On behalf of our *eHearsay* team, it is my pleasure to welcome you to the inaugural issue of *eHearsay*, the online journal of the Ohio Speech-Language-Hearing Association (OSLHA).

*HearSay*, OSLHA’s long-standing print journal, last appeared in 2007. Since that time, Dr. Laura W. Kretschmer, *HearSay* Editor and OSLHA Director of Technology and Publications, has been working with OSLHA’s Executive Council and Legislative Council to bring *HearSay* to its new incarnation as *eHearsay*.

*eHearsay* remains a peer reviewed scholarly publication whose purpose is to serve the membership’s professional development needs. Annual themed issues will be published online each summer. Themes allow for in-depth coverage of topics relevant to speech-language pathology and audiology. In each issue off-theme articles and features will also appear, rounding out the journal’s eclectic reporting of information pertinent to both disciplines. *eHearsay* will publish invited and submitted papers.

We considered many formats for the online journal, but we have arrived at providing content as downloadable pdf’s. Hotlinks within articles will direct readers to other resources and to online visuals and videos. Readers will be able to leave comments in response to journal content. We encourage readers to discuss the articles, share resources and ideas, and network. Links will be provided to authors’ emails for direct correspondence. ASHA CEU’s will be offered for passing online quizzes on some of the articles in each issue.

The *eHearsay* editorial team reports to OSLHA’s Director of Technology and Publications. I am honored to serve as *eHearsay*’s first Editor, having been associated with Hearsay since 1999 as a column editor and Associate Editor. Our new Associate Editor is Dr. Kate Krival. We round out our team by inviting Guest Editors who have specific knowledge of themed content. Kate and I will work with Guest Editors to invite authors to write on-theme and off-theme papers for each issue. In addition, we have an ongoing open call for on-theme and off-theme submissions. All papers undergo peer and editorial review. Calls for submissions will run in each issue of *eHearsay* and Communication Matters, OSLHA’s quarterly newsletter. Access to the newsletter is at http://www.ohioslha.org/m_members.htm. **Guidelines for Submissions to eHearsay** are published in this issue and will appear in every issue. I would also like to thank the other members of the editorial board and former Hearsay editors, John Clark and Wayne Secord. The last member of our editorial team is Chelsea Bailey, OSLHA’s Assistant Executive Director, who manages *eHearsay*’s presence on the OSLHA Web site.

We encourage OSLHA members to become involved with *eHearsay* as authors and reviewers. A call for peer reviewers is posted at http://www.ohioslha.org/p_peerreviewer.htm.

The editorial team is excited to be moving *Hearsay* to its new online format. Your ideas and comments are welcome. Please email me at mpershey@csuohio.edu.

We hope you will enjoy Volume 1 of *eHearsay*!

Sincerely,

**Monica Gordon Pershey, Ed.D., CCC-SLP**

*Editor*
This inaugural publication focuses on issues related to identifying and helping children with hearing loss. The topic is particularly relevant considering the increasing number of infants identified at early ages and who receive cochlear implants and benefit from various advanced technologies. Despite the fact that many practicing professionals were not initially trained to meet the many demands associated with diagnosing and treating children with hearing loss, today’s professionals must traverse an entirely new landscape. Recent developments include:

- early intervention that begins in the first few months of life,
- extraordinary and evolving technologies that are available,
- mainstream education begins in schools at earlier ages, and
- an increasing percentage of parents desire listening and spoken language outcomes for their children.

This issue begins with an interview with featured author Dr. K. Todd Houston, a leading advocate, invention specialist, and researcher in the area of listening and spoken language development in children with hearing loss. This issue features two articles that explore professional preparedness to meet the needs of a new generation of children with hearing loss— a report on the findings of a survey of Early Hearing Detection and Intervention (EHDI) & Part C coordinators and a literature review that examines the challenges facing the higher education programs that prepare practitioners.

Professionals are not alone in trying to meet the challenge of developing language and literacy in children with hearing loss; parents must navigate their children's hearing loss from early intervention until the final transition to young adulthood. In this issue, a parent’s role in raising a child with hearing loss is explored through a case study.

Related to prevention of hearing loss in children and youth, this issue includes a paper on professional responsibilities for preventing noise induced hearing loss (NIHL) and for and identifying students at risk for NIHL.

This issue features two off-theme articles. Featured are a study of the use of a linguistic analysis tool to analyze parent-child discourse and a study of the effects of visual stimuli on conversation skill in persons with dementia. In Pragmatically Speaking, a forum for views and commentary, a perspective on continuing professional development is offered, based upon work by Mary Ellen Nevins; a student contributor lists the top ten reasons for choosing a career in audiology; and a group of occupational therapists describes their professions’ input in the rehabilitation of persons with hearing loss.
Acknowledgments

Peer reviewers are essential to the eHearsay publication process. Peer reviewers are acknowledged on the eHearsay pages of the OSLHA web site. Papers underwent editorial review by Lori Pakulski, Monica Gordon Pershey, and Laura W. Kretschmer.

Reading eHearsay and completing CEU self study questions is an ASHA-approved professional development opportunity for all OSLHA members. Peer reviewers are an essential part of this process. The reviewers’ generous assistance in evaluating manuscripts insures quality scholarship.

Special thanks is extended to Volume 1 CEU reviewers whose names are published on the eHearsay pages of the OSLHA web site.

Special thanks to eHearsay Associate Editor, Kate Krival, for her technical savvy, to the OSLHA staff, Nancy Bailey and Chelsea Bailey, for answering numerous questions and handling unending requests, to OSLHA officers Janice Wright and Michelle Burnett, for their assistance with the CEU verification process, and to production manager Jody E. Johnson for her creative talents. Utmost appreciation for unfailing dedication and generosity and for countless hours spent creating the first eHearsay goes to Laura Kretschmer, OSLHA Director of Technology and Publications. Without Laura, this issue would not have come to be.

Lori A. Pakulski, Guest Editor
Monica Gordon Pershey, Editor

Guidelines for Submissions to eHearsay
Online Journal of the Ohio Speech-Language-Hearing Association


2. eHearsay publishes annual themed issues each summer, online only, at http://www.ohioslha.org

3. eHearsay publishes invited and submitted papers. All papers undergo peer and editorial review.


5. Authors transfer copyright to OSLHA. eHearsay prefers to publish previously unpublished material. Any previously published content must be accompanied by written permission granted by the original source.

6. Papers may be submitted at any time to m.pershey@csuohio.edu or to Guest Editors listed on a Call for Submissions. Papers submitted after December 1 may not appear in the subsequent summer issue.
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**Open Call for Peer Reviewers**
OSLHA welcomes Dr. K. Todd Houston to Ohio. Dr. Houston has joined the University of Akron (UA) faculty as an Associate Professor of Speech-Language Pathology. Prior to joining UA, Dr. Houston was an Assistant Professor of Speech-Language Pathology in the Department of Communicative Disorders and Deaf Education at Utah State University, where he developed auditory-based intervention and educational opportunities for children with hearing loss who are acquiring spoken language. He served as Director of the Graduate Studies Program in Auditory Learning and Spoken Language, an innovative personnel preparation program for graduate students in speech-language pathology, audiology, and deaf education. Dr. Houston was a former Executive Director and Chief Executive Officer (CEO) of the Alexander Graham Bell Association for the Deaf and Hard of Hearing (AG Bell), located in Washington, DC.

Dr. Houston’s professional interests and research have focused on the development of listening and spoken language in young children with hearing loss. Specifically, he is currently evaluating the viability of telepractice models (“Tele-Intervention”) as a service delivery model for young children with hearing loss and their families. He’s also collecting data on the role of fathers in the intervention/habilitation of their children with hearing loss.

As a speech-language pathologist and a Certified Auditory-Verbal Therapist (Cert. AVT®), Dr. Houston has served children with hearing loss in a wide variety of clinical and community settings, specifically focusing on their spoken language development. Dr. Houston is an adjunct faculty member at University of Queensland in Australia and he continues to lecture both nationally and internationally, presenting scientific papers and keynote addresses on a variety of topics related to childhood hearing loss.

Interview with Dr. Houston

How did you get interested in auditory and spoken language of children with hearing loss?

My interest in deafness started with a family member, a cousin, who was born profoundly deaf. He and I were the same age, and he grew up using American Sign Language (ASL). For many years, I thought that all children with hearing loss used sign. After a short career in journalism, I decided to return to graduate school to pursue a passion of working with children with hearing loss. However, I didn’t know which profession to pursue. I considered audiology and deaf education, but I ultimately decided upon speech-language pathology. After graduate school, my first job was as the speech-language pathologist for the middle school on the campus of the N. C. School for the Deaf in Morganton, NC. While I truly enjoyed my students, I saw first-hand that the children there needed different opportunities for communication and education. The school was an ASL environment, which was appropriate for many students. However, it wasn’t appropriate for all of the students. Unfortunately, there wasn’t many spoken language programs available at that time. That’s when I started to question the services children and families were receiving and learned that parents often didn’t have a range of communication options available to them. That experience also led me to explore Auditory-Verbal Therapy (AVT) as a communication methodology/philosophy. After seeing the outcomes that AVT children were having, I knew this would become my passion.
Why are you so passionate about personnel preparation in auditory and spoken language in children with hearing loss?

We have some exciting developments in the field today, such as universal newborn hearing screening and ever-evolving hearing technology (digital hearing aids, cochlear implants, FM systems). We can now identify newborns with hearing loss and get them into early intervention. When the early intervention is combined with appropriate hearing technology, these children can have typical speech and language outcomes. However, to make this happen, we need more professionals – pediatric audiologists and speech-language pathologists – who can meet the needs of these infants and toddlers with hearing loss. Most training programs just aren’t offering enough coursework and/or practicum experience with this population at the preservice level. We’ve really got to do better. We’ve also got to meet the training/staff development needs of inservice professionals, too. The professionals who are working in early intervention today most likely were trained before newborn hearing screening was available and may not have the skills to work with infants and toddlers with hearing loss and their families. Because of the advanced hearing technology that we have today, more and more families are choosing spoken language outcomes for their children with hearing loss. But most professionals weren’t trained to provide those services. So we all have considerable work to do at the both the preservice and inservice levels!

Why do you enjoy speaking about human possibility?

At my core, I’m an optimist. I truly believe that anything is possible – in almost every situation. When we put that into the context of children with hearing loss, many today are learning to use hearing aids and/or cochlear implants to achieve language outcomes that are on par with their hearing peers. Of course, many components have to be in place: early identification, consistent use of hearing technology, appropriate early intervention, motivated parents/caregivers, and the support of well-trained professionals. I’d like to see all parents of children with hearing loss have access to each of these components, regardless of where they live or their socio-economic level.

What do you think is a major misconception in the communication development and education of children with hearing loss?

We have to separate the diagnosis of hearing loss from how the child functions communicatively. That is, years ago, I knew professionals who would only look at the child’s audiogram and then make recommendations for how that child should communicate. The diagnosis of hearing loss really shouldn’t have much impact on how a child communicates today, because we now have early detection, early intervention, hearing aids and cochlear implants. As professionals, we have to raise our expectations for what is possible for these children.

What top five facts/concepts would you like all professionals working with children with hearing loss to know?

1. Children with even the most profound hearing loss can learn to listen and talk.
2. Ninety-nine percent of parents really want to do what is best for their children with hearing loss.
3. Parents do know their child better than anyone else does.
4. If you want to be successful with children with hearing loss, you MUST involve and engage the parents in the child’s intervention/habilitation. This means understanding and using adult-learning strategies!
5. Most of what you know today will be obsolete in five years!
What are some of your recent publications so that I could further explore your work?


Abstract

The onset of widespread universal newborn hearing screening has allowed for children with hearing loss to be identified and enrolled in intervention earlier than ever before. Unfortunately, many of these children do not receive the early intervention services to which they are entitled. One factor that can lead to lost to follow-up (LTF) or lost to documentation (LTD) is reduced communication between professionals and state program administrators. In this study differences in perceptions of service delivery and available resources between two groups designated with providing early detection and intervention for children with hearing loss and their families are described. Questionnaires were sent to Early Hearing Detection and Intervention (EHDI) and Part C early intervention coordinators in each state, U.S. territory, and the District of Columbia (DC). Responses from 89 (EHDI, n=51; Part C, n=38) participants revealed discrepancies in knowledge of available resources and the delivery of services to infants and toddlers with hearing loss and their families.

Learning Objectives

1. List at least three trends supporting the early identification and intervention of infants with hearing loss as well as potential barriers to this process;
2. Describe differences in the perspectives of EHDI and Part C coordinators regarding available services and resources provided to young children with hearing loss and their families; and
3. Identify specific recommendations that may improve service coordination and eventual outcomes for children with hearing loss.

In the United States, hearing loss continues to be the most commonly occurring birth defect, affecting approximately three in every 1000 births (Stach & Ramachandran, 2008; White, 2003). Over the past two decades, advances in hearing screening technology and the development and implementation of public health policy in support of universal newborn hearing screening (UNHS) have allowed for the early identification of children with hearing loss. Today all states, U.S. territories, and the District of Columbia (DC) conduct UNHS programs and 43 states have passed mandates or public policy requiring hearing screening of newborns (White, Forsman, Eichwald & Munoz, 2010). In fact, as a result of widespread UNHS, 97% of all newborns receive a hearing screen before they leave the hospital or birthing center, resulting in an average age of diagnosis of 2-4 months (White et al, 2010).

Several studies have demonstrated that early detection and diagnosis of hearing loss and the provision of timely intervention services can result in positive language outcomes for children with hearing loss (Calderon, 2000; Calderon & Naidu, 2000; Moeller, 2000; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). While UNHS has successfully increased the number of children who are identified with hearing loss before the age of three months, the Centers for Disease Control and Prevention (CDC) (2009) report that 43% of children who failed newborn hearing screening are considered lost to follow-up (LTF) and lost to documentation (LTD) for diagnosis. Within the same report, the CDC stated that only 66% of children who were identified with hearing loss were enrolled in early intervention. Thus, despite significant advances in efforts to identify infants and toddlers with hearing loss, obstacles remain that prohibit the successful delivery of early intervention services.
Recent studies have identified numerous barriers that contribute to both LTF and LTD and result in children and their families not receiving services through the state-level early intervention system. While not an exhaustive list, these barriers include insufficient screening equipment, inadequate screening protocols within the hospital or birthing center, lack of well-trained pediatric audiologists, relocation and mobility of families, parent refusal of hearing screen, failure to keep appointments or missed appointments for follow-up services, cultural and language differences, poor understanding of the importance of hearing screening and early intervention exhibited by medical personnel, inadequate reimbursement for diagnosis, poor understanding of privacy-sharing laws, general failure to receive follow-up appointments for diagnosis after the hearing screen, the lack of early intervention services available within the community, absence of family support programs, and the service provider’s minimal knowledge of intervention practices for children with hearing loss (American Speech-Language-Hearing Association [ASHA], 2008; Farrell, Stone, & Dayalu, 2011; Houston, Behl, White, & Forsman, 2010; Houston, Munoz, & Bradham, 2011; Joint Committee on Infant Hearing [JCIH], 2007; McNeil, 2007; Morrow & Sherwood, 2011; Proctor, Niemeyer, & Compton, 2005; Shulman et al., 2010; Watkins, 2007; White, 2003).

Currently two state agencies are responsible for the detection and intervention of children with hearing loss: the Early Hearing Detection and Intervention (EHDI) program and the Part C (a component of the Individuals with Disabilities Education Act [IDEA]) early intervention program. The primary purpose of the EHDI program is to ensure that a coordinated system of hearing screening, diagnosis, referral, and tracking occurs throughout the state and involves most – if not all – hospitals and birthing centers. Since 2005, every state has had an EHDI coordinator.

**Converging Systems: Part C Early Intervention and EHDI**

Services provided through the Part C system focus on family-centered intervention. Once a child with hearing loss is identified and referred for early intervention, a service coordinator is provided to “help the family obtain services based on the child’s needs, the state’s offerings, and the resources allocated by the state for early intervention” (Sorkin, 2008, p. 223). Unfortunately, while children with hearing loss fall under the group of children served by IDEA, only five out of 50 states define how these children qualify for services (White, 2003). Furthermore, many programs for children with hearing loss may fail to address the unique needs of infants and toddlers with hearing loss, because they were developed before the advent of newborn hearing screening, which made it possible to identify these children at birth (White, 2003).

**Communication Options: Defined**

After receiving a diagnosis of a hearing loss, parents and caregivers have several communication options from which to choose. In most states Part C service coordinators and/or early interventionists present the options to parents based on the child’s needs and the desired outcomes of the family. The availability of the services in the community is another factor that influences the discussion of specific communication options (Sorkin, 2008). The communication options typically include American Sign Language (ASL), Bilingual-Bicultural (Bi-Bi), Total Communication (TC)/Simultaneous Communication (SC), English-Based Sign Systems, Cued Speech, Auditory-Oral (A-O) and Auditory-Verbal Therapy (AVT) (BEGINNINGS, 2010; Houston, 2010).

ASL is a visual language with its own unique grammatical structure, morphology, and phonology and is considered the language of Deaf Culture. The Bi-Bi methodology emphasizes the use of ASL as the child’s first language and is used in the academic
setting. English is taught as a second language through reading and writing. Both ASL and the Bi-Bi methodologies focus on integrating the child with hearing loss into the Deaf Culture through a common language (Houston, 2010).

TC is not a communication mode, but rather an educational philosophy often promoted for children with hearing loss. Its goal is to provide the most appropriate mode of communication for the child’s needs at any one time. Children, parents/caregivers, and teachers may utilize any of the communication modes, or a combination of them (BEGINNINGS, 2011; Houston, 2010), to meet the child’s communicative and academic needs. Simultaneous Communication (SC) is an extension of the Total Communication philosophy whereby early interventionists or educators would use speech and sign language at the same time. English-based sign systems utilize signs with English grammar and morphological markers. There are several English-based sign systems, including Signed Exact English (SEE), Signed English, Conceptually Accurate Signed English (CASE), and Pidgin Signed English (PSE). Cued Speech is an approach that utilizes the movement of hand shapes placed near the mouth to represent the sounds of speech and to aid in speechreading (Houston, 2010).

The A-O approach and AVT focus on the development of spoken language for children with hearing loss through the use of amplification. Both methodologies emphasize the importance of amplification and require parents to support the use and maintenance of hearing technology. While parent involvement is emphasized in both approaches, AVT targets the parents as the main consumer and provides them with coaching and training on specific techniques to enhance audition and language skills (Alexander Graham Bell Association for the Deaf and Hard of Hearing [AG Bell], 2007; Estabrooks, 2006; Houston, 2010). The JCIH (2007) states that these communication options should be presented to parents in a non-biased manner, and the communication option chosen should be based on the specific needs of the family and child and the parents’ desired communication outcomes.

Early Intervention Curricula and Support Materials

Several curricula are available for professionals to use when informing parents/caregivers about the range of communication options available. While not a complete list, the most commonly utilized resources are Guide-By-Your-Side (GBYS), the BEGINNINGS Parent Guide, Oral Deaf Education Materials, and the SKI*HI Curriculum. GBYS is a program supported by Hands and Voices, a nation-wide nonprofit organization whose goal is to provide support to families of children with hearing loss and the professionals who serve them. GBYS connects parents of children with hearing loss with parent mentors trained in providing support and information, regardless of the parents’ chosen communication option (Hands and Voices, 2005).

The BEGINNINGS Parent Guide (2010) was developed by BEGINNINGS for Parents of Children Who are Deaf and Hard of Hearing, Inc., a statewide non-profit organization based in Raleigh, NC. The organization’s primary function is to provide impartial information to parents of children with hearing loss that allows them to make informed choices about communication and service options. Once parents/caregivers have chosen a communication approach, BEGINNINGS will assist by connecting the family to the appropriate service providers. The Parent Guide was originally written by parents and includes information on topics such as childhood hearing loss, assistive technology, communication options, education, and advocacy (BEGINNINGS, 2010).

Oral Deaf Education (2009) materials are distributed online at (http://www.oraldeafed.org) through
The aim of the foundation is to provide free resources to support early intervention and education of children with hearing loss utilizing spoken language and listening. The parent resource materials include a DVD and booklet that provide an overview of communication methodologies and a rationale for choosing spoken language.

The SKI*HI Curriculum (Hope, Inc., 2008) was developed by the Sensory Impairment Home Intervention (SKI*HI) Institute based at Utah State University. SKI*HI provides training materials for parents and professionals working with children with a variety of sensory impairments and disabilities. The SKI*HI curriculum provides structured lessons, activities, and handouts for parents on a range of topics devoted to childhood hearing loss.

Availability of and Satisfaction with Early Intervention Services

Regardless of the communication approach a family chooses, they should have access to services from well-trained professionals who are skilled in providing intervention in that methodology (JCIH, 2007). However, a 2005 survey that included 36 Part C coordinators indicated that AVT and sign language instruction services were often difficult for families of children with hearing loss to obtain (Proctor, Niemeyer, & Compton, 2005). Likewise, EHDI coordinators reported that “appropriate educational intervention programs for infants and toddlers with hearing loss are not as widely available as they should be” (White, 2003, p. 84).

These data, combined with the rates of children who are LTF and LTD, illustrate that children with hearing loss and their families are not receiving the early intervention services to which they are entitled. However, further research is needed to determine why early intervention services are unavailable and how agencies that serve children with hearing loss can better collaborate to prevent loss to LTF and LTD.

While others have surveyed EHDI and Part C coordinators’ views of early intervention, there is a lack of information regarding how these separate agencies view the availability of specific services and resources in their states. Thus, the purpose of this study is to determine how state program administrators from Part C and EHDI programs perceive service delivery for children with hearing loss and their families.

Method

Participants

The Part C and EHDI coordinators from every state, U.S. territory, and the District of Columbia (DC) were asked to participate in this study. These groups were selected for this study based on their administrative and/or direct service role in providing services to children with hearing loss and their families. In some cases the coordinator responded that s/he lacked the specific knowledge needed to complete the survey, so a designee answered the survey. Of the 116 surveys that were sent to Part C and EHDI coordinators, 38 responses were received from Part C (64% response rate) and 51 (86% response rate) from EHDI. For 36 states, responses were received the both the EDHI and Part C coordinator.

Design and Procedure

Survey research was used in order to answer the following research questions: (a) Do state coordinators of Part C & EHDI programs view service delivery, including the availability of communication options, Deaf mentors, existing legislation, and other resources in their states, the same way?; and (b) In what areas of service delivery do Part C and EHDI coordinators differ in their views?

The survey was developed, pilot tested, and distributed with the cooperation of individuals involved with Part C and EHDI programs.
Questions focused on the availability of existing services within the state or territory and the current knowledge of program coordinators in EHDI and Part C. The survey consisted of 15 questions that addressed a wide range of information about communication options, current legislation, and other resources that are available to families of young children with hearing loss. The survey document was sent electronically to both program coordinators (EHDI and Part C) in every state, US territory, and the District of Columbia. A letter accompanied the survey explaining the intent of the research and explaining that their participation was voluntary. The participant was asked to return the completed survey electronically within a three-week time period. If the survey was not returned, a follow-up phone call was made. The questionnaire is included in Appendix A.

Validity

Two coordinators from Part C programs and two from EHDI programs reviewed the initial questionnaire during the piloting stage to establish face validity. Coordinators evaluated each question to determine whether the question could easily be interpreted and to validate the worthiness of the question. Suggestions for edits to the initial draft of the questionnaire were integrated into the final version that was distributed in the study.

Results

Data Analysis Procedures

Frequency counts were calculated on responses to questions 1 through 15. These data were recorded in a Microsoft Excel spreadsheet and were entered twice to confirm consistency of findings. The rate of response for each question was individually calculated for the EHDI and Part C groups. To compare the two groups within the same states, responses to the questions returned by both the Part C and EHDI coordinator (n=36) were reported when available.

Survey Responses

Question 1 and 2 (Agency that housed and regulated the early intervention/Part C and EHDI programs). A substantial portion of EHDI (39%, n=20) and Part C (42%, n=16) participants responded that the Department of Health and Human Services in the state or territory housed the Part C program. Similarly, the majority of EHDI and Part C coordinators agreed that their states’ EHDI program was housed in the Department of Health and Human Services (EHDI= 56%, n=28; Part C=59% n=23). The remaining 44% (n=22) of EHDI coordinators responded that they were housed in an agency other than the Department of Health or the Department of Education.

In the responses to these two questions, it was noted that small differences in the names of the agencies within each state affected the participants’ responses. For example, some states marked “Other” and then reported that the EHDI or Part C system was housed under “Department of Health” instead of marking “Department of Health and Human Services.”

Questions 3a and 3b (Effectiveness of service coordination and sharing of information between different agencies). Question 3 asked the respondent to rate statements on a scale of 1 (Strongly Agree) to 5 (Strongly Disagree). The first statement was “Our state/agency offers a seamless system of service coordination among the agencies serving children who are deaf and hard of hearing and their families.” The majority (83%, n=31) of responses from Part C providers were 1 or 3, indicating that they agreed with or felt neutral about this statement. EHDI coordinators most frequently (42%, n=21) responded with a “3” indicating neutral agreement with this statement. Only 6% (n=3) of EHDI respondents strongly agreed and 30% (n=15) of EHDI respondents somewhat or strongly disagreed with this statement. Findings are depicted in Figure 1.
The second statement of question three was “Our state/territory has excellent strategies for sharing information among providers from screening to diagnosis through intervention.” A majority (88%, n=44) of the EHDI respondents indicated that they agreed somewhat or were neutral about this statement, while 10% (n=5) of EHDI coordinators indicated that they disagreed somewhat with this statement. Part C participants most often (41%, n=15) reported neutral agreement. Findings are depicted in Figure 2.

**Question 3c (Ability to provide services based on the family’s choice).** For the third part of this question, participants were asked to respond to the statement “Our state/territory has local or regional community capacity necessary to provide early intervention based on family choice regardless of the selected communication methodology or modality.” Both groups responded (EHDI=36%, n=18; Part C=51%, n=19) with neutral agreement to this statement as indicated by a “3.” Only 2% (n=1) of the EHDI participants and
11% (n=4) of the Part C participants indicated that they strongly agreed with this statement. Findings are depicted in Figure 3.

Question 3d (The presence of family support systems in the early intervention services). The final statement of question three was “Our state/territory has an identifiable strategy for integrating family support into the system of care for children who are deaf and hard of hearing.” The most common response from each group (EHDI=36%, n=18; Part C=38%, n=14) was a “2,” indicating that the respondents somewhat agreed with this statement. This remained the most common response when the responses for the each group were matched. However, there was a greater discrepancy between the responses with 40% (n= 14) of Part C and 31% of EHDI (n=11) responding with a “3” to this question. From the matched states, 19% (n=7) of Part C somewhat disagreed with this statement and 22% (n=11) of the EHDI respondents somewhat or strongly disagreed. Findings are depicted in Figures 4 and 5.
Question 4 (Whether or not the state has an agency that is designated to provide information about the range of communication options available). This item required a “Yes” or “No” answer as to whether or not the state has an agency that is designated to provide information to parents or caregivers about the range of communication options available. Of the EHDI respondents, 54% (n=27) indicated that there was not a designated state agency and 68% (n=26) of Part C respondents indicated that there was a designated state agency. A similar discrepancy in results was seen when analyzing the responses of both coordinators from the same state (EHDI “No”=58%, n=21; Part C “Yes”=69%; n=25).

Question 5 (The name of the agency designated to provide information about communication options). Individuals who indicated that their state did have a designated agency to provide communication options information were asked several questions about that agency. The first asked the respondents to indicate whether the designated agency was early intervention/Part C, a non-Part C public educational agency, the state school for the deaf, a contracted service provider,
EHDI participants most often cited early intervention/Part C as the lead agency (45%, n=15). Forty-one percent (n=12) of Part C coordinators indicated that early intervention/Part C was designated as the lead agency, and they also indicated (21%, n=6) that an agency other than the ones listed was responsible for sharing information on communication options. Findings are depicted in Figure 6.

**Question 6 (The professional background of individual providing communication options information).** The coordinators were asked to describe the professional background of the individual within the designated agency who usually provides information to parents and caregivers. The individual was described as non-degreed (high school diploma with additional agency-provided training), an early childhood educator/early childhood special educator, an educator of the deaf, a speech-language pathologist, an audiologist, a parent of a child with hearing loss, or as having a professional background other than those listed. Educator of the deaf was most often cited as the professional who provided communication options information by EHDI (26%, n=12) and Part C respondents (26%, n=13). Professions other than the ones listed that were cited by the participants included a social worker and an individual with a public health background. Findings are depicted in Figure 7.

**Question 7 (Whether or not this agency also provides direct early intervention services).** Those that responded that their states had one designated
agency for providing communication options information were then asked if that agency also provided direct services or early intervention. Eighty-seven percent (n=20) of EHDI and 85% (n=22) of Part C respondents indicated that communication options information and direct early intervention were provided by the same agency.

Question 8 (The name of the agencies sharing that responsibility when an agency was not designated). When a respondent indicated that there was not a state agency designated to provide parents or caregivers with information about communication options, they were asked to indicate if any of the listed agencies shared the responsibility of providing that information. EHDI (26%, n=25) and Part C (27%, n=11) respondents most often listed Part C as one of the agencies that was designated to provide this information. Other responses included audiologists and parent advocacy/support groups. Findings are depicted in Figure 8.

Questions 9 and 10 (The range of communication options and the availability of each option within the state). The communication options listed in this question included Oral/Aural, AVT, Total Communication/Simultaneous Communication, Cued Speech, Bi-Bi/ASL. Bi-Bi/ASL was reported as being available in the highest portion of states according to EHDI coordinators, with 92% (n=45) reporting that this option was available in their states. Ninety-four percent (n=33) of Part C coordinators reported that Bi-Bi/ASL was available in their states. Oral/Aural communication was cited as an available communication option by state Part C coordinators, with 97% (n=34) listing it as available in their states. Cued Speech is an available resource for 58% (n=29) of EHDI participants and 71% (n=25) of Part C participants. It was noted that across all of the communication options listed, the rate of response was closely matched in those states that had completed surveys from both the EHDI and Part C. Findings are depicted in Figures 9 and 10.

Respondents were then asked to rate the availability of each communication option as (1) available statewide with many providers, (2) moderate access with services available in some parts of the state, or (3) limited access with isolated availability. For Oral/Aural communication, 45% of Part C (n=17) and 45% of EHDI (n=23) coordinators most often rated it as being moderately accessible. For AVT, the most frequent response was a rating of 2 from Part C coordinators (34%, n=13), and a rating of 3 from EHDI coordinators (38%, n=20). For TC,
42% (n=16) of Part C coordinators rated the availability as a 1, and 41% (n=21) of EHDI participants rated it as being moderately accessible. Cued Speech was reported as the least widely available communication option of the ones listed with 42% (n=16) of Part C coordinators and 43% (n=22) of EHDI coordinators rating the availability as a 3. Bi-Bi/ASL was reported as being a moderately available communication option by 37% (n=19) of EHDI Coordinators and as being widely available by 39% (n=15) of Part C coordinators. It is noted that the ratings were less similar for the Oral/Aural communication option but were more similar for the TC option when responses were received from coordinators from Part C and EHDI within the same states. Findings are depicted in Figures 11 through 14.

For this question, participants from each of the groups did not respond to all or some of the communication options ratings. In some cases, participants responded that they could not rate the communication option because it was not available at all in their states. Others indicated that they did not have the knowledge to respond to this question or left it blank without an explanation. Communication options other than the ones listed included Signed Exact English
(SEE) and programs that utilized combinations of approaches, which were described as being moderately available in some states.

**Question 11 (The curriculum used to explain communication options).** When asked to identify the curriculum used to explain communication options to parents and caregivers from a list that included GBYS, the BEGINNINGS Parent Guide, Oral Deaf Education materials, SKI*HI curriculum, and In-House/Agency generated materials, the Part C (30%, n=20) participants reported that the SKI*HI curriculum was used most frequently. The SKI*HI program and In-House generated materials were listed equally by the EHDI participants (26%, n=27 for each response). The question also allowed for respondents to state that they did not know which curriculum was used. It was noted that 8% (n=8) of the EHDI responses and 10% (n=7) of the responses from Part C reported that they did not know which curriculum was used in their states. Findings are depicted in Figure 15.

**Question 12 (The presence of an established Deaf Mentor program).** Deaf mentors are adults who visit parents to share the language of ASL and their experiences with Deaf Culture. When asked whether or not their states had an established Deaf-mentor program, 54% (n=27) of EHDI participants and 50% (n=19) of Part C participants indicated “No,” while 14% (n=7) of EHDI participants and 24% (n=9) of Part C participants indicated that they did not know. Of the 11 states that currently have a Deaf Child Bill of Rights, nine of the EHDI coordinators and eight of the Part C coordinators responded to this question. The EHDI responses were evenly split, with three of the states responding to each of the options of “Yes,” “No,” and “I don’t know.” Of the Part C responses, only one indicated

**Question 13 (Legislation to support Deaf Child Bill of Rights).** The Deaf Child Bill of Rights is part of the “National Agenda: Moving Forward on Achieving Educational Equality for Deaf and Hard of Hearing Students” developed by national members and consumer organizations related to deafness. The Deaf Child Bill of Rights outlines several policy goals for states and educational agencies which include communication, availability of qualified and certified personnel, education with same language mode peers, opportunities to interact with deaf and hard of hearing adults, equal opportunity to benefit from services and programs within the public school, and appropriate assessment. Currently 11 states have passed a Deaf Child Bill of Rights: California, Colorado, Georgia, Hawaii, Louisiana, Maine, Montana, New Mexico, Rhode Island, South Dakota, and Texas (National Association of the Deaf, 2008).

When asked whether or not their states had passed legislation to support a Deaf Child Bill of Rights, 73% (n=36) of EHDI participants and 43% (n=16) of Part C participants indicated “No,” while 18% (n=9) of EHDI participants and 43% (n=16) of Part C participants indicated that they did not know. Of the 11 states that currently have a Deaf Child Bill of Rights, nine of the EHDI coordinators and eight of the Part C coordinators responded to this question. The EHDI responses were evenly split, with three of the states responding to each of the options of “Yes,” “No,” and “I don’t know.” Of the Part C responses, only one indicated

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**Figure 15. Early Intervention Curricula Preferences**

**EHDI**
- Beginnings 8%
- Oral Deaf Ed Materials 6%
- In-House/Agency Generated Materials 26%
- Other 12%
- Don’t Know 8%
- Guide By Your Side 12%

**Part C**
- Beginnings 6%
- Oral Deaf Ed Materials 6%
- In-House/Agency Generated Materials 28%
- Other 10%
- Don’t Know 10%
- Guide By Your Side 10%
that the state did have a Deaf Child Bill of Rights, while two reported that they did not. The majority (five) indicated that they did not know.

**Question 14 and 15 (Presence of legislation regarding insurance coverage of hearing aids and/or cochlear implants).** The goal in asking these questions was not to obtain the actual number of states that have passed legislation regarding insurance coverage of hearing aids and cochlear implants, but rather to obtain information on the participants’ knowledge about existing or pending legislation. ASHA (2009) reported that 13 states (Colorado, Connecticut, Delaware, Kentucky, Louisiana, Maine, Maryland, Minnesota, Missouri, New Jersey, New Mexico, Oklahoma, and Oregon) require that insurance plans cover hearing aids for children. Wisconsin was reported as the only state that requires coverage for both hearing aids and cochlear implants (ASHA, 2009).

When asked whether or not their state had passed legislation regarding insurance coverage for hearing aids, 70% (n=35) of EHDI participants indicated “No,” and two of them stated that they did not know. Of the Part C participants, 61% (n=22) indicated that their state did not have this legislation in place while nine participants (25%) indicated that they were unaware of legislation regarding insurance coverage for hearing aids.

Of the thirteen states that currently have legislation regarding insurance coverage of hearing aids, responses were received from 12 EHDI coordinators and eight Part C coordinators. Impressively, all 12 of the EHDI coordinators reported that their states did have this legislation in place. Their Part C counterparts were not so unanimous in their response, with five respondents indicating that this legislation was in place in their states and the remaining three reporting that the legislation did not exist.

When asked about insurance coverage for cochlear implants, 37% (n=14) of Part C participants indicated that they did not know if legislation was passed in their states, while 10% (n=5) of EHDI participants reported that they did not know the answer to this question. The remaining Part C participants (63%, n=24) indicated that there was not legislation regarding insurance coverage of cochlear implants in their states. Of the remaining EHDI responses, 82% (n=41) indicated that legislation was not passed, and 8% (N=4) indicated that their states had passed legislation. It was interesting to note that according to the information provided by ASHA, none of the states that indicated that they had legislation regarding insurance for cochlear implants actually have that legislation in place (ASHA, 2009).

**Interpretations**

The results of this study provide insight into EHDI and Part C coordinators’ differing perceptions of existing services and the availability of resources in their states. Furthermore, the responses to this survey reveal areas of need in the range of services provided to young children with hearing loss and their families. For example, one concern stems from the results of the third question in the survey. The statements in this question are qualities that should define an early intervention system that is providing services for children with hearing loss and their families, regardless of state or location: a seamless system of service coordination and information sharing, the capacity to provide intervention based on family choice of communication mode or methodology, early intervention provided by well-trained professionals in the family’s chosen communication option, and a strategy for integrating family support (JCIH, 2007). However, few respondents indicated that they strongly agreed that these statements described their state early intervention system or the services being provided. These responses may indicate the need for state early intervention/Part C coordinators to re-evaluate and reorganize early intervention services and to provide additional training to existing service providers.

Additionally, responses to questions about the agency designated to provide parents or caregivers with information regarding communication options also are problematic. First, a large discrepancy existed between EHDI and Part C coordinators as to whether or not their states have one designated
agency to provide this information. It is not unreasonable to infer that this discrepancy between the group screening and identifying the child (EHDI) and the agency providing intervention for the child/family (Part C) could result in a miscommunication of information to the parent. It is also reasonable to infer that some parents may “fall through the cracks” and not receive the appropriate information at all. To ensure that parents are appropriately served and receive critical information on which to base informed decisions about services and communication options, an agency must be designated to provide communication options information, and, more importantly, all stakeholders and service providers should be well-informed about who, when, and how this information is shared with parents of newly identified children with hearing loss.

Another potential concern involves the responses related to the organization or agency charged with providing communication options information to parents. The majority of Part C and EHDI coordinators replied that the organization providing this information also delivered early intervention services to the families. This situation presents a potential conflict, because the individual providing early intervention could be inherently biased to present only those communication options that are supported by their organization or agency, rather than presenting all of the communication options as viable forms of intervention for the child and family.

To meet the standards set forth by the JCIH (2007), parents should be able to choose a communication option based on the needs of their child, the form of communication or language used in the home, and the desired outcomes for their child. As this study shows, many of the communication options were described as being only moderately or rarely available by EHDI and Part C coordinators. Within any community, the absence of a range of communication options most likely will limit the parents’ ability to choose the best communication methodology for their child. Studies demonstrate that the general lack of well-trained early interventionists who can meet the communication needs of young children with hearing loss continues to have a significant impact on the availability of these services (Houston, Munoz, & Bradham, 2011; Proctor, Niemeyer, & Compton, 2005). Together, these findings suggest that Part C and EHDI coordinators should partner with other stakeholders (e.g., universities, other state agencies, private practitioners/centers) to ensure that early intervention providers are well-trained and that the full range of communication options are available to families.

Across all the items on this survey, one of the most disappointing responses was that of “I don’t know.” Overall, this response was given more frequently from the Part C participants. As a state agency that is charged with providing early intervention for all children with disabilities, Part C coordinators may not be as informed as the EHDI coordinators, who focus on services specifically for children with hearing loss. However, a state’s Part C agency is legally responsible for ensuring that appropriate services are provided to children and their families after a hearing loss has been identified. Information such as the availability of communication options, the curriculum used to educate parents about communication options, the use of Deaf Mentors, and existing legislation that could affect the services provided to children with hearing loss and their families should be widely known by program coordinators and disseminated to service providers in the field.

Limitations of the Study

It is important to acknowledge several limitations of this study. Some the issues were unavoidable due to the nature of performing a survey study. First, because of the voluntary nature of a survey, it is nearly impossible to receive results from every potential participant who was sent a survey. We found that EHDI participants were quicker to respond, which may be a result of their focused responsibilities on children with hearing loss. As well, even for those that did return a survey, answers to some questions were omitted. With
some completed surveys, the participant indicated that he/she was not responding due to a lack of knowledge about the question, but this was not always the case. We may have received a more clear reflection of each participant’s knowledge if they were able to indicate “I don’t know” for each question.

Another issue that may have resulted in a bias within the results was that some of the coordinators did not respond to the survey themselves, but designated someone else on staff who they felt was more knowledgeable on the subject. While this may have caused some of the results to not be a true representation of the Part C coordinator’s knowledge of hearing loss and related services, it could also be assumed that the designated respondent is consulted on issues related to childhood hearing loss. Therefore, in some cases, this “designated” individual still represents the knowledge of the respective state program.

Finally, a lack of definition of the terms used in the survey may have impacted the results. For example, not all coordinators are familiar with the differences between A-O and AVT. This may have led some to inaccurately respond to questions regarding the availability of communication options. Similarly, the investigators found that a single definition of “family support” does not exist across both groups of coordinators. In follow-up research, greater specificity in the definition of terms will be used to ensure even more accurate results.

**Conclusions**

The evolution of universal newborn hearing screening has allowed for earlier diagnosis and more timely delivery of early intervention to increasing numbers of infants and toddlers with hearing loss and their families. Effective follow-up for these children requires that the different agencies providing services communicate with each other. The current study reveals several areas of need in service coordination for children and families and also identifies gaps in the knowledge of program coordinators in both EHDI and Part C. To meet national standards (JCIH, 2007), considerable more work must be done to ensure a seamless system of service coordination and information sharing between EHDI and Part C. Early intervention should be based on the needs of the child and the parents’ desired communicative and educational outcomes for their child. However, to achieve these national goals in every state or territory, the range of communication options must be widely available. Furthermore, when communication options are explained to parents, this information should be presented in an unbiased manner by well-trained professionals who are not providing early intervention services. Program coordinators indicate that the full range of communication options is not available in their states or territories and the agency that explains the options also provides the early intervention services.

Pediatric audiologists and speech-language pathologists play a critical role in the communication development of young children with hearing loss. Because of newborn hearing screening, more infants are being referred for full audiological evaluations. Once identified with hearing loss, these children can be fit with appropriate hearing technology and receive timely early intervention services. Speech-language pathologists are the appropriate professionals to provide speech and language intervention that results in age-appropriate communication development.

While this study provides some insight into how coordinators from these two state systems view available resources and service delivery for infants and toddlers with hearing loss and their families, more research is needed to identify why these gaps in knowledge exist and to find possible solutions. If that aim is successful, a seamless system of service coordination may be achieved, and children with hearing loss and their families will be able to receive all of the services to which they are entitled.

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References


Appendix A

SURVEY OF EHDI COORDINATORS & PART C/EARLY INTERVENTION COORDINATORS

Communication Options for Children with Hearing Loss

On behalf of the Department of Communicative Disorders and Deaf Education (COMD) at Utah State University, thank you for completing this survey. We are collecting this information to ascertain how parents & caregivers of children with hearing loss receive information about the range of communication options available to them. The cumulative results of this study will be published, but the names or identities of participants will not be made known. All data collected as part of this study will be kept on file by the primary researcher at the conclusion of the study.

Please complete the survey and email your responses back to me, K. Todd Houston, PhD. You can place an “X” beside your answer OR use your highlight/bold feature to indicate your response.

If, at any point, you have questions about the survey, please contact me at (435) 797-0434.

Please provide the following information:
Name:
Title/Position:
Address:
State/Territory:

1. What agency houses the early intervention/Part C program in your state?
   a. Department of Health & Human Services
   b. Department of Education
   c. Other________________

2. What agency houses the Early Hearing Detection and Intervention (EHDI) program?
   a. Department of Health & Human Services
   b. Department of Education
   c. Other________________

3. Rate the following statements from 1 (completely agree) to 5 (completely disagree).
   a. _____ Our state/territory offers a seamless system of service coordination among the agencies serving children who are deaf and hard of hearing and their families.
   b. _____Our state/territory has excellent strategies for sharing information among providers from screening to diagnosis through intervention.
   c. _____Our state/territory has local or regional community capacity necessary to provide early intervention based on a family choice regardless of the selected communication methodology or modality.
   d. _____Our state/territory has an identifiable strategy for integrating family support into the system of care for children who are deaf and hard of hearing.
4. Has your state designated a specific agency to provide information to parents or caregivers about the range of communication options available in the state?
   Yes
   No
   If you circled YES for question # 4, please answer questions 5-7 and 9-15. If you circled No, please skip to question 8 and answer 8-15.

5. Which agency in your state has been designated as the specific agency to provide information to parents or caregivers about the range of communication options available in the state?
   a. Early Intervention/Part C Program
   b. Public education agency/resource center/ local school district (non-Part C)
   c. State School for the Deaf
   d. Contracted service provider (private practitioners/agencies)
   e. Non-government/Non-Profit organization
   f. Other_________________

6. Within the designated agency providing information about communication options to parents and caregivers, describe the professional background of the individual who typically provides this information to parents and caregivers.
   a. Non-degreed (high school diploma with additional agency-provided training)
   b. Early Childhood Education/Early Childhood Special Education
   c. Educator of the Deaf
   d. Speech-Language Pathology
   e. Audiology
   f. Parent of a child with hearing loss
   g. Other_________________

7. Does the agency that provides the information about communication options to parents and caregivers ALSO provide direct services/early intervention?
   a. Yes
   b. No
   c. Don’t know
8. **(SKIP ONLY IF YOU ANSWERD “YES” for #4)** If your state has not designated a specific agency to provide information to parents or caregivers about the range of communication options available, please circle or mark all applicable agencies which may be sharing this responsibility.
   a. Early Intervention/Part C Program
   b. Public education agency/resource center/local school district (non Part C)
   c. State School for the Deaf
   d. Contracted service provider (private practitioners/agencies)
   e. Non-government/Non-profit organization
   f. Other____________________________

9. Describe the range of communication options available to parents and caregivers in your state.
   a. Oral/Aural Yes No
   b. Auditory-Verbal Therapy Yes No
   c. Total Communication/Simultaneous Communication Yes No
   d. Cued Speech Yes No
   e. Bi-Bi/American Sign Language Yes No
   f. Other____________________

10. Describe the following communication options as being:
    1=Available statewide/many providers
    2=Moderate access/available in some parts of the state
    3=Limited access/isolated availability due factors such as geography, professional credentials, etc.

    | Communication Option            | Rating |
    |---------------------------------|--------|
    | a. Oral/Aural                   | _____  |
    | b. Auditory-Verbal Therapy      | _____  |
    | c. Total Communication/Simultaneous Communication | _____  |
    | d. Cued Speech                  | _____  |
    | e. Bi-Bi/American Sign Language | _____  |
    | f. Other                        | _____  |
11. What curriculum is used to explain the range of communication options to parents and caregivers in your state? (Circle all that apply.)
   a. Guide-By-Your-Side
   b. BEGINNINGS Parent Guide
   c. OralDeafEd Materials
   d. SKI*HI Curriculum
   e. In-house/Agency generated materials
   f. Other________________________
   g. Don’t know

12. Does your state have an established Deaf Mentor program?
   a. Yes
   b. No
   c. Don’t know

13. Has your state passed legislation in support of a Deaf Child’s Bill of Rights?
   a. Yes
   b. No
   c. Don’t know

14. Has your state passed legislation for insurance coverage of hearing aids?
   a. Yes
   b. No
   c. Don’t know

15. Has your state passed legislation for insurance coverage of cochlear implants?
   a. Yes
   b. No
   c. Don’t know
CEU Questions for Houston and Allen
Shared Responsibilities: A Survey of EHDI & Part C Coordinators Serving Young Children with Hearing Loss and Their Families

1. As a result of widespread universal newborn hearing screening (UNHS), ___% of all newborns receive a hearing screen before they leave the hospital or birthing center, resulting in an average age of diagnosis of ____ months.
   a. 80, 8-10
   b. 97, 2-4
   c. 75, 18-24
   d. 50, 24-36

2. The two state agencies responsible for the early identification and intervention for children with hearing loss and their families are:
   a. Department of Education & Department of Human Resources
   b. Child Find & Department of Health
   c. Early Hearing Detection & Intervention (EHDI) Program & Part C Early Intervention Program
   d. Early Head Start & Department of Public Instruction

3. According to both groups of coordinators, the professional who was most often cited as the person providing communication options information to parents was:
   a. Educator of the Deaf
   b. Speech-Language Pathologist
   c. Audiologist
   d. Physician

4. The published curriculum most often cited as being used to explain communication options to parents was:
   a. BEGINNINGS Parent Manual
   b. SKI*HI Curriculum
   c. Guide By Your Side
   d. Oral Deaf Materials
Abstract

Permanent hearing loss (HL) affects approximately 17 in 1,000 children under age 18 (NIDCD, 2007). These youngsters experience more academic, social, and communication hardships throughout their childhood than peers with normal hearing. Evidence shows that there is a correlation between parental involvement and the success of a child with HL. Raising a child with HL can create stress: selecting professionals, using equipment, choosing educational options, and obtaining financial assistance, among other decisions. Support and information that facilitate raising a child with HL are available to parents, though often not always easily accessed. This longitudinal case study explores the successes and challenges of a mother and her daughter who is deaf.

Learning Objectives

1. Participants will be able to describe the factors associated with successful outcomes of children with hearing loss.
2. Participants will be able to define the predominant need of parents when their child is diagnosed with hearing loss.
3. Participants will be able to describe the journey of one parent and her child with hearing loss.

Hearing loss (HL) significantly affects children and their families in different ways. However, many of the emotions and decisions concerning raising a child with HL are shared globally. In recent years, investigators have addressed the socioemotional impact of HL on families and have begun to explore the parents’ role in their child’s development. Yet, to date, few studies have specifically documented the parent’s evolving role in raising a child with HL. In this longitudinal case study, the authors sought to examine the personal experiences, challenges, and choices of a mother and her daughter with congenital profound HL, in an effort to gain insight into the parents’ role and responsibilities in raising a child with HL.

Early Identification

Hearing loss has been identified in individuals of all ages and in all stages of life. Studies have shown that identifying HL and beginning an appropriate intervention program in early infancy significantly increases an individual’s ability to develop speech, language, and cognition commensurate with hearing peers (Ching et al., 2008; James, Rajput, Britton, & Gaswami, 2008; Kennedy et al., 2006; Mauk & White, 1995; Philips et al., 2009; Sharma et al., 2004; Uziel et al., 2007; Werker & Tees, 2005; Wolff et al., 2004; Yoshinaga-Itano, Sedey, Coulter & Mehl, 1998; Young & Tattersall, 2006). Although the outlook for children with HL is more encouraging than ever, families can experience gaps in the areas of service coordination, availability of information, and integration of social service and support (Fitzpatrick, Angus, Durieux-Smith, Graham, & Coyle, 2008).

In 1993, less than 5% of all newborns were screened for HL prior to hospital discharge. In fact, the average age of identification was around 2.5 years of age. More recent data demonstrate that most hospitals with universal newborn hearing screening (UNHS) programs are able to screen 95%+ of all newborns prior to discharge (National Center for Hearing Assessment & Management [NCHAM], 2008; Forsman, 2007). A continued rise is expected as more states adopt infant screening programs and refine their existing protocols. Despite these encouraging rates, nearly 45% of children who fail the newborn screening are lost to follow-up Centers for Disease Control
and Prevention (CDC, 2009), possibly due to lack of appropriate family-centered service (Joint Committee on Infant Hearing [JCIH], 2007). Thus, recent attention has turned toward how professionals might better support families with a child who has HL. This discussion is particularly relevant today considering the many advances in intervention and education for children with HL. The need for qualified, knowledgeable professionals is at an all time high. There is considerable research now that supports family-centered approaches, inclusion in educational settings, and spoken language outcomes (for those who desire it). Scientists have documented the neuroplastic properties of the brain and have tracked ability of children with HL who receive appropriate and early intervention to develop in ways that are typical of their hearing peers. The factors that affect interventions are examined below.

Factors Affecting Intervention

Investigators have reported on parents’ emotional wellbeing and stress in raising a child with HL. From a parental perspective, most agree that infant screening and early intervention are a step in the right direction (Kurtzer-White & Luterman, 2003; Russ et al., 2004). Parents have relayed that hearing impairment “caught early” gives them more hope for a positive outcome (Young & Tattersall, 2007). HL described in this way implies that it is a life threatening disease or illness that lacks a “cure.” Although this is clearly not the case, one can sympathize with a parent whose wish is maximize opportunity for his/her child to develop a strong sense of language and communication, and to narrow the gap of the inevitable developmental delay evident in children whose HL is identified late. However, parent perspectives regarding HL are varied. On the other side of the issue, some parents argue that infant screening has taken away precious time with their newborn. Some feel that they are missing “bonding” time and are unable to develop the relationship with their child that they had expected because of the emotions that accompany the reporting of their child’s HL.

We know from parent accounts that their journeys are long ones during which understanding grows, knowledge is slowly or quickly acquired, decisions are made and remade, different directions are taken from those originally envisaged, and differing and conflicting professional views are regularly encountered (DesGeorges, 2003). Initially, learning of a child’s diagnosis of HL can be a very emotional time for parents and families. Feelings of denial, guilt, shock, relief, and sadness are all common for parents National Center for Hearing Assessment & Management (NCHAM, 2008). Later, parental distress may be derived from role restriction, isolation, and personal factors, such as feelings of poor competence in parenting, conflict with the co-parent, depression, or lack of social support (see Pipp-Siegel, Sedey, & Yoshinaga-Itano, 2002 for more detailed information), all of which may have a profound impact on the socioemotional development of the child (Hintermair, 2006). Consequently, parents need professionals who are sensitive to, and considerate of, these emotions and offer not only professional advice, but emotional support. Regrettably, providers often lack enhanced training in communication skills, in delivering abnormal test results, and in identifying and dealing empathetically with likely parent reactions (Russ, et al., 2004), which may also contribute to families’ emotional distress.

Fortunately, there is gradual shift in approach by professionals which will likely benefit families, one that contributes to a more holistic way of dealing with HL and other disabilities, rather than a medical perspective. This new approach is connected with the changing conceptions of “health.” There has been a shift away from a pathogenic view to one that includes a broader notion of “relative well-being” (Hintermair, 2006). This notion is not completely new; it has been supported by the Deaf community for decades. Factors’ ethnicity and income also impact access to early identification and intervention. For example, Sorkin and Zwolan (2008, p. 137) reported that a survey of parents of children who received cochlear
implants revealed perceived bias: “Children who were non-Caucasian and of lower socioeconomic status were underrepresented in the cochlear implant population and parents noted a lack of “comprehensive and bias-free” information regarding communication options and technology and sometimes experienced difficulty in obtaining certain services.” The researchers concluded that some families (particularly low- and moderate-income families) may have greater difficulty negotiating the cochlear implant process. Thus, it is up to professionals to assist families in navigating their children’s HL resources and services.

Despite the inherent flaws, early identification programs have revolutionized the way parents, families, and professionals deal with HL, creating a new world of opportunities for these children. One important development is a better understanding of brain development and the brain’s neuroplasticity. We now know that the brain is highly moldable and capable of rewiring itself (Sharma, et al., 2004; Werker & Tees, 2005) in order to accommodate HL and amplification. And thus spoken language development is possible, particularly when appropriate early interventions are in place (Ching et al., 2008; James et al., 2008; Kennedy et al., 2006; Philips et al., 2009; Uziel et al., 2007; Wolff et al., 2010; Yoshinaga-Itano, 2003; Young & Tattersall, 2006). As a result, investigators have focused on ways to optimize children’s success once HL has been identified. An overarching source of success appears to be parent involvement (American Speech-Language-Hearing Association [ASHA], 2008a; DesJardin, 2006; Moeller, 2000). Research and literature related to early intervention service delivery ascertains that parents play the strongest role in their child’s growth, development, and resultant outcomes (Flexer, Schmidt Robb, Wray, & Sommers, 2005). Clearly children with HL are in need of strong support, encouragement, and advocacy from well-informed, involved, and educated parents.

There is no parent manual that explains the proper way to raise a child with HL. Each situation is different and must be treated as such. It is left up to each individual and each family to determine which method of communication, which forms of amplification, and which types of education will be most beneficial. Thus, parents must be seen as the main target (Simser, 1999) and professionals should nurture, guide, educate, and support parents of children with HL in order to achieve a positive impact upon the development in these children (Harrigan & Nikolopulous, 2002; Hintermair, 2006; Moeller, 2000). It is imperative that parents have a network of support to aid in choosing what is best for their child and themselves.

The Intervention Team

After diagnosis, a parent may struggle with which professionals to see for which services, from which ones to seek advice, and which ones to trust. Service delivery models vary significantly from state to state and are highly dependent upon family choices, the needs of the child, professional knowledge and skills, and community resources. Initially, early intervention professionals should work in collaboration with families to identify priorities, resources, and concerns in the development and implementation of the Individual Family Service Plan (IFSP) (ASHA, 2008b). The Individuals with Disabilities Act (IDEA) Part C requires a team approach and a strong family focus in the development and implementation of the IFSP as the core of an early intervention program (White, 2006). In addition to the family, the team may include a pediatric audiologist, speech-language pathologist (SLP), teacher of the deaf and hard of hearing, early intervention specialist, physician, and many related professionals, such as an occupational therapist (ASHA, 2008b; Houston & Perigoe, 2010). Among the goals of the interdisciplinary team are (a) to maximize the child's communicative potential, and (b) to support the family needs, each of which requires
qualified professionals who understand child development, understand contemporary approaches to achieving desired communication and developmental outcomes, know how to work with families, and have a rich knowledge of community resources (ASHA, 2008b).

Unfortunately, many early service providers lack the necessary training and skills to fulfill the needs of the family and their child with HL (JCIH, 2007; Marge & Marge, 2005; Muma & Perigoe, 2010; White, 2006), particularly but not exclusively when the family chooses a listening and spoken language approach. Further, university training programs for SLPs, pediatric audiologists, early interventionists, and related personnel are slow to respond to the intervention paradigm shifts, particularly toward family-centered approaches which emphasize listening and spoken language, and thus, are failing to adequately prepare graduates to provide family-centered, evidence-based early intervention services to children with HL and their families (Lenihan, 2009; White, 2006; Wilson, Nevins, & Houston, 2010; Ying, 2008). In fact, it is estimated that “less than 10% of the world’s children who are deaf or hard of hearing and whose families desire a spoken language outcome have access to qualified professionals” (Auditory-Verbal International Strategic Plan, 2002, as cited by Goldberg, Dickson, & Flexer, 2010, p. 130). According to White (2006), the concern is expected to heighten, considering that less than 10% of 2004 graduates from teacher of the deaf or hard of hearing preparation programs were from programs that focused on listening and spoken language options. According to JCIH (2007), this dearth of qualified personnel and limited availability of appropriate family-centered service contributes significantly to children ‘lost to follow-up,” which, as stated above, was reported in 2009 to be 44.9% (CDC, 2009).

In addition to professional services, another critical factor for success is support from other parents. Studies have shown that parents’ predominant need when they had recently been informed that their child had a HL is contact with other parents of children with HL (Fitzpatrick, et al., 2008; Kurtzer-White & Luterman, 2003; Porter & Edirippulige, 2007). Initially, the guidance of other families who have had similar experiences helps parents with their emotional concerns. In time, these parents may help inform other parents of devices, modes of communication, area professionals, educational choices, and community resources that were of particular benefit to them and their children. In some regions, there are community based parent organizations that have parent mentors to help parents begin making decisions for their children and their family. Support groups also make information more accessible to parents. When professionals are not available or may not have extensive knowledge about certain issues, other parents typically welcome questions and are open to giving advice. Topics of particular interest to parents include mode of communication and education (Luterman & Kurtzer-White, 1999).

**Therapy and Education**

It must be noted that there are a variety of ways in which a child with HL can learn and communicate in the world. Parents may choose to raise their child to communicate using a variety of different methods (or a combination of them) including American Sign Language (ASL), Signed Exact English (SEE), cued speech, auditory-oral, or listening and spoken language (Auditory-Verbal) methods. Children can learn in a home-schooled environment, in a self-contained classroom with other students with HL, or can be included in a classroom with hearing peers (either individual or group inclusion). Decisions about educational approaches and communication methodologies cannot be based on the audiogram alone; the family must make educated decisions based upon a complex interaction of their values, desires for their child, and the overall best interests of the child and family. Parents need time to sort through these variables within a program that offers emotional support and that is free of methodological bias.
Whatever method is chosen, it is important for the family to be involved and supportive throughout the child’s therapy and education.

As a result of infant screening and early identification, new technologies, and other advancements, the educational trajectory is very promising for children with HL. One way of achieving educational goals is through an appropriately designed Individualized Education Plan (IEP). The IEP process is best completed as a smooth transition from the IFSP, including continued involvement of the interdisciplinary team. The process must involve the family and be supported by proper equipment and services from various professionals. According to one astute parent, “...every week and every month that goes by and his hearing isn’t enhanced he is going to delay his learning experience and that’s your priority now you know as a parent, now our priority is to ensure that he stands every chance of integrating into mainstream school and acquiring language to the best of his ability and having the best chances in life” (Young & Tattersall, 2007, p. 214 [sic]).

Family involvement in the therapeutic process should include goals and objectives that target audition, speech, language, cognition, and literacy development (Flexer et al., 2005). A parent may be involved by observing therapy, participating in therapy sessions, taking notes, asking questions, and providing feedback on any improvements or regressions observed at home. Equally important is the integration of language (and listening if opted by the parents) in everyday routines. For example, investigators have reported on ways in which parents can facilitate language and literacy development in the routine of shared storybook reading (DesJardin, Ambrose, & Eisenberg, 2009; Kaderavek & Pakulski, 2007; Pakulski, Easley, & Kaderavek, submitted for publication), resulting in both improved language/literacy outcomes and increased enjoyment when parents are able to maintain their child’s engagement in the interaction.

Inclusive education holds many advantages for children with HL, particularly for those whose intervention begins early with the desire for a spoken language outcome. Conversely, children experiencing very late diagnosis (often those with mild and moderate losses) often struggle in the regular education classroom, requiring extra assistance and grade repetition (Russ et al., 2004). Inclusive education is less costly. Children are exposed to good language models and a social environment to interact with peers. However, Luterman (2003, p. 12) offers another important consideration that is relatively new to the educational system and particularly relevant to children with cochlear implants: “They are neither culturally deaf, nor are they hearing. The educational thrust and direction of early identification and cochlear implantation is clearly the mainstream. This means that these children will have to make their way through an educational and social environment that is not especially geared to their needs. Counseling and support is going to be needed within the school as well as the home. The technology is only as good as our ability to provide and support it. Mindful informational and emotional counseling needs to be an important component of the successful use of the cochlear implant.”

In summary, parents must navigate a sometimes challenging and complex system in order to identify the most appropriate options and services for their child with HL. Beyond availing themselves of professional services and resources, parents must learn to optimize their own knowledge and skills in communicating with their child and completing in daily routines. The present study sought to illustrate one family’s choices, experiences, and challenges.

**Methods**

**Participants**

In order to gain perspective on parent impact on the development of a child with HL, a mother-daughter dyad was studied. Jane and Thomas Martin (who have asked that their names not be used) are the parents of five children; their third and fourth children were identified with HL at a young age. While Thomas is instrumental in the lives of his children, this study reflects the parental...
role of the mother, Jane. This mother is dedicated to her children and their success in a “hearing world” despite setbacks that are frequently evident when HL is present. Before her third child was born, Jane had no experience with, or education about, individuals with HL. She holds a two-year degree in an unrelated field. The following case study analyzes her role as a parent dealing with HL for the first time and her continued role as her daughter prepares to pursue further education at the college level.

Susan Martin, now 19 years old, is the third daughter of Jane and Thomas. She was diagnosed with bilateral severe to profound sensorineural HL at the age of 18 months (see Appendix A for a copy of her early audiogram). Her HL is a secondary trait to a heart condition, Jervell and Lange-Nielsen Syndrome, also identified as Long QT Syndrome. Susan was fitted with hearing aids two months following her diagnosis. Currently she relies on a cochlear implant, hearing aid, and when necessary (e.g., in academic settings) she uses a personal FM system for auditory input. She has developed her auditory skills and language through the Auditory-Verbal (AV) method of therapy. Susan’s education began at a local preschool and was continued in a home-schooling program through the middle of her seventh grade year. For the remainder of seventh grade, Susan was enrolled in a mainstreamed private classroom. She was home educated in eighth grade and took several high school courses with her two older sisters. Susan was mainstreamed in a local public high school with audiological support and regular consultation with an SLP, teacher of the deaf, and intervention specialist.

Data Collection

Data collected for this case study include the first author’s experience with the family as their pediatric audiologist for more than a decade and interviews and observations of the participants conducted by the second author over the course of nine months. Nine issues relate to all aspects of their lives, including their initial reaction, building a professional “team,” amplification/assistive devices, mode of communication, education, school accommodations, therapy, financial aid, parental peer support, and advocating for other families in the community.

Interviews

Interviews were conducted with Jane and Susan to address each of the nine priority issues. In order to obtain a broad scope of information, informal meetings were also conducted with Susan’s siblings and professionals who worked with the Martin family, including their audiologists, AV therapists, school SLP, teacher of the hearing impaired, coaches, and Spanish teacher.

Observations

To fully explore the nine priority issues, observations were made frequently and in a variety of environments and situations:

• Appointment for processor activation/initial mapping
• AV therapy with the outpatient AV therapist
• Speech-language therapy at school
• Spanish class at the high school
• Auditory and Language Enriched Playgroup
• Flag Corps practice
• Flag Corps football game
• School fundraiser
• At home
• At the zoo
• At a presentation in a local hospital where Susan served on a panel of individuals who are Deaf/Hard of Hearing (DHH)

Results

Initial reaction to identification of HL

Initial concerns regarding Susan’s development arose when Jane observed that her daughter had not spoken words at one year of age (newborn
screening was not mandated at that time). Initially, the pediatrician minimized Jane's concerns and suggested a “wait and see” approach. Medical concerns arose and eventually lead to Susan being diagnosed with HL at 18 months of age. Jane admitted relief about the diagnosis; she had suspected that there was a more serious concern and was willing to accept and deal with this diagnosis. On the other hand, her husband, Thomas, reported that he was “crushed.”

**Building a Professional Team**

From the time of Susan's diagnosis to the present time, her parents sought a diverse team of professionals including pediatricians, audiologists, SLPs, AV therapists, early intervention specialists, otolaryngologists, and various other medical professionals for her HL and heart condition. One would assume that the easiest solution in choosing professionals would be to select those who practice in one's local area. When adequate services cannot be provided, or if there are no local professionals to fill positions, choosing professionals may prove to be a more difficult task, one which Jane frequently encountered in her region of the Midwest. Consequently, Jane routinely sought the expertise of professionals many miles away and hours from her home. In order to provide the best for her children, she made an average of six trips a year to regional centers (often traveling 2-3 hours one way) which employed professionals with the necessary expertise. She availed herself and her family of a variety of services including a visit to the former Beebe Center in Fort Washington, PA, and video consultation with national experts. Additionally, Jane strongly encouraged local professionals to bring in national experts for professional workshops and family consults. Early on, Jane saw herself not only as an advocate for her family, but other families as well. She dedicated much time and effort to improving services for families of children with HL.

Typically, in the first meeting between a professional and a client, the professional conducts an interview to assess the needs of the client. From this initial interview, a client may obtain information, and a professional is able to determine the types of services to provide to meet the needs of the client. However, from the beginning of her journey, Jane assumed the role of the interviewer when identifying new professionals and services. She took it upon herself to become thoroughly educated about the services that she sought and continues to seek for her children and keeps up with current technology. Her experiences have led her to have a strong sense of her children's needs and how professionals might best meet those needs; she then holds those professionals to the highest standards.

**Amplification Devices**

Two months after diagnosis, Susan was fitted with her first power analog behind-the-ear hearing aids. Ever vigilant of her daughter’s auditory access and development, Susan was upgraded to the first hybrid digital hearing aids upon her mother's instance two years later. Susan had a personal FM system as a preschooler, due, at least in part, to her mother's tenacious approach to obtaining equipment and the funding for that equipment. The FM system was used daily in family routines and provided improved auditory access at home and in other important places (e.g., visits to the zoo and family weddings). Jane narrated life for Susan.

Increased demands for auditory input eventually led to the decision to fit Susan with a cochlear implant. At almost seven years old, she received a cochlear implant. After four years, Susan upgraded from a body-worn to a behind-the-ear model. A cochlear implant device failure in the summer of 2006, shortly before her freshman year, left her without the optimal auditory input she had been accustomed to, forcing her to rely solely on her hearing aid on her non-implanted
ear, a personal FM system, speech-reading, and a note-taker as she entered high school. Days before her freshman year began in late August, Susan had surgery to explant her old internal implant, which was replaced by a Hi-Resolution internal device, another cochlear implant two generations newer than her previous implant. In mid-September of that same year, Susan was re-activated with a new processor. With the various types of amplification devices and equipment available, it can be difficult for a parent to decide which is best. Jane took an active role in obtaining information and guidance from the professionals with whom she worked, understanding her children's auditory needs, and ultimately researched products on her own to help determine how to proceed with amplification. (As a result, a different implant was selected for each of her children with HL. Six years after Susan was implanted with her CI, her younger brother was also implanted.) When considering a new implant after the failure of the first, both Jane and Susan struggled with options for new devices, re-implantation, and unilateral implants vs. bilateral implants. Susan reported that it is her belief that the second implant “does not help anywhere near as much as the first implant,” and she did not see the value of going through a surgery that she felt “was unnecessary and would not provide the vast benefit of the first implant.” She also considered that before her implant failure, she was able to hear and understand speech with her implant and hearing aid in the other ear. Ultimately, Susan and her parents decided to upgrade her existing implant and proceed with the cochlear implant for one ear and hearing aid with the other. It has been Jane’s practice to maintain a relationship of open communication with the manufacturers of her children’s devices to get the answers she desires.

Mode of Communication

Choosing how Susan would communicate with the world was also a pivotal decision for Jane and her family. Although Susan began weekly visits to an SLP immediately after diagnosis, Jane reported that it took about a year before she made the decision regarding the best method of communication for Susan. With no previous experience of HL and no bias from the professionals with whom she worked, Jane thoughtfully explored the various options. She spent time interviewing a third-generation deaf man who communicated through manual communication (ASL) and did not have the ability to speech-read. Interviews were conducted through an interpreter. Jane was discouraged. Even though this man showed a heightened sense of visual stimulation, she reported, “it was not true communication” with which her family was familiar or competent. She wanted to give Susan the opportunity to make decisions for herself and to “achieve her dreams.” She also visited with families of children who had implemented a form of the Auditory-Oral approach (which at the time was defined very differently than AV). The aim of this method (as defined at that time) was to maximize a client’s hearing and listening potential in order to communicate through spoken language, which may include visual cues and gestures, and often took a remedial approach. Still not convinced, Jane’s family traveled to the former Helen Beebe Center in Fort Washington, PA to learn about yet another method of communication, the AV approach. She recalled that the information she received at the Helen Beebe Center was “very clear” to her. They were adamant about various aspects of this communication approach. Primarily, a supportive and active family is critical. Educating the family, involving them in therapy, and giving them the means to help the child improve and excel are key in the success of this program. All of these principles were appealing to her and consistent with their family values and ideals. Jane reported that one early and influential intervention as part of the AV therapy was the use of experience books (See Pakulski & Kaderavek, 2004 for explanation of experience books; Appendix B contains excerpts from Susan’s early experience books).
Jane recalled that the introduction of goals and ideas to help Susan maximize her potential across settings was another element critical for Susan’s success. Beyond her parents, other family members attended therapy sessions to learn ways to incorporate therapy in daily routines to ensure carryover. Educating teachers and other services providers about HL and Susan’s needs was also key. Jane spent a great deal of time and effort identifying open-minded professionals and working closely with them to maintain an interactive and supportive interdisciplinary team. (When her son was born and diagnosed with HL three years later, her decision was made easier because of the success she encountered with the AV approach with Susan.)

**Education**

Susan’s formal education began in a private preschool; the interdisciplinary team supported inclusive education (which was individual inclusion at that time). It was an excellent opportunity for Susan to interact with her peers and have a number of spoken language models. However, Susan’s parents were unimpressed with the program due to excessive noise, which created a poor listening environment, and lack of the intense auditory enrichment she desired for her daughter. Despite Jane’s efforts to bring in knowledgeable professionals to deepen understanding of how the preschool could create an appropriate listening environment, little improvement was made. The public schools in the area focused on manual communication, and consequently was not an option. Jane visited an oral-deaf school in the region, but found that those children were not talking and that their goals did not fit those she had outlined for Susan as an AV child. As a result, Susan’s parents concluded that a home schooling program would best benefit their daughter. She joined her older sisters in home schooling. In time, all five of their children were home schooled.

AV goals were incorporated into Susan’s home school program and were reinforced in speech-language therapy and through visits by special education teachers who came to the home as part of their early intervention services. When Susan was older, both of her sisters began going to school part time. She decided that she wanted to observe a parochial school in the community to see what there was to offer. Susan, with the support of her family, decided to enter school at age 13 in the seventh grade. With the aid of her cochlear implant, hearing aid, FM system, and continued speech-language therapy, Susan was prepared to excel in an individual inclusive classroom setting. A small classroom size and the opportunity for one-on-one attention provided Susan adequate assistance to address her educational concerns. At the conclusion of her seventh grade year, she decided to home school for eighth grade, and then continue her education at a local public high school.

For the first time, Susan was exposed to a larger classroom size, changing teachers and classrooms, and various extracurricular activities, among other aspects of an inclusive education in a large public high school. Upon the beginning of her freshman year, she was presented with various obstacles. The implant failure during the preceding summer proved to be a hindrance when she started at her new school, as she was unable to hear her peers and teachers for a month while her incision healed prior to the re-activation of her implant. Countless meetings with the school administrators, special education coordinators, school SLP, educational audiologist, teachers, and teacher of the hearing impaired were conducted to make accommodations for Susan as she started school while awaiting activation of a new implant. Countless meetings with the school administrators, special education coordinators, school SLP, educational audiologist, teachers, and teacher of the hearing impaired were conducted to make accommodations for Susan as she started school while awaiting activation of a new implant. Jane’s strong advocacy skills were put to the test. To ensure continued academic success, Susan completed an MFE (multi-factored evaluation) and was provided services through an IEP throughout her high school career. Jane’s
knowledge, tenacity and advocacy were of utmost importance in assuring that her daughter had the necessary accommodations to excel in the inclusive education setting. In high school, Susan was actively involved in extra-curricular activities while maintaining exceptional grades. In comparison with her peers, she performed on a level at or above that of others in her class.

School Accommodations

At the time of this writing, Susan has graduated from public high school. Many accommodations were implemented to help her adjust to an inclusive education setting, particularly in a large public high school. Accommodations provided to Susan through her IEP are illustrated in Figure 1.

When school commenced for her freshman year, Susan was without a working cochlear implant. Her main source of auditory input came from wearing a hearing aid and personal FM system. Consequently, additional modifications were necessary to ensure effective communication following the failure of her cochlear implant, the transition period between implants, and the adjustment period to allow Susan to acclimate herself to the new device. Susan is naturally a skilled speech-reader and was able to compensate by using visual cues for much of the information that was lost in the auditory sense. To assist her during classroom lectures, an adult note-taker was provided to record the pertinent information.

Despite these accommodations, Susan reported that the beginning of high school proved to be very stressful for her, both emotionally and physically. Due to ineffective communication, she found herself at times unintentionally missing assignments and information to be covered on tests. She was accustomed to having homework to make up because she missed school a couple of times a month, on average, to attend necessary health and audiology appointments. In order to keep up with her peers, she requested assignments from the classes she would be missing in advance, so that she did not fall behind. On a daily basis, the extra effort she put into receiving
and interpreting acoustic signals was a burden not shared with her peers, which left her physically and mentally exhausted by the day’s end.

Since the activation of her new implant, she has been able to take notes in classroom lectures without the aid of her note taker. Upon the second author’s observation of Spanish class, it appeared as though Susan was able to hear and understand the lecture without the use of the FM system as she was very attentive and offered a great deal of class participation in comparison with her peers. However, as she reflected upon her educational experiences, she recalled that she was more successful in classes in which she utilized her personal FM system than in the classes where the personal FM system was not used. She was a consistent Honor Roll student. Her grades reflected her outstanding effort in academics, as she continually earned a 4.0 grade point average each semester. She was the recipient of several scholarships and graduated in the top ten percent of her class.

She received speech-language therapy once a week during her study hall period in her freshman year and services from the teacher of the deaf. The teacher of the deaf was in contact with Susan weekly the first year to ensure that she was getting the appropriate accommodations. Communication with the teacher of the deaf helped Susan to gain access to closed captioning for movies, preferential seating, and the support of the regular classroom teachers, among other important aids. Jane and Susan also developed a relationship with the school’s audiologist, who ensured that she was provided with the correct equipment, batteries, personal FM system, and was available for troubleshooting issues. Jane was highly instrumental in developing Susan’s IEP and ensuring that these accommodations were implemented, which, as many parents report, can be a monumental task that requires perseverance and tact. Through meetings, phone calls, emails, and visits to the school, Jane maintained ongoing communication with the school administrators, intervention specialist, regular education teachers, teacher of the deaf, speech-language pathologist, and audiologist in order to encourage, educate, and support the interdisciplinary team, which was critical to Susan in reaching her educational goals.

In keeping with what the literature reveals, Jane reported that most of their regular education teachers had received little or no training in HL, since it is considered a low-incidence disorder, and that, for some, Susan was the first student with HL that they had encountered. As a result of her mother’s tenacity in numerous situations involving services and accommodations relating to her HL, Susan has developed excellent self-advocacy skills and has taken an active role in voicing concerns regarding her HL. Over time, both Susan and her brother have developed Power Point presentations through which they have provided information to school professionals and students about HL, including effective ways to communicate with them and effective use of their personal FM systems in classroom situations.

The services declined as she aged, but she continued to receive consultation from the SLP and teacher of the deaf with decreased frequency. After her freshman year, she presented her own teacher in-service prior to the beginning of each semester. Susan was never a student in a self-contained classroom for students with special needs.

**Therapy**

Susan has received therapy from SLPs and AV therapists most of her life, both privately and later in school. As noted above, her mother and other family members were highly involved. Periodically, with Jane’s encouragement, other professionals, including the pediatric audiologist and early intervention providers, observed and participated in therapy. (Likewise, the SLP was involved in hearing assessment on occasion.) The family and the professionals with whom they worked diligently provided auditory and language enrichment, following developmentally appropriate
goals, throughout Susan’s daily routines. The interdisciplinary team maintained communication and the team worked together when concerns arose. For example, if Jane expressed concern that Susan did not respond consistently to spoken language at home, the SLP noted which sounds Susan was struggling with and contacted the pediatric audiologist, who would, in turn, make any necessary adjustments to the amplification device.

Financial Aid
As most parents of children with HL discover Jane found that HL can be quite costly, particularly for those who wish to provide their children with advanced technology. Jane reported success with obtaining financial aid and funding from the Bureau for Children with Medical Handicaps (BCMH) for hearing aids, batteries, ear molds, therapy, and doctor visits. Through her health insurance provider, the cost of the cochlear implant was covered. She also discovered other funding sources such as the HIKE fund (Hearing Impaired Kids Endowment Fund) that has provided the children with FM systems, which were not covered by their insurance and would have caused financial hardship for the family. During Susan’s four years in public high school, she was eligible for funds for hearing aids, a personal FM system, and other school-based accommodations.

Peer Support and Advocating for Other Families in the Community
As reported above, when Susan was first diagnosed, Jane sought the support, experience, and advice of many individuals with HL and families of children with HL. As Jane became more knowledgeable and experienced, she too became very instrumental in advocating not only for the success of her own children, but also for the success of others. Jane and her family have devoted countless hours to organizations to promote awareness of children with HL, both in and out of her local community. Jane has worked as a parent mentor for several grant-funded programs designed to meet family needs and improve access to appropriate services. Using her own experience and self-taught skills, Jane has counseled families of children with HL and served as a resource for them. She was instrumental in developing programming in the community, including annual workshops for families and professionals with nationally known speakers, a playgroup for children with HL and their typically hearing peers, and support/education groups for parents. Jane and her family have readily volunteered to educate others by speaking to university classes, being interviewed on local television programs, and participating in other events designed to inform professionals and other families. Leading by example, Jane has been instrumental in both Susan and her son’s involvement in panel discussions and presentations about HL, in order to provide information for professionals, families, and their own peers.

Discussion
This case study involved analyzing hours of observations and interviews that were categorized into nine priority areas of families with children with HL. However, there are many more reasons for Susan’s success that include other facets of her life. Beyond school, Susan enjoyed the Flag Corps, horseback riding, and ballet. She earned a position on her school’s basketball cheerleading squad. Susan obtained her driver’s license shortly after her 18th birthday.

Susan has proven to be a very determined individual. She used to dream of being an actress, but admitted that it “wouldn’t be practical.” Rather, Susan’s future goals include attending a university and studying to become a journalist. Susan has been accepted into a selective journalism program at a well-known university.

In reflecting on her experiences, Jane reports that her greatest challenge was finding caregivers to provide the services that she determined that her
children needed. “It is disheartening to work with professionals who are unwilling to address the [individual] needs of the children.” On the other hand, Jane’s most rewarding experience is to see change in her own family as well as others. She appreciates that others recognize her knowledge and experience related to HL and a parent’s role. Her ultimate goal would be to bring a cochlear implant and comprehensive AV therapy program to her area to help local families, and save them the challenges of frequent lengthy travel. Cochlear implant surgeries are finally being performed in the Martins’ hometown.

**Conclusion**

From identification to intervention, parents experience many emotions and endure many challenges. They must make many life-altering decisions regarding their children and their HL. Early identification has provided many opportunities to these children that they have not had in the past. Research studies show that the emotions and concerns of parents, their ability to navigate the support and services of professionals, and their choices of intervention and educational approaches all contribute to their child’s success. The example set by the Martin family is a model for any family with a child who has HL. Regardless of mode of communication, types of amplification, education, and therapy, parent knowledge and involvement are vital to a positive outcome.

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Appendix A. Susan’s pre-implant audiogram

Appendix B. Excerpts from Susan’s experience books
References


CEU Questions for Pakulski and McBurney
A Parents’ Role in Raising a Child with Hearing Loss

1. Which of the following is likely to play the most important role in the development and academic achievement of a child with hearing loss?
   a. parent
   b. speech-language pathologist
   c. audiologist
   d. teacher

2. Studies have shown that parents’ predominant need when they had been recently informed that their child had hearing loss was which of the following?
   a. Counseling by a skilled professional
   b. Contact with other parents of children with hearing loss
   c. Videos/published materials explaining hearing loss
   d. Parenting classes that focus on raising a child with hearing loss

3. What was Susan’s pediatrician’s response to her mother’s concerns that she did not have any spoken words at one year of age?
   a. Referred her to an audiologist to rule-out hearing loss
   b. Told her to “wait and see”
   c. Referred her to a speech-language pathologist to learn how to promote spoken language
   d. Told her that most children do not speak that early

4. Which likely contributed to Susie’s success?
   a. Parental involvement
   b. Focus on maximizing audition with hearing aids, FM and cochlear implant
   c. Daily language and literacy experience
   d. All of the above
Abstract

The emergence of advanced hearing technologies has resulted in an increase in the number of families who select listening and spoken language options for their children with hearing loss. Unfortunately, some university training programs may not be keeping pace with current trends in aural habilitation and consequently may be less able to prepare future clinicians to maximize the technological benefits for these children. This article will discuss the need for change in the manner in which we train tomorrow’s leaders to help children with hearing loss achieve their full potential in listening, spoken language, and literacy.

Learning Objectives

1. Participants will be able to describe the standard established by the Joint Committee on Infant Hearing (2007).
2. The participants will be able to describe three reasons that contribute to increased numbers of families requesting listening and spoken language options for their children who have hearing loss.
3. The participants will be able to describe the role that speech-language pathologists play in the early intervention and management of children with hearing loss who use advanced hearing technologies.

Twenty-first century advancements in newborn hearing screening, hearing technologies which allow listeners to access the frequency spectrum for speech, and intense early intervention have created a seismic shift in intervention paradigms for children who have hearing loss, necessitating a transfer in focus from early childhood to infancy, from visual teaching to auditory skill development, and from educational management in segregated classrooms to collaborative models and placement in mainstream settings (Cole & Flexer, 2011; Morrison, Perigoe, & Bernstein, 2010). Evidence continues to mount indicating that infants who have hearing loss and who are identified early and who receive appropriate technologies and intense early intervention, have the possibility of achieving age-appropriate speech-language and literacy outcomes (Dornan, Hickson, Murdoch, Houston, & Constantinescu, 2010; Geers, 2006; Niparko et al., 2010; White, 2006). Further, the vast and increasing literature on the achievements of children with cochlear implants who are severely or profoundly deaf indicates a dramatic shift toward spoken language skills that can closely approximate those of hearing peers (Dornan et al., 2010; Geers, 2006; Nicholas & Geers, 2007; Niparko et al., 2011). The landscape of deafness has changed dramatically, due to evidence-based research involving technology, cortical research pertaining to the neuroplasticity of the brain, and early identification. As a result, tomorrow’s communication specialists will encounter a new and different generation of children who have hearing loss (Cole & Flexer, 2011; Flexer, 2011).

The purpose of this article is to present a case for the demand that training programs in higher education increase the number of highly qualified speech-language pathologists (SLPs) who can deliver evidence-based best practice services to infants, toddlers, and children who have hearing loss, in order to maximize the benefit of advanced technology to develop listening and spoken language skills. The development of listening and spoken language skills is the necessary foundation for emergent literacy, as determined by the National Early Literacy Panel (2004). For the past decade the American Speech-Language-Hearing Association (ASHA) has taken the position that SLPs are active collaborators in developing a foundation of understandings about sound, print, and oral language that lead to successful formal reading instruction (ASHA, 2001). Because children who have hearing loss historically have
been challenged in their literacy development, the SLP must assume a critical role in ameliorating this deficit in secondary language skills (Robertson, 2009).

The national Early Hearing Detection and Intervention (EHDI) system, comprised of state programs, was reauthorized by the United States Congress in 2010 for an additional five years (Lyons, 2011). EHDI grants have provided substantial success while increasing the number of newborns screened for hearing loss in this country. The Centers for Disease Control and Prevention reported that an impressive 97% of newborns in the United States were screened for hearing loss (Malphurs & Mustain, 2010). Effective EHDI programs in many states have reportedly reduced the age of identification of a child with hearing loss from 2 ½ to 3 years of age to younger than 3 months (Koop, 2010). However, numerous challenges may preclude newborns who fail screenings from receiving timely and appropriate follow-up services that provide the subsequent steps of referral, diagnosis, and intervention. For example, approximately half of infants referred for a full audiologic evaluation following a failed hearing screening are “lost to the system” (Lyons, 2011; Malphurs & Mustain, 2010). Further, in spite of the Joint Committee on Infant Hearing (JCIH), 2007 recommendation, one-third of infants who fail screenings do not receive audiologic diagnostic evaluations by 3 months of age, and more than half of those diagnosed with hearing loss are not enrolled in early intervention programs by 6 months of age (Lyons, 2011). Unfortunately, the “gold standard” established by the JCIH that recommends hearing screening by 1 month, diagnosis by 3 months, and placement in an intervention program by 6 months is falling far short of its objectives (Russ, White, Doughtery, & Forsman, 2010; Russ, White, Doughtery, & Jagadish, 2010). In a 2008 document developed by the ASHA Working Group on Loss to Follow-Up, it was concluded that there are few meaningful resolutions being offered to improve identification of the families and clients who are at highest risk for being lost to the system. Thus, despite federal legislation to reduce the negative outcomes of hearing loss, which remains the number one birth disorder in the United States, prompt diagnostic evaluations and timely placement in early intervention programs are not consistently occurring (White, 2006).

The National Need for Specialized SLPs

After a child is diagnosed with hearing loss, federal guidelines stipulate that a referral should be made to an early intervention program and services should be initiated as soon as possible after diagnosis but no later than 6 months of age (JCIH, 2007). Studies indicate that when children who have hearing loss are identified early and intervention is initiated before 6 months of age, they achieve language, speech, and social-emotional outcomes that are significantly better than those children who are identified later (Apuzzo & Yoshinaga-Itano, 1995; Mayne, Yoshinaga-Itano, & Sedey, 1998; Pipp-Siegel, Sedey, VanLeeuwen, & Yoshinaga-Itano, 2003; Yoshinaga-Itano, 2001). Early intervention service providers may come from a variety of academic disciplines (JCIH, 2007), but SLPs often are the professionals who deliver direct services focused on communication development for children who have hearing loss and their families (ASHA, 2004; 2008). For more than a decade, successful outcomes for children identified early with hearing loss have been tied to the services delivered by SLPs and audiologists who are well-trained in parent-infant intervention (Calderon, 2000; Mayne et al., 1998; Moeller, 2000). However, access to highly skilled practitioners, especially SLPs, remains a challenge for most families. Numerous studies indicate that many practicing SLPs display significant shortcomings in their professional training and are often unable to meet the current communication and educational needs of children with hearing loss (Compton, Tucker, & Flynn, 2009; Houston & Caraway, 2010; Houston & Perigoe, 2010; Johnson, 2004; Lenihan, 2010; Luckhurst, 2008; Robbins & Caraway, 2010; Vernon, 2007). This dearth of
appropriately trained early interventionists has led many children who have hearing loss and their families to be either underserved or not served at all. For example, one-third of the EHDI programs surveyed (N=55) reported that a lack of early intervention services was a major problem (Shulman, Besculides, Saltzman, Ireys, & White, 2010) and not occurring by six months of age, as recommended.

The Need to Offer Families a Variety of Choices for Communication Modes

As a result of technological advancements, early identification, and efficacy studies of early intervention (Connor, Craig, Raudenbush, Heavner & Zwolan, 2006; Geers, Strube, Tobey, Pisoni, & Moog, 2011; Nicholas & Geers, 2007), more families are choosing to use spoken language as a sole option or as a component of their child’s communication mode (Brown, 2006; Gallaudet Research Institute, 2008). Approximately 95% of children with hearing loss are born to parents with normal hearing (Mitchell & Karchmer, 2004). That fact, coupled with parents’ access to the Internet, where the results of prompt early intervention and advanced hearing technology can be observed, more parents are requesting early intervention services and educational programs that focus on facilitating listening, spoken language, and literacy, providing that they are aware that spoken language is a viable option for their child who has hearing loss (Goldberg, Dickerson, & Flexer, 2010; Houston & Perigoe, 2010; Wilson, 2006). As Table 1 illustrates, when clear programmatic alternatives are made available, the preference of families for a spoken language mode of communication has increased dramatically over time.

In terms of research findings, neural imaging has revealed the critical need to stimulate the auditory cortex as early as possible in order for a child to significantly benefit from “critical periods” of neurological and linguistic development (Merzenich, 2010; Sharma, 2009; Sharma & Nash, 2009; Sharma, Dorman, & Kral, 2009; Zupan & Sussman, 2009). If a child’s auditory brain centers are not accessed and stimulated via advanced hearing technologies during these critical language learning years, the child’s ability to meaningfully utilize acoustic input will significantly diminish due to the “retrograde deterioration of auditory pathways and psychosocial (attention, practice, and learning) factors” (Goldberg et al., 2010, p.132). In a related vein, current information regarding language development in children with typical hearing provides a rationale for the structure of auditory-based practice in the development of listening, spoken language, and emergent literacy outcomes (Musiek, 2009; Sloutsky & Napolitano, 2003; Zupan & Sussman, 2009). Children cannot effectively optimize listening, spoken language, and emergent literacy outcomes without the assistance of a qualified service provider possessing a knowledge and skill base that can optimize listening, spoken language, and emergent literacy skill development (Goldberg et al., 2010). Unfortunately, only 8% of the world’s children whose families choose an auditory-based option for their child who has hearing loss have access to a qualified provider (Auditory-Verbal International Strategic Plan, 2002, as cited in Goldberg et al., 2010). Goldberg et al. (2010) reported that in the United States only 379 professionals are Listening and Spoken Language Specialists (LSLS). An action plan for

<table>
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<tr>
<th>Year</th>
<th>1995</th>
<th>2005</th>
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<tr>
<td>Spoken Language Modes</td>
<td>40%</td>
<td>85%</td>
</tr>
<tr>
<td>Sign or Visually-Based Modes</td>
<td>60%</td>
<td>15%</td>
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Note: Data from Brown (2006).
higher education training programs that will significantly increase the number of personnel who can teach listening and spoken language to infants, toddlers, and children who have hearing loss is essential. There is a need for professionals who can provide early intervention that is evidence-based for children who have hearing loss in the 21st century (Flexer, 2011).

It should be noted that most university training programs have not yet adjusted their curricula to provide SLPs with specific knowledge and skills needed for this crucial and growing population (Wilson, 2006; Ying, 2008). Similarly, in the United States, only a limited number of university training programs in Deaf education or speech-language pathology and audiology prepare graduates to provide services for today's generation of early identified infants and toddlers whose parents choose listening and spoken language communication modes (Houston & Perigoe, 2010; Lenihan, 2010; White, 2006). Furthermore, many practicing professionals received their education and clinical training before universal newborn hearing screening, digital hearing aid technology, and cochlear implants were available (Marge & Marge, 2005; Wilson, Nevins, & Houston, 2010). Therefore, training tomorrow's leaders in providing evidence-based practice to children with all degrees of hearing loss continues to serve as a major challenge to current university training programs (Houston & Perigoe, 2010; Wilson, Nevins, & Houston, 2010).

Our Consortium’s Approach to Providing SLPs with Education in Hearing Loss

SLPs play a pivotal role in providing ongoing support for parents on issues that relate to monitoring, managing, and basic troubleshooting of advanced hearing technologies, such as digital hearing aids and cochlear implants. Developing experience in these areas is essential if an SLP is to be considered a qualified provider of early intervention to children who have hearing loss (JCIH, 2007; Robbins, 2009). The reality is that many SLPs have extremely limited experience working with children who have hearing loss, stimulating emergent literacy skills in this population, and providing family-centered early intervention with infants and caregivers (Robbins, 2009; Shulman et al., 2010). Typically, most speech-language training programs offer very few clock hours involving the planning and management of intervention plans that develop auditory, speech-language, and emergent literacy skills in children who use advanced hearing technologies such as digital hearing aids or cochlear implants (Wray & Flexer, 2010). The knowledge and skill set required by SLPs who provide services to this population is largely driven by the ever-changing advancements occurring in the technologies routinely utilized by infants, toddlers, and children with hearing loss. SLPs must possess the necessary competencies and knowledge and skill set based on evidence-based research to optimize the use of these advanced hearing technologies (Cole & Flexer, 2011; Goldberg et al., 2010).

Recent surveys of novice and seasoned SLPs who currently serve children who have hearing loss indicate a wide gap in their knowledge and skill set; few respondents report any exposure to children who have hearing loss during their preservice training (Compton, Tucker, & Flynn, 2009; Luckhurst, 2008; Wilson, 2006). Further, the shortage of experienced SLPs who can facilitate listening and language development with children with hearing loss has been previously documented at the state level in Ohio (Rowan, Sommers, & Wray, 2005). Over 15 years ago SLPs in northeast Ohio were surveyed to identify their knowledge of aural (re)habilitation, cochlear implants, and subsequent intervention that maximized the use of advanced hearing technologies. This was found to be the area of greatest training deficiency. Nearly a decade later, SLP respondents in Ohio continued to perceive their clinical skills and competencies in treating “hearing” when it was the primary disorder to be rated as “poor” (Wray, Rowan, & Sommers, 2002).
More recently, as part of a federally funded U.S. Department of Education grant awarded to The University of Akron, Kent State University, and the Family Child Learning Center (FCLC), a survey was disseminated to the over 800 members of the Ohio School Speech-Language Pathology and Educational Audiology Coalition (OSSPEAC). Members were asked to rate their comfort level in evaluating and treating five of the most common communication disorders observed in children (i.e., articulation, fluency, language, voice, and communication disorders due to hearing loss). The top two disorders ranked at the most “uncomfortable” levels were voice disorders (44%) and disorders associated with hearing loss (25%). However, when asked to rank order their preferences for receiving additional continuing education, “communication disorders due to hearing loss” was overwhelmingly ranked as their first preference (i.e., 42%) with a need for continuing education in “voice disorders” ranked as last (i.e., 4.6%). While 45% stated that they believed they knew how to develop listening and spoken language skills in children who wear hearing aids, only 25% stated they could do so with children who wear cochlear implants. Further, 87% reported a high interest in receiving professional development in the area of “hearing,” with 69% reporting that most of their skills were acquired “on-the-job” as opposed to other venues (e.g., graduate program, conferences, on-line training, etc.).

Local Shortages of Qualified SLP Providers

At a recent regional conference, 50 practicing SLPs were offered a survey similar to that disseminated to OSSPEAC members. Of those attending the conference, 80% responded. The results parallel those obtained at the state-wide level. The top two disorders ranked as being judged at the most “uncomfortable” levels were again voice disorders (ranked first) and disorders associated with hearing loss (ranked second). Further, respondents most preferred to receive continuing education in either communication disorders due to hearing loss (37.5%) or voice (40%). These data led the Consortium mentioned to develop a graduate program option or pre-service SLPs.

There are five cochlear implant centers within two hours of The University of Akron (UA) and Kent State University (KSU), further underscoring the demand that there be qualified providers for the many recipients of cochlear implants generated by those centers. The University of Akron is one of only a few university training programs for speech-language pathology in Ohio that routinely provides an opportunity for graduate SLP students to engage in a clinical rotation that involves providing services to children who have hearing loss using an Auditory-Verbal approach. (Wray & Flexer, 2010). Of the 15-22 clients with hearing loss receiving services each semester at UA’s Audiology and Speech Center, approximately 80% wear cochlear implant systems and, of those, 75% are implanted bilaterally.

Having a limited number of in-state programs with this specific focus mirrors the shortages reported in deaf education teacher preparation programs nationally (Lenihan, 2010; White, 2006; Wilson, Nevins, & Houston 2010). At the pre-service level, only eight out of 70 colleges and universities with deaf education programs in the United States offer specialized training in auditory/oral (listening and spoken language – LSL) education (White, 2006). Consequently, there is a significant lack of qualified personnel with skill in managing, monitoring, and maximizing the benefits of hearing technologies. Since 2007, Kent State University, UA, and Family Child Learning Center have collaborated on a federally funded personnel preparation program from which 36 SLP scholars with a specialty in working with children with hearing loss have graduated.
These graduates have completed the traditional course of study for a master’s degree but additionally have at least 100 hours in clinic practice in the category of “children’s hearing loss.” Further, they are enrolled in two Hearing Loss Seminars and a Family-Professional Collaboration class. This program requires an additional summer semester to complete. Surveys of the graduates show that they are working with children with hearing loss (44% in schools with children with hearing loss on their caseload; 38% in pediatric rehabilitation centers where all have children with hearing loss on their caseload; 12% in pediatric hospitals and/or cochlear implant centers; 6% in early intervention centers where there are children with hearing loss and their families).

Evidence-based research reveals that given aggressive audiologic management, early intervention goals targeting auditory brain growth and family-focused coaching, spoken language and literacy outcomes for children with hearing loss can be age-appropriate or close to that of hearing peers. The challenge for professionals will continue to be remaining current on in the interventions and hearing technologies that emerge. For those institutions that are training tomorrow’s communication specialists, the charge will be to share in the classroom and clinic the research and evidence-based practices that achieve near age-appropriate speech-language, auditory, and literacy outcomes for the new generation of children who have hearing loss.

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eHearsay Volume 1 BLOG – We Want To Hear From You!

Do you have a comment about something you’ve read in this issue of eHearsay? Do you know of additional resources on this topic that might be of interest to our readership? Please take a moment to share your thoughts and direct your fellow readers to information of interest. The eHearsay Editors invite your participation. I’ll be monitoring this board regularly, and if you have a question I can’t answer, I’ll help you find someone who can. Help us celebrate the inaugural issue of eHearsay and tell us what you think. — Kate Krival, PhD CCC-SLP

GO TO: http://ohioslha.org/wordpress2/?p=56
References


CEU Questions for Wray, Rowan and Espe-Sherwindt
Meeting the Needs of the New Generation of Children with Hearing Loss: One Ohio University Consortium’s Answer

1. The landscape of childhood deafness in the 21st century has been changed because of:
   a. digital hearing aids
   b. cochlear implants
   c. newborn hearing screening
   d. brain elasticity research
   e. all of the above

2. According to some sources, the age of identification of many children with congenital hearing loss has been reduced to:
   a. 2-3 years
   b. 6-9 months
   c. Less than 3 months
   d. 12-24 months

3. In the decade from 1995-2005, the primary communication modes chosen by families of children with early onset deafness:
   a. remained about the same
   b. changed in favor of spoken language modes
   c. changed in favor of sign or visually based modes
   d. included Cued Speech

4. According to the authors, the primary barrier to families and children being able to benefit from early intervention services that support listening and spoken language development is:
   a. the lack of access to qualified early intervention professionals
   b. lack of cochlear implant teams
   c. lack of qualified teachers of the deaf
   d. lack exposure to children with hearing loss in university training programs
Abstract

School personnel (e.g., audiologists, health teachers, nurses, and speech-language pathologists [SLPs]) are in a position to support hearing conservation and early identification of emerging hearing loss resulting from exposure to loud sounds from personal listening devices such as I-Pods, MP3 players, and other risky practices. This report reviews the literature in communication disorders, education, medicine, and nursing to examine current practices and concerns related to this important area. The primary purpose of this report was to explore the ways in which at-risk students are identified in schools, the roles professionals have on a collaborative screening team, and preventing hearing loss in an educational setting. The aim is to raise awareness and to improve collaboration across professions, advocate for policy change, improve conservation efforts, and develop programming that effectively identifies noise damage earlier in order to minimize the negative consequences on academic, social, and other important developmental areas.

Learning objectives
1. Participants will be able to define the roles of school personnel (speech-language pathologists, audiologists, nurses, and health educators) positioned to address noise issues of school age children.
2. Participants will be able to identify three common causes of noise induced hearing loss among school children.
3. Participants will be able to identify three ways noise exposure or noise induced hearing loss impacts school children.

For decades, researchers have documented the negative impact of noise on adults, particularly in the workplace. Noise is not limited to the workplace, but can be found in many environmental and recreational contexts. Noise induced hearing loss (NIHL) and the psychological and physiological effects of chronic noise exposure are of concern. More recently, research indicates that school-aged children are at-risk for NIHL and the many psychological and physiological effects of chronic noise exposure which impact their health, brain development, and learning as significantly as they do adults.

The incidence of preventable hearing loss (Shargorodsky, Curhan, Curhang, & Eavey, 2010) and the frequency of health and learning problems associated with chronic exposure to loud ambient noise (Lercher, Evans, & Meis, 2003) in school children is increasing. A rise in hearing loss among school children is of grave concern considering that even a modest amount of hearing loss can sabotage speech perception, speech and language development, and social development, all of which have a profound impact on learning (Daud, Noor, Rahman, Sidek, & Mohamad, 2010; Lercher et al., 2003; Pittman, Vincent, & Carter, 2009; Tharpe, 2008). Moreover, chronic ambient noise exposure is now considered an environmental emergency in school children (World Health Organization [WHO], 2010), since it adversely impacts cognition, attention, reading acquisition, memory, and other learning functions as well as other physiological (e.g., blood pressure) and psychological mechanisms (Haines et al., 2001; Lercher et al., 2003; WHO, 2004). Despite these known facts, an increasing number of school children routinely experience loud ambient noise, and many will also acquire permanent, irreversible hearing loss from this exposure.
Another confounding factor is the fact that NIHL and chronic overexposure to noise may go undetected for long periods of time. The reasons for this oversight include: (a) the symptoms are not commonly considered to be related to hearing and listening issues, (b) the insidious, yet subtle nature of the damage may be masked or initially compensated for by schoolchildren, and (c) early symptoms vary widely and can easily be confused with other concerns such as distractibility or inattention. Yet, over time, the impact intensifies, and, if hearing loss occurs, it may also be accompanied by ringing in the ear (tinnitus), creating additional problems. Among the leading causes of damage to children’s hearing is exposure to high intensity sounds (loud volumes) associated with personal listening devices such as iPods and MP3 players along with other sources including toys, video games, indoor sporting events, outdoor sporting and hunting events, and concerts. With the increasing popularity of personal audio technology, millions of children (and adults) are at greater risk of NIHL than ever. The ambient noise, or daily “noise-scape,” of school children includes sounds ranging in intensity from moderately loud to harmful, created by sources such as traffic, yard work (e.g., lawn mowers and leaf blowers), household noise (e.g., dishwashers and exhaust fans), “second-hand” bass from car stereos, classroom noise, and many other sources (U.S. Environmental Protection Agency [EPA], 1981).

Despite these mounting concerns, less than 12% of physicians screen hearing (Kochkin, 2005) or refer for hearing evaluations routinely (Cohen, Labadie, & Haynes, 2005). Furthermore, it is likely that emerging hearing and listening related problems will go unidentified in school children because: (a) several states do not mandate hearing screenings for school age children, (b) in those states that do mandate screening, it is not routinely performed past the 9th grade unless a referral is made (and the subtle signs contribute to difficulty in identifying the need for screening), and (c) screening personnel tend to use traditional pure tone audiometry for screening hearing (Hendershot, Pakulski, Thompson, Dowling, & Price, 2011), which may not be sensitive to early cochlear damage secondary to injury from noise (Hall & Lutman, 1999; Meinke & Dice, 2007). Regarding adverse affects related to chronic noise exposure, no common screening tool exists.

Within the educational system, there are many personnel who are capable of providing early identification and hearing conservation programs. In fact, the literature in communication disorders, education, medicine, public health, and related disciplines is replete with research on this subject. Yet there is a gap in school programming for conservation (Folmer, 2006) and little literature on collaborative efforts among various school personnel.

To examine these issues, the current review was conducted with several purposes in mind: (a) to recap the current literature relative to NIHL and chronic exposure to loud ambient noise among school children, (b) to examine the role and barriers for school personnel (e.g., audiologists, general education teachers, health educators, school nurses, and speech-language pathologists [SLPs]) with respect to participating in identification of NIHL and in conservation among school children, and (c) to discuss current practice, with a long-term aim of advocating for policy change and more collaboration among professionals.

**Noise Exposure Among School Children**

Noise exposure among schoolchildren results from many daily experiences; examples are provided in Table 1. While some potentially damaging sound sources are obvious (e.g., tractor pulls), others are much more difficult to identify. Furthermore, the range of sound levels can also vary significantly for a single source, depending upon circumstances. For example, an iPod at half volume is likely not to pose harm, whereas listening to the same iPod at full volume can lead to NIHL (Fligor, 2009).
Because most items do not come with warning labels, it is also difficult to recognize the hazardous noise levels of some children’s toys. These toys typically include vehicles with horns or sirens, musical and educational electronic toys, squeaky toys, toy phones, and cap guns. Similarly, television volume, rock or orchestra concerts, and lawn mowers can all create potentially damaging noise, but if an individual is at a sufficient distance or if the volume is below damaging levels, there may not be any long-term impact. Time of exposure also plays an important role. Higher intensity sounds (above 85 dB) will cause damage in a shorter time than will relatively softer sounds. Other leading causes, which have been readily documented in the literature, include: (a) classroom noise, (b) indoor sports and recreational facility noise, (c) environmental noise (e.g., traffic), and (d) noise in and around the home (American Speech-Language-Hearing Association [ASHA] 2010; Bittel, Freeman, & Kemker, 2008; Fligor, 2009; Klatte, Hellbruck, Seidel, & Leistner, 2010; Rabinowitz, 2000).

Classroom noise. Classroom acoustics are influenced by several factors including: (a) ambient noise (from electronic equipment, heating and cooling systems, moving chairs, shuffling papers, etc.), (b) speech-to-noise ratio (SNR) at the student’s (listener’s) position, and (c) reflected or reverberated sounds (Crandell & Smaldino, 2000; Flexer, 1980; Yang & Bradley, 2009). Poor classroom acoustics in the U.S. and other countries are well documented and many schools have improved the SNR and consequently improved select student outcomes by using classroom amplification systems (Crandell, Smaldino, & Flexer, 1995; Rosenberg et al., 1999). Yet, many classrooms are not amplified, and while improving the SNR for the teacher’s voice is a benefit, the overall noise-scape still poses significant concerns. For example, Klatte and Hellbruck (2010) describe an increase in noise level during common classroom activities such as group work (which is not typically associated with the use of a classroom FM system). They report that the increase in noise is due to reverberation that is further boosted by what they term “the café effect,” (i.e., a manifestation of the Lombard effect in social situations): “When separate groups of children are working in the room, each group competes with the reverberant noise from other groups (p. 2).”

Klatte and colleagues (Klatte & Hellbruck, 2010; Klatte et al., 2010; Klatte, Lachmann, & Meis, 2010; Klatte, Meis, Sukowski, & Schick, 2007; Klatte, Wegner, & Hellbruck, 2005) provide some of the most recent and comprehensive evidence of the significance and impact of the noise-scape in the classroom and other learning environments (e.g., preschool facility). Their work is based upon several well-established premises about learning: (a) most classroom instruction is delivered orally, and thus, facilitating listening is a necessity for successful learning (Flexer, 1980), (b) optimal acoustical conditions for instruction are essential to learning facilitation (Crandell & Smaldino, 2000; Flexer, 1980; Larsen & Blair, 2008), and (c) school-aged children are more negatively affected by poor SNR since their communication and listening skills are not fully developed until adulthood (Klatt & Hellbruck, 2010; Shield & Dockrell, 2008; Yang & Bradley, 2009), and those skills are more likely to be compromised when hearing loss exists (Daud et al., 2010; Lieu, 2004; McFadden & Pittman, 2008). Klatt and colleagues and others have documented SNR, reverberation, and other measures of unfavorable noise-scapes and report negative outcomes for schoolchildren including reduced cognitive performance, annoyance, and altered social-emotional school attitudes. Highlights of this work, which strongly link noise with psychological, physiological, and learning concerns, are below:

- Compromised language and reading acquisition (Evans & Maxwell, 1997; Haines et al., 2001; Maxwell & Evans, 2000), poor execution of oral instructions, and difficulty categorizing speech sounds (Klatte et al., 2007);
• Poorer scores on standardized tests of literacy, mathematics, and science (Shield & Dockrell, 2008);
• Decreased intelligibility of speech (Crandell & Smaldino, 2000; Yang & Bradley, 2009);
• Poorer performance on phonological discrimination tasks (Klatte et al., 2007);
• Self-reported increases in level of stress and annoyance (Klatte & Hellbruck, 2010);
• Negative effects on cognition including short-term memory (Klatte et al., 2010), intentional, incidental, and recognition memory (Lercher et al., 2003) and disrupted memory for nonwords (Klatte et al., 2007), and
• Less positive view of relationships with peers and teachers (Klatte et al., 2010).

In summary, noise exposure may or may not lead to NIHL, but it has the potential for a profound but not yet completely understood impact on children.

Indoor sports and recreational facilities noise exposure. Despite the increasing number of children involved in indoor sports and recreation and the implications for the noise-scape, few researchers have published sound levels recorded during these events. In one study of noise levels during adult aerobics, Torre and Howell (2008) recorded intensity of the noise using lapel-level dosimeters. They reported peak noise levels between 90.5 and 99.7 dBA1; the mean noise level was 87.1 dBA. The Institute of Sound and Vibration Research (ISVR, 1997) has reported the noise levels for typical recreational activities. In a series of pilot studies, Akbar-Khanzadeh and colleagues (Akbar-Khanzadeh & Spino, 2004; Akbar-Khanzadeh & England, 2004; Ames & Akbar-Khanzadeh, 2006) reported varying levels of noise across sporting venues. Typical levels of noise exposure at the field-boundaries (area monitoring) of sporting events (primarily indoors) reported by Akbar-Khanzadeh and colleagues (2004, 2006) were as follows:

• karate classes, the minute-time-weighted average exposure ranged up to 112 dBA;
• soccer games, noise levels average 86-90 dBA;
• basketball games, noise levels ranged up to 77 dBA;
• hockey games, noise levels ranged up to 86 dBA;
• swim meets, noise levels ranged up to 94 dBA;
• volleyball matches, noise levels ranged up to 83, dBA and
• indoor skate parks with wooden ramps, average area noise ranged up to 95 dBA.

Peak noise levels for each of these events were as high 145 dBC. [It should be noted that these noise levels, except in a few cases, were determined by area monitoring; personal noise exposures are likely to be higher since the results of area monitoring most often underestimates real personal exposure. Secondly, dBA scales represent averaged noise levels, whereas dBC levels are peak measurements.]

Environmental noise and noise in and around the home. Environmental noise exposure and the adverse effects in children have been established, particularly related to transportation noise from traffic, trains/subways, and airports (e.g., Klatte et al., 2007; van Kempen et al., 2010). Much less is known about the daily noise-scape of the home, since it is not easy to quantify as it is so variable. Considering the decibel levels of everyday sounds within and around the home reported in Table 1, it is likely that children have substantial noise exposure of at least a moderate intensity level, and likely more.

Noise Induced Hearing Loss

When noise exposure does lead to temporary or permanent NIHL, the psychological and learning problems grow exponentially. Even mild high frequency hearing loss exacerbates learning problems since the child has to contend with noise issues as well as challenges of sound access and the impact of the loss itself (Lieu, 2004; Lieu, Tye-Murray, Karzon,

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1 The A-weighting sound levels approximate the 40-phon equal loudness contour, thereby representing normal hearing sensitivity in the human ear (Goldberg & McCormick Richburg, 2004, p. 159).
### Table 1. Typical “Noise-Scapes” of School Children

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<tr>
<th>Sound Source</th>
<th>Decibel Level (dBA)</th>
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<tr>
<td>Computer</td>
<td>37-45</td>
</tr>
<tr>
<td>Laser printer</td>
<td>58-65</td>
</tr>
<tr>
<td>Video/electronic games (e.g., Wii, DS, Game Cube)</td>
<td>68-76</td>
</tr>
<tr>
<td>Personal listening device (iPod, Mp3) – varies by earphones and volume level</td>
<td>45-110</td>
</tr>
<tr>
<td>Baby rattle</td>
<td>73-89</td>
</tr>
<tr>
<td>Squeeze toy</td>
<td>81-97</td>
</tr>
<tr>
<td>Television</td>
<td>70-90</td>
</tr>
<tr>
<td>Telephone</td>
<td>60-75</td>
</tr>
<tr>
<td>Alarm clock</td>
<td>60-80</td>
</tr>
<tr>
<td>Inside car with windows closed</td>
<td>60-90</td>
</tr>
<tr>
<td>Food disposal</td>
<td>67-93</td>
</tr>
<tr>
<td>Refrigerator</td>
<td>40-45</td>
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<tr>
<td>Dishwasher</td>
<td>54-85</td>
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<tr>
<td>Clothes washer</td>
<td>45-75</td>
</tr>
<tr>
<td>Bathroom exhaust fan</td>
<td>54-55</td>
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<tr>
<td>Stereo playing in the background</td>
<td>45-50</td>
</tr>
<tr>
<td>Stereo playing at maximum output</td>
<td>110-125</td>
</tr>
<tr>
<td>Normal conversation</td>
<td>50-65</td>
</tr>
<tr>
<td>Lawn mower</td>
<td>68-103</td>
</tr>
<tr>
<td>Electric lawn edger</td>
<td>81</td>
</tr>
<tr>
<td>Weed trimmer</td>
<td>94-96</td>
</tr>
<tr>
<td>Leaf blower</td>
<td>95-115</td>
</tr>
<tr>
<td>Restaurant</td>
<td>105-112</td>
</tr>
<tr>
<td>Indoor sports facility</td>
<td>77-112*</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>90</td>
</tr>
<tr>
<td>Snowmobile</td>
<td>105-120</td>
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<tr>
<td>Subway</td>
<td>88</td>
</tr>
<tr>
<td>Train</td>
<td>75-102</td>
</tr>
<tr>
<td>Heavy city traffic</td>
<td>70-100</td>
</tr>
<tr>
<td>Light city traffic</td>
<td>45-50</td>
</tr>
<tr>
<td>Rock concert</td>
<td>140</td>
</tr>
</tbody>
</table>


By definition, noise exposure is characterized by exposure to sounds that exceed 85 dBA SPL across a given time period. Researchers have reported that damage to the structures of the inner ear, as a result of noise exposure, is caused by an interaction of mediators or confounders including noise intensity, duration, number of exposures, and individual susceptibility (Cooley Hidecker, 2008; Fligor, 2009). Sound exposure may be chronic (lower levels across an 8-hour or longer period) or acute, which occurs as a result of a single event such as an explosion or gunshot close to the ear. Chronic damage may cause temporary shifts in hearing threshold and eventually leads to permanent changes in hearing (or other physiological and psychological problems). Whereas, acoustic trauma caused by an acute exposure creates an immediate hearing loss. Outer hair cell/sensory cell damage resulting from noise is typically associated with a high frequency sensorineural hearing loss (centered at 4000-6000 Hz) that can gradually lead to a shift at all frequencies. Ringing in the ears, or tinnitus, is a commonly associated warning sign of NIHL, but is often ignored. Over time, the tinnitus can become quite severe and interfere with daily activities, including sleeping.

Although changes in hearing threshold may be considered subtle, the NIHL is permanent and worsens with continued exposure. While much less is known about childhood NIHL, emerging research results indicate correlations of NIHL with the following:

- individual noise-scapes,
- exercise and eating habits,
- sleep disturbances,
- body mass index (BMI),
- depressive and anxiety disorders,
- heredity factors related to hearing loss, and noise exposure dosage (Daniel, 2007; Holgers & Pettersson, 2005), and
- interaction with chemical and prescription drugs.

For example, Holgers and Pettersson reported that the risk for temporary threshold shifts (TTS) was nine times higher in students with existing hearing loss. Similarly, the risk for tinnitus related to noise exposure was approximately four times higher in students who attended concerts 6-12 times per year as compared to those who never attended concerts. In a promising study of the relationship between physical fitness and hearing loss, Kolkhorst et al. (1998) reported an association between diminished TTS and physical fitness, which they attributed to more oxygen-rich blood available to the inner ear at the time of injury.

Regardless of the causation factors, when NIHL is present, it creates problems in listening, language acquisition, and learning, leading to the potential for serious academic and social concerns that jeopardizes quality of life (ASHA, 2010; Kochkin, Luxford, Northern, Mason & Tharpe, 2007; McFadden & Pittman, 2008). According to ASHA (2010) there are four major ways in which permanent hearing loss affects children: (a) it causes delay in the development of receptive and expressive communication skills (speech and language); (b) the resultant language deficit causes learning problems that lead to reduced academic achievement; (c) communication difficulties often lead to social isolation and poor self-concept, and (d) it may have an impact on vocational choices.

In summary, children with unidentified NIHL are particularly at-risk because they may not display overt signs of hearing loss, so that the resulting academic, social and learning problems may be blamed on other factors (e.g., attention deficit hyperactivity disorder (ADHD), behavior problems, and learning disability). Similarly, children with chronic exposure to intense ambient sound may experience psychological and physiological problems in addition to learning deficits.

**Identifying Noise-Related Problems in School Children**

Hearing loss and other school performance problems related to noise may go undetected for long periods of time because of the nature of the
screening process (Hendershot et al., 2011; Meinke & Dice, 2007) and the ways in which the loss manifests itself. Common signs of hearing loss include inattentiveness, distractibility, lack of focus, and even academic and/or behavioral problems, most of which are easily associated with other concerns, such as ADHD. Since many professionals (Hendershot et al., 2011; Lass et al., 2010; McCormick, Richburg, & Goldberg, 2006) and parents may not be aware of the signs of noise related hearing problems, and few physicians or other medical personnel routinely screen hearing (Kochkin, et al., 2007), at-risk students or those with established NIHL or problems associated with noise exposure face serious barriers for identification and intervention. Although there are national recommendations that children should be screened yearly in the early grades (age 3 to grade 3) (ASHA, 1985), this practice is not universally in place. Many children are screened every other academic year (e.g., 1st, 3rd, 5th, 7th, and 9th grade), so that early detection may not occur. In fact, only 21% of school children diagnosed with hearing loss during their school years were identified due to a “failed school hearing screening” (Kochkin et al., 2007). When children do fail a screening and are referred, parents may not choose to pursue testing, particularly if they do not notice a problem. Additionally, since basic information about noise exposure and hearing conservation information remains conspicuously absent from most school curricula (Folmer, Griest, & Hal Martin, 2002), diagnosis alone may not be sufficient.

Considering the impact of NIHL on academics and quality of life, it is paramount that professional partners collaborate to develop and implement hearing conservation programs. Yet, studies show that there are many barriers to implementing such programs, including lack of knowledge about the consequences of noise exposure, time, and resources (e.g., Hendershot et al., 2011).

**Personnel considerations.** Audiologists, school nurses, and SLPs can perform hearing screenings (ASHA, 2004; ASHA, 2007a; National Association of School Nurses, 2002); these personnel along with health educators can work cooperatively to establish hearing conservation programs according to the scope of practice (SOP) for each profession (ASHA, 2004; ASHA, 2007a; National Commission for Health Education Credentialing, Inc., 2011; National Association of School Nurses, 2002). However, there are relatively few educational audiologists, and school-based nurses, SLPs, and health educators may not have the knowledge and experience with NIHL and noise-related concerns. For example, ASHA’s (2007[b]) study of educational audiologists revealed that nearly half do not participate in hearing screenings, only 37% provide hearing conservation education, and 79% report a shortage of educational audiologists in their state to complete these kinds of programs. In the Hendershot et al. (2011) survey of nurses, 19% reported that their school did not have a mandate and more than 75% stated there are barriers to screening. Knowledge deficiencies have been reported by SLPs (e.g., see Pakulski, 2004) and health educators (Lass et al., 1990) on the topics of hearing, hearing loss, and the effect of noise on hearing as well.

In their work, Goldberg and McCormick Richburg (2004) reported anecdotal evidence of frequent misperceptions among professionals and the corresponding need to “educate parents and professionals who work with students with [minimal] hearing loss, including teachers, administrators, audiologists, SLPs, and school nurses” (p. 159). Those misperceptions are listed as follows:

1. Minimal hearing loss (MHL) does not exist. In essence, these children have hearing within normal limits;
2. students with MHL will be identified through school hearing screenings;
(3) if students with MHL pass the hearing screening, they should have no difficulties learning in the classroom;

(4) preferential seating is a sufficient recommendation or modification for students with MHL, and

(5) hearing conservation programs are not needed in school settings (pp. 153-158).

In a follow-up study, McCormick Richburg and Goldberg (2006) surveyed teachers’ perceptions about MHL with respect to the five myths. While some of the myths did not hold true (e.g., a majority of their participants acknowledged that MHL does exist), other myths were confirmed (e.g., a disturbing number of teachers indicated that traditional hearing screening protocols are sufficient to detect MHL and that preferential seating alone was all that was needed to accommodate the learning needs of students with MHL). The authors concluded that school personnel play an important role in identifying and addressing the needs of children with MHL. Moreover, through collaboration, team members can contribute accurate information and provide effective intervention for students with MHL.

In earlier studies, Lass et al. (1985) surveyed classroom teachers’ and special educators’ knowledge of hearing and hearing loss. Their conclusions were similar to those of Goldberg and McCormick Richburg’s two studies, including the notion that more academic preparation or continuing education is necessary, considering that special educators may have had only a single discussion as part of a course that included hearing and/or hearing disorders and the majority of classroom teachers will not have had any academic exposure. Lass et al. (1990) also surveyed health educators’ knowledge of hearing, hearing loss, and hearing health practices. They reported similar deficiencies in personnel preparation, particularly regarding the effect of noise on hearing. Other noteworthy findings: (a) the majority of health teachers (74.2%) reported that they never wear hearing protection themselves, and (b) more than one-fourth (28.1%) did not know the non-medical professional who specifically studies and tests hearing was an audiologist.

In a related study, previously conducted by the present authors (Hendershot et al., 2011), school nurses were surveyed regarding their practices and knowledge related to screening for NIHL and hearing conservation programming. The Hendershot et al. findings were as follows: perceived benefits of providing hearing screening included: (a) increases quality of life for students (83.6%), (b) provides information to parents about hearing loss (78.2%), and (c) creates awareness of hearing loss problems (68.6%);

- potential barriers related to screening students’ hearing included: (a) a lack of parental response (36.5%), (b) not having enough time (34.1%), and (c) not knowing how to properly screen for noise-related hearing loss (30.7%);

- benefits of offering conservation programs included: (a) decreased incidence of hearing loss across students’ lifetime (76.3%), (b) improved academic (76.6%) and social (63.4%) outcomes, (c) increased student motivation to take action to prevent hearing loss (72.0%);

- potential barriers to providing conservation programs were: (a) lack of time to focus on students who may be at-risk because of other job responsibilities (63.9%), (b) lack of expertise on noise-related hearing loss prevention in our school (59.1%), (c) lack of standardized material for parents and students (55.6%), and (d) lack of resources (46.7%).

Similar to the other personnel studies, Hendershot et al. (2011) concluded that school nurses must recognize the importance of detecting NIHL, must be able to make appropriate referrals, assume a leadership role in advocating for programs to address NIHL, and must help parents, students, and staff understand the importance of hearing
conservation. More emphasis should be placed upon incorporating hearing and noise education into school curricula.

**Discussion**

Hearing and listening play a crucial role in learning and academic achievement because they provide the avenue through which children become acculturated into our society and learn its language (Hearing Loss Association of America, 1999). Even a seemingly insignificant decrease in hearing threshold (e.g., 10 dB) will reduce a child’s [subjective] perception of loudness of a speech signal by half (Madell & Flexer, 2008). Considering the many confounding factors, such as distance from the teacher in the classroom and background noise, no degree of hearing loss can be considered “acceptable.” Nevertheless, marginal/mild hearing loss is a frequent occurrence in school children (Daud et al., 2010; Shargorodsky et al., 2010) that creates more severe consequences than are generally realized (Daud et al., 2010; Tharpe, 2008) by parents and school personnel alike.

Congenital severe to profound hearing losses are most often considered the source of concern for children with hearing loss. Yet MHL, commonly associated with early noise exposure, is much more common. In fact, prevalence estimates range as high as 19.5% (Shargorodsky et al., 2010) and many of these losses go undetected because individual students may not overtly display communication-related problems. As a consequence, the “risk” status for language and academic development tends to be overlooked. However, when group performance is considered, or when a detailed evaluation is conducted on an individual child with hearing loss, these deficiencies become apparent (Daud et al., 2010; Kaderavek & Pakulski, 2002; Tharpe, 2008). Areas of concern include speech and language development, especially in the area of discourse, poorer academic achievement, and psychosocial adjustment (Daud et al., 2010; Lieu, 2004; Lieu, Tye-Murray, Karzon & Piccirillo, 2010; Shargorodsky et al., 2010). This is not surprising, considering school age children are still learning language, and even a mild hearing loss may make it difficult to grasp many of the grammatical features of speech (particularly those conveyed by weak final consonants such as /s/ for plural and possessive formation).

Not surprisingly, studies have shown a significant relationship between students who have poor academic performance and mild hearing loss (Daud et al., 2010; Tharpe, 2008). As many as 37 percent have failed at least one grade, especially those with unilateral hearing loss, compared to a two percent failure rate by their normally hearing peers (Bess, Dodd-Murphy, & Parker, 1998; Oyler et al., 1998). Students with mild hearing loss in upper grades exhibit poorer ratings for stress, self-esteem, and social support than normally hearing children (Tharpe, 2008). Similarly, chronic noise exposure can create stresses to the body’s physiology that can have devastating effects.

Considering that teachers in noisy schools report greater fatigue, annoyance, and less patience when compared to teachers from quieter schools (Evans & Hygge, 2000), these findings make sense. These stresses have the potential to impact teachers’ attitudes towards their students. As for the children, “listening becomes more effortful, and noise makes concentration and mental work more difficult” (Klatte & Hellbruck, 2010, p.2). They blame the strenuous nature of listening and talking in a loud and reverberant atmosphere and the frequent disruptions in the “flow of instruction” necessitated by repetitions and efforts to control noise through classroom management.

The U.S. Environmental Protection Agency (1981) provides a useful summary of the magnitude of effects on humans related to various types of noise across the day and night at intensity levels ranging from 55 to 75 dB (see http://www.nonoise.org/library/handbook/handbook.htm).
Specifically, this document provides risk estimates for non-auditory disease (e.g., stress), compromised speech intelligibility, annoyance, overt community reaction, and anticipated negative attitudes exacerbated by noisy environments.

Despite these known concerns, some schoolchildren are not routinely screened for hearing and most are not involved in hearing conservation programs. While audiologists are best suited to provide these services, there are personnel shortages in many states. As a result, fewer than half provide hearing screening and hearing conservation education (ASHA, 2007b). Seventy-five percent of school nurses report barriers to screening (Hendershot et al., 2011). Most health educators do not address NIHL in their curricula (Folmer, 2002). Little is known about SLPs' involvement in hearing screening or hearing conservation.

Social attitudes are also of concern and should be a regular part of school curricula (Hendershot et al., 2011; McCormick Richburg & Goldberg, 2006). In a study of elementary children's knowledge and intended behavior toward hearing conservation, Chen et al. (2009) found that only 55% of children knew that hearing protective devices could protect them against noise; 28% of children did not intend to adopt any protection behavior. Holmes, Widen, Erlandsson, Carver, and White (2007) reported that very few young adults report consistent use of hearing protection either, despite the fact that more than 20% complain of ear pain, tinnitus, and/or a temporary threshold shift after noise exposure. The majority of health educators in the Lass et al. (1990) study reported they did not intend to use hearing protection themselves. Equally concerning, half of the nurses (50.0%) in the Hendershot et al. (2011) survey believe they cannot change students' behavior related to personal listening devices and other causes of NIHL.

Hearing education and conservation must also include parents, caregivers, health care personnel (e.g., pediatricians) and educators/administrators. Ideally, a collaborative team of educational personnel teamed with parents could be a resource for the community to gain access to information about noise and NIHL, how to better manage noise and deal with hearing loss, and how to recognize when changes in a child's behavior might be due to subtle changes in hearing status as the result of noise exposure. NIHL is 100% preventable and school personnel should work together towards educating the people that they serve regarding this condition and its consequences. If school personnel work cooperatively with an aim of promoting hearing health, children would greatly benefit as students and into adulthood.

There are many areas for future research. Although scope of practice and practice guidelines for audiologists, school nurses, and SLPs address hearing screening, little is known about each profession’s daily practices related to identifying students at-risk for NIHL, prevention, and education. Similarly, more needs to be learned about potential contributions of health educators and collaborative efforts among school personnel. Equally important, more research needs to examine the impact of noise from students’ daily noise-scape.

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References


eHearsay Volume 1 BLOG – We Want To Hear From You!

Do you have a comment about something you’ve read in this issue of eHearsay? Do you know of additional resources on this topic that might be of interest to our readership? Please take a moment to share your thoughts and direct your fellow readers to information of interest. The eHearsay Editors invite your participation.

I’ll be monitoring this board regularly, and if you have a question I can’t answer, I’ll help you find someone who can. Help us celebrate the inaugural issue of eHearsay and tell us what you think. — Kate Krival, PhD CCC-SLP

GO TO: http://ohioslha.org/wordpress2/?p=56
CEU Questions for Pakulski, DeVantier, Thompson and Hendershot
Professional Roles and Responsibilities in Preventing and Identifying Students at Risk for Noise Induced Hearing Loss in Schools

1. Which school personnel could contribute to the prevention of noise induced hearing loss among school children?
   a. Speech-Language Pathologists
   b. School Nurses
   c. Health Educators
   d. All of the above

2. Which is a visible sign of damage to the sensory cells caused by noise?
   a. There are no visible signs
   b. Inflamed tympanic membrane (eardrum)
   c. Drainage from the ear
   d. Malformed outer ear/pinna

3. Which of the following is considered a risky behavior that is likely to contribute to noise induced hearing loss among school children?
   a. Listening to a personal listening device (iPod) at 1/3 volume for 6 hours
   b. Listening to a personal listening device (iPod) for 1 hour at full volume
   c. Listening to the marching band at an outdoor stadium during half-time of a football game
   d. Riding the school bus for 15 minutes per day with moderate conversation among the children

4. Why might emerging hearing and listening related problems go undetected in school children?
   a. Several states do not mandate hearing screenings for school age children.
   b. The subtle signs associated with noise induced hearing loss make it difficult to identify.
   c. Screening personnel tend to use traditional pure tone audiometry for screening, which may not be sensitive to early damage of the sensory cells of the inner ear.
   d. All of the above
Abstract

The purpose of this study was to examine the effects of different types of Memory Book stimuli in the conversations of persons with dementia. Six participants with moderate dementia were engaged in five minute conversations with three versions of their Memory Book (one with only pictures; one with only text; and one with pictures and text). The combined text + picture condition elicited more novel utterances than the other two conditions. The results of this study support the use of Memory Books with picture and text stimuli in conversations with persons with dementia.

Learning objectives

1. Participants will be able to describe the benefits of a Memory Book.
2. Participants will be able to construct a Memory Book with pictures and text.
3. Participants will be able to describe improved features of conversations with a Memory Book.

The Effects of Visual Stimuli on Conversations in Dementia

Dementia is a degenerative neurologic disease that involves the deterioration of memory and other cognitive functions over time and impairs social and occupational functioning (DSM-IV, 1994). Communication difficulties, such as generating ideas and conveying meaning, are common in dementia. There are also memory issues, such as word finding difficulties and repetitive behavior (Bourgeois & Hickey, 2009). These problems often impact the everyday life of the individual with dementia and make it hard for the family and caregivers to communicate with them about everyday tasks and situations. Individuals experiencing dementia often have trouble finding the words that they want to use in conversation and remembering the answers to questions their caregivers just provided.

With progression of the disease, both short term and long term memory become increasingly impaired. The inability to save new information from short term memory into long term memory causes the retrieval of memories to be difficult and to impact quality of life negatively. The use of an external memory aid helps trigger stored long term memories and reduces the frustration experienced by persons with dementia during conversations (Bourgeois, 2007).

Memory Books are used as written and graphic cues to support memory and conversation. It has been found that the use of Memory Books increases the quality and quantity of conversations in those with dementia because persons with dementia have the preserved ability to read written cues (Bourgeois, 2007). The use of Memory Books is a compensatory strategy that helps to get around the memory problem without directly teaching or re-training the information that has been forgotten (Bourgeois, 2007). Memory Books facilitate conversation using the sentences and pictures that illustrate the life and times of individuals and their families by triggering long term memories.

The previous research on the effects of Memory Books on patients with dementia involved Memory Books consisting of written sentence and picture stimuli (Bourgeois, 2007). Each Memory Book page included one sentence or phrase and at least one picture; for example, “I graduated from Pomfret School in 1968,” and the picture of the school building. In previous research, Memory Books included both types of stimuli. It is not clear, however, what specific type of stimulus (print,
picture, or a combination of the two) contributes the most to the process of accessing memories during conversation. The original purpose of using a combined stimulus for Memory Books was to give individuals the most potential to access memories. Understanding the relative benefits of each stimulus would help clinicians to know how best to design Memory Books for future clients.

The purpose of this study, therefore, was to determine the relative benefits of different types of stimuli used in conversations with Memory Books. The research questions asked were: How do different types of stimuli affect the amount and types of utterances produced in conversations of patients with dementia? Is print alone better? Are pictures alone better? Or does the combination of print and picture stimuli facilitate the best conversations? It was hypothesized that the combination of both print and picture stimuli would yield the best quality and quantity of utterances by individuals with dementia.

Method

Participants

Participants who had a diagnosis of dementia and were willing to engage in conversation with another individual were recruited from local nursing homes upon recommendation from the staff. Consent was obtained from the family. The experimenter screened potential participants using the *Mini-Mental State Examination* (MMSE) (Folstein, Folstein, & McHugh, 1975) and the Bourgeois Oral Reading Screen (Bourgeois, 1992a). The purpose of these measures was to document the severity of dementia and the font size (either 36 point font or 14 point font) that could be easily read by the participant. Additional information regarding hearing loss or vision impairment was gathered, either from the participant or a family member/caregiver to confirm that the participant could hear the experimenter and see the materials.

Six individuals, four females and two males, with a mean age of 85 years (S.D. = 4.6) participated. The mean MMSE score was 17.2 (S.D. = 3.3) indicating dementia of moderate severity. All participants read the 36 point font with two or fewer errors.

![Sample Memory Book format](image)

Figure 1. Sample Memory Book format. Shown above is an example of the three versions of the Memory Book created for each participant.
Factual information and pictures of important people, things, and hobbies in the participant’s life were gathered from their family member using the Memory Book Information Form (Bourgeois, 2007). The information was compiled into a ten-page memory book consisting of one sentence and one picture per page. Two additional versions of the Memory Book were made; one that consisted of the sentences only (one per page) and another that consisted of the pictures only (one per page) as seen in Figure 1.

All pages were 8 ½ x 11 inches in size and presented in plastic page protectors. All text was 36 point font. Each version of the Memory Book was placed in separate ½ inch black binders.

Setting
Each session was conducted in a quiet room at the nursing home or family home of the individual. The experimenter sat at a 90 degree angle to the subject around the corner of a table which allowed the experimenter to turn the page or assist the participant if needed. No distractions, such as the television, were permitted. The rooms were well lit to eliminate the possibility of any vision issues during the sessions.

Design
A within-subjects group design was used to investigate the effects of three stimulus conditions (combined, text alone, and pictures alone) on multiple conversational variables. The six participant variables were: Memory Book Statement, Novel Related Statement, Novel Unrelated Statement, Perseverative Utterance, Error Statement, and Other Speech Act. There were three partner (experimenter spoken) variables: Partner Prompt, Partner Statement, and Partner Other. See Figure 2 for definitions of these variables.

Procedure
Each participant conversed with the experimenter during three sessions, each of which was approximately 30 to 45 minutes in length and on separate days. During each session, the three versions of the Memory Book were presented in a counter-balanced order. Counter-balancing occurred not only between trials for the participant but also between each of the participants. Between presentations of each Memory Book, a distraction activity was presented such as a craft or a puzzle. The purpose of this is to clear their mind from the task at hand and prevent recall of specific conversation from the previous trial. Each trial began with the partner statement,
“I made a book for you. It has pictures (sentences/pictures, sentences) about your life. It can help you talk about your life/family/things that were important to you.”

During the conversational sessions, if the participant did not respond within 5 seconds or stopped talking, the partner prompted with “Please read this” or “What else can you tell me about that?” The session continued until a stopwatch signaled that five minutes had passed. If the participant was still engaged in conversation when the stopwatch signaled that five minutes had elapsed, the partner waited for a lull in conversation before moving on to the distraction activity. The sequence of Memory Book stimulus then distraction activity continued until the three stimulus materials had been presented.

**Transcription and Coding**

Each session was audio taped with an Olympus Digital Voice Recorder WS-400S. The recording was transcribed and divided into statements. Each sentence or utterance was numbered and coded using definitions adapted from Bourgeois (1992b). A description of each code is listed in Figure 2. The coding system captured qualitative and quantitative features of the conversation. A second individual was recruited to learn the codes and she scored 20% of the conversations separately. Overall inter-rater reliability was 85.2% agreement, ranging from 80% to 93%.

**Results**

**Analysis of Participant Data**

Figure 3 shows the mean frequency of each dependent variable for participant utterances. To answer the research question of which stimulus contributed most to conversations, the total number of utterances was analyzed. The text, picture, and combined conditions averaged 29.1 (S.D. = 10.20), 31.3 (S.D. = 14.40), and 35.3 (S.D. = 12.90) utterances, respectively. The combined condition yielded the most total number of utterances on average and the Repeated Measures ANOVA of the mean number of Total Utterances was statistically significant [F (1,5) = 6.67; p < .05. The Bonferroni post-hoc comparisons, however, did not reveal any significant differences between any of the stimulus conditions.

Novel Related Statements elicited from the six participants are also shown in Figure 3. The mean Novel Related Statements for text, picture, and combined conditions were 10.3 (S.D. = 5.58), 14.5 (S.D. = 6.99), and 16.6 (S.D. = 7.09), respectively. The combined condition again yielded the most Novel Related Statements on average. These means were statistically different [F (1,5) = 10.26; p = .024]; however, the Bonferroni post-hoc comparisons did not reveal any significant differences between any of the stimulus conditions.

The mean of Memory Book Statements, as shown in Figure 3, for text, picture, and combined conditions were 8.22 (S.D. = 0.91), 0.00 (S.D. = 0.00), and 5.39 (S.D. = 1.99), respectively. The text condition elicited more Memory Book Statements on average than the combined condition. No text was presented in the picture condition, thus no Memory Book Statements could possibly be elicited. The means were statistically different [F (1,5) = 18.45; p < .01]. The Bonferroni post-hoc comparison revealed differences between the text and picture conditions (p > .001), the picture and combined conditions (p = .004), and the text and combined conditions (p = .023).

The mean Novel Unrelated Statements for the text, picture, and combined conditions was .56 (S.D. = 0.69), 1.94 (S.D. = 1.94), and 1.61 (S.D. = 1.51), respectively. These means were not statistically different [F (1,5) = 2.05; p = .212]. On average, fewer than two Novel Unrelated Statements were produced in any single conversation, but the picture condition yielded the most Novel Unrelated Statements overall.

Perseverative Statement and Error Statement dependent variables were similarly low frequency behaviors. The Other Statements variable had means of 7.6 (S.D. = 2.74), 12.1 (S.D. = 6.90), and 9.3 (S.D. = 5.61) for text, picture, and combined conditions, respectively. There were no
Figure 3. Participant Utterances. The figure above shows the mean frequency of all participant utterances by type and condition. Statistical difference is indicated by an asterisk after the dependent code in the legend to the left. Note that there is no Memory Book bar in the picture condition because this condition had no text presented.

Figure 4. Partner Utterances. The figure above shows the mean frequency of all partner utterances spoken by the experimenter across conditions.
Analysis of Partner data

The statistical analysis revealed that the means were not significantly different for any of the partner dependent variables. This confirms that the experimenter was consistent in following the protocol for each condition and each participant (see Figure 4 for details).

Discussion

The purpose of this study was to examine the relative benefits of different types of stimuli presented in a Memory Book. In previous research, the use of a Memory Book with a combined stimulus was used to give those with dementia the most opportunity and potential to talk about different topics in the Memory Book (Bourgeois, 2007). The results of the current study revealed that the combined condition produced significantly more Total Utterances overall and more Novel Related Statements than either separate condition. The text alone condition produced more Memory Book Statements than either of the other two conditions; and the picture alone condition produced more Novel Unrelated Statements and Other Statements than the other two conditions. There were no significant findings for the categories of Perseverative, Error, or Other Statements. Similarly, there were no significant differences in the number of Total Partner Utterances, Partner Prompts, Partner Statements, and Partner Other Statements and across stimulus conditions.

The current study confirms that the combined stimulus condition allowed participants to talk more (Total Utterances) and to generate more Novel Related Statements than text or picture stimuli alone. These findings are similar to those of previous Memory Book studies (Bourgeois, 1992b; Bourgeois, 2007). Furthermore, the current study revealed no significant differences between stimulus conditions regarding behaviors that have been previously seen to decrease significantly with the presence of cueing such as Perseverative Statements, Error Statements, and Other Statements. This supports previous research in that any form of cueing helps to decrease these behaviors (Bourgeois, 2007). These findings suggest that clinicians and families should be advised to use both picture and text stimuli when creating and using Memory Books with family members.

The text alone condition produced more Memory Book Statements than either of the other two conditions. Previous research has not investigated the use of text alone to elicit conversation in persons with dementia. The findings in the present study suggest that when presented with text only, persons with dementia read the text and often move to the next page of the Memory Book. The text condition seems to be insufficient in accessing other related memories (when compared to the combined condition). It is possible that the presence of a picture carries important and different information that is used to access memories. As with the text alone condition, previous research has not investigated the use of only pictures to elicit conversation in persons with dementia either. The picture alone condition produced more Novel Unrelated Statements and Other Statements than the other two conditions. It is possible that the picture condition produced more Novel Unrelated and Other Statements because the cueing provided in the picture condition is not as specific as the text condition. In both cases (text alone and pictures alone), the participants often tried to retrieve a memory on their own without sufficient cueing. More research is needed to understand the relationship between text and pictures and cued memories.

The limitations of this study are related to the number and type of participants. This was a small study investigating the conversations of only six participants with moderate dementia. More participants with a wider range of severity of dementia would be needed to generalize the findings of this study to the larger population of patients with dementia.
Conclusions

Because previous Memory Book research investigated the use of a combined (pictures and text) stimulus only, there has been little evidence for the relative benefits of each stimulus individually. The current study supports the use of a combined stimulus as the most effective in eliciting and supporting conversations in dementia. Family members and others interested in improving the conversations and the quality of life of individuals with dementia would be well advised to create Memory Books including both pictures and text.

Acknowledgments

The authors wish to thank Sara Porter for her help with reliability coding of conversations as well as the participants and their families. This study was funded by The Ohio State University College of Arts and Sciences: Social and Behavioral Sciences Undergraduate Research Grant. Ms. Wilhelm may be contacted by email at wilhelmcl@gmail.com

References


CEU Questions for Wilhelm and Bourgeois
The Effects of Visual Stimuli on Conversations in Dementia

1. Persons with dementia may have all the following characteristics except:
   a. problems with long term memory
   b. intact short term memory
   c. forgetting the questions that were just asked of them
   d. troubling remembering names or words for what they want to talk about

2. Memory Books that have been shown to be effective in increasing the quality and quantity of conversation in persons with dementia likely include the following:
   a. written cues (if the client can still read)
   b. audio samples
   c. picture cues
   d. video samples
   e. both a and c

3. The participants in this study had all the following characteristics except:
   a. Mini-Mental State Exam scores within normal limits
   b. Ability to read 36 point font sentences with 2 or fewer errors
   c. Family members who could provide Memory Book content
   d. Reasonable ability to see and hear the instructions

4. The experimental conditions in this study included which of the following?
   a. Memory Book with one sentence per page
   b. Memory Book with one picture per page
   c. Memory Book with one picture and one sentence per page
   d. All of the above

5. The primary conclusion of this study was that:
   a. text and picture should not be used as memory aids together
   b. audio recordings helped subjects produce more total utterances
   c. text and picture together encourage more total utterances and novel utterances
   d. memory books of any sort do not aid persons with dementia in conversation
Clinicians and researchers need to document variations in parent-child discourse during various interactive contexts to facilitate the language development of children. It is particularly important to document communication patterns for children with language impairments (LI) because children with LI are less active conversational partners as compared to children who are typically developing. In this article, the authors identify a specific approach that employs discourse- and utterance-level measures and pilot test the approach with a case study to document the utility of the tool in analyzing communication differences in a parent-child dyad during book reading and mediated television/video viewing contexts. Implications for practice and further research are discussed.

**Learning objectives**

1. Participants will describe the importance of incorporating shared book reading into interventions for children who are language impaired and the potential learning opportunities for mediated television/video watching
2. Participants will describe the rationale for evaluating both discourse and utterance-level analyses during parent-child interactions
3. Participants will understand the importance of identifying contingent responses during parent-child interactions

Parent-child discourse within engaging and familiar routines of childhood is a fundamental opportunity for facilitating children’s language learning (Hart & Risley, 1995; Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991; Landry & Smith, 2006; Snow, 1986; Whitehurst & Lonigan, 1998). Parents’ own communication and expectation for a child’s communication performance vary according to the communication context (Crain-Thoreson, Dahlin, & Powell, 2001). For example, parents typically ask more direct questions and lead the discussion during book reading as compared to other interaction contexts, such as toy play (Sulzby & Kaderavek, 1996). This variation in expectations and communication demands impacts child language output (Girolametto, Weitzman, Van Lieshout & Duff, 2000).

It is particularly important to examine parent-child communication routines in different contexts for children who have a language-impairment (LI) because discourse parameters during parent-child interactions are altered when a child has a LI. For example, previous research indicates that children with LI are less active conversational partners and do not initiate conversations as often as children who are typically developing (Conti-Ramsden, 1990). Not only are children with LI less active conversationally during parent-child exchanges (Brinton, Fujiki, & Powell, 1997; Conti-Ramsden, 1990; Hadley & Rice, 1991; Hutcheson & Conti-Ramsden, 1992), children with LI are negatively impacted by directive adult interaction styles.
Girolametto and his colleagues compared teacher-child discourse features in two contexts, book reading and a Play-Doh activity (Gorplametto et al., 2000). The language of eight children with developmental disabilities and LI between the ages of 2;9 and 4;2 was compared to peers who were typically developing. The children with LI evidenced more interaction and verbal output during the Play-Doh activity as compared to book reading. Since the teachers evidenced more directive behaviors in the book reading interaction, it was hypothesized that the less-directive Play-Doh context enhanced language production for children with LI. Thus, there is a need for clinicians and language researchers to examine subtle differences in children's responsiveness (especially for children with LI) within varying adult-child contexts. Such fine-grained linguistic analysis of discourse- and utterance-level features can highlight specific communication practices that either facilitate or inhibit children's communication in different contexts.

**Discourse Analysis Tool**

Fine-grained linguistic analysis of parent-child interaction requires sensitive tools and measures that should include discourse analysis. A discourse analysis tool, at a minimum, should be able to capture (a) topic control, (b) communication mutuality, and (c) various utterance features. Further, it should be sensitive enough to distinguish differences in discourses patterns across contexts.

**Topic control and communication mutuality.**

Discourse analyses should document a child's ability to effectively convey information and to introduce his or her own topic; this is considered a measure of topic control. It is important to document topic control in children with LI because children with LI are less proficient at introducing and maintaining new topics compared to children with typically developing language (Dollaghan & Miller, 1986). Discourse analysis also documents communication mutuality. Topic contingency, which reflects the conversational partners “sharing a conversation,” is demonstrated when a conversational turn connects to the previously introduced topic. In an effective conversation, communication partners share information using topically linked exchanges. Topic contingency codes answer the question: Do the communication partners share and elaborate each other's topics?

In this study, three discourse codes were developed to document topic contingency, *partner topic* (PTO), *joint topic* (JT), and *extension* (EXE). We adapted the control of interaction (COI) codes from Rescola and Fechnay (1996). There is a serial dependency to the coding system (i.e., the need for a code is determined by the number and order of linked parent-child turns). The codes are described in more detail in Table 1.

In the current study, researchers coded an utterance as a *new topic* (NTO) whenever the parent or the child introduced a new idea or thought. If the communicator continued talking (without a comment from the communication partner) this was coded as *own topic* (OTO). The parent's or child's use of NTO and OTO were identified as evidence of topic control. In contrast, the PTO, JT, and EXE codes indicated topic contingency. A *partner topic* (PTO) code was scored if the communication partner “picked up” on the new topic. Continued link exchanges on the same topic are coded as either a JT (if the communication partners alternate their comments) or EXE (if the same partner extends his/her topic one time without a comment from the communication partner) after a joint topic has been established. The codes were designed to capture important elements of parent-child discourse even in brief interactions, since parent-child interactions are often less than 30 minutes in length. Codes were noted for each partner (mother, child). It was hypothesized that a preponderance of mother “control” codes (i.e., an unbalanced use of topic control evidenced by the mother's use of NTO, OTO) represents a lack of child-initiated communication. In contrast, (a) equivalent use
Table 1. Control of Interaction (COI) Discourse Codes

<table>
<thead>
<tr>
<th>CATEGORY Code</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>CONTROL</td>
<td></td>
</tr>
<tr>
<td>NTO:</td>
<td><strong>New Topic:</strong> A speaker produces an utterance that introduces a new topic. The topic is considered new if it was not the focus of either partner’s most recent utterance.</td>
</tr>
<tr>
<td>OTO:</td>
<td><strong>Own topic:</strong> A speaker produces an utterance that maintains topic control following his/her own topic initiation (NTO). OTO is also used when a speaker continues to speak following his/her “turn” without a contribution from the other partner.</td>
</tr>
<tr>
<td>CONTINGENT</td>
<td></td>
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<tr>
<td>PTO:</td>
<td><strong>Partner’s Topic:</strong> A speaker produces an utterance that is related to a preceding new topic initiation (NTO), or joins the partner’s own topic continuation (OTO).</td>
</tr>
<tr>
<td>JT:</td>
<td><strong>Joint topic:</strong> A speaker joins or extends the partner’s topic (PTO). The utterance may be brief (e.g., yes, no, uh huh) or extended.</td>
</tr>
<tr>
<td>EXT:</td>
<td><strong>Extension of topic:</strong> A speaker produces an utterance that extends his/her topic (JT). Once extension is allowed by the same speaker (i.e., two consecutive utterances) following the establishment of joint topic (JTO). If, after one extension, the speaker continues talking without the partner joining in, subsequent utterances are coded as “own topic” (OTO).</td>
</tr>
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of NTO and OTO by both mother and child and (b) equivalent percentages of “contingent” codes (PTO, JT, EXE) represent a balanced discourse exchange.

**Utterance-level analysis.** In contrast to discourse-level codes, utterance-level analyses provide an utterance-by-utterance examination of communication output. The authors chose four utterance-level analyses: (a) mean length of utterance (for both the mother and the child), (b) number of maternal questions, (c) number of different words (mother/child), and (d) total number of utterances (mother/child).

Mean length of utterance (MLU) has robust reliability and validity as an index of language acquisition in children with and without language impairment. Growth curve modeling of longitudinal MLU data demonstrates that MLU is a reliable measure of child language ability over time (Rice, Redmond, & Hoffman, 2006).

The number of maternal questions was included in the utterance-level analyses. The use of maternal questions is thought to promote more sophisticated child language. The use of maternal questions must be carefully monitored, however, because direct questioning is inconsistent with cultural norms in some non-majority communities (Anderson-Yockel & Haynes, 1994) and high levels of maternal questioning can reduce child topic control (Rabidoux & McDonald, 2000). The use of the known question (e.g., such as when the adult asks, “What is that? when both the adult and the child know the item’s name) may be an unfamiliar task to a child from a non-European tradition.

Finally, the mother’s and child’s number of different words (NDW) and the number of total utterances were included in the utterance-level analyses. The number of different words frequently is used to measure lexical diversity (Klee, 1992; Owen & Leonard, 2002). The number of total utterances reflects the length of the interaction. Comparing the mother’s number of utterances with the child’s number of utterances also highlights the balanced (or unbalanced) nature of the interaction.

The purpose of the study is to determine if the proposed linguistic analysis tool captures discourse and utterance-level language features during book reading and mediated television/video viewing. The authors chose these two contexts because book reading has a considerable literature base and mediated television/video viewing is a potential alternative context to book reading for children with LI. Mediated television viewing may be particularly relevant for children who are initially not responsive to book reading and for parents with limited literacy skills.

**Parent-Child Book Reading Context**

The efficacy of book reading as an opportunity for building joint attention, vocabulary, and language within a shared routine is well established (Bradshaw, Hoffman, & Norris, 1998; Crain-Thoreson & Dale, 1999; Cronan, Cruz, Arriaga, & Sarkin, 1996; Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Ezell, Justice, & Parsons, 2000; Hockenberger, Goldstein, & Haas, 1999; Katims, 1991; Saint-Laurent, Giasson, & Couture, 1998; Yoder, Spruytenburg, Edwards, & Davies, 1995). Research has demonstrated that during book reading interactions (a) mothers’ speech is more complex (Snow, Arlmann-Rupp, Hassing et al., 1976), (b) there are more opportunities for children to progressively engage in abstract language and discourse turn taking (Crain-Thoreson & Dale, 1999; Hockenberger et al., 1999), and (c) children produce more frequent questions forms (Martinez & Roser, 1985).

However, book reading interactions can be challenging for children with LI who have limited linguistic resources to cope with sophisticated language requirements (Kaderavek & Justice, 2002; McNeill & Fowler, 1999). In a reciprocal fashion, due to the bi-directional nature of discourse, maternal communication patterns change in response to child competencies. For example, mothers of children with LI may initiate and control more of the reading interaction as compared to mothers of children who are typically
developing. Unfortunately, this may not facilitate increased child language since mothers’ rate of maternal questioning during shared book reading was negatively correlated with children’s expressive vocabulary in a study of 12 children with LI (Justice & Ezell, 1998).

Other researchers have reported corroborating data. For example, Rabidoux and MacDonald (2000) studied mother-child communication patterns with 20 children with LI during book reading interactions. Mothers’ communicative behaviors were classified into three communicative styles: as *readers* (i.e., mothers who controlled the book reading interaction), *waiters* (i.e., mothers who interspersed book reading with opportunities for child participation), and *talkers* (i.e., mothers who followed the child’s lead with frequent opportunities for child-initiated communication). Children were more passive and rarely initiated conversations in the *reader* dyad pairs.

Justice and Kaderavek (2003) coded discourse patterns during shared book readings of 11 mothers and their preschool children with LI. The children ranged in age from 3;9 to 5;7 years old. The book readings were coded for topic participation; the researchers noted whether new topics were initiated by the mother or child and coded incidences of contingent or shared topic constructions. Three topic control patterns were observed during the 11 dyadic book reading interactions. Three dyads were observed to be *topically balanced* with equal occurrence of mother and child new topic initiations and maternal support of child topics by developing partner topics and topic extensions. Five dyads were *maternally controlled* with a preponderance of maternal new topic initiations, frequent continuation of the mothers’ own topics, and infrequent child initiated topics. Two dyads were classified as *child controlled*. Child controlled book reading interactions consisted of frequent child topic initiations and maternal continuation of the child’s topic. Identification of three different mother-child interaction patterns during book reading (i.e., *topically balanced*, *maternally controlled*, *child controlled*) highlights the need to document individual parent-child interaction styles. Further understanding of topic control in book reading interactions and comparison with other parent-child joint routine contexts is needed.

**Parent-Child Mediated Television/Video Viewing Context**

Shared book reading is clearly a priority interaction for parents and children. However, children with LI need ongoing language input throughout the day. Additional language-learning opportunities are particularly relevant for parents who have reduced reading ability or for children who resist book reading but are willing to participate in other language-enhanced interactions. For example, Wells (1983) estimated that 11% of preschool children who are typically developing do not engage in storybook readings. Similarly, Kaderavek and Sulzby (1998) reported that four out of the ten children with LI in their home observational study showed low engagement levels (a quality called “low orientation” to book reading) during parent-child book reading. Television/video viewing as a joint activity may provide a unique opportunity for parents to facilitate the language development of children with LI.

However, mediated television/video viewing’s potential as a language-learning opportunity for children with LI is infrequently investigated. Opportunities for facilitating language development during mediated television/video viewing are highly likely to occur in most households as television/video viewing is a major free-time activity for young children (Huston & Wright, 1998; Neuman, 1995; Timmer, Eccles, & O’Brien, 1985). Further, previous research indicates that parent-child conversations during television/video programs can facilitate language learning in typical children. For example, Howe and Solomon (1979) reported that children who watch Sesame Street together with their mothers or fathers gain more than children who watch the program without parent mediation. Unfortunately, however,
television/video viewing – as it is typically incorporated into American daily life – decreases the amount of time for parent-child interaction. Specifically, Vandewater, Bickham, and Lee (2006) reported that for every hour of television/video that children view on a weekday (without their parents present), they spend less time with their parents in overall daily interaction: 0- to 2-year-olds, 52 minutes; 3- to 5-year-olds, 45 minutes; 6- to 8-year-olds, 15 minutes; 9- to 12-year-olds, 23 minutes. These data highlight the need for further exploration of the effects of mediated versus solitary television/video viewing.

**Pilot Analysis of the Tool with a Case Example**

“Nathan” (a pseudonym) interacted in a book reading and a mediated interaction while viewing a videotaped child’s television program. This was Nathan’s first exposure to the book and television program. A trained observer developed verbatim written transcripts of the maternal and child utterances during the audio taped parent-child sessions (one session = book reading, one session = video viewing). Nathan’s mother’s utterances that centered on behavioral management that were extraneous to the interaction and were unrelated to the ongoing activity were eliminated (e.g., “Do you need to go to the bathroom?” “Let me wipe your nose.”). Only the spontaneous talk produced around the book reading was transcribed; the mother’s reading of the book text was not included in the transcripts. Unintelligible utterances were marked in the transcript as “xxx”; the guideline for marking an utterance as unintelligible was three passes of the audiotape. Running speech was parsed at the utterance level using the conventions described in Miller and Chapman (1996). The transcripts were entered into the Systematic Analysis of Language Transcripts (SALT) software (Miller & Chapman, 1996) and converted to Child Language Data Exchange System (CHILDES, MacWhinney, 2000). Transcripts were checked for adherence to transcription conventions using the automatic checking system in CHILDES.

Four utterance-level linguistic variables were computed using the Computerized Language Analysis (CLAN) program (found within the CHILDES system); (a) mean length of utterance (MLU: the average number of words produced in each utterance for a speaker), (b) number of different words (NDW; vocabulary diversity), (c) number of maternal questions, and (d) number of utterances produced by each speaker.

Following transcription and linguistic analysis, the interactions were coded and analyzed at the discourse level using Control of Interaction (COI) codes. After all maternal and child utterances were coded, the proportion of utterances where each type of code occurred was summed for each transcript. The proportion variable was derived by dividing raw frequencies of each code by the total number of interaction utterances, to represent the proportion of occurrence for each type of COI code within the discourse context.

Nathan is a European-American male with a chronological age of 3;10 at the time of the parent-child interactions. His MLU was 1.17, placing his language age 20 months below his chronological age as computed by SALT. Nathan’s language was evaluated using the Receptive One-Word Picture Vocabulary Test (Gardner, 1985) and the Expressive One-Word Picture Vocabulary Test – Revised (Gardner, 1990). He obtained a standard score of 76 for receptive language and a standard score of 72 for expressive language; both scores are approximately 1.5 standard deviations below the mean of 100. He had a normal hearing screening and evidenced normal oral structure and function. All other development milestones were within the normal limit.

Nathan and his mother read the storybook Goodnight Moon (Brown & Hurd, 1947) and were provided a videotape of Dora the Explorer (Gifford & Walsh, 2000). The book interaction lasted 11 minutes, the video lasted 30 minutes. The mother was instructed to view the videotape of Dora with Nathan as she would typically do. The same instructions were provided for book reading (i.e.,
to read the book as she would typically do). The researcher taped the interactions.

Nathan’s MLU during the book reading and video contexts was the same (Book, N = 1.2; Video, N = 1.2). His NDW and number of utterances also were rather equivalent across contexts (NDW; Book, N = 13; Video, N = 10; Number of utterances; Book, N = 16; Video, N = 12). Two comments are important. First, this similarity in NDW and number of utterances occurred even though the video interaction was 19 minutes longer than the book reading. Second, and most important, was that five of Nathan’s 13 utterances during the book interaction were highly rejecting (“Down!” “Wanna play”) and Nathan was crying throughout the book interaction. Nathan can be considered as having a low orientation to book reading (Kaderavek & Sulzby, 1998). Nathan’s linguistic data are visually presented in Figure 1.

Nathan’s mother’s MLU also was equivalent across contexts (Book, N = 3.3; Video, N = 3). She produced more NDW and more utterances in the video interaction as compared to the book interaction (NDW: Book, N = 41; Video, N = 95;
Number of utterances, Book, N = 23; Video, N = 72). Nathan’s mother’s linguistic data are visually presented in Figure 2. Nathan’s mother produced a higher percentage of questions in the book interaction (Book % questions = 21%) as contrasted to the video interaction (Video % questions = 12%). Percent of questions produced is presented in Figure 3.

Topic control analysis is visually demonstrated in Figure 4. Nathan’s mother produced more “control” utterances than Nathan in both interactions. She produced 41% “control” utterances in the book interaction; Nathan produced 18%. In comparison, she produced 54% in the video interaction and Nathan produced 6%. It should be reiterated, however, that approximately half of Nathan’s “new topic” codes in the book interaction were rejections of the task. Nathan produced 20% “contingent” utterances in book interaction and 17% in the video interaction. The discourse analysis during the mediated video viewing demonstrated that Nathan and his mother are at the beginning stages of developing communication reciprocity but there is a clear need to continue to intervene in this regard.
Discussion

In this study, the authors’ pilot tested an analysis tool that combined linguistic discourse- and utterance-level analyses to examine language discourse patterns between a parent and a child with LI in two different contexts: book reading and mediated video viewing. The analyses captured context variations. During the contrasting context of book reading and mediated video viewing, Nathan and his mother demonstrated consistent MLU, NDW, and number of utterances. Discourse analysis, however, showed a different pattern. Nathan’s mother produced more questions during the shorter book reading interaction demonstrating an increased density of question-asking behavior.

This single case study does not allow the authors to infer whether this question asking was the cause of Nathan’s low engagement during the storybook, or if his mother was using questions in an attempt to increase Nathan’s interest and participation. We suspect the latter, but further studies of other participants are required to answer this question.

Nathan’s highly negative reaction to the shared book reading but not to video viewing substantiates the authors’ hypothesis that some children with LI may benefit from mediated television/video viewing as an alternative to book reading with a gradual introduction of matched-theme storybooks to build literacy orientation. This finding also has two implications: (a) there is a need to revise the linguistic analysis tool to include a specific count of rejection/negative occurrences codes and (b) such fine-grained linguistic analysis of discourse- and utterance-level features can highlight communication practices in contexts facilitating or inhibiting children’s communication. If additional studies on the validity of the tool are able to document the above patterns, the tool will be able provide valuable data to clinicians to individualize their intervention practices.

This pilot study is a preliminary step in the application of the linguistic tool to understand the impact of contextual variations on caregivers’ communicative interaction styles. Albeit a very small step, this article expands the literature by examining mediated parent-child video viewing with one child with LI. There is a great potential and need for examining discourse interactions in the context of mediated television/video viewing. The analyses suggest that Nathan was more cooperative during television/video viewing than during book reading.

Further research is needed to replicate the current study with a larger sample to document differences in mothers whose different discourses styles during book reading are already known and to determine if discourse patterns are the same or different in the context of mediated television/video viewing. It is possible that children’s interest during television/video viewing may provide additional intervention opportunities for children with LI and may serve as a scaffold for improved parent-child discourse exchanges. Potential negative aspects of mediated television/video watching also should be evaluated. It is possible that mediated television/video watching may reduce the amount of time parents and children spend together in other contexts. Additionally, some children may be so engrossed in the television/video program that their language output is reduced even with parent mediation. In sum, this is a relatively unexplored area of research that warrants future investigation.

Dr. Kaderavek may be contacted by email at joan.kaderavek@utoledo.edu
References


CEU Questions for Kaderavek and Pindiprolu
A Linguistic Analysis Tool to Analyze Parent-Child Discourse in Different Contexts

1. During adult-child interactions research has noted that children with language impairment
   a. Often respond quite well to direct questions
   b. Often initiate interactions during parent-child discourse
   c. Are less active conversational partners
   d. Answers A and C

2. During book reading
   a. Mother speech is more complex
   b. Child can readily engage in turn-taking
   c. Children are likely to produce more questions
   d. All of the above

3. An example of an utterance-level code in linguistic analysis is:
   a. Mean length of utterance
   b. Joint topic initiation
   c. Morphological analysis (e.g., verb tense analysis)
   d. All of the above

4. In the study described in this paper, the discourse analysis revealed the following:
   a. Nathan’s MLU was much longer in the book interaction than the mediated television viewing
   b. Nathan was highly responsive to the book reading interaction
   c. Nathan’s mother asked more direct questions in the book interaction as compared to the mediated television viewing
   d. All of the above
The top ten reasons why students in communication sciences and disorders (CSD) should consider a career in audiology:

1. **Audiologists work with all people of all ages.**

   It is a common misconception that only elderly individuals seek the services of an audiologist. Anyone, at any age, can have a hearing loss. Audiologists work with newborns, toddlers, teens, and adults of all ages – often baby boomers and the elderly.

2. **Audiologists provide a wide variety of services.**

   Nearly everyone is familiar with the grade school hearing test routine: Raise your hand when you hear the beeps. While pure tone audiometry continues to be the most common diagnostic test for determining type and degree of hearing loss, audiologists diagnose hearing and balance problems using many other complex tests such as otoacoustic emissions, auditory brainstem response, and platform posturography, to name a few. Beyond identification and assessment of a hearing loss, audiologists’ scope of practice includes prevention, rehabilitation, advocacy and consultation, education, research, and administration (American Academy of Audiology, 2004; American Speech-Language-Hearing Association, 2004).

3. **Audiologists have job security.**

   The incidence of hearing loss is on the rise and there will be a continued need for this health-related human service (CNN Money Magazine, 2009).

4. **Audiologists can be their own boss.**

   While many audiologists choose to work in physicians’ offices or as part of a hospital/center-based team, some establish their own practices.

5. **Audiologists can earn a competitive salary.**

   The average salary for a full-time audiologist is $60-80,000 (American Speech-Language-Hearing Association, 2010). How rewarding it can be to have a rewarding career that also pays well!

6. **Audiology is both an art and a science.**

   Audiology is a blending of evidenced-based evaluation/diagnosis and people-centered emotional support. In other words, in conjunction with the diagnosis and fitting of amplification, audiologists provide patient and family support and help them overcome any obstacles associated with their hearing loss.

7. **Audiologists work in a variety of settings.**

   Beyond choosing between working in private practice or for an employer, audiologists can choose to work in medical facilities (e.g., hospital), Veteran’s Administration facilities, long-term health care, ENT practices, schools, community and university speech and hearing clinics, cochlear implants centers, and various other settings.

8. **Audiologists often work closely with other professions.**

   Depending upon professional expertise, audiologists may work with physicians, speech-language pathologists, educators, occupational therapists, neuropsychologists, early interventionists, and others. Trans-disciplinary teams are particularly important in working with certain disorders or in some intervention settings (e.g., cochlear implant team).
The theories, assessments, technologies, and intervention techniques in audiology are always evolving. Audiologists must continually seek to improve their knowledge and skill in order to meet the needs of their patients and the demands of the profession.

10. Audiologists help people.
Hearing underlies spoken communication, which serves to connect people and provide a foundation for language development and learning. When parents choose for their children to listen and talk, an audiologist provides the tools. When teens (or people of any age) choose risky behaviors such as excessive noise exposure, audiologists can aid in the identification and prevention of hearing problems. Audiologists assist people of all ages in learning to live well with hearing loss.

References


Recently, my friend and colleague, Dr. Mary Ellen Nevins, has challenged me to think critically about my career journey and the role of continuing education. Dr. Nevins is a national leader in professional learning programs for speech-language pathologists, audiologists, and teachers working with children with hearing loss. Below, I offer a perspective from Dr. Nevins’ work.

The career journey of a speech and hearing professional has multiple stages, each of which has specific knowledge to be acquired and skills to be attained. This is particularly true for those working with children with hearing impairment. Paradigms shift, children’s needs change, and parental knowledge and skill evolve. Throughout their careers, professionals must continually evaluate their knowledge and practices, and update and improve their skills.

Fortunately, professional learning (PL) is readily available in many forms. However, as consumers, we have the tough job of determining the relevant opportunities and meaningful resources that connect our own interests, values and knowledge, and skills and abilities to real demands in the workplace.

Have you charted your own career path and identified PL goals? What do you seek in professional learning? How committed are you to the PL journey? Now is a good time to set some PL goals! As you do so, keep these facts in mind:

• One-day workshops are likely to build only preliminary levels of topic awareness and knowledge as compared to more participatory professional training. The Learning Retention Pyramid (Sousa, 2006) suggests that only 5% of what is presented in lecture format is retained after a 24 hour period,

• Large or small group presentations should engage participants as active learners for authentic professional development,

• Sustaining engagement with professional learning attendees is the responsibility of the attendee, the CEU provider, and the agency with whom the provider contracts to provide the service,

• While the content of the journey is unique to our field, the process of professional learning may have more similarities than differences to other fields. Thus, CEU providers might look to experts in general education and business training as they craft professional learning activities.

Before you plan your next professional learning experience (as a provider or a consumer), stop to consider your journey. How might you improve the process? A worthy first step would be to analyze the types of offerings available to speech and hearing professionals; what is already being provided and how might this PL opportunity be better and different? Second, consider including engaging activities to immerse participants in authentic professional decision-making activities during the training session. Finally, determine how real learning will be measured. What skills will the participants be able to demonstrate as a result of the PL opportunity?

As you travel the PL journey, consider job-embedded mentoring and coaching, which is current best practice for skill development. Real professional change is likely to take more time, but can be worth the commitment. Remember that professional learning is a lifetime journey—and the best trips are often the longest!

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Reference

The purpose of this article is to provide an introduction to the field of occupational therapy for professionals who work with individuals with hearing impairment. As audiologists, speech-language pathologists, educators, and otolaryngologists know this population the best, they may be in an optimal position to identify where there may be matches between the needs of their clients and the skills of occupational therapists. This may support collaborative practice among professionals. We will begin with a review of the occupational therapy scope of practice and then take a look at the occupational therapy perspective on hearing impairment.

Occupational therapy is approaching its centennial anniversary as an organized profession and has a storied history (American Occupational Therapy Association, 2007). It sprang from the observation that soldiers returning from World War I with injuries recovered their motivation and drive more quickly when they were engaged in any manner of task rather than convalescing. From this arose a holistic philosophy that engaging in meaningful and purposeful tasks promotes health and wellness. Tasks were tailored to the interests and abilities of clients in order to present them with opportunities to improve their own health and wellness through active doing. The term applied to this meaningful with purpose doing was occupation, giving birth to the profession of occupational therapy. The application of meaningful doing to promote recovery spread quickly to other settings, including psychiatric hospitals and children’s homes.

Certainly there was an original emphasis on productivity related tasks such as arts and crafts, but the term occupation came to encompass any task that an individual does to fulfill his/her various roles in society (or an individual’s occupations) including self care, homemaking, school, work, social participation, and leisure. To make these occupations accessible to individuals with disabilities, occupational therapy practitioners would suggest modifications to the materials or approach used in the task. Fabrication of assistive devices became a large part of the practice. With World War II, the emphasis in health care shifted toward treatment of medical conditions. In keeping, occupational therapy grew its scope of practice to include intervention strategies aimed at remediation of the underlying condition. This led to the inclusion of treatments such as orthotics, exercise, motor control therapies, and sensory integration therapy into occupational therapy practice. As we approach the close of our first century, the profession of occupational therapy has combined its original emphasis on wellness through doing with contemporary rehabilitation practices that promote independence in everyday life. In this manner, occupation is the both the means of therapy and the ends of the therapeutic process.

There are two levels of education for occupational therapy practitioners. A Certified Occupational Therapy Assistant (COTA) has earned an Associate’s level degree and works under the supervision of a Registered Occupational Therapist (OTR). The current entry requirement for the OTR is a Master’s degree, though several universities offer entry-level doctorates. Both levels of practitioners sit for a national examination. Licensure to practice is administrated by individual states. In Ohio, COTAs and OTRs are licensed by the Ohio Occupational Therapy, Physical Therapy, and Athletic Trainers Board. Continuing education is required for license renewal.
Therapists can work with individuals of any age in many settings including acute care hospitals, inpatient and outpatient rehabilitation facilities, subacute care and skilled nursing facilities, schools and educational service centers, and early intervention practices. Community-based practice is a growing field. Therapy services can be provided directly to the client or in consultation with team members. There is no state requirement for a physician’s referral to initiate occupational therapy; however, insurance policies often do require a referral for reimbursement. Funding mechanisms for occupational therapy include private insurance, Medicare, Medicaid, the Individuals with Disabilities Education Act (IDEA, both Parts B and C), the Elementary and Secondary Education Act (ESEA, through Response to Intervention), philanthropic funding, and private pay.

The scope of practice for occupational therapy practice includes evaluation of factors that influence participation in an individual’s occupations including, but not limited to, motor, sensory integration, perception, cognition, psychosocial, and social interaction skills. Occupational therapy intervention promotes or enhances performance of occupations through remediation or acquisition of abilities and skills, compensation for limitations, and modification of tasks and environments. Best practice in occupational therapy relies on two core features: client-centered practice and occupation-based practice. In client-centered practice, therapeutic goals and interventions are dictated by the client’s goals and interests. Other individuals in the client’s life may be included in this emphasis; the parents of a pediatric client, for example. Occupation-based practice emphasizes actual engagement in therapeutic tasks that have specific purpose and meaning for the client, as opposed to sole reliance on rote exercise. To accomplish this, the therapist must carefully match the elements and demands of the occupation to the interests and abilities of the client to inspire drive and to create a just right challenge that will promote growth. Along with our colleagues in health care and education, we strive for collaborative teamwork and evidence-based practice.

This brings us to consider an occupational therapy perspective on the influence that hearing impairment may have on an individual’s engagement in his/her occupations as well as how occupations may be used for the therapeutic benefit of individuals with hearing impairment. As this could be a wide ranging topic, we provide a specific situation for illustration: Preliteracy in children with hearing impairment. Preliteracy sets the stage for reading, an essential key to success in education and vocation. Preliteracy includes activities like storybook reading, learning the letters of the alphabet and the sounds they make, and becoming aware of words in the environment and their relationship to the things they stand for. It is well established that children with hearing impairment often have difficulties in developing early literacy skills, including limited attention when being read to, decreased print awareness, and low story comprehension (Bodner-Johnson & Sass-Lehrer, 2003; Mogford, Gregory, & Keay, 1979); therefore, individuals with hearing impairment are at risk for lower achievement. Professionals, including speech-language pathologists, audiologists, and educators, providing services to individuals with hearing impairment are already aware of this risk and have initiated a number of effective approaches to improve literacy in this population (for example, Kaderavek & Pakulski, 2007; Pakulski and Kaderavek, 2004), yet occupational therapy may provide a novel perspective. When the link between the spoken word and the printed word is interrupted, the meaning for engaging in preliteracy activities may be undermined, both for children and their caregivers. Meaning is a central principle of occupational therapy theory. If a person does not have meaning in the occupations in which they participate, they will not be as beneficial to him or her. Nelson and Thomas (2003, p. 101) define meaning as “the entire interpretive experience...
engaged in by an individual encountering an occupational form.” It is a lived, felt experience that takes place within a person. The physical and sociocultural aspects of an occupation and the skills a person possesses combine to produce an internal interpretation, or meaning. When a person has meaning in her occupations, it is likely that a sense of purpose, or motive, results. A child’s primary and meaningful occupation is play. According to Mary Reilly (1974), a pioneer in the field of occupational therapy, the struggle for mastery within one’s environment is intermeshed with play. Mastery through play helps develop skills, interests, abilities, and habits of cooperation and competition needed for competence in adulthood. Through play, children learn rules, the concept of roles, socialization, communication, creativity, flexibility, and cognition (Parham & Primeau, 1997). Pairing of preliteracy activities with play capitalizes on this intrinsic drive to master one’s environment. This facilitates the interaction between children with hearing impairment and their caregivers when engaging in preliteracy activities. For example, one could pair play themes with the topic of storybooks, and then alternate between playing and reading so that the engagement in the latter becomes associated with and driven by the former. Welcome (2010) conducted a pilot study focused on the pairing of play themes with the content of storybooks and saw improved engagement.

There is a call for further study of the role of occupational therapy to promote preliteracy for children with hearing impairment. The population of individuals with hearing impairment may benefit in other ways from occupational therapy services. Fianberg, Kuneyl, and Altman (2005) and Bharadway, Daniel, and Matzke (2009) reported high proportions of children with cochlear implants who have difficulties in sensory processing, an area of advanced practice within occupational therapy. Fianberg, Kuneyl, and Altman (2005) described this population’s clinical presentation as craving of intense movement and poor attention to fine motor activities. If this is representative of the population, then audiologists and occupational therapists must collaborate to provide the best services. A number of reports from Horn and colleagues (2005; 2006; 2007) suggest delays in fine motor, gross motor, and visual perception in children with hearing impairment. Practitioners working with this population may want to consider referrals to occupational therapy for evaluation and treatment in the event that these co-occurring difficulties present challenges to their client’s abilities to engage in their meaningful everyday occupations.

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References


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