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Auditory-verbal therapy : a comprehensive approach for children who are hearing impaired

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NORTHERN ILLINOIS UNIVERSITY

Auditory-Verbal Therapy:

A Comprehensive Approach for Children Who Are Hearing Impaired

A Thesis Submitted to the

University Honors Program

In Partial Fulfillment of the

Requirements of the Baccalaureate Degree

With University Honors

Department of Communicative Disorders

by

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May 10, 1997

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Honors Thesis Abstract

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Abstract:

The focus of this project was auditory-verbal practice with children who are hearing impaired. Auditory-verbal practice is a comprehensive approach which teaches the child with a hearing impairment to make maximum use of his or her amplified residual hearing. Emphasis is placed on early identification and ongoing audiological evaluation and aural habilitation. Parents and auditory-verbal professionals then work together to teach the child to listen, to process verbal language, and to speak. As a result, the child acquires the ability to communicate through speech. After learning about auditory-verbal therapy through class work and observation, I became particularly interested in learning more about the history, techniques, and outcomes of this approach. Therefore, I chose to explore some of the primary components of the auditory-verbal process, including the following: the auditory-verbal position, audiological management, therapy strategies and techniques, auditory-verbal outcomes, and personal observations of auditory-verbal clients.

Although I researched this topic in books and journals, I gathered much information through direct observation. During the Fall semester, I observed various auditory-verbal clients in the NIU Speech and Hearing Clinic. This semester, however, I was given the opportunity to assist a

graduate clinician in therapy with a two-year-old auditory-verbal child. I participated in therapy two times a week for fifty minutes each session. I also gathered information from Auditory-Verbal International and auditory-verbal professionals. I was then able to compare my research with my direct observations. I found that auditory-verbal practice is a very ongoing, family-centered process. To insure auditory-verbal success, parents and auditory-verbal professionals must work together to shape the approach into a way of life.

Section One

Introduction

Parents of hearing impaired children are confronted with many challenging feelings and decisions. Their initial response to the diagnosis may consist of feelings of sadness and fear. The root of these feelings often stems from the parents' uncertainty about how the hearing impairment will affect their child's life and future. These parents are also faced with many important decisions. One important decision, which requires immediate attention, involves choosing a system of communication. The parents, with help from the audiologist and other trained professionals, must become educated about all of their options. They must then decide which system to pursue as a means of developing their child's communicative abilities.

One must remember, however, that no one communication system can meet the individual needs of every child who is hearing impaired. Whether the system involves auditory-verbal intervention, Cued Speech, Total Communication, or strictly the use of sign, the chosen approach must be appropriate for the individual child. Daniel Ling, a dedicated pioneer of auditory-verbal therapy, believes that auditory-verbal intervention should "...be the first option for parents to explore" (1993, p.187). Ling explains, "Auditory-verbal intervention is appropriate only for those who have sufficient residual hearing to benefit from it" (1993, p.187). Ling contends, however, that with the availability of technologically advanced hearing aids and cochlear implants, most children have usable residual hearing which can be utilized. Therefore, most hearing impaired children are candidates for auditory-verbal intervention.

Auditory-verbal practice is a comprehensive approach which focuses on the entire child. From ongoing audiological evaluation and rehabilitation to education and socialization, parents and auditory-verbal professionals work together to achieve auditory-verbal success. As an ongoing process, auditory-verbal intervention begins at an early age and continues throughout the child's school age years. This paper explores some of the primary components of the auditory-verbal process, and includes sections on the following: the auditory-verbal position,

audiological management, therapy strategies and techniques, auditory-verbal outcomes, and personal observations of auditory-verbal clients.

Auditory-Verbal Position

The auditory-verbal philosophy supports the realization that children with hearing impairment can be taught to use minimal amounts of amplified residual hearing. The position statement of Auditory-Verbal International states, "Use of amplified residual hearing in turn permits its children with hearing impairment to learn to listen, to process verbal language, and to speak." The child learns to listen to and understand spoken language. As a result, the child with a hearing impairment acquires the ability to communicate through speech. This ability supports the primary goal of auditory-verbal practice. Auditory-Verbal International states, "The goal of auditory-verbal practice is that children with hearing impairment can grow up in regular learning and living environments that enable them to become independent, participating, and contributing citizens in mainstream society." Therefore, auditory-verbal therapy works to teach the child how to listen and communicate through speech in a naturalistic setting. Parents are taught ways to create an auditory environment which promotes spontaneous and meaningful communication. The ultimate goal of this practice is that the child will be able to participate and function independently in the mainstream hearing-speaking society.

The Auditory-Verbal position statement also includes a set of practice principles and evidence which supports these principles. The practice principles are a set of working guidelines which outline the requirements needed to attain the auditory-verbal goal. These principles support such practices as early identification and detection of hearing impairment, the use of appropriate amplification, and the establishment of conducive auditory and language learning environments. Auditory-Verbal International (AVI) then provides rationale for these principles with support from research and theories. A reprint of the official Auditory-Verbal Position Statement has been included at the end of this section (See Section One-Appendix A).

AUDITORY-VERBAL POSITION STATEMENT

4 following document, prepared by the Board of Directors of Auditory-Verbal International, was adopted as the official position statement of AVI in October 1991. Members of the Board of Directors responsible for the development of the document include Nancy Caleffe-Schenck, Marian Ernst, Warren Estabrook, Carol Flexer, Donald Goldberg, Chester Homer III, Daniel Ling, Judith Marlowe, Dennis Pappas, Doreen Pollack, Susan Schmid-Giovannini, Judy Simser, Sally Tannenbaum, Maxine Turnbull, and James Watson.

Auditory-Verbal

The Auditory-Verbal philosophy is a logical and critical set of guiding principles. These principles outline the essential requirements needed to realize the expectation that young children with hearing loss can be educated to use even minimal amounts of amplified residual hearing. Use of amplified residual hearing, in turn, permits children with hearing loss to learn to listen, to process verbal language, and to speak.

The goal of Auditory-Verbal practice is that children with hearing loss can grow up in regular learning and living environments that enable them to become independent, participating, and contributing citizens in mainstream society. The Auditory-Verbal philosophy supports the basic human right that children with all degrees of hearing loss deserve: an opportunity to develop the ability to listen and to use verbal communication within their own family and community constellations.

System or Principles of Auditory-Verbal Practice are:

1. Supporting and promoting programs for the early detection and identification of hearing loss and the auditory management of infants, toddlers, and children so identified;
2. providing the earliest and most appropriate use of medical and amplification technology to achieve the maximum benefits available;
3. instructing primary caregivers in ways to provide maximal acoustic stimulation within meaningful contexts, and supporting the development of the most favorable auditory learning environments for the acquisition of spoken language;
4. seeking to integrate listening into the child's total personality in response to the environment;
5. supporting the view that communication is a social act, and seeking to improve spoken communicative interaction within the typical social dyad of infant/child with hearing loss and primary caregiver(s), including the use of the parents as primary models for spoken language development, and implementing one-to-one teaching;
6. seeking to establish the child's integrated auditory system for the self-monitoring of emerging speech;
7. using natural sequential patterns of auditory, perceptual, linguistic and cognitive stimulation to encourage the emergence of listening, speech and language abilities;

8. making ongoing evaluation and prognosis of the development of listening skills an integral part of the (re)habilitative process;
9. and supporting the concepts of mainstreaming and integration of children with hearing loss into regular education classes with appropriate support services and to the fullest extent possible.

Principles of Auditory-Verbal Practice have been adapted from Pollack (1970, 1985)

Existing Evidence That Supports The Rationale For Auditory-Verbal Practice

1. The majority of children with hearing loss have useful residual hearing; a fact known for decades (BeZold & Siebenmann, 1908; Goldstein, 1939; Urbantschitsch 1982).
2. When properly aided, children with hearing loss can detect most if not all of the speech spectrum (Bebe, 1953; Goldstein, 1939; Johnson, 1975; Johnson, 1976; Ling, 1989; Ling & Ling, 1978; Pollack, 1970, 1985; Ross & Calvert, 1984).
3. Once ALL available residual hearing is accessed through amplification technology (e.g., binaural hearing aids and acoustically tuned earmolds, FM units, cochlear implants) in order to provide maximum detection of the speech spectrum, then a child will have the opportunity to develop language in a natural way through the auditory modality. That is, a child with hearing loss need not automatically be a visual learner. Hearing, rather than being a passive modality that receives information, can be the active agent of cognitive development (Boothroyd, 1982; Goldberg & Lebahn, 1990; Robertson & Flexer, 1990; Ross & Calvert, 1984).
4. In order to benefit from the "critical periods" of neurological and linguistic development, then the identification of hearing loss, use of appropriate amplification and medical technology, and stimulation of hearing must occur as early as possible (Clopton & Winfield, 1976; Johnson & Newport, 1989; Lennenberg, 1967; Marler, 1970; Newport, 1990).
5. If hearing is not accessed during the critical language learning years, a child's ability to use acoustic input meaningfully will deteriorate due to physiological (retrograde deterioration of auditory pathways), and psychosocial (attention, practice, learning) factors, (Evans, Webster, & Cullen, 1983; Merzenich &

Kaas, 1982; Patchett, 1977; Robertson & Irvine, 1989; Webster, 1983).

Current information about normal language development provides the framework and justification for the structure of auditory-verbal practice. That is, infants/toddlers/children learn language most efficiently through consistent and continual meaningful interactions in a supportive environment with significant caretakers (Kretschmer & Kretschmer, 1978; Lennenberg, 1967; Leonard, 1991; Ling, 1989; MacDonald & Gillette, 1989; Menyuk, 1977; R611, 1990).

As verbal language develops through the auditory input of information, reading skills can also develop (Geers & Moog, 1989; Ling, 1989; Robertson & Flexer, 1990).

Parents in auditory-verbal programs do not have to learn sign language or cued speech. More than ninety percent of parents of children with hearing loss have normal hearing (Moore, 1987). Studies show that over 90% of parents with normal hearing do not learn sign language beyond a basic preschool level of competency (Luetke-Stahlman & Moeller, 1987). Auditory-verbal practice requires that caregivers interact with a child through spoken language and create a listening environment which helps a child to learn.

A severe or profound hearing loss automatically makes all individuals neurologically and functionally "different" from people with normal hearing (Furth, 1964; Myldebust & Brutton, 1953), then the auditory-verbal philosophy would not be tenable. The fact is however, that outcome studies show that individuals who have, since early childhood, been taught through the active use of amplified residual hearing, are indeed independent, speaking and contributing members of mainstream society (Goldberg & Flexer, 1991; Ling, 1989; Yoshinaga-Itano & Pollack, 1988).

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Section Two

Audiological Management

The success of the auditory-verbal approach is dependent on intensive audiological management. . The goal of auditory-verbal practice is to teach the child to utilize his or her residual hearing in order to learn to listen, understand spoken language, and communicate through speech. To attain this goal, early identification of hearing loss, appropriate selection of amplification, and comprehensive audiological care are essential. .

The audiologist in the auditory-verbal approach plays an integral role in audiological management. . The audiologist is responsible for accurately identifying the type and degree of hearing loss. The audiologist'S responsibilities also include selecting amplification which is appropriate for each individual child. This includes maintaining continuous support services which insure optimal functioning of the amplification device. This is very important in providing the child with a "high quality listening and learning environment" (Marlowe, 1993). To maintain such an environment, the audiologist must develop a partnership with the child's parents or caregivers and active professionals. In her article "Audiological Assessment and Management in the Auditory- Verbal Approach," Judith Marlowe states, "The audiologist must convey specific information and appropriate recommendations to parents, therapists, teachers, physicians, as well as to the child to fully address issues related to residual hearing and its stability, effects of amplification, speech acoustics, and educational programming" (1993, p.206). Parents should be included in all decisions and play an active part in the audiological process. The audiologist's responsibilities also include continuous audiological evaluation. The audiologist should frequently assess the child's hearing to detect any changes and insure proper functioning of amplification. Providing the child with an optimal listening environment is an important component of auditory-verbal practice. In order to accomplish this, effective audiological care is essential. .

Early Identification and Evaluation

Early identification of hearing loss is an essential component of the auditory-verbal approach. Identifying a child's hearing impairment as close to the onset as possible is imperative. Children learn language through continuous auditory stimulation during the critical period for language acquisition. Therefore, depriving the child of auditory stimulation " ...during the first 24-36 months of life will have a lifelong impact upon the level of auditory language function achieved" (Marlowe, 1993). For this reason, the auditory-verbal approach emphasizes the importance of early identification of hearing impairment in children. Auditory-verbal practitioners argue that with modern technological advances in newborn hearing screening, delayed detection of hearing impairment beyond the neonatal period is unnecessary.

Early identification can be accomplished by newborn hearing screening. Hearing loss is often difficult to detect in children, especially when the impairment is moderate in degree. This is one reason why auditory-verbal practice supports routine newborn screening. In her article, Marlowe explains that "...routine screening for hearing offers the most effective means of assuring that the option of auditory-verbal therapy is offered to families" (1993, p.207). Although routine screening does not take place in all medical settings, suggestions have been made regarding which infants should be tested. In her book Educational Audiology for the Limited Hearing Infant, Doreen Pollack states, "Hearing should always be tested when the infant is a "high risk" baby, when parents express anxiety, when any change is observed in a child's response to sound, or when language development is delayed or defective" (1970, p.15). Disagreement remains in regards to the methods which will be used, and the criteria which will be established to determine which newborns will and will not be screened. Professionals have stated their concerns about using the High Risk Register to decide screening eligibility. Research has demonstrated that this method "...allows 35-50% of children with hearing impairment to escape detection" (Stein, Clark, & Kraus, 1983). Still others point out the inadequacies of behavioral assessment in newborn screening. Studies have found these procedures to be unreliable. Just as an infant who is hearing impaired may "pass" the test and proceed undiagnosed, an infant with normal hearing may "fail" and be labeled hearing impaired

(Ling, Ling, & Doehring, 1970). Currently, auditory brainstem response (ABR) is among the most technologically advanced screening methods. Although this test is not without its own imperfections, it is considered by many to be most reliable in newborn screening. Regardless of the methods which are used and the criteria for screening which are established, the importance of early identification in the auditory-verbal approach cannot be over emphasized.

After a child has been identified as hearing impaired, a complete audiological evaluation is necessary to determine the type and degree of hearing loss. This information is needed to choose an appropriate amplification device. Auditory-Verbal International has compiled a battery of procedures which was developed as a protocol to standardize testing. Marlowe states, "Use of a battery approach combining parent interview, otoscopic inspection, complete immittance measures, and selected behavioral as well as electrophysiological tests is imperative ..." (1993, p.209). Although testing procedures will vary depending on the child's age and ability, the measures mentioned above are the basics which provide essential information needed in the auditory-verbal process. Despite the developed protocol, auditory-verbal practice urges assessors to be mindful of the limitations of certain testing techniques. Hearing may be present, for example, beyond the limits of some testing equipment. Clinicians must be patient and flexible in order to gain complete and accurate information. While the information obtained in the initial diagnostic evaluation is essential, it is imperative that audiological assessment be an ongoing process. This is necessary to ensure that any changes in hearing will be detected. A reprint of the protocol developed by Auditory-Verbal International has been included at the end of this section (See Section Two-Appendix A).

Parents become an important part of the audiological process. Diagnosing a child's hearing impairment can be an emotional and trying experience for both parents and professionals. Parents often anguish over their suspicions for some time before seeking an audiological evaluation. Upon having their suspicions confirmed, parents may experience many different emotions. For the audiologist, conveying this information may be very challenging. While being supportive and providing information, the audiologist must respond to the needs of

the family. As a result of this shared experience, a partnership may develop between parents and the audiologist. The involvement of parents in this partnership is essential, for the parents will play an integral role throughout the auditory-verbal process. Therefore, auditory-verbal practice supports the involvement of parents in audiological evaluations. Audiological evaluations provide an excellent opportunity to educate parents. By including parents in testing procedures, they may gain a better understanding of audiological tests, as well as an increased awareness regarding their child's auditory response. Parents can also be a valuable tool to the audiologist. Parents can provide the audiologist with useful information regarding their child's performance.

Amplification Devices

Selecting an appropriate amplification device is an integral part of the auditory-verbal approach. The "best" amplification instrument, whether hearing aids, FM system, or cochlear implant, will allow the child to make maximum use of his or her residual hearing, creating an optimal learning and listening environment. This is the basis for auditory-verbal success. Therefore, this process should be handled with precision and care. Auditory-verbal practice emphasizes the importance of an amplification device being fitted as soon as the diagnosis has been made, and medical clearance obtained. Early exposure to auditory stimulation is critical to the process of language acquisition. Auditory-verbal practice also recommends that the child be fitted with "...highly adjustable binaural instruments with a wide frequency response" (Marlowe, 1993). If residual hearing is available in each ear, binaural fitting will provide the child with the maximum amount of potential hearing. Auditory-verbal practice also stresses that amplification devices be worn during all waking hours. Learning to listen and language acquisition are not processes which evolve from weekly therapy sessions. Instead, the two are continuous processes which should be part of the child's daily life. Therefore, consistent utilization of amplification is essential.

With advances in modern technology, cochlear implants have become an important part of auditory-verbal practice. Cochlear implants are devices which convert sounds into electrical currents which directly stimulate remaining auditory nerve fibers in the inner ear, generating a

hearing sensation (Estabrooks, 1994). Since the cochlear implant bypasses missing or damaged structures of the inner ear, directly stimulating nerve fibers, significant auditory information becomes available to hearing impaired persons who have demonstrated little or no benefit from hearing aids. As a result of the cochlear implant, the development of spoken language may become an option for children who have profound sensorineural hearing impairment. Professionals must remember, however, that prior to implantation, the child may have had little or no experience with sound. Therefore, a strong auditory habilitation program must be provided. For this reason, children with cochlear implants often account for a significant number of clients within an auditory-verbal program.

While working with the child who has a cochlear implant, the auditory-verbal therapist will utilize techniques and strategies which enhance listening skills and develop language. The auditory-verbal therapist will begin by working with parents and other professionals (e.g. audiologists, speech pathologists, educators) to create an optimal language learning environment. Since parents serve as the child's primary language and communication models, they will become the focus of this process. In order to make maximum use of the child's auditory potential with the cochlear implant, the auditory-verbal therapist works with parents to help them "...provide auditory experiences, structured programming in auditory skills development, and carry-over in meaningful, play activities, in order to generalize speech, language, cognition, and communication goals" (Estabrooks, 1994). The auditory-verbal therapist teaches the parents certain techniques and strategies which will provide their child with an optimal language learning environment. These techniques and strategies will be discussed in Section Three.

Although significant gains in spoken communication have been demonstrated by many children utilizing cochlear implants, success must continue to be viewed on a continuum. Just as outcomes vary for children utilizing hearing aids, there will be a wide range of communicative abilities in children with cochlear implants. While some children, after extensive auditory-verbal therapy, will develop the ability to understand conversational speech, other children's

understanding of spoken language may be limited to closed-set tasks (Estabrooks, 1994). This notion, however, is not intended to undermine the significant communicative gains which have been made by some children as a result of cochlear implantation. Studies show, for example, that children with cochlear implants have made significant gains in all areas of speech perception in comparison to their performance with hearing aids on pre-operative tests (Estabrooks, 1994). While cochlear implants may provide another avenue for auditory-verbal success, auditory-verbal professionals must continue to work with parents to develop realistic expectations.

(Adapted from AVI, 1989)

SUGGESTED PROTOCOL FOR AUDIOLOGICAL AND HEARING AID EVALUATION

The audiological test procedures indicated are recommended for use with children. In order to ensure that maximal use of residual hearing can be achieved in the auditory-verbal approach. A battery of audiological tests is recommended since no single procedure has sufficient reliability to stand alone. Optimally, every aural habilitation program should have on-site audiological services, but, regardless of setting, close cooperation between audiology and therapy service providers is essential. Parents should be sent for and participate in the administration of all assessment procedures include them in this aspect of the child's care.

PROCEDURES TO BE INCLUDED IN ALL ASSESSMENTS, REGARDLESS OF CHILD'S AGE

- Case History/Parent Observation Report
- Otoscopic Inspection
- Acoustic Immittance: Tympanometry, Physical Volume Test, and Acoustic Reflexes
- Cautious interpretation is recommended if the child is younger than six months.

6 months - AUDITORY BRAINSTEM RESPONSE (ABR)

- Alternating click and tone pip response by air conduction and by bone conduction.

CAUTION: ABR SHOULD NOT STAND ALONE FOR DIAGNOSTIC PURPOSES. LACK OF RESPONSE TO ABR TESTING DOES NOT NECESSARILY INDICATE AN ABSENCE OF USABLE HEARING.

AMPLIFICATION AND AUDITORY LEARNING ARE RECOMMENDED AS THE FIRST OPTION UNLESS SPECIAL IMAGING (Cf SCAN OR MRI) CONFIRMS AN ABSENCE OF THE COCHLEAR BEHAVIORAL TESTING, AMPLIFICATION AND THERAPY ARE INDICATED BEFORE A DECISION OF NO USABLE HEARING IS MADE.

months - 2 years BEHAVIORAL OBSERVATION/VISUAL REINFORCEMENT - AUDIOMETRY

- Detection/Awareness of voice and warbled tones from 250-6000 Hz in the sound field and/or 250-8000 Hz under headphones.
- Startle response in sound field, under headphones, and by bone conduction.
- Evaluation of auditory skill development.

5 years - COMMON PLAY AUDIOMETRY

- Response to pure tones from 250-12,000 Hz by air conduction and bone conduction from 500-4000 Hz with masking (at 3 In years+).
- Speech Awareness Threshold (Speech Recognition Threshold if language development allows) using Ling Five Sounds; body parts; speech perception tasks, or formal tests such as the WIPL.

years + STANDARD AUDIOMETRY

- Air and bone conduction. Speech Recognition and Speech/Word Identification.

(AMPLIFICATION) ASSESSMENT

ELECTRO-ACOUSTIC ANALYSIS OF HEARING AIDS

- On day of fitting
- At 30 - 90 day intervals at user volume as well as full-on volume.
- Whenever a hearing aid is repaired, in addition to a close check of internal settings.
- Whenever parental listening check or behavioral observation raises concern.

SOUND FIELD AIDED RESPONSE

- Parents and therapists can prepare the child by teaching him or her to respond consistently to voice and the Ling Five Sounds.
- Aided measures should include: Speech Awareness or Recognition, Word Identification at 55 dB in quiet and, if possible, in noise; response to warbled pure tones from 250-6000 Hz wearing binaural hearing aids or mono aural measures to compare responses at each ear.

CAUTION: It is important that the aided results be evaluated in relation to the unaided audiogram. Recommended aided results for the "left ear" audiogram with optimum amplification should be in the 35-45 dB (ANSI) range at 250, 500, 1000 Hz or better.

PROBE MICROPHONE (REAL EAR) MEASURES

- Unoccluded measurement of External Ear Effect as well as full occlusion with the hearing aid OFF to measure insertion loss.
- Insertion gain measured with hearing aid in customary settings to verify appropriate gain and output levels, and to compare changes in settings.

CAUTION: Extra gain may be required by children with severe to profound hearing impairment.

FM SYSTEMS

- When FM systems are in use they should be evaluated at the time of the complete audiological and hearing aid assessment using the same format described for amplification.

FREQUENCY OF ASSESSMENT (AIDED AND UNAIDED)

- Every 90 days once diagnosis is confirmed and amplification fitted, until age 3. As early as possible, but at least by age 2, complete unaided and aided audiogram should be obtained (preferably under headphones, but at least in the sound field.) New earmolds may need to be obtained at 90 day intervals or sooner until age 3 in view of the typically rapid growth rate during this time.
- Assessment every 6 months from age 4 - 6 is appropriate if progress is satisfactory.
- Above age 6, assessment at 6 - 12 month intervals is appropriate with earmolds at the same intervals.
- Immediate evaluation should be scheduled if parents or caretakers suspect a change in hearing or hearing aid function.

CAUTION: Modifications or this schedule are appropriate when middle ear disease is chronic or recurrent and when additional disabilities are present.

REPORTS

- Reports should be supplied promptly upon receipt of written release to parents, therapists, physicians, and educators. Reports should include:
 - Test procedures and reliability assessment
 - The complete audiogram with symbol key, calibration standard, stimuli used
 - Hearing aid identification - make, model, output and tone settings, compression or special feature settings, volume setting, earmold style and quality of fit
 - FM system identification and settings
 - Interpretive information regarding relationship of audiological findings to acoustic phonetics, especially with respect to distance hearing and message competition
 - Analysis of auditory behavior and development of the listening function

Section Three

Therapy Strategies and Techniques

Auditory-verbal therapy incorporates therapy techniques and strategies which teach the child with a hearing impairment to learn to listen, to process verbal language, and to speak. The auditory-verbal therapist works to teach the child how to listen and communicate through speech in a naturalistic setting. Therefore, parents play an integral role in therapy. Parents are taught ways to create an auditory environment which promotes spontaneous and meaningful communication. Parents are taught techniques and strategies which can be incorporated into the child's natural environment. Auditory-verbal practice concentrates on the whole child and develops communication through a variety of activities incorporating audition, speech, language, and cognition. Activities are chosen which are creative, interesting, and appropriate for the individual child's age and developmental stage. These activities utilize some basic techniques which promote maximum communication development in each individual child.

Development of Listening

The development of listening skills is the initial stage of auditory-verbal therapy. During this stage, the auditory-verbal therapist begins teaching parents techniques and strategies which can be carried over from a highly structured clinical setting to the child's natural environment. This carryover is very important because it is in these naturalistic settings, at home and in the community, where the most active learning takes place. Therefore, parents play an integral role in auditory-verbal success.

Both the parents and the auditory-verbal therapist begin to create an effective listening environment. Warren Estabrooks (1994), editor of Auditory-Verbal Therapy for Parents and Professionals, explains that this can be accomplished by doing the following:

- Speaking close to the child's hearing aids.
- Speaking with natural voice quality, attending to appropriate suprasegmental features.
- Reducing ambient background noise.
- Presenting a variety of listening activities using toys, objects and situations relevant to

the child's chronological age, hearing age, and developmental stage. (p.78)

Creating a listening environment is important for hearing impaired children of all ages and in every stage of listening development.

During my observations of David (a name chosen to maintain confidentiality), a two year old auditory-verbal client, I observed these strategies being used. Therapy was always performed in a room located in one of the outermost corners of the clinic. In this location, background noise was minimal. During therapy, David was seated in a high chair which clamped onto a small table. The clinician would position herself close to David's side and at his eye level. The clinician would speak at a normal conversational level and would carefully attend to the natural prosodic features of speech. If asking David a question, for example, the clinician would ask it with rising intonation. The clinician also carefully chose toys and activities which were appropriate for David's age and interests. These toys included noisemakers, plastic farm animals, a bus with people inside, and a toy airplane. Although certain strategies may change depending on the individual, a positive listening environment must be created for every hearing impaired child despite their stage of listening. These stages of listening can be divided into the following chronological categories: infants up to seven months, eight to fourteen months, and fifteen months and beyond (Simser, 1993).

In her article "Auditory-Verbal Intervention: Infants and Toddlers," Judith Simser first addresses the listening stage from infancy up to seven months. She explains that although infants are born with certain innate reflexes, their actions soon become purposeful as the baby begins to imitate movements and sounds. During this time, auditory stimulation revolves around repetitive activities. A parent may say, for example, "up, up, up" as they lift the child, and then "down, down, down" as they seat him in a high chair. These types of repetitive auditory stimulation are incorporated into therapy and strongly encouraged by the therapist to be practiced by parents at home. In her article, Simser includes a list of beginning vocabulary which incorporate repetitive stimulation and provide great acoustic information (See Section Three-Appendix A).

The next listening stage described by Simser is for children eight to fourteen months. Simser explains that during this stage, the baby's experiences increase. Repetitive acts continue, although they are incorporated into a wider variety of games and activities. Simser also describes conditioned listening tasks which may be incorporated into the child's play activities. During therapy, the parent may model the activity by holding a block or ring to their ear, waiting in anticipation of the sound. The sound (e.g. a drum being beat) is then presented by the clinician. Upon hearing the sound, the parent will stack the block or ring and respond by pointing to their ear and saying, "I heard that!" The child will then be conditioned until he can perform the activity, listening only, on his own. This will stimulate the child to begin making the mental connection between sound and the physical act of hearing. Later in this stage, as the child begins to use meaningful words, the therapist may teach parents how to practice listening activities involving requesting objects, performing tasks, and following directions (Simser, 1993).

Simser explains that hand cues may be incorporated into any of these listening activities. The therapist or parent may use a hand cue to briefly cover his or her mouth while the child is looking directly at the adult. In this way, the child is relying on auditory cues only. The hand cue may also be used by the adult gently moving his or her hand toward the child's mouth. This is a way to signal to the child to vocally imitate a production.

The final listening stage described by Simser is for children fifteen months and beyond. During this stage, as the child's listening ability improves, there is a simultaneous development in spoken language and cognition. Simser explains that parents continue to be taught ways to expand their child's auditory memory. The therapist will then begin building upon the child's auditory successes by presenting the child with more difficult discrimination tasks. The stimuli used in these tasks will be less redundant. Simser stresses that strategies used in these early stages of therapy should incorporate games and activities which make learning to listen fun!

During my observations of David, many of the techniques used to develop listening were incorporated into therapy. As mentioned earlier, David is a two year old child who has a

bilateral sensorineural hearing loss. He utilizes binaural amplification and his aided hearing thresholds fall within the 40 to 50dB HL range. Much of David's therapy involved auditory stimulation through repetitive activities. One of David's favorite activities involved a toy bus. The clinician would roll the bus across the table saying, "bu, bu, bu, bu, bus." She showed David how the wheels on the bus go "round and round, round and round," and how the doors "open ...shut, open ...shut." During this activity, the clinician would often use a hand cue to signal to David to imitate her production of "bu, bu, bu, bu, bus." David was just beginning to vocalize on demand. The clinician and David would then say "bye-bye" to the toy as they put it away. This repetitive auditory stimulation was repeated through many different toys and activities.

Conditioned listening tasks were also incorporated into David's therapy. David was instructed to listen as he held a peg to his ear in anticipation of a sound. The clinician would then beat a drum either behind David or under the table. Upon hearing the sound, David would place the colored peg into the board while the clinician exclaimed, "I heard that!" This activity was also repeated with different toys. Although the clinician had not performed this conditioned task with speech sounds, requiring David to imitate her productions, she did change the stimuli. She used various bells which were higher in frequency and lower in intensity, and therefore, more difficult to detect. David, was also successful detecting these stimuli.

David's mother was an important part of each therapy session. Although she did not sit in for the entire session, she would actively participate in many of the activities. While observing, I noticed that David's mother was enthusiastic about her son's therapy and his success. She would incorporate the strategies learned in the clinic at home, monitor David's hearing aids, and report developments in David's speech. She will play a very integral role in her son's auditory-verbal success.

Speech Production

Most infants who are hearing impaired will babble, cry, coo, and laugh just as infants with normal hearing do. According to Simser, these vocalizations should be encouraged and reinforced. Infants will also begin to physically imitate models (usually parents). Therefore, in

the beginning, parents are encouraged to imitate both the physical and vocal activity of their baby (Simser, 1993). Eventually, the baby's ability to physically imitate will evolve into vocal imitation. Simser states, "After extensive listening experience, babies begin to imitate what they have heard, developing an auditory feedback loop" (1993, p.222). Parents will begin to attach meaning to familiar speech sounds that their child may produce while babbling. Upon hearing their child vocalize "aaaa," for example, a parent may give this sound meaning by associating the noise with an airplane. Parents and therapists will begin to practice speech enhancing techniques.

The clinician working with David utilized many speech enhancing techniques in therapy. David was especially fond of a toy airplane. The clinician would roll the airplane across the table saying "aaaa" with fluctuating intonation patterns. She then gave the airplane to David and signaled with a hand cue for him to imitate the sound. The clinician and David would continue this activity for several minutes with each of them taking turns. Another speech enhancing activity used by the clinician involved balloons. The clinician, using a hand cue, would say "pop" as she popped a balloon. David, wanting to see and hear another balloon pop, would attempt to repeat the production.

As the child begins to produce meaningful words, vocabulary building becomes a very important part of therapy. According to Doreen Pollack, author of Educational Audiology for the Limited Hearing Infant, beginning vocabulary should consist of functional words. Pollack defines functional words as "the words a child needs to communicate in his everyday experiences ..." (1970, p.III). In her book, Pollack has listed beginning functional words which may be used by parents and therapists (See Section Three-Appendix B). Pollack then points out that the auditory approach allows parents to use a wide variety of functional words, instead of being limited by vocabulary which is easiest to say or lip-read. After the child begins to spontaneously produce a number of words, the teaching of two-word and three-word utterances may be incorporated into therapy.

I observed a video of Amanda (a name chosen to maintain confidentiality), a four year old auditory-verbal child, whose therapy session incorporated many vocabulary building strategies. Amanda has a bilateral sensorineural hearing loss and has been aided binaurally since one year of age. Her aided audiogram indicates hearing thresholds within the speech curve. During her session, I immediately noticed the use of functional words. After finishing with a toy, for example, the clinician always encouraged Amanda to repeat "bye-bye" as the toy was put away. If Amanda dropped a toy, the clinician responded, "Uh-Oh. Pick it up." Other functional words used in therapy included up, down, open, stop, and thank you. During the session I observed, Amanda was also learning parts of the body (e.g. leg, arm, foot). The clinician would point to the part on a stuffed animal and then have Amanda point on her own body. I noticed that the clinician used the same repetitive auditory strategies which were incorporated in the listening stages. Since Amanda's mother and sister were included in therapy, they were included in these repetitive tasks. The clinician's series of repetitive statements and questions may be similar to the following:

"This is a leg." (pointing to stuffed animal)

"Mom, what is this?" (again, pointing to animal)

"Here's my leg." (pointing to self)

"Amanda, where is your leg?"

The vocabulary for each of the body parts was taught in a similar way.

I observed another interesting technique during Amanda's therapy session. Although Amanda was at the stage in which she was learning new vocabulary, the clinician would also have her practice babbling. The clinician would have Amanda practice producing a series such as "ba, ba, ba, ba, ba," or "ma, ma, ma, ma ma." In this way, Amanda could practice her motor skills by repeatedly manipulating her articulators.

Language

Language will also be a focus of auditory-verbal therapy. Language may be defined as "a system of abstract symbols and rule-governed structures, the specific conventions of which are

would expand Steven's mean length of utterance (MLU). The clinician would model ten sentences in which the MLU ranged from five to seven words. Steven was able to correctly imitate many of the sentences. When having difficulty, however, the clinician would assist Steven until he was able to successfully repeat the sentence. If Steven was having difficulty with a certain word, for example, the clinician would model the word in isolation. Once Steven produced the word correctly, the clinician would again model the entire sentence. This strategy seemed to work effectively for Steven. A tracking exercise was also performed at the sentence level. The clinician would read a sentence from a children's book and have Steven repeat verbatim what was read. The clinician would apply certain adaptive strategies, such as targeting a word in isolation, to assist Steven in repeating the sentence correctly. Although Steven was not timed, the clinician did monitor how many words she had to assist him with. His progress was then logged each week. This activity required Steven to be attentive and concentrate. The clinician was also focusing on expanding Steven's short attention span.

Other activities fostered the production of spontaneous conversational speech. In one activity, the clinician read a short children's book which she and Steven then discussed. The clinician asked many open-ended questions which required Steven to recall events and characters, list certain items, and formulate conclusions. The goal of this activity was to target receptive listening skills, memory, organization of ideas, and summarizing skills. In another activity, the clinician and Steven discussed items which he had brought from home. The clinician then asked what the items were, what they were used for, who they were used by, etc. This task targeted Steven's storytelling skills.

The clinician also conducted activities which focused on adjectives and the use of morphological markers. In the first activity, Steven had to describe various toys with two to three adjectives each. The goal of this activity was to improve Steven's use of attributes. In another activity, a game was played to enhance Steven's understanding of plurals. Steven was shown pictures of single and multiple objects (e.g. car and cars). The clinician would then point to each picture and model, "This is a picture of one car and this is a picture of many cars." The

clinician would then point to one picture and have Steven state, in the same way modeled, what the picture was of. The wide variety of activities conducted by the clinician demonstrated some of the many aspects of language which are addressed through auditory-verbal therapy.

Auditory-verbal practice concentrates on the whole child and develops communication through a variety of activities incorporating audition, speech, language, and cognition. Activities are carefully chosen which are creative, interesting, and appropriate for the individual child's age and developmental stage. These activities utilize some basic techniques which promote maximum communication development in each individual child.

Section Three-Appendix B

FROM: Educational Audiology for the
Limited Hearing Infant by
Doreen Pollack

First Words: *Bye-bye, AU gone, More, Oh, OU, Nice,
Rough, Hi, Up, Down, Yummy, Ow, Hot,
Cold, Light, No, Yah, Pooie, Peeoo, Uh-Huh,
Stop, Cut, Knock-knock. Open the door. I
heard that. Pick it up. Bad Girl. Bye-bye
in the car. Daddy shop. I love you. Come
here. Thank you. Peek-a-boo.*

Section Four

Introduction

Clinical efficacy is an important component of any aural habilitative program. Therefore, examining the effectiveness of auditory-verbal practice is essential. Although there is limited published data regarding the outcomes of the auditory-verbal approach, one particular study, conducted by Donald M. Goldberg and Carol Flexer, investigated the status of auditory-verbal graduates. In their article "Outcome Survey of Auditory-Verbal Graduates: Study of Clinical Efficacy," Goldberg and Flexer present the findings of their study. The following is an abstract of this article.

The purpose of the authors' study was to investigate the status of auditory-verbal graduates to determine if auditory-verbal practice indeed reaches its stated goal. In retrospect, AVI states that the goal of auditory-verbal practice is "...that children with hearing impairments can grow up in regular learning and living environments that enable them to become independent, participating, and contributing citizens in mainstream society." The authors explain that one important way to determine the efficacy of auditory-verbal practice is to evaluate the primary goal of the approach in terms of its social validity. In other words, do auditory-verbal graduates actually achieve the desired outcome of the approach? Goldberg and Flexer contend that one way to investigate this question is to evaluate the outcomes "...as perceived by recipients of the service." Therefore, the authors surveyed graduates of auditory-verbal programs.

Methods

The initial step in gathering information involved contacting auditory-verbal graduates. To do so, a list of auditory-verbal therapists and centers was established. Using the list of auditory-verbal principles as a reference, the represented programs were then evaluated to ensure that they were indeed auditory-verbal ones. After verification of the program, each identified therapist was asked to contact former students who met the following criteria: (1) 18 years of age or older and (2) participation in the auditory-verbal program for at least 3 years. The therapists

then served as the contact person, sending the questionnaires to their former clients, strongly encouraging their participation. The questionnaire was seven pages in length and consisted of both open and closed-ended questions. The following areas were addressed: hearing loss and amplification, school history, personal history, work history, therapy history, and miscellaneous. A reprint of this survey is included at the end of this section (See Section Four-Appendix A). Of the 366 surveys which were sent to therapists and programs, 157 usable forms were returned. This equaled a response rate of 42.9 percent..

Results

Background information was gathered regarding each respondent's hearing loss and amplification device. Based on the pure-tone average for the better ear, 93 percent of the respondents reported having a hearing loss in the severe to profound range. Ninety-five percent indicated that the onset of their hearing loss was "prelingual." This is defined by Goldberg and Flexer to be a loss which is acquired by three years of age. The results of the survey indicated that the average age of identification of the hearing loss was 23 months. Twenty-seven months was the average age for initial amplification. Of the initial hearing aid fittings, 64.1 percent were binaural..

Results of the survey indicated significant personal and familial involvement in the auditory-verbal program. Respondents demonstrated a long term commitment to auditory-verbal therapy. The results indicated that the average number of years to be involved in an auditory-verbal program was 11. The span of therapy time ranged from 3 to 23 years. The majority of respondents reported strong family involvement.. All respondents, with the exception of one, stated that their mothers were very involved in their therapy program. Some of the respondents noted that their mother would actively participate in therapy sessions, watching and learning the lessons so that they could be practiced at home. Over 80 percent indicated that their fathers were involved in the auditory-verbal process. Almost 67 percent reported the participation of their siblings. The type of involvement offered by fathers was described differently than that reported for mothers. Although fathers were commonly perceived as a source of financial

stability, respondents also reported that their fathers provided support and encouragement. The surveys indicated that siblings commonly served as speech and language role models, as well as a source of moral support.

The survey also gathered information regarding educational, work, and social history. Some of the most impressive data obtained from the survey was in regards to education. The results indicated that the majority of respondents were mainstreamed, or fully integrated, into "normal" schools. While almost 80 percent were mainstreamed during their elementary years, over 86 percent were mainstreamed in middle and high school. The survey indicated that 152 respondents had completed high school. Nearly 70 percent reported that they were between 16 and 18 years of age at the time of high school graduation. Over 95 percent of the students continued on with some type of secondary education. Of these 139 students who continued beyond high school, 124 reportedly attended or were enrolled in university or college settings. Only 12.1 percent of the individuals reported that they attended or were enrolled at National Institute for the Deaf or Gallaudet University. The remainder of students attended post-secondary programs which were not designed primarily for persons with hearing impairment. Because many of the graduates were still enrolled in post-secondary educational programs, the information regarding work history was not representative of the population surveyed. Only 92 respondents reported job titles, settings, and income levels. However, of these participants, a wide range of jobs was reported. Occupations included blue collar positions such as bus driver and factory worker; office positions such as computer programmer, bank vice-president, and secretary; and other professional positions such as social worker, counselor, engineer (two respondents), attorney (three respondents), dentist, and physician (two respondents). More than 50 percent of respondents also indicated involvement in a variety of social and community activities. Activities which were reported included coaching, teaching CPR, sororities, and fraternities.

Respondents were also asked questions regarding their perceptions of their current involvement in the "hearing," "deaf," or both worlds. Nearly 73 percent of the individuals

surveyed reported that they were part of the "hearing" world. Of this group, 13.3 percent stated specifically that they were given the opportunity to be part of the hearing world as a result of the choices which were available to them. Only one individual reported being in the "deaf" world. Approximately 25 percent of the respondents described being part of both the "hearing" and "deaf" worlds. Of those respondents who stated that they participated in the "hearing" world, many described their lives as being very positive and fulfilling.

Discussion

The purpose of Goldberg and Flexer's study was to determine if auditory-verbal practice indeed meets its stated goal: that children with hearing impairment will grow up in regular learning and living environments that enable them to become independent, participating, and contributing members of mainstream society. Many of the findings were consistent with the auditory-verbal practice principles. For instance, the auditory-verbal approach emphasizes the importance of early identification and amplification. The results of the study indicated that the majority of respondents were identified by 2 years of age and fit with binaural amplification. Goldberg and Flexer note that this was early for 20 years ago. Another important finding is that 93 percent reported their hearing loss to be within the severe to profound range. This supports the notion that children with moderate hearing losses are not the only candidates for auditory-verbal therapy. Auditory-verbal practice also strongly encourages the support and involvement of parents. In fact, parents play an integral role in auditory-verbal success. A high percentage of respondents noted the involvement of their mothers, fathers, and even siblings in the auditory-verbal process. The survey indicated that mothers were particularly active participants. Perhaps the primary goal of auditory-verbal practice is that the child will be able to participate and function independently in the mainstream society. Many of the individuals surveyed certainly seem to have met this goal. The majority of respondents reported that they were mainstreamed in local schools and attended or are attending post-secondary institutions not designated specifically for persons with hearing impairment. A high percentage of respondents also indicated an involvement in community activities. Another important finding involved self

perception. Nearly 75 percent indicated that they perceived themselves to be part of the "hearing" world. Approximately 25 percent reported their participation in both the "hearing" and "deaf" worlds.

Conclusion

Although more research is needed in the area of auditory-verbal outcomes, this study seems to indicate that the auditory-verbal approach is capable of reaching its desired goal. For the majority of respondents, the guiding principles of auditory-verbal practice were incorporated into their auditory-verbal program. As a result, auditory-verbal practice did indeed provide the majority of individuals with the opportunity to grow up in regular learning and living environments that enabled them to become independent and active participants in mainstream society.

Section Four-Appen4ix A

From: "Outcome Survey of Auditory_ Verbal Graduates: Study of Clinical Efficacy" by Donald M. Goldberg and Carol Flexer

I. Hearing Loss and Amplification

Degree of hearing loss:

	250	500	1000	2000	4000	8000 Hz	
RE	___	___	___	___	___	___	dB HL
LE	___	___	___	___	___	___	dB HL

Aided (with hearing aids) thresholds:

		500	1000	2000 Hz	
with hearing aids	___	___	___	___	dB HL

Aided Speech Recognition Threshold (SRT): ___ dB HL

Aided Word Recognition (Discrimination) Score: _____%

Wordlist used: _____

Presentation level: _____ dBHL

Age of onset of hearing loss: _____

Cause of hearing loss: _____

Did you or your mother have any of the following?	Yes	No
1. Asphyxia	___	___
2. Bacterial meningitis	___	___
3. Congenital perinatal infections	___	___

- 4_ Defects of the head or neck _____
- 5_ Elevated bilirubin (jaundice) _____
- 6_ Family history of childhood hearing impairment _____
- 7_ Low birth weights _____

Age of identification of hearing loss: _____

How frequently did you experience middle ear problems? _____

Age first amplified/provided with hearing aid(s): _____

One hearing aid or two hearing aids? _____

How consistently did you wear your hearing aids as a child?

Has your hearing loss been progressive?

___ Yes ___ No

If yes, describe: _____

Have you ever made use of assistive listening devices (ALDs) such as an FM system? If so, please describe, including ages/grades when ALDs were used. Describe their benefits, if any:

N. School History

Briefly describe your educational program as you were growing up. Be specific, for example, if you were mainstreamed for all or part of your classes, list the grade, which courses, etc.:

Did you receive any special services while in elementary and/or secondary school, for example, speech-language therapy, teacher of the hearing impaired, occupational therapy, tutoring, reading assistance, learning disability assistance, counseling, etc.?

Please describe the ages/grades and the extent of the special services you received:

How would you describe your elementary school?

Fully mainstreamed "normal" school _____

Partially mainstreamed "normal" school _____

Oral day school/classroom _____

Oral residential school _____

TC day school/classroom _____

TC residential school _____

Manual school/classroom _____

Other (please describe) _____

How would you describe your middle school?

Fully mainstreamed "normal" school _____

Partially mainstreamed "normal" school _____

Oral day school/classroom _____

Oral residential school _____

TC day school/classroom _____

TC residential school _____

Manual school/classroom _____

Other (please describe) _____

How would you describe your high school?

Fully mainstreamed "normal" school _____

Partially mainstreamed "normal" school _____

Oral day school/classroom _____

Oral residential school _____

TC day school/classroom _____

TC residential school _____

Manual school/classroom _____

Other(please describe) _____

Did you complete high school? ____ Yes ____ No

How old were you when you completed high school? _____

Did you continue your education after high school? _ Yes ___ No

Did you enter a vocational school, college, or university? _ Yes ____ No

If so, please name and describe: _____

Did you receive a degree? _ Yes ____ No

If yes, what type? _____

Did you receive additional professional schooling?

Advanced degrees, e.g., M.A., M.S., M.B.A., Ph.D., M.D., J.D., etc.?

III. Personal History

Have you ever been married? ____ Yes ____ No

Are you currently married? ____ Yes ____ No

Have you been divorced? ____ Yes ____ No

If you are/were married, does your spouse have a hearing loss?

____ Yes ____ No

Do you have children? ____ Yes ____ No

If yes, how many? _____

Do any of your children have a sensorineural (permanent) hearing loss? _____ Yes ____ No

If yes, describe: _____

If you have a child who has a hearing loss, what method(s) are you using to educate your child?

IV, Work History

What is your current job title and job setting? _____

Briefly name and describe past jobs you have held (employment history):

Please choose the annual income range that describes *your* personal (not family) earnings presently:

- | | | | |
|-------------------|-------|-------------------|-------|
| Under \$4,999 | _____ | \$20,000-\$24,999 | _____ |
| \$5,000-\$9,999 | _____ | \$25,000-\$29,999 | _____ |
| \$10,000-\$14,999 | _____ | \$30,000-\$39,999 | _____ |
| \$15,000-\$19,999 | _____ | \$40,000-\$49,000 | _____ |
| | | Above \$50,000 | _____ |

V. Therapy History

For how many years did you receive auditory-verbal (Acoupedic, unisensory, auditory training) therapy?

Who was your therapist/teacher/clinician? (If more than one, please try to list):

Describe the schedule of your therapy (years, frequency per week, etc.):

Describe your mother's involvement in your therapy and education:

Estimate the number of hours per week that your mother provided home therapy:

Describe your father's involvement in your therapy and education:

[If you have any brothers and/or sisters, describe their involvement in your therapy and education:

What was your mother's occupation when you were a child?

What was your father's occupation when you were a child?

VI. Miscellaneous

Are you able to use (receive and send messages) the telephone (voice)? Yes No

If yes, with what degree of success do you use the telephone (voice)?

Do you make use of a TDD? Yes No

Do you, or did you, have any other problems in addition to your hearing loss, for example, visual problems, learning disabilities, physical disabilities, etc.? Yes No

If yes, describe: _____

Are you involved in any community activities? Yes No

If yes, please describe: _____

How would you describe yourself in regard to your hearing impairment? (See samples listed below)

Select one of the following and comment (if you wish) OR fill in the "OTHER" line in your own words.

- i. "I am a person with a hearing loss who participates completely in the hearing world." _____
- ii. "I am a person with a hearing loss who participates in both the hearing and 'deaf worlds.'" _____
- iii. "I am a person who is deaf who participates primarily in the deaf community." _____
- iv. OTHER: "I am a _____"

THANK YOU VERY MUCH FOR TAKING THE TIME TO COMPLETE THIS SURVEY. THIS INFORMATION WILL BE HELPFUL TO PROFESSIONALS IN THE FIELD OF HEARING, PARENTS, AND OTHER PERSONS WITH A HEARING LOSS. PLEASE REMEMBER THAT YOUR IDENTITY WILL NEVER BE REVEALED IN CONNECTION WITH YOUR RESPONSES TO US.

Because we are interested in collecting additional information on adults with a hearing loss who were trained to listen as children; it would be greatly appreciated if you would complete the identifying information requested below. However, you do not have to tell us who you are if you don't want to.

Name _____

Street Address _____

City, State (Province), Country _____

Date of Birth _____

THANK YOU AGAIN FOR YOUR COOPERATION, AND WE WISH YOU ALL THE BEST!

Donald Goldberg
Easton, Pennsylvania

Carol Flexer
Akron, Ohio

Dennis Pappas
Birmingham, Alabama

Section Five

Background Information

This semester [was given the opportunity to participate in therapy sessions with an auditory-verbal client.. The client, E.T., is a two and a half year old girl who has a bilateral, profound, sensorineural hearing loss. She utilizes binaural amplification and her aided thresholds are in the moderate to severe range. On April 22, she underwent cochlear implant surgery for her left ear. E.T.. is currently relying on amplification in her right ear until the implant is hooked up. E.T.. has been an auditory-verbal client at the Northern Illinois University Speech and Hearing Clinic for the past year.. She attends therapy twice a week for fifty minutes each session. E.T. is a very expressive and energetic child. She seems to look forward to therapy and enjoys the activities.

Goals/Objectives

The goals for this semester focused on teaching E.T.. to listen, vocalize, discriminate between sounds varying in prosody, and understand some basic language concepts. One of the main goals for this semester was to reinforce E.T.'s listening skills. Each session began with a play audiometry activity which required E.T.. to focus on listening. Although E.T.. demonstrated an understanding of the concepts of play audiometry, the clinician continued to reinforce her understanding of the relationship between sound and the physical act of hearing. Another important goal involved encouraging E.T.. to vocalize more frequently. E.T.. is a very expressive child who often uses facial expressions and gestures to communicate. The clinician was working with E.T.. to encourage her to rely more on vocalizations to communicate. The clinician was also working with E.T. to encourage her to listen to and discriminate between words varying in prosody. At the beginning of the semester, E.T.. was very successful in accurately detecting sounds and various word stimuli. Therefore, the clinician progressed to a more difficult listening task which required E.T.. to distinguish between two words which varied in prosody. Finally, each session incorporated activities which focused on building language concepts. These

language concepts were constantly being reinforced throughout therapy. The daily objectives reflected these goals. The objectives for each session were typically as follows:

1. E.T. will be encouraged to listen to and understand the concepts of play audiometry through the use of Ling's sounds and toys.
2. E.T. will be encouraged to listen to and discriminate between two word stimuli varying in prosody.
3. E.T. will be encouraged to listen to and produce words related to language concepts.
4. E.T. will be encouraged to close each activity with "bye-bye."

These objectives remained the same throughout the course of the semester.

Teaching Methods

Many methods were used in teaching E.T. the objectives described above. To reinforce her listening skills, play audiometry was frequently used. Using a game or toy (e.g. blocks, puzzle, rings), the clinician would encourage E.T. to hold the particular item to her ear in a "ready position." The clinician would not continue with the task until she demonstrated that she was ready to listen. Using Ling's Six Sounds (*la!*, *li*, *lu*, *li*, *~*, *lra!*), the clinician would hold her hand in front of her mouth and produce one of the speech sounds. In this way, E.T. was relying on auditory cues only in detecting each sound. Upon hearing the sound, E.T. could move the item from her ear and continue with the activity (e.g. placing a piece in a puzzle). A similar task was used to encourage E.T. to produce the speech sounds. The clinician would hold the item to her mouth and produce one of Ling's sounds. She would then pass the piece around the table and we would each imitate her production. E.T. would anxiously await her turn. Upon receiving the item, she would produce the sound and proceed with the activity. Not only did this activity encourage E.T. to vocalize the speech sounds, it reinforced the concept of turn-taking.

Modeling and imitation were used to teach E.T. to produce certain sound and word stimuli. The clinician would first try to encourage E.T. to rely on auditory cues only to correctly imitate her production. To do so, the clinician would use a hand cue to briefly cover her mouth. When E.T. had difficulty correctly imitating the word or sound, the clinician would model the

target with visual cues. While modeling a production, the clinician would directly face E.T. After producing the target word or sound, the clinician would gently use a hand cue to signal to E.T. to imitate. When E.T. had difficulty producing consonants such as /p/, /b/, and /m/, the clinician would also provide tactile cues. When teaching /m/, for example, the clinician would hold E.T.'s hand to her mouth to enable her to feel the closure of her lips. The clinician would then place E.T.'s hand over her own mouth while modeling the production. This technique was very helpful in teaching E.T. to correctly produce these sounds.

To teach E.T. to discriminate between word stimuli which varied in prosody, animal sounds (e.g. meow, woof, moo, oink-oink) were frequently used. The clinician would bring in two toy animals such as a cat and a dog. She would then point to each of the animals and produce the corresponding sound. This would encourage E.T. to associate the correct sound with each of the animals. She would then produce one of the sounds and indicate to E.T. to show her which one. Throughout this activity, the clinician would need to reestablish the correct sound with its corresponding animal. These discrimination tasks were also used to teach E.T. the concept of same and different.

To reinforce language concepts, the clinician would incorporate many games, books, and play activities. These activities often included functional words and phrases such as up, down, open, shut, all done, uh-oh, bye-bye, and hi. The clinician would use repetitive auditory stimulation to emphasize these words. While playing with Fisher Price cars and a slide, for example, the clinician would lift the car "up, up, up," and then let it slide "down, down, down." The teaching of language concepts often involved parts of the body (e.g. head, nose, ear, mouth, leg, arm). This was often done in reference to E.T.'s own body. The clinician would point to the specified part on a picture or doll and would then show E.T. on her body.

E.T.'s mother played an important part in teaching E.T. the objectives. By including E.T.'s mother in all of the activities, she had the opportunity to practice each of the techniques and strategies which the clinician used throughout the session. She could then use these techniques with E.T. at home. E.T.'s mother also served as an effective model for E.T. When

E.T. would not respond for the clinician, E.T.'s mother would attempt to elicit the targeted behavior. Parallel play was also used between E.T. and her mother. During the listening activities, for example, each would have a puzzle. The clinician would then have each of them take turns listening in order to receive a piece of the puzzle. Involving E.T.'s mom helped E.T. to remain on task and become more enthusiastic about participating in each of the activities. Using parallel play also reinforced the concept of turn-taking. Not only did E.T.'s mother assist the clinician during the session, she encouraged carry-over.

Results

Over the course of the semester, I have observed some changes in E.T.'s ability to detect and produce certain phonemes. At the beginning of the semester, E.T. could detect *la!*, *lii*, *lui*, and *lm!* with 100 percent accuracy. She could not detect *lsi* and *~!*. During the last few weeks of therapy, E.T. was beginning to detect *lsi* and *6!*. Her responses, however, were very inconsistent. Changes were also observed in E.T.'s ability to produce sounds. At the beginning of the semester, E.T. could produce *la!*, *lii*, and *lui* with 100 percent accuracy using auditory and visual cues. Towards the middle of the semester, E.T. was producing *la!* using auditory cues only with about 90 percent accuracy. At that time, her production of *lii* and *lui* with auditory cues only was inconsistent. During the last few sessions, E.T. seemed to be more responsive to auditory cues. She was becoming more consistent in correctly producing *la!*, *lii*, and *lui* with auditory cues only. The clinician has currently been working with E.T. on the phonemes *lm!*, */hl*, and *lp!*. E.T. has been very successful in her productions of the phoneme */hl*. By the end of the semester, E.T. was correctly producing */hN* with 100 percent accuracy. To produce *lm!* and *lp!* correctly, E.T. required auditory, visual, and tactile cues. She continues to be inconsistent in correctly producing each of the sounds.

Overall, E.T. has become much more vocal. Towards the end of the semester, she was using gestures and vocalizations to express herself, instead of relying on just gestures. In general, more responses were recorded in later sessions than were at the beginning of the semester. Her attempts to produce word stimuli have become more frequent. During therapy,

E.T. has approximated the following words: up, down, pop, bus, boy, balloon, and open. She has also demonstrated a better understanding of language concepts. E.T. was able to identify parts of the face (eye, ear, nose, eye, mouth) with 100 percent accuracy. She has also demonstrated an understanding of concepts such as open, all done, up, down, and bye-bye.

Personal Reactions

I am very pleased that I was given the opportunity to participate in E.T.'s auditory-verbal therapy sessions. I found this to be a very enjoyable and educational experience. I also feel that this truly contributed to my understanding of the auditory-verbal approach. I was able to see many of the techniques and strategies which are a part of auditory-verbal therapy. By being included in many of the activities, I had the opportunity to practice using some of these methods. I was also able to observe the partnership which existed between the audiologist and E.T.'s mother. Most important, I gained an understanding of how the auditory-verbal approach becomes a way of life for the child and the child's family. This was a very positive learning experience.

Conclusion

Auditory-verbal practice is a comprehensive approach which concentrates on the whole child. Emphasis is placed on early identification and ongoing audiological evaluation and aural habilitation. Communication is developed through continuous exposure to activities incorporating audition, speech, language, and cognition. Auditory-verbal practice also focuses on the child's education and socialization. Parents and auditory-verbal professionals work together to optimize the auditory-verbal experience in every aspect of the child's development. As a result, auditory-verbal practice becomes a way of life for the child and his or her family.

The ultimate goal of auditory-verbal therapy is that the child with hearing impairment will be able to participate and function independently in the mainstream society. To obtain this goal, the child with a hearing impairment is taught to make maximum use of his or her amplified residual hearing. Parents and auditory-verbal professionals then work together to provide the child with an optimal listening and language learning environment. Parents are taught ways to

create an auditory environment which promotes spontaneous and meaningful communication. Parents are also taught therapy techniques and strategies which can be incorporated into the child's natural environment. As a result, the child develops the ability to communicate through speech. This enables the child to grow up in regular learning and living environments. This helps the child to develop the skills necessary to become an independent and active participant in the mainstream hearing-speaking society.

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Observation Log: Fall 1996

<u>Date</u>	<u>~</u>	<u>Type of Service/Therapy</u>
9-24	4yrs.	video: auditory-verbal
10-1	6yrs.	auditory-verbal
10-11	2yrs.	auditory training/auditory-verbal
10-18	2yrs.	auditory training/auditory-verbal
10-22	6yrs.	auditory-verbal
11-8	2yrs.	auditory training/auditory-verbal
11-14	6yrs.	auditory-verbal

Observation Log: Spring 1997

<u>Oak</u>	<u>~</u>	<u>Type of Service/Therapy</u>
1-23	2yrs.	audi tory-verbal
1-28	2yrs.	auditory-verbal
1-30	2yrs.	auditory-verbal
2-4	2yrs.	auditory-verbal
2-6	2yrs.	auditory-verbal
2-11	2yrs.	auditory-verbal
2-20	2yrs.	auditory-verbal
3-6	2yrs.	auditory-verbal
3-18	2yrs.	auditory-verbal
4-1	2yrs.	auditory-verbal
4-3	2yrs.	auditory-verbal
4-8	2yrs.	auditory-verbal
4-10	2yrs.	auditory-verbal
4-15	Zyrs.	auditory-verbal
4-17	2yrs.	auditory-verbal
4-29	2yrs.	auditory-verbal