total deafness, Sara was taught adhering to an oral philosophy without any instruction in sign language. At 13 years of age, Sara was implanted with a Nucleus 24-cochlear implant. Since that time, Sara has been inundated with auditory training, speech production and perception training, and language therapy. One year post implant, Sara has shown remarkable improvements in all areas of speech and language. Sara is a perfect example of how implantation, along with intensive intervention, can significantly impact on the deleterious effects of a profound hearing loss.

SATURDAY, JUNE 12

8:30 - 9:30 Speech Production and the Profoundly Deaf

Geoff Plant, 1999 Invited Speaker; *Hearing Rehabilitation Foundation*

This presentation will look at speech production by two groups of profoundly deaf individuals. The first part of the presentation will concentrate on the acquisition of speech by congenitally deaf children who are using sign as their primary mode of communication. This will focus on the development of a training program – "Step by Step" (Plant, 1998) – which attempts to provide children with the necessary foundations for intelligible speech. The use of tactile aids, and importance of developing syllabic, word, and phrasal patterns in speech training will be discussed, as will the use of simple rhymes. A series of videotapes will show the children's development over the course of training. In the second part of the presentation the focus will shift to the speech of adventitiously deaf adults. A panel of four listeners were asked to rate the speech of over 30 deaf adults and 24 normal hearing controls, across a number of areas such as voice quality, suprasegmental control, vowel production, and consonant production. The results highlighted a number of areas

in which the speech of the deafened participants differed from that of the control group.

9:30 - 10:15 Current ASHA Audiology Issues and Activities

Vic Gladstone, 1999 Invited Speaker; *American Speech-Language-Hearing Association, Rockville, Maryland*

This session will focus on ASHA activities that support and promote audiologists and the profession of audiology. Specific attention will be paid to: legislative and regulatory issues, practice policies and positions, continuing education products and activities, autonomy and credentialing, and governance issues. Participants will discuss and identify strategies and resources that positively impact the marketing of audiology and audiology services.

10:30 - 11:00 Assessment of a Computerized Training Program

Kate Gfeller and Shelley Witt; *University of Iowa, Iowa City, Iowa*

At the 1998 ARA Summer Institute, we presented the rationale for and content of a computerized music training program developed specifically for adult cochlear implant recipients. Throughout Fall 1998 and Spring 1999, implant recipients using the Nucleus Cochlear Implant have been randomly assigned to either the training program or a pretest posttest only control group. This presentation will include test outcomes for perceptual accuracy and appraisal of sound quality of various types of musical sounds included in the training program, and an evaluation of various features of the computer program itself.

11:00 - 11:30 A Case Study of Language Acquisition in a Child With Severe to Profound Hearing Loss

Jan A. Moore and Christine Carey; *University of Iowa, Iowa City, Iowa*

This project documented the first year of language acquisition in a 6-year-old child with severe to profound hearing loss. This child's pre-school history included sensory and language deprivation but no social or physical deprivation due to her placement in a Guatemalan orphanage prior to her adoption by a U.S. family. Her sign and oral language development was followed for the first year and compared to normal hearing children, hearing impaired peers, and Genie, the classic case in the literature of language deprivation. Results indicated that this child's language development was idiosyncratic but gave insights into the types of therapy goals which should be used for these cases.

11:30 - 12:30 Rehabilitation Factors Predictive of the Development of Auditory Speech Perception Skills in Children Implanted Before Age 5

Ann Geers, 1999 Invited Speaker; *Central Institute for the Deaf, St. Louis, Missouri*

It is hypothesized that the benefits obtained from a cochlear implant are related to the child's dependence on spoken language for communication and the amount of auditory, speech, and language instruction a child receives post implant. This hypothesis is being addressed in a 5-year study of 180 8- and 9-year-old children who were implanted before age 5. Forty-five such children are invited each summer, along with a parent, to participate in a 3-day research camp. Children receive a 6-hour battery of tests of audition, speech, language, cognition, and reading. Their educational and rehabilitation history is obtained from questionnaires completed independently by their parents, cochlear implant centers, and therapists.

This report will focus on results obtained in a multiple regression analysis designed to predict results on the auditory speech perception battery administered to 92 children so far in the study. The auditory battery includes psychophysical measures of implant performance, speech feature perception tests, closed- and open-set word and sentence tests, a visual enhancement measure, and a parent-completed auditory responsiveness questionnaire. Rehabilitation measures include a history of communication mode used, hours of therapy received, therapist experience, type of class placement, and parent participation in therapy. Retrospective data include the first 3 years post implant. Intervening variables that constitute controlled factors include IQ, family size, education and income, age at onset of deafness, age at implant, and type of implant. Results indicate that about half of the variance in auditory speech perception can be accounted for by factors directly related to characteristics of the implant itself. However, significant additional variance attributable to rehabilitation factors is observed.

SUNDAY, JUNE 13

8:30 - 9:30 Deafness Research Foundation National Campaign for Hearing Health

John Wheeler and Donna Wagner; *Deafness Research Foundation, Albany Medical Center, Albany, New York*

The National Campaign for Hearing Health is a 5-year $12 million, public outreach, professional education, government relations, and advocacy ini-

tiative to ensure that every American, especially children, can benefit from breakthroughs in hearing research and can enjoy a lifetime of Hearing Health. The goals of the National Campaign for Hearing Health are: assure that the hearing of newborns is tested and that prompt intervention is received; educate the public and government to control toxic noise and other threats to hearing; teach people about the alternatives to restoring lost hearing and obtaining the hearing devices they need; and fund the search to end all forms of hearing impairment, including tinnitus. In sum, the Campaign is putting Hearing Health on the national agenda! We are putting the best corporate, media, and political talent to work on the cause.

9:30 - 10:00 Enhancing Speech Production Outcomes of Cochlear Implantation Through Palatometry

Barbara H. Bernhardt, Kathleen Pichora-Fuller, and Ghea Williams; *University of British Columbia, Vancouver, British Columbia, Canada*

This paper reports on the effects of a course of palatometry (computerized visual feedback) treatment for a child who had unintelligible speech despite 4 years with a cochlear implant, a strong educational program, and parent support. The child showed significant gains in speech production after palatometry. Although gains in speech intelligibility cannot be unequivocally attributed to palatometry, neither the processor nor her educational program changed in that period. The study suggests that a visual feedback system can have a positive influence on speech development as a complementary methodology for someone with a cochlear implant and minimal speech gains.

10:45 - 11:15 Speech Treatment with an English Speaking Child With Hearing Loss Whose First Language was ASL

Sheila Pratt; *University of Pittsburgh, Pittsburgh, Pennsylvania*

The speech treatment results of a bilingual (ASL and oral English) child with severe bilateral hearing loss will be presented. Within the framework of a single-subject design, the child was treated for fricative production at the syllable level using a multisensory approach. A pattern of extreme variability and reorganization prior to acquisition was observed. Generalization to words was noted but less was observed for untreated fricatives in syllables. The pattern of acquisition was not appreciably different from that previously observed with children with hearing loss whose first and primary language was English.

11:15 - 11:45 Transition From Sign to Speech in Children who are Successful Cochlear Implant Users

Jan A. Moore and Jessica Muller; *University of Iowa, Iowa City, Iowa*

Analysis of communication mode was performed on data from 8 children with multichannel cochlear implants (CI) representing children who developed highly intelligible speech. This analysis was performed at pre-implant and at annual visits up to 48 months post-implant. Fifty words were used in the analysis at each visit, and the speech was gathered in a story re-telling task. Results indicated that the children made a dramatic change in communication mode over a 1-year period of time. The time frame in which this occurred differed among subjects; however, once the child moved to oral communication they no longer chose to use sign.