1-1-1975

Study of auditory imperception with suggested techniques for remediation

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A STUDY OF AUDITORY IMPERCEPTION
WITH SUGGESTED TECHNIQUES FOR REMEDIATION

by

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A RESEARCH PAPER

SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS IN EDUCATION

(EDUCATION OF LEARNING DISABLED CHILDREN)

CARDINAL STRITCH COLLEGE

Milwaukee, Wisconsin

1975

This research paper has been

approved for the Graduate Committee

of Cardinal Stritch College by

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Date Mar. 1, 1975

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CHAPTER I

INTRODUCTION

The child with auditory imperception difficulties is found in the midst of a world where sounds are combating one against the other. Modern day classrooms are individualized to provide for a number of activities to be going on simultaneously, each activity having its own sound, be it the click of a tape recorder, a film strip machine, phonograph, or turning of pages. In the home, there is the telephone ringing, the radio blaring, the television going, the doorbell ringing, and the baby crying. At the grocery store, there are children talking, carts rolling, boxes falling, and the cash register ringing or buzzing. The child with auditory imperception difficulties rotates within this merry-go-round environment and is unable to adequately and consistently discriminate one sound from another.

The writer uses the word "adequately" to point out the fact that the child does hear sound and is interested in it, but cannot discriminate one sound from another. Even though the sounds may seem to be familiar, he cannot recall how to use them and benefit from their use. This problem will be further explained in Chapter II.

It is important to note that the child's peripheral hearing is intact. There is, however, a central auditory impairment in the

central nervous system, which when interpreted means the child can hear the sounds but does not understand them and hence reacts like a child who is hard-of-hearing, deaf, or aphasic. This confusion is difficult for the child to deal with as well as for educators to remediate. To further complicate the issue, researchers know relatively little about how we hear.

> Speech pathologists have explored faulty speech production in relation to what people hear. There has been little research into auditory perceptual skills or how children hear. There is a large body of literature devoted to the nature of children's language acquisition but these investigations have been concerned almost exclusively with linguistic theory and cognition in spite of the fact that the heart of language acquisition is auditory perception - the mechanics by which we learn to listen, to hear, to understand, and to remember.[1]

Manufacturers have involved their companies in producing teaching materials designed to minimize or correct a child's learning difficulty. Productivity has been most significant in the area of visual-motor training which deals with eye-hand coordination, tracking skills, depth perception, closure, fine motor control, gross motor control and other visual-motor areas. Relatively few materials are designed to deal specifically with auditory imperception problems. The visual-perceptual process has appealed to scholars for a long time. There is substantial knowledge about the processing of visual stimuli and tools available for assessing their dysfunction. However, there are no comparable resources available in the investigation of auditory imperception. This lack of knowledge has lead to misdiagnosis. Because the mannerisms of children with auditory deficits pattern them-

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[1]Sylvia B. Kottler, "The Identification and Remediation of Auditory Problems," Academic Therapy Quarterly, VIII (Fall, 1972), 75.

selves after the deaf or hard-of-hearing, they are often classified and labeled among the deaf or hard-of-hearing population.

Statement of Purpose

The purpose of this paper was to describe the child with an auditory imperception problem, to differentiate him from the deaf or hard-of-hearing, by pointing out characteristics that pertain to him alone, and to suggest ways to remediate the problem within a classroom environment. This necessitated the writer's selective choice of authorities. Many studies and research projects have dealt with auditory deficits, but relatively few authorities have made practical suggestions for dealing with and remediating the problem. The emphasis of this paper was on what can be done on an informal basis by the classroom teacher. Once the "problem child," it is the writer's intent that this neglected and misunderstood child will be reviewed as a child with a problem that can be remediated.

Conclusion

In this chapter an introduction to the problem of auditory imperception was given. Distinctions were made so as not to confuse these children with the deaf or hard-of-hearing population. It was pointed out that much information and many materials are available when dealing with a visual imperception deficit but relatively little is known about exactly how the human hears and even less has been done to provide materials which could be used to remediate an auditory imperception problem.

Information in the following chapter has been gleaned from the practitioner-researcher so as to obtain an understanding of how to deal with an auditory imperception deficit once it has been identified.

Chapter II presents a more detailed and descriptive explanation of an auditory imperception deficit. The chapter includes:

1. Reference to the importance of hearing.
2. Simplified version of how the human hears.
3. Problems of assessing an auditory deficit.
4. The characteristics of a young school age child with an auditory deficit.
5. The need for early identification of an auditory deficit.
6. Some informal diagnostic techniques.
7. The importance of the special educator's role.

Chapter III contains the definition, characteristics, and remedial techniques for the following specific problem areas:

A. Auditory Reception
B. Auditory Discrimination
C. Auditory Memory
D. Auditory Closure
E. Auditory Association

Appendix A is a list of suggested formal tests for assessing auditory processing, and is by no means an exhaustive listing.

Appendix B is a list of suggested teaching materials and the companies from which the items may be purchased.

The review of research was limited to the information available at Cardinal Stritch College, Milwaukee, Wisconsin.

CHAPTER II

REVIEW OF RESEARCH

Hearing has been described as the most taken-for-granted of man's five senses. "Asked to select the most previous of the five senses, few people would name hearing. Yet of all man's links to the outside world, hearing seems to be the essential sense, the one that makes man peculiarly human."[1] To better understand and appreciate what it means to hear, a view of how important and vital hearing is, along with a brief and simplified version of how the hearing process takes place is given. In this way, the writer hopes to make the reader more attuned to the difficulties with which a child with an auditory imperception problem has to cope.

Zigmund describes the importance of hearing very succinctly when she says:

> In man, hearing serves vital functions: it is a warning and a scanning system for keeping a constant vigil on the activity of the world around us. It alerts him to possible danger, records changes in the surroundings, and scans for sounds which have particular relevance.[2]

Zigmund further states that hearing is more useful than vision as a survival sense:

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[1]S. S. Stevens, Fred Warshofsky, and Editors of Life, Sound and Hearing. (New York: Time Incorporated, 1965), p. 9.

[2]Naomi K. Zigmund and Regina Cicci, Auditory Learning. (California: Dimensions Publishing Company, 1968), p. 2.

> Vision is basically directional: at any one time it functions in a limited area; it cannot travel through walls or around corners; it ceases to function in the dark. If we close our eyes we stop the flow of incoming information. By contrast, hearing is non-directional and non-selective. We can hear from all directions simultaneously, and we cannot close our ears . . . . Nature's plan seems to have been to provide us with one sense which functions without interruption to keep us in contact with the environment at all times.[3]

Stevens, Warshofsky, et al have this to say:

> How precious hearing is becomes clear when it is lacking . . . . The virtuosity of human hearing is as remarkable as its importance . . . throughout waking life it receives an uninterrupted stream of messages from the outside world--audible messages which must be screened and sorted, filed away, or acted upon. The automobile horn blares an instant, demanding signal. A siren screams, policemen blow shrill whistles, the telephone rings and each sound carries a definite message to the hearer.[4]

Experts know even less about the actual process of how a human hears. It is a phenomenon and continues to baffle the most intelligent men. "Human ears are not much to look at . . . working together, the structure of the outer, middle and inner ears perform acts of amazing range and virtuosity, even after decades of study the full capacity of the ear can only be guessed at."[5]

Eden, Green and Hansen offer the following simplified explanation:

> In order to hear, we first of all need sound waves as they are the stimuli for hearing. Our environment contains many simple and complex sounds which enter the ear. The ear does not hear as it is merely the mechanism that receives the

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[3] Ibid., p. 2.

[4] Stevens, Warshofsky and Editors of Life, Sound and Hearing, p. 9.

[5] Ibid., p. 31.

> sound waves. The ear is divided into three parts: the external ear; the middle ear; and the inner ear. These are the parts of the ear that receive the sound waves and process them for transmission to the brain. The connection between the ear and the brain is provided by the auditory nerve. The incoming sound waves cause the auditory nerve to be stimulated thereby creating impulses that are then sent to the brain.[6]

These same authors conclude the explanation by pointing out that "although relatively little is known about the actual functioning of the brain, it is felt that once the impulses reach the brain a very complex processing of information takes place."[7]

It is this "mental processing" that allows us to understand and make sense out of what was heard. Exactly what happens in the brain to make us react to a telephone ringing or someone calling us, remains the phenomenon it has always been. It seems feasible that researchers agree hearing is, indeed, a vital sense. They cannot, however, offer encouragement when it comes to identifying adequately and precisely a child with an auditory imperception difficulty.

Kidd and Kidd suggest that there is difficulty with instrumentation, causing the production of controlled auditory stimuli which has been a major drawback to research in auditory imperception. "Toys, noisemakers, clankers and bells, whistles, tuning forks and a myriad of other devices have been used to elicit a response in infants and children."[8]

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[6]Kathleen Eden, Jean S. Green and Janice Hansen. Auditory Training. (Iowa City, Iowa: By the Authors, 1973), p. 1.

[7]Ibid., p. 2.

[8]A. H. Kidd and R. M. Kidd, "The Development of Auditory Perception in Children" in Perceptual Development in Children, ed. by A. H. Kidd and J. L. Riviore (New York: International Press, Inc., 1966), p. 66.

These devices have "produced stimuli of varying and variable degrees of loudness and timbre" which obviously make it difficult, if not impossible, for adequate assessment.[9]

As early as 1954, Myklebust wrote:

> One of the primary problems confronting specialists in auditory disorders of children is the development of reliable methods for determining auditory acuity. The methods most commonly used were designed for adults, but many diagnosticians have assumed that these methods were equally suitable for infants and young children . . . . Evaluating the auditory capacity of adults who are emotionally, intellectually and physically mature is a different diagnostic problem from that of evaluating the auditory capacity of young children who are physically, emotionally and intellectually immature.[10]

Myklebust further cautions "clinicians who examine the auditory capacities of children to consider whether the techniques and procedures are genetically suitable whether the tests require mental, physical and emotional maturity beyond the child's capacity to respond."[11]

Kottler concurs when she states: "Our current knowledge of the problems associated with auditory imperception is based primarily on research conducted with adults who lost their language following a cerebral vascular accident, tumor, or other brain damage.[12]

"In spite of its significance, the auditory development of young children has not been subject to the same careful observation

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[9] Ibid., p. 66.

[10] Helmer R. Myklebust. Auditory Disorders in Children: A Manual for Differential Diagnosis. (New York: Grune and Stratton, 1954), p. 2.

[11] Ibid., p. 2.

[12] Sylvia B. Kottler, "The Identification and Remediation of Auditory Problems," Academic Therapy Quarterly, VIII (Fall, 1972), p. 73.

and analysis as Gesell and others have given to visual, motor, and other learning tasks."[13]

> Appraisals of children for school readiness weigh heavily on visual perceptual and motor functioning and often neglect auditory processes including language. Yet listening is one of the chief and crucial demands placed on the child as he enters school. Listening is the chief mode of learning in the early school years, and, at least in the primary grades children prefer gaining information by listening rather than by reading.[14]

Consider then the child between the ages of two and five. This age bracket is a saturating period of "do's and don'ts" as parents and teachers attempt to define conformity patterns for the child.

> It is a time for listening to favorite stories being read, listening to records, overhearing adult conversations, being intrigued by unusual noises and soundmaking toys, listening to corrections made of speech patterns, and attempting to comply. The child listens to shadings in tone, modulations in sound, and variations in tuning; he learns to listen in order to learn.[15]

It is not difficult to understand the problems a child with a generalized deficit in auditory learning poses for himself as well as those educators who are faced with the challenge of teaching him. At a time when the child should be learning to understand and appreciate what sound can do for him, "he hears, but does not interpret what he hears, he cannot understand spoken words or environment sounds." It is unfortunate that "he is unable to structure his

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[13] Zigmund and Cicci, Auditory Training, p. 3.

[14] Ibid., p. 3.

[15] Ibid., p. 3.

auditory world, to sort out and associate sounds with particular objects or experiences and because he fails to make these associations his responses to sound are inconsistent and cause him to be thought of as deaf or hard-of-hearing."[16]

To further characterize the child in a classroom, he might be identified because he forgets directions right in the middle of a task, or even before he begins. He may be searching for the teacher's face while she is speaking or constantly be asking the children around what to do. The child may just silently copy from a paper next to his. Occasionally the child is a victim of his own surroundings and he can be seen flitting energetically and endlessly from sound to sound and image to image. The child may be a puzzle to himself as well as to others because his auditory information is inconsistent: "one day sounds are clear and intelligible to him, the next day they are muffled and jumbled and he responds accordingly."[17]

Myklebust defines auditory imperception as a deficiency in structuring and appropriately attending to auditory stimuli.

The basic problem is one of confusion. The child is not able to organize the auditory stimuli in a way that is consistent or meaningful. Because this confusion is relative to the complexity of the situation, the child can react to some sounds, understand some words, acquire some language and communicate to a limited degree. For these

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[16]Doris J. Johnson and Helmer R. Myklebust. Learning Disabilities: Educational Principles and Practices. (New York: Grune and Stratton, 1967), p. 67.

[17]Georgia Ann Pitcher Baker. "Behavior Problem or Auditory Interferences?" Academic Therapy Quarterly, VI (Fall, 1970-71), p. 385.

reasons his disability may be undetected while his behavior is misdiagnosed as laziness or emotional liability.

It is quite understandable why he never listens to stories and never follows directions. He rarely understands them. It is reasonable to predict that he would soon become bored with the activities he does not understand and would attempt to occupy himself with something else, an act that would elicit a stern reprimand from his teacher. And so the cycle is endless.

> In the elementary school when a child has a marked auditory deficit, identification is relatively easy and the teacher has a speech therapist or community resource to whom she can refer the child. However, there are intelligent children in the regular classroom with no hearing impairment who are unable to learn and whose problems are ambiguous and in fact very subtle. These are the children who the teacher says won't listen, don't try to understand, just daydream.[18]

"The young child who has a disorder of the auditory processing function needs to be identified early and provided with an appropriate therapy . . . . Early intervention may prevent later frustration and academic failure."[19]

Early identification of the child with an auditory imperception problem rests primarily with the parent and the classroom teacher. Emphasis for this early identification should undoubtedly be placed on the classroom teacher since it has been established that formal tests and instruments tend to be unreliable and invalid when attempting to detect an auditory imperception problem. The writer

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[18]Kottler, "The Identification and Remediation," p. 73.

[19]M. Winifred Danwitz. "Auditory Processing Disturbances in the Young Child," Highlights, LII (Summer, 1973), p. 34.

is not discrediting the role of the otolaryngologist, the pediatrician, the audiologist, or other specialists in the auditory field since they do play an important role. However, their instruments cannot decipher an imperception problem. Hence, it is the watchful, observant eye of the educator, (be it in a regular classroom or one designed for special children) to detect the problem in the child and begin to remediate the situation immediately.

The following represent simple diagnostic-type tasks which a classroom teacher may find useful.

To test for acuity:

1. Hold a wrist watch near first one ear and then the other of the child, ask if he can hear it.
2. Whisper instructions to him.
3. Click coins behind each ear.

To test for perception:

1. Present commands in a normal voice and watch for response.
2. Play a tape and ask the child to repeat the contents.
3. Record sounds on a tape and ask children to identify the sounds.
4. Play listening games such as "Simon Says."
5. Observe the child's knowledge of simple general items of information such as the names of the days of the week.
6. Observe the child's performance at "Charades".
7. Observe his ability to recite simple nursery rhymes.
8. Observe his performance when confronted with a series of complex directions or a series of letters or digits.[20]

See Appendix A for a list of suggested formal tests for assessing auditory processing.

Semel has suggested the following general hints for minimizing auditory imperception problems in children:

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[20]Donna Brown, "An Analysis of Learning Disabilities for the Classroom Teacher" (Paper presented at a Follett In-Service Seminar, St. Louis, MO. April 6, 1973), p. 22.

1. Use language effectively: that is, don't overtalk.
2. Develop the use of consistent attention-getting devices before giving an assignment; for example, say "listen," "are you ready," or "begin."
3. Do not present too many tasks or directions at one time.
4. Elicit a child's interest in an activity by relating the materials to previous experiences; usually explaining the purpose and value of a listening activity increases a child's desire to participate.
5. Learn to wait for the delayed responses and slow assimilation of information that initially characterize some children with auditory imperception problems.
6. Learn to aim listening activities at the child's level of perception.
7. Phrase questions carefully; learn how to word questions to elicit specific types of responses.
8. Learn how to use key question words and phrases such as who, what, where, when, why and how much.
9. In teaching plurals, use consistent patterns in which, for example, the teacher always says, "This is a shoe; these are shoes."
10. Use patterns of questions and answers in which a child can readily predict what is coming; for example, use a series of questions such as "Where is the . . .?" and ask the child to consistently respond "The dog is . . ."
11. Train a child with problems to watch other peoples' mouths when they talk; also ask the child to watch the movements of his own mouth in a mirror as he repeats directions; visual cues can help interpret auditory information.
12. Learn how and when to use gestures with language; hence, gestures can enable a child to grasp a general idea of what is said without having to understand the specific auditory details.
13. Learn to use clearly articulated, slow speech, but do not use a quiet monotone.
14. Ask a child to repeat what was said if he is having difficulty understanding what he heard.[21]

If there appears to be substantial evidence that there is an auditory problem, a more thorough diagnosis is in order. This, then, is the time to refer the child to the specialist. Certainly no one discipline is likely to have all of the answers to meet a child's needs. It, therefore, becomes a matter of great importance that

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[21]Eleanor Semel. Sound, Order, Sense. (Chicago: Follett Educational Corporation, 1970), p. 32.

knowledge, skills, and expertise be shared for the benefit of the child.

> This can be illustrated by the suggestion that the physician should know the importance of speech reading, or the use of hearing aids, but he should not presume to be the educator. The speech pathologist, or audiologist should know the importance of intellectual and emotional factors, but he should not presume to be the clinical psychologist.[22]

Brown offers this final note: "No teacher should attempt a clinical diagnosis: there are people trained to help you."[23]

To diagnose the problem as auditory imperception still does not give the teacher the information she needs to remediate the disability although it may help to relieve the child from a degree of pressure.

Summary

In this chapter, the writer attempted to define and characterize the child with an auditory imperception problem. Care was taken to point out the fact that the child being described was not deaf or hard-of-hearing. The child does hear sound, but is confused by it. This point was emphasized several times because the writer wanted the distinction to be well-defined in the reader's mind.

To more adequately understand and appreciate what the child with an auditory imperception problem has to cope with, brief statements in regard to the importance of hearing and how the human hears were presented. Early identification of the auditory imperception

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[22] Myklebust, Auditory Disorders, p. 30.

[23] Brown, "An Analysis of Learning Disabilities," p. 22.

problem was stressed, and simple classroom "tests" were suggested along with common characteristics the teacher should look for when a child is suspected of having an auditory problem.

Overall generalized hints for minimizing an auditory imperception problem were also listed. The roles of the audiological specialists were also mentioned but not emphasized since the initial diagnosis of a problem generally comes from the classroom teacher.

Chapter III presents remedial techniques for five specific auditory disabilities that admit an element of confusion (imperception) in the auditory channel. They are intended to be of use to the classroom teacher dealing with children who have imperception problems in the auditory channel.

This review of research is not an exhaustive one. The term "imperception" is not a generally used term. Most researchers refer to the problem as an auditory perception deficit. It does not appear in the Educational Research Index nor in Mental Retardation Abstracts.

CHAPTER III

REMEDIAL TECHNIQUES

The initial stages of auditory training to remediate an auditory imperception problem should be structured as much as possible. The classroom should be some distance away from traffic and continuous playground noise mainly because these children do not understand sounds, they would not know which sounds to attend to and which ones to ignore. It is only as they learn to associate sounds with experiences that their responses become more appropriate.[1]

Myklebust further suggests that:

> The daily classroom routine should be planned so that auditory and nonauditory activities are alternated. Because children with severe auditory receptive disabilities have considerable difficulty in listening, they fatigue easily. They need periods of quiet after working on auditory tasks. At times, they become so frustrated and fatigued that they withdraw from the situation by covering their ears. It is necessary to watch for signs of fatigue and to provide quiet periods during which they can regain their equilibrium.[2]

Once the classroom setting and daily routine have been established, the task of remediating an imperception problem begins. It is the proper classroom setting and daily routine that will add greatly to the success of individual or group remediation techniques.

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[1] Johnson and Myklebust, Learning Disabilities, p. 69.

[2] Ibid., p. 69.

The techniques listed in this chapter were designed with the preschool child in mind, specifically between the ages of two and five. Five auditory disabilities have been selected, namely those related to:

A. Auditory Reception
B. Auditory Association
C. Auditory Figure-Ground Discrimination
D. Auditory Closure
E. Auditory Memory

These five areas were selected because each of them admits an element of confusion. The reader will recall that auditory imperception was defined simply as "confusion." Therefore, it is in regard to the confusion related to these five auditory functions that the remainder of this paper will concern itself. The writer will hereafter deal with:

1. Definitions of the above stated disability
2. Characteristics of the child having the disability
3. Suggested guidelines for dealing with the deficit
4. Remedial techniques which include those suggested by the writer and practitioner-researchers.

Each of the five disability areas will be organized in the same manner so as to facilitate the reading.

A. Auditory Reception

"Auditory reception involves the ability to derive meaning from what is heard whether it concerns specific sounds, conversations, or other verbally presented material."[3] An example of auditory reception would be a baby turning his head as a response to a mother's call. This process is further tested by requiring yes and no answers to questions such as, "Are dogs purple?" A yes or no response elim-

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[3]Eden, Auditory Training, p. 3.

inates the necessity of a child's explaining what he understands. A gesture response is equally acceptable if the child is unable to speak.[4]

The following characteristics may be exhibited by the child experiencing this particular problem:

1. The child may be unable to sort out sound from non-sound.
2. The child may be unable to localize sound.
3. The child may be unable to grasp more than simple short directions.
4. The child does not care for word games or games which require response to verbal directions.
5. The child relates poorly to his peers because he is unable to understand what the other children are talking about.
6. The child requires more visual aids to supplement verbal directions.[5]

Remediation of a deficit in auditory reception is directed toward helping the child to gain meaning from spoken language and other auditory symbols. This is a representational level ability involving the interpretation of auditory signals which represent concepts or objects.[6]

If a child shows a deficit in the auditory-reception process the following guidelines should be followed:

1. Use short, one-concept phrases.
2. Ask short questions.
3. Give visual clues whenever possible (gestures, written material, etc.
4. Use visual aids whenever possible.[7]

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[4]Wilma Jo Bush and Marian Taylor Giles, Aids to Psycholinguistic Teaching, (Ohio: Charles E. Merrill, 1969), p. 1.

[5]Eden, Auditory Training, p. 4.

[6]Samuel A. Kirk and Winifred D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation, (Illinois: University of Illinois Press, 1971), p. 138.

[7]Bush and Giles, Aids to Psycholinguistic Teaching, p. 1.

Some of the following suggestions will aid the teacher in dealing with the child who has an auditory reception problem.

Preliminary to all reception of sound is paying attention to a sound. Recognizing sound from no sound is a first step for the child whose auditory imperception makes even this a difficult task. A game that encourages an awareness of sound from no sound might proceed in the following manner:

1. The teacher makes a sound (squeeze toy, bell, drum, keys) in front of the child.

2. The child responds each time he hears the sound by hitting a mallet on the table, placing a ring on a spindle, or dropping chips into a container.

The object of the game is to help the child receive the message that this "bell" makes certain noise or sound. The child does, indeed, hear the sound for he is neither deaf nor hard-of-hearing. When the teacher makes the bell ring the child drops a chip in the container, thus "saying," figuratively speaking, he is paying attention to the noise and responding appropriately.

Some children might find the oral directions confusing; consequently, the teacher has to adapt and use fewer words. As the child begins to respond appropriately on a more consistent basis, the teacher should ring the bell out of the child's view so that the child has to respond to the sound alone which is the object of the game.

Variations of the game might include:

1. Using a variety of noisemakers as opposed to using just one sound, the teacher would then be sure the child is responding to sound.

2. Blindfold the child and have him raise his hand each time he hears the noise.

The writer feels it is necessary to point out again that the child is hearing the sound but does not derive meaning from what he hears. The teacher is not testing a hearing loss but is trying to eliminate a confusion of sounds. The child has to integrate the fact that the sound he is paying attention to goes with the particular object he is viewing. The teacher is helping the child put together, as it were, a number of two piece puzzles.

Following attention to sound is localization of sound. Localization refers to locating the sound source or direction of sound. The child has associated meaningful sounds with various objects, all of which have been presented to him with a single spaced environment. A tape recorder may have brought him his world of sound and now he must learn that the bell on the ice cream truck is outside the house on the street and not in the classroom. The power mower is in the back yard and the vacuum cleaner is in the house; the electric mixer indicates that someone is in the kitchen and running water in the tub is in the bathroom.

Activities for testing sound localization might include:

1. Blindfolding the child and then making noises in various parts of the room, having the child turn and point in the general direction of the noise.

2. Everyday classroom noises can be made, for example: the pencil sharpener, the water bubbler, scissors, cutting, the piano playing, and children talking; when the sound is made, the child has to identify it and point out where it came from.

Cicci has this to say about the localization of sound:

> Children generally learn to localize sound in a natural way. They are not unduly concerned with background sounds. They keep their attention on foreground sounds meaningful to the moment,

> shifting attention to background sounds if they are unfamiliar, indicate danger, or cause fear . . . . Some children are hypersensitive to sounds and are distracted by background noise. They may have trouble keeping attention focused on the foreground. They may be disturbed by footsteps in the corridor, the click of the light switch, ticking of a clock, the sound of the air conditioner, or traffic noises. They may require special help to learn to attend to some sounds and ignore others.[8]

Sound discrimination will be dealt with under auditory figure-ground-discrimination.

The suggestions previously listed have been applicable to the very young child who is of preschool age. As soon as the attention to sound and the ability to localize sounds has been mastered, the teacher can proceed with readiness skills, such as:

1. Saying the name of an animal or environment object, the child then recalls and then imitates the sound associated with the object or animal.
2. The teacher says a sequence of numbers, letters, or words, the child listens and then repeats the numbers in proper sequence.
3. The teacher gives a command to the child, and the child should be encouraged to listen carefully as the directions should be given just once.
4. The teacher says a sentence and the child repeats what he has heard.
5. Read a short nonsense sentence to the child and have him tell what he has heard.[9]

Kirk and Kirk have a detailed listing of specific activities that the writer would certainly recommend to the teacher who is dealing with an auditory reception deficit in a child. They point out the following as areas of possible confusion for the child:

1. The child may not recognize and identify sounds in his environment.

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[8]Zigmund and Cicci, Auditory Learning, p. 46.

[9]Eden, Auditory Training, pp. 29-31.

2. The child may not have developed a listening attitude.
3. The child may have difficulty attaching meaning to words.
4. The child may not have consecutive speech.[10]

As mentioned above, each of these points are dealt with in Kirk's book and merit the reader's attention.

B. Auditory Association

Auditory association refers to the ability to relate to spoken words in a meaningful way. The following characteristics may be exhibited by the child experiencing this particular problem:

1. The child may not be able to relate concepts to one another; for example, "How are shoes and slippers alike?"

2. The child may have difficulty classifying and categorizing such things as fruits, toys, or animals.

3. The child may have difficulty identifying and verbalizing first-order relationships (directly relating two verbal concepts.)

4. The child may have difficulty identifying and verbalizing second-order relationships (finding a specific relationship to match one already given).

5. The child may have difficulty finding and evaluating alternative solutions to a problem.

"In remediating a deficit in this organizing process at the representational level, an effort is made to help the child organize and integrate percepts and concepts to form new relationships."[11] If a child shows a deficit in the auditory association process, the following guidelines are offered:

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[10]Kirk and Kirk, Psycholinguistic Learning Disabilities, p. 30.

[11]Ibid., p. 143.

1. Ask one-concept questions, eliciting several short answers.
2. Accept concrete answers.
3. Supply more abstract cues for him.
4. Provide visual cues where possible.
5. Give ample time for response.[12]

Prior to suggesting some remedial techniques dealing particularly with auditory association, the writer wishes to point out the fact that no sharp line can be drawn between auditory reception and auditory association, since both are necessary for competent functioning in the auditory channel.

Kirk points out that:

> In normal behavior, each undoubtedly triggers the other so that increased auditory association stimulates added auditory reception and vice versa. Likewise, although in normal development auditory reception precedes verbal expression, it is advisable in corrective work to combine the two processes whenever possible.[13]

Keeping the above thought in mind, the following suggestions are offered for improving auditory association.

1. Gathering three dimensional objects such as fruits, toys and hats, the child is asked to separate them according to (a) things to eat, (b) things to play with, (c) things to wear.

2. Gather various farm animals and zoo animals, and have the child separate them accordingly.

3. Show a series of pictures and have the child classify them according to the room they belong in; for example, the bedroom, the kitchen, or the bathroom.

4. Say a series of words slowly and let the child answer verbally which two go together, for example, (a) ball, cow, hat, (b) bread, butter, candy.

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[12]Bush and Giles, Aids to Psycholinguistic Teaching, p. 57.

[13]Kirk and Kirk, Psycholinguistic Learning Disabilities, p. 138.

5. Build concept of same and different by asking how the following things are alike: for example, (a)apple, orange, banana, potato, (b) shoe, boot, slipper, hat.

Categorizing is a basic activity in a preschool room and the child who is confused in this regard is bound to feel discriminated against.

Once the child gains proficiency in categorizing objects, the teacher can begin verbal activities. Eden offers the following constructive and interesting activities:

1. The teacher reads a list of object names, most of the words on the list name some kind of food, the child raises his hand when he hears a word that does not name some kind of food.
2. The teacher will play a record of sounds from a zoo, a city street, a farm, a kitchen, the child has to identify the sound as to the location and object or thing making the noise.
3. The teacher names three or four objects that belong to the same category; for example, boot, hat, scarf, mittens, the child tells how they are alike and how they are different.[14]

Remedial techniques for aiding the child in directly relating two verbal concepts are offered by Kirk and Kirk:

1. Demonstrate opposite by using common tangible characteristics such as up-down, in-out, hot-cold, big-little.
2. Help the child identify differences and similarities by comparing two concepts; for example, how are milk and water alike?
3. Help the child derive relationships such as parts of the whole (child to family, [illegible]e to foot), things that usually happen together (light switch and light, bell and time to go home), things used together (raincoat and umbrella, ice cream and ice cream cone), tool and user (doctor and medicine, fireman and fire truck).
4. Help the child derive cause and effect relationships by telling stories or events; for example, the boy was not watching and so he fell down, ask the child what happened as a consequence of not watching.

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[14]Eden, Auditory Training, pp. 221-223.

5. Develop an understanding of temporal relationships; before and after, pretty soon, after a while, not now, today, tomorrow, yesterday, first, middle, last, and next (there are many more).[15]

Many more suggestions are available, but a sufficient selection has been included now for purposes of this research paper.

The practitioner-researchers being cited are not dealing specifically with imperception, but many of the ideas are applicable. The imperceptive child's inability to organize information causes his responses to be limited. Referring once again to the problem of reception, it is easy to understand that association without adequate reception is impossible. If the child is not receiving the information in proper order, he certainly cannot associate an appropriate meaning to it.

C. Auditory Figure-Ground Discrimination

Auditory figure-ground discrimination is the ability to distinguish the most important sound while surrounded by other extraneous sounds. A child experiencing this difficulty is lost in a barrange of sound and is unable to single out the most prominent sound--be it the teacher's voice in a classroom or a mother's voice in the home.

Children exhibiting this particular disability may be characterized by the following:

1. They cannot "tune-out" unnecessary sounds.
2. They confuse words that sound similar.
3. They cannot adequately identify the most important stimulus in the environment.

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[15] Kirk and Kirk, Psycholinguistic Learning Disabilities, pp. 145-146.

4. They are attentive to everything while being accused of not attending at all.

Remediation of a deficit in auditory-figure-ground discrimination is directed toward helping the child to sort out the various sounds in his environment. Remedial techniques might proceed as follows:

1. Discriminating sound from background noise.

Sounds which contain variations such as a melody (for example, the first musical line of "Mary Had a Little Lamb") or very low bass tones ought to be used. In the absence of an actual hearing loss, these are the easiest things to hear. In fairly quiet rooms, work with the child until you are sure he can recognize the sound chosen whether a steady rhythm pattern, a melody, or whatever. Have the child imitate it, to be sure he knows it. Then add some noise. Tape recorders are very good for this since the volume can be varied and you can "collect" assorted noises which are not always available. The goal of the exercise is to have the child pick "his sound" from the background sounds. Initially, the background volume should be kept low and the volume may be increased and additional noises added to it.

Likewise, the length of time over which the volume of the child's sound reaches a level at which he can hear it, may be increased. In order to be sure the child is really hearing the sound, have him imitate it simultaneously with its production. Variations of this activity are excellent for learning to discriminate and single out one sound as opposed to others that are interfering.

2. Listening to sounds:

a. The teacher makes two distinct noises; the child tells which is the loudest.
b. The teacher plays a series of common noises and the child tells what he heard.
c. The teacher points out a recurring sound to the child and then plays a series of sounds; each time the recurring sound is heard, the child raises his hand.
d. Play "Simon Says"; the child has to hear the two word introduction.
e. Give one step directions; for example, fold your hands, raise your lef, etc., the child has to follow along carefully; increase the difficulty of the game by giving several directions at once.
f. Ring bells of various sounds and have the child identify the correct bell.
g. Stand the child in front of you and tap a rhythm; the child has to repeat it without looking.[16]

"As much as possible the tasks should be domonstrated without using many words or explanations, just gestures and changing facial expression. This is not to say that words should not be used, but oral directions might make the task more confusing."[17]

Listening games should be done for brief periods of time, no longer than five minutes initially. They should be stopped before the child has lost interest. Activities can be expanded to include a wide variety of sound sources with progressively finer auditory figure-ground discriminations being required of the child.

D. Auditory (Grammatic) Closure

Grammatic closure refers to the ability to detect what particular word or phrase is being sought when only part of the word or part of the phrase is spoken. An example of grammatic closure would include

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[16]Brown, An Analysis of Learning Disabilities, pp. 24-27.

[17]Zigmund and Cicci, Auditory Learning, p. 47.

completing a word when only the first part of the word is given such as tel e ph___ (telephone).

The following characteristics may be exhibited by the child experiencing this particular problem:

1. The child may have trouble learning plurals and past tenses and irregular forms of verbs.
2. The child may mispronounce words he has heard many times, such as pasgetti for spaghetti.
3. The child may put the parts of a sentence together in the wrong way; for example, "Jumped on me the dog," instead of, "The dog jumped on me."
4. The child may mix up parts of words, thereby creating spoonerisms such as, "Jose can you see by the dawn's early light," instead of "Oh say can you see by the dawn's early light."[18]

Remediation of a deficit auditory-closure should be directed toward helping the child automatically fill in the missing parts of what is partially heard. He must be helped to internalize certain redundancies from his past experience.

If a child shows a deficit in grammatic closure, Kirk and Kirk offer the following guidelines and possible reasons why the deficit occurred:

1. The child may not have had sufficient exposure to the material being presented.
2. The child may lack adequate short-term auditory-memory.
3. The child may not reactivate what he hears, either vocally or subvocally.
4. The child may not learn readily even when experiences have been repeated many times.
5. The child may have difficulty synthesizing isolated sounds into words (sound blending).[19]

The following techniques are presented as suggestions for remediating an auditory (grammatic) closure problem:

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[18]Eden, Auditory Training, p. 5.

[19]Kirk and Kirk, Psycholinguistic Learning Disabilities, pp. 205-08.

1. The teacher shows a picture of an object and the child has to respond "This is a boat;" one word responses are not acceptable.
2. The teacher states an incomplete sentence and the child supplies a word that will complete the thought; for example, "The clock is on the _____ (wall)."
3. The teacher says a word and then repeats only part of the word, the child then must complete the word; for example, elephant -- ele_____.
4. On a higher level, the teacher repeats two lines of a rhyming couplet, eliminating the last rhyming word and the child supplies the missing word and repeats the couplet; for example, "Ding, Dong, Dell, pussy's in the _____(well)."
5. The child learns a sentence by repeating it several times; then the teacher reads the sentence omitting a different word each time, the child has to identify the missing word and repeat the sentence in its entirety.[20]

The child's ability to develop adequate grammatic closure is important because of its relationship to auditory reception and verbal expression, as well as its practical use in communicating with others and acquiring academic skills.

E. Auditory Sequential Memory

Auditory sequential memory is the process involving memory in a given order of something the child has heard. An example of this skill would involve following a series of classroom instructions in the proper order and being able to repeat a list of words or numbers in the same sequence it was given.

The following characteristics may be exhibited:

1. The child may be unable to learn the days of the week or months of the year in proper sequence.
2. The child may mispronounce words, for example, "emeny for enemy, and aminal for animal."
3. The child is unable to follow a sequence of commands.
4. The child is confused about concepts like yesterday, today, and tomorrow.

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[20]Eden, Auditory Training, pp. 205-8.

5. The child may perform only the last of a series of simple commands.[21]

Remediation of a deficit in auditory sequential memory would necessarily involve using content that the child will utilize in his everyday life since it is easier to repeat meaningful sentences as opposed to non-meaningful sounds as digits, random words, or nonsense syllables. There are two variables involved here. Long-term memory is being able to recall experiences or remember things over a long period of time. Short term memory is being able to repeat immediately what was just heard.[22]

If a child shows a deficit in auditory sequential memory, the following guidelines may be of assistance when planning:

1. Permit the child to use visual clues.
2. Use short, one-concept sentences.
3. Use visual aids.[23]

The following remedial techniques may be helpful in developing auditory sequential memory:

1. To demonstrate the importance of sequences, the teacher might ask the child to "step off" a sentence, that is, the teacher reads a sentence and the child takes a step for each word spoken.
2. The teacher puts objects on a table and points to them in the same order as the child should point to them.
3. The teacher shows a series of pictures, such as a cow, a dog, and a kitten; they are placed in front of the child and the child is told the cow is first, then the dog, and then the kitten; the child studies the arrangement and the teacher then picks up the cards before handing them to the child to put in the same order.
4. The teacher asks the child to carry out a series of commands, for example, "stand up, clap your hands, and turn around."

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[21]Eden, Auditory Training, p. 5.

[22]Kirk and Kirk, Psycholinguistic Learning Disabilities, p. 192.

[23]Bush and Giles, Psycholinguistic Aids to Teaching, p. 192.

5. The teacher names a common experience (brushing teeth, going outside, taking a bath) and the child is expected to list the steps necessary to carry out the activity.
6. The teacher claps his hands and the child has to clap the same pattern.
7. The teacher makes a series of animal noises as people would make them and the child is expected to repeat the sounds in sequence.
8. The teacher says a series of animals, for example, cow, dog, donkey; the child is expected to make the sounds of these animals in the same sequence, that is "moo - arf - hee-haw."
9. The teacher plays a taped sequence of noises; the child is expected to arrange the pictures of these noises in the same order.
10. The teacher gives directions for a specific drawing and the child responds; for example, "Get out a piece of drawing paper, your crayons and pencils."[24]

All of life follows a sequence of events, one happening building on another. The child who is unable to sequence events does indeed have a problem. Teachers tend to take too many things for granted in a classroom setting. They must talk slower and give more visual clues if they are to aid the child who has an auditory sequential deficit.

Summary

This chapter was devoted to defining, characterizing and offering remedial techniques for the child who has an auditory imperception problem. The techniques are the same as those one might use in teaching the deaf or hard-of-hearing; however, the teacher must keep uppermost in his mind that he is dealing with an element of confusion, not a hearing loss. The child does hear sound but does not relate meaning with it. What exactly the child is hearing remains unknown. The problem has to be dealt with at an early age so proper learning can take place. Educators are, indeed, challenged by this child with a problem but knowing they have alleviated the frustrations of a young child who is

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[24]Eden, Auditory Training, pp. 137-53.

confused has to be worth the effort.

A suggested list of materials designed to aid the teacher in applying these remedial procedures and the various companies from which the items may be purchased can be found in Appendix B. It is always good to keep in mind that "the materials themselves are not as important as how the materials are used. Well-stocked shelves are of little value unless applied appropriately to individual children on the basis of their age and previous experiences.[25]

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[25]Zigmund and Cicci, Auditory Learning, p. 76.

CHAPTER IV

SUMMARY AND CONCLUSION

A review of research indicates that the term auditory imperception is not generally used by researchers who deal with a central auditory impairment in the central nervous system. Myklebust delineated four central nervous system communication disorders and among the four was auditory imperception. The writer's review of literature on auditory disabilities failed to find the term referred to by any other of the researchers dealing with auditory deficits. It was pointed out that the term does not appear in the Educational Index Review or in the Mental Retardation Abstracts. Because the review of literature was limited to the Cardinal Stritch College Library, it is possible that it appears in sources not available to the writer.

It was the writer's intent from the conception of the paper to "pin point" the child whose auditory channel of learning is confused and causing him to be misdiagnosed as hard-of-hearing or deaf because his responses and actions are those of the latter mentioned population. Consequently, although the term imperception was not directly used, the researchers were describing the child the writer was dealing with.

The writer began with an explanation of the importance of

hearing and the pleasures an individual experiences by means of hearing. It was pointed out that asked to select the most precious of the five senses, few would name hearing.

Scientists and researchers are still trying to probe the mystery of exactly how the human hears -- this, too, was pointed out at the outset of Chapter II. Sound waves can be traced to the inner ear and as far as the auditory nerve which creates the impulses for sending the message to the brain. Once the message gets to the brain it is still not known how the human knows it is the doorbell and not the telephone he hears ringing.

All of this information was preliminary and was to serve as a base for a greater appreciation and understanding of the child whose hearing is in a state of constant confusion.

Poor instrumentation and lack of adequate information was emphasized but equal emphasis was placed on the fact that although educators could place the blame for inadequate knowledge on the experts and simply let these confused children remain "problem children," they must take upon themselves the challenge these children display.

It was stated that the basic problem is one of confusion. The child is not able to organize the auditory stimuli in a way that is consistent or meaningful. Because this confusion is relative to the complexity of the situation, the child can react to some sounds, understand some words, acquire some language, and communicate to a limited degree.

If the disability can be detected early and defined in meaningful terms, special action can be undertaken to counteract the

problem. This might be the establishment of a resource room in the school where the child could go during regular activities that were too complex for his perceptual abilities. In this special room, with other children with similar problems, he could spend a short time each day being coached by a teacher specially equipped and trained to develop perceptual skills.

A large section of the paper was devoted to defining, characterizing, and offering remedial suggestions for specific problem areas. While the remedial techniques and suggestions are not exhaustive, they offer a starting point to teachers who are looking for specific directions.

Two appendices are attached. Appendix A supplies a list of formal tests which could be used to diagnose a particular deficit area once the auditory disability has been spotted. Appendix B is a list of teaching materials and the companies from which they can be purchased.

Suggested areas for further study might include:

1. A follow-up study of the child with an auditory perception problem between the ages of 5 to 8.
2. A study of the various names used by researchers, all of whom describe the same disability; for example, auditory aphasia, or auditory agnosia.
3. A study of the children who have been misdiagnosed as deaf or hard-of-hearing when, in fact, they have adequate hearing but have to contend with an auditory imperception problem.

The writer found the study very interesting and hopes that it answers some of the needs of the confused child who is labeled as having an auditory imperception problem.

APPENDIX A

This is a list of suggested tests for assessing auditory processing. It is by no means a complete list of all formal tests available.

Assessment of Children's Language Comprehension;
Foster, Gidden, and Stark, 1969; for children having difficulty processing four or fewer elements.
Consulting Psychologists Press, 577 College Avenue, Palo Alto, California 94306

Auditory Test for Language Comprehension
Elizabeth Carrow, 1968; 3 to 7.5 years.

Boehm Test of Basic Concepts
Ann Boehm, 1970; Kindergarten to Grade two.
The Psychological Corporation, 304 East 45th Street, New York, New York 10017.

Developmental Sentence Scoring.
Laura L. Lee, 1971; Journal of Speech and Hearing Disorders, 36, 315-340, 1971.

Goldman-Fristoe-Woodcock Test of Auditory Discrimination.
Goldman, Fristoe, and Woodcock, 1966; 4 years and older.
American Guidance Service, Publishers' Building, Circle Pines, Minnesota 55014.

Grammatical Comprehension Test. Bellugi and Klima, 1968;
Illinois University, National Coordinator Center, Urbana, Illinois.

Houston Test of Language Development.
Margaret Crabtree, 1958; 6 months to 3 years. (Part I) and 3 to 6 years (Part II); Houston Text Company, Box 35152, Houston, Texas 77035.

Illinois Test of Psycholinguistic Abilities.
J. McCarthy and S. Kirk, 1961; 2.6 to 9 years; University of Illinois Press, Urbana, Illinois.

Northwestern Syntax Screening Test.
Laura L. Lee, 1969; 3 to 8 years; Northwestern University, Evanston, Illinois.

REEL - Receptive-Expressive-Emergent Language Scale; birth to 36 months; Tree of Life Press, P.O. Box 447, Gainesville, Florida 32601.

Evaluation of Grammatical Capacity.
Paula Menyuk, 1963; 3 to 5.11 years; Journal of Verbal Learning Behavior, 2, 429-439, (1963).

APPENDIX B

In teaching matching and discrimination of gross sounds, noisemakers and rhythm band instruments can be used. These include drums, tambourines, finger cymbals, rhythm sticks, triangles, jingle clogs, tone blocks, wrist bells, castanets, step bells and xylophones.

Records and prepared tapes or tapes to be made by the teacher can be used for listening activities including gross sound discrimination of speech sounds.

Standard play equipment in nursery schools and kindergartens can be used to teach language concepts and to develop vocabulary. Some of these items include:

1. Housekeeping toys - sink, refrigerator, stove, doll beds.
2. Play cooking utensils and dishes of plastic or metal.
3. Various sized and shaped building blocks of wood or cardboard.
4. Doll figures representing family and community helpers of rubber, plastic or wood.
5. Human and animal finger puppets.
6. Rubber, plastic, cardboard, or wood domestic and wild animals.
7. Plastic fruits and vegetables.
8. Transportation toys.
9. Woodworking tools.
10. Puzzles of heavy cardboard or wood.
11. Flannel board and flannel board figures.
12. Chalk board.
13. Chart rack.
14. Table games including little cards.

Companies that supply these materials include:

Acadia Press, Inc.
438 Adler Street
Scranton, Pennsylvania 18505

Community Playthings
Rifton, New York

Creative Playthings, Inc.
Edenburg Road, Rt. #1
Cranbury, New Jersey 08512

Developmental Learning Materials
3505 North Ashland Avenue
Chicago, Illinois 60657

Educational Teaching Aids
159 West Kinzie Street
Chicago, Illinois 60610

Ideal School Supply
11000 South Lavergne Avenue
Oak Lawn, Illinois 60453

J. S. Latta & Son
2218 Main Street
Cedar Falls, Iowa 50613

Miles Kimball
41 West 8th Avenue
Oshkosh, Wisconsin 54901

Milton Bradley Company
Springfield, Massachusetts 01101

Perception Aid, Inc.
Livonia, Michigan 48150

Phonovisual Products, Inc.
4708 Wisconsin Avenue
Washington, D.C. 20016

Schick Supply and Equipment Company
801 Perrysville Avenue
Danville, Illinois 61832

Scott, Foresman and Company
Glenview, Illinois 60025

Special Education Materials
Development Center (SEMDC)
Washington, D.C. 20009

This is not an exhaustive listing but should be of assistance when looking for proper teaching materials.

All children's books can be used to teach language. Books for little children should be durable with realistic pictures that represent life-like objects and experiences. Imaginary stories should be presented as pretend tales with frequent questions asked of the children to check for confusion.

Reading readiness books and workbooks present specific tasks for listening and developing auditory perceptual skills.

These materials were suggested and recommended by Regina Cicci in her book on Auditory Learning.

Upon request, the companies listed will send catalogs for viewing materials available.

The writer suggested most of the companies because of their proximity to the Midwest.

BIBLIOGRAPHY

Baker, Georgia Ann Pitcher. "Behavior Problem or Auditory Interferences?" Academic Therapy, VI (Fall, 1970), pp. 385-89.

Bangs, Tina E. Language and Learning Disorders of the Pre-Academic Child. New Jersey: Prentice-Hall, 1968.

Barr, David F. Auditory Perceptual Disorders: An Introduction. Illinois: Charles C. Thomas, 1973.

Bush, Wilma Jo and Giles, Marian Taylor. Aids to Psycholinguistic Teaching. Ohio: Charles E. Merrill Publishing Co., 1969.

Danwitz, M. Winifred. "Auditory Processing Disturbances in the Young Child," Highlights. (Summer, 1973), pp. 111-22.

Eden, Kathleen, Green, Jean S., and Hansen, Janice. Auditory Training. Iowa City: Campus Stores, 1973.

Flack, Vilma T. "Auditory Processing for the Child with Language Disorders," Exceptional Children, XXXVIIII, (February, 1973), pp. 413-16.

Francis-Williams, Jessie. Children with Specific Learning Difficulties. New York: Pergamon Press, 1970.

Furness, Edna L., "Listening and Learning," Peabody Journal of Education, XXXIII (January, 1956), p. 212.

Gray, Burl and Ryan, Bruce. A Language Program for the Nonlanguage Child. Illinois: Research Press, 1973.

Green, Leonard, "The Special in the Special Teacher," Journal of Learning Disabilities, V (October, 1972), pp. 513-5.

Hewett, Frank, and Forness, Steven R. Education of Exceptional Learners. Boston: Allyn and Bacon, Inc., 1974.

Huffman, Lois, and McReynolds, Leija, "Auditory Sequence and Learning in Children," Journal of Speech and Hearing Research, XI (1968), pp. 161-78.

Johnson, Doris J. and Myklebust, Helmer R. Learning Disabilities: Educational Principles and Practices. New York: Grune and Stratton, 1967.

Jones, Reginald L. Ed. Problems and Issues in the Education of Exceptional Children. Boston: Houghton Mifflin Company, 1971.

Kirk, Samuel A. Educating Exceptional Children. Boston: Houghton Mifflin Company, 1972.

Kirk, Samuel A. and Kirk, Winifred D. Psycholinguistic Learning Disabilities and Remediation. Urbana: University of Illinois Press, 1971.

Kottler, Sylvia B., "The Identification and Remediation of Auditory Problems," Academic Therapy Quarterly, VIII (Fall, 1972), pp. 73-83.

Liberman, A. M., et al., "The Discrimination of Relative Onset-Time of the Components of Certain Speech and Non-Speech Patterns," Journal of Exceptional Psychology, LXI (1961), pp. 379-88.

McGinnis, Mildred A. Aphasic Children Identification and Education by the Association Method. Washington, D.C.: Alexander Graham Bell Association for the Deaf, Inc., 1963.

Murphy, John F., "Learning by Listening: A Public School Approach to Learning Disabilities," Academic Therapy, VIII (Winter, 1972), pp. 141-53.

Murphy, Patricia. Special Way for the Special Child in the Regular Classroom. California: Academic Therapy Publications, 1971.

Myers, Patricia I. and Hammill, Donald D. Methods for Learning Disorders. New York: John Wiley & Sons, Inc., 1969.

Myklebust, Helmer R. Auditory Disorders in Children: A Manual for Differential Diagnosis. New York: Grune and Stratton, 1954.

Price, Landon Dewey, "The Trouble with Poor Auditory Discrimination," Academic Therapy Quarterly, VIII (Fall, 1972), pp. 331-38.

Ringler, Lenore H. and Smith, Inez L., "Learning Modality and Word Recognition of First Grade Children," Journal of Learning Disabilities, VI (May, 1973), pp. 307-12.

Sabatino, David A., "The Construction and Assessment of an Experimental Test of Auditory Perception," Exceptional Children, XXXV (1969), pp. 726-36.

Sapir, Selma G. and Nitzburg, Ed. Children with Learning Problems. New York: Brunner Mazel Publishers, 1973.

Smith, Robert M., Ed. Teacher Diagnosis of Educational Difficulties. Ohio: Charles E. Merrill Publishing Co., 1969.

Sommers, Ronald K., et al., "Articulatory Effectiveness, Stimulability, and Children's Performances on Perceptual and Memory Tasks," Journal of Speech and Hearing Research, XV (September, 1972), pp. 579-89.

Sperry, Victoria B. A Language Approach to Learning Disabilities: A Source Book of Activities for Teachers. California: Consulting Psychologists Press, 1972.

Stevens, S. S. and Warshofsky, Fred, et al. Sound and Hearing. New York: Time Incorporated, 1965.

Vande Voort, Lewis and Senf, Gerald M., "Audiovisual Integration in Retarded Readers," Journal of Learning Disabilities, VI (March, 1973), pp. 170-79.

Zigmund, Naomi K. and Cicci, Regine. Auditory Learning. California: Dimensions Publishing Company, 1968.