DOCUMENT RESUME

ED 128 591 08 CE 007 719

TITLE Speech Pathology Assistant. Trainee Manual.
INSTITUTION National Association for Hearing and Speech Action, Silver Spring, Md.
SPONS AGENCY Department of Labor, Washington, D.C.
PUB DATE 74
NOTE 91p.; For a related document see CE 007 718

EDRS PRICE MF-$0.83 HC-$4.67 Plus Postage.
DESCRIPTORS *Health Occupations Education; Instructional Materials; *Job Training; Manuals; *Medical Assistants; *Speech Pathology; Study Guides

ABSTRACT

Part of an instructional set which includes an instructor's guide, this trainee manual is designed to provide speech pathology students with some basic and essential knowledge about the communication process. The manual contains nine modules: (1) speech pathology assistant, (2) the bases of speech (structure and function of the speech mechanism, language development, and phonetics), (3) hearing, (4) communication disorders (articulation disorders, language disorders, stuttering, and voice disorders), (5) diagnostic evaluation and clinical management procedures, (6) ethnic and cultural differences, (7) exceptional children and adults, (8) client follow-up procedures, and (9) practicum and work experience. Each module contains objectives, study content, and references. A glossary is also included. (WL)

Speech Pathology Assistant

Trainee Manual

U.S. Department of Health, Education, and Welfare
Caspar W. Weinberger, Secretary

U.S. Office of Education
William Pierce, Commissioner

Division of Manpower Development and Training

Developed pursuant to a contract with the
Department of Health, Education and Welfare

and the

U.S. Department of Labor

by

The National Association for Hearing and Speech Action

1974

TABLE OF CONTENTS

Foreword ii

Acknowledgments iv

Preface vi

This Training Program vii

Module I: The Speech Pathology Assistant 1

Module II: The Bases of Speech 11

- Module II-A: Structure and Function of the Speech Mechanism 12
- Module II-B: Language Development 18
- Module II-C: Phonetics 27

Module III: Hearing 41

Module IV: Communication Disorders 43

- Module IV-A: Articulation Disorders 45
- Module IV-B: Language Disorders 50
- Module IV-C: Stuttering 54
- Module IV-D: Voice Disorders 58

Module V: Diagnostic, Evaluation and Clinical Management Procedures 61

Module VI: Ethnic and Cultural Differences 65

Module VII: Exceptional Children and Adults 66

Module VIII: Client Follow-up Procedures 68

Module IX: Practicum and Work Experience 70

Glossary 77

FOREWORD

At a time when numerous practitioners in the health field are concerned with problems of manpower shortage and manpower maldistribution in various areas, it is only logical that positive action be taken to improve the clinician-client ratio currently existing in speech pathology. Unlike other professions, speech pathology heretofore has not developed different levels of needed supportive personnel. There is a tremendous need for well-trained speech pathology assistants to help the speech pathologist with the performance of a wide variety of duties.

This guide was prepared for the use of the trainee along with classroom instruction by a speech pathologist. The speech pathology assistant who has successfully completed, in an approved setting, both the prescribed instructional program and the work experience program will be qualified to compile case histories and other evaluative information, participate in various therapy programs, maintain liaison with clients and their families, participate in population screenings, and aid in the coordination of client activities.

It is hoped that this guide will help agency and university personnel to implement high-quality training programs for persons who wish to serve as supportive personnel in the field of speech pathology.

Howard A. Matthews, Director
Division Manpower Development
and Training

DISCRIMINATION PROHIBITED Title VI of the Civil Rights Act of 1964 states: "No person in the United States shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Therefore, the Vocational and Technical assistance from the Department of Health, Education, and Welfare, must be operated in compliance with this law.

Contractors undertaking such projects under government sponsorship are encouraged to express freely their judgment in professional and technical matters. Points of view or opinions do not, therefore, necessarily represent Office of Education policy."

ACKNOWLEDGMENTS

This training guide was prepared by the National Association for Hearing and Speech Action under a grant from the U.S. Office of Education, Department of Health, Education, and Welfare and the U.S. Department of Labor. A curriculum committee composed of the persons listed below advised on the development of the guide:

Sylvia G. Balik, M.A.
Chairman, Speech Pathology and Audiology
Beth Isreal Medical Center
New York, New York 10003

*Walter J. Beaupre, Ph.D.
** Professor, Speech Pathology
University of Rhode Island
Kingston, Rhode Island 02881

Aaron Favors, Ph.D.
Professor, Speech Pathology
Howard University
Washington, D.C. 20001

Alice Frazer
National MEDHIC Coordinator
Division of Allied Health Manpower
Bethesda, Maryland 20014

Donna Gamble
Speech Pathologist
Canton Public Schools
Canton, Ohio 44707

**Victor P. Garwood, Ph.D.
Senior Education Audiologist
Los Angeles Unified School District
Los Angeles, California 90024

William A. Grimm, Ph.D.
Chairman, Hearing and Vision Conservation
Ohio Department of Health
Columbus, Ohio 43216

Roberta G. Hansen, M.A.
Consultant, Speech and Hearing
Department of Health and Weifare
Augusta, Maine 04330

Wanda Kobotic
Indian Health Service
Sante Fe, New Mexico 87501

**Alice M. Mason, M.A.
Director, Southeastern Speech and Hearing Service of North Carolina
Fayetteville, North Carolina 28305

**Darryl Norton, Ph.D.
Assistant Professor,
*** Communication Sciences Department
Federal City College
Washington, D.C. 20001

**William A. Nose, M.A.
Supportive Personnel Program Director
Ohio University
Athens, Ohio 45701

**James P. Spadafore, M.Sc.
Director, Clnical Program Hearing and Speech Center of Columbua and Central Ohio
Columbus, Ohio 43201

*Curriculum committee chairman
**Members of curriculum advisory committee
***Editor

Ray R. Seitz, M.Ed.
Director, Hearing and Speech
Services of Rhode Island
Providence, Rhode Island 02906

**Charlena M. Seymour, Ph.D.
Assistant Professor
University of Massachusetts
Amherst, Massachusetts 01002

William D. Tobin, M.Sc.
Private Practice, Speech Pathology
N. Kingston, Rhode Island 02852

Thomas W. Walpool, M.A.
Director, United Speech and
Hearing Services
2106 Augusta Road
Greenville, South Carolina 2096

In addition to the committee, the following NAHSA staff members assisted in the development of the guide: Tom Coleman, Executive Director and Edgar B. Porter, Director of Education and Training, and Judith Jaffe, Education Program Director, Office of Education, Manpower Development and Training.

The purpose of this training manual is to give the trainee a basic understanding of the communication process. No attempt was made to delve into philosophical arguments concerning speech and language because the SPA is not a theoretician but a practitioner. He delivers services under the direct supervision of a certified licensed Speech Pathologist.

It is expected that the instructor of the SPA will elaborate on subject matter when necessary and rearrange material where appropriate.

This manual is but a first step in the unification of a curriculum to train supportive personnel as assistants to clinically trained Speech Pathologists. It is anticipated that others will borrow extensively from its contents and new therapy techniques introduced will require periodic revisions.

This manual would not have been possible without the help of many dedicated people. My gratitude is extended to Walter J. Beaupre, Ph.D. who chaired the Curriculum Advisory Committee and was a major contributor to the manual. To Victor P. Garwood, Ph.D., Alice M. Mason, M.A.; William A. Nose, M.A.; James P. Spadafore, M.Sc.; and Charlena M. Seymour, Ph.D., who all contributed their time and kind comments and without which this manual would still be in the formative stages.

For those persons who preceded me as project directors, Patsy Baugh, M.S. and Ben Drew, M.A., my appreciation. But my deepest appreciation is for Rosemary Moss, my secretary, who has struggled through the many necessary changes required and her family which suffered through her long hours of devotion to this project.

Darryl Norton, Ph.D.
Project Director

---

*Curriculum committee chairman
**Members of curriculum advisory committee
***Editor

PREFACE

The information contained in this manual is intended to augment the materials provided by qualified instructors and additional readings.

The manual is designed to accompany the booklet *Speech Pathology Assistant, A Suggested Guide for A Manpower Training Program*. It was developed pursuant to a contract with the United States Department of Health, Education, and Welfare, Office of Education, Division of Manpower Development and Training, by the National Association for Hearing and Speech Action in cooperation with the Department of Labor.

The purpose of this manual is to provide individuals who are training to be speech pathology assistants with some basic and essential knowledge about the communication process. Materials were obtained from various texts and articles and collated to make this curriculum manual as concise as possible. The Advisory Committee and the National Association for Hearing and Speech Action decided that an original text was not necessary. The feeling was that sufficient materials for training speech pathology assistants were available and needed only to be identified, isolated, edited, and bound together for convenient use.

THIS TRAINING PROGRAM

You are involved in a training program that will prepare you to be a speech pathology assistant. The shortage of trained professionals in health-related fields has prompted many specialities to train supportive personnel to provide important and needed services. In your role as a speech pathology assistant, you will learn to help with record-keeping, administration of speech and hearing tests, and treatment of communicatively handicapped individuals. Being a speech pathology assistant is a new career. The success or failure of this career may depend in large measure upon your ability to perform the functions of your new role with skill, independence, good judgment, responsibility, and professionalism. Very rarely does an opportunity like this occur, and it is hoped that you will make the most of it. You may be able to open doors for other people in the future.

In the course of your training, you will encounter some words and terms that may be new to you. The glossary you will find at the end of this manual can be helpful in teaching you the meaning of these words.

MODULE I: THE SPEECH PATHOLOGY ASSISTANT

Objectives:

- To understand the nature and scope of the speech pathology assistant program and its relationship to speech pathology
- To understand the functions of the speech pathology assistant
- To understand the purposes, roles, duties, and responsibilities of the speech pathology assistant in conjunction with the speech pathologist
- To develop a self-concept supportive of the role of the speech pathology assistant

Speech pathology is a field of study involved with the identification, diagnosis, and treatment of speech handicapped individuals. The professional person who does this type of work is called a speech pathologist. As a *speech pathology assistant*, your primary responsibilities will involve helping the *speech pathologist* perform duties in these areas. You will be under the direct supervision of the speech pathologist while you are providing care for the speech handicapped.

The speech pathology assistant must have basic knowledge in the following areas:

- Anatomy of the speech and hearing mechanism
- Neurological aspects of speech
- Language and speech development
- Phonetics and language structure
- Hearing and hearing measurement

This basic knowledge will help you understand the following disorders of communication:

- Articulation disorders
- Language disorders
- Stuttering disorders
- Voice disorders

In addition, the assistant must have a good grasp of basic concepts concerning diagnosis and clinical management procedures. The assistant utilizes appropriate materials in treatment of speech handicapped patients. The assistant, after training, may take case history information, assist with intake and follow-up procedures, work with health-related personnel, and advise parents.

In summation, the speech pathology assistant is a member of the supportive personnel team who has successfully completed the prescribed training program in an approved setting under adequate supervision and who has had experience in an approved work environment. As a speech pathology assistant, you will be qualified for employment in a wide variety of settings including public schools, Head Start programs, day care centers, and rehabilitation hospitals. You will work under the direct supervision of a certified speech pathologist or one who meets the requirements for such certification.

The speech pathologist to whom you were assigned for this first round of observations is an experienced clinician who is licensed by the state or who holds a valid certificate of clinical competence. This certificate indicates that she/he has completed training requirements, has passed a national written examination, and subscribes to a code of ethical practice.

As a speech pathology assistant, you too must also conduct yourself in a manner that demonstrates your ethical responsibility in performing your job.

The speech pathologist is legally responsible for the well-being of the children and adults who come to her/him for speech and language services. During your stay with the speech pathologist, she/he will spend some time answering your questions and talking about what she/he does as a professional clinician.

Training Program

This training program is divided into two phases. The first phase is composed of two months of intensive instruction, first-hand observation, and practical exercises. This time will be spent learning the responsibilities, duties, and limitations of the speech pathology assistant as they relate to the care of patients under the supervision of a speech pathologist. Time also will be devoted to gaining academic knowledge about the aspects of speech and language previously outlined. These first two months will consist of 130 or more hours of instruction.

During this period your instructors will have ample opportunity to observe your progress and to learn as much as possible about your capabilities. Their evaluation will determine whether or not you are ready for the next part of the training program.

The second phase of the training program is two months of work experience. This work experience will consist of 244 or more hours of direct contact with patients. You will assist in history-taking, diagnosis, evaluation, clinical management, and client follow-up services. In this phase you will begin to put into practice all the knowledge you acquired during the instructional portion of the program. Monthly summaries of your work will be submitted to the National Association for Hearing and Speech Action. This will help the Association determine how you are developing in your work and what program areas need to be strengthened to assist you in further development.

Upon successful completion of the four-month program, you will be awarded a diploma, certifying you as a speech pathology assistant. The final recommendation that you will receive from the supervising speech pathologist for the diploma will depend in part on the following criteria: *Criteria for Evaluating the Trainee's Readiness for Employment.*

Technical performance is the primary criterion for determining whether or not the trainee is ready for employment. However, the trainee's understanding of her/his job and insight into how to use newly acquired skills to provide service are of such great importance that every attempt must be made to evaluate trainee progress in these areas as well.

The speech pathology assistant trainee must demonstrate proficiency in the instructional phase before entering into the work-training phase. Evaluative tools selected by the training facility may be utilized at any time to enable the instructor and the trainee to evaluate the trainee's progress. The training facility is responsible for testing the trainees to see that they have acquired a fundamental knowledge of the subject matter and are competent to carry out basic diagnostic and therapeutic procedures. A written recommendation from the training facility is required for successful completion of the training program. A speech pathology assistant diploma will be issued by the National Association for Hearing and Speech Action when the trainee has met the requirements and has been recommended by the training facility.

It is important for the trainee to develop or strengthen the following kinds of personal qualities, work habits, and competencies during the training and apprenticeship program:

- Courtesy and tact in dealing with supervisors, professional people, and the general public
- Acceptable appearance through cleanliness, neatness, and sensible choice of clothing
- Cooperative attitudes toward work
- Understanding of her his own role and the roles of others
- Ability to work with or without immediate supervision
- Ability to develop and follow a work plan or schedule
- Good use of techniques and methods for keeping equipment and facilities orderly and in good condition
- Punctuality in all aspects of work
- Ability to take constructive criticism and make appropriate behavioral changes

Vocational Opportunities

There are many kinds of employment opportunities for a speech pathology assistant. Some facilities may provide more extensive training for their assistants in order for them to perform duties that are not included in the standard training program. Examples of employment opportunities are:

- Health centers
- Federal health programs
- Head Start programs
- Public school screening programs
- University speech clinics
- Rehabilitation hospitals
- Special education programs
- Nursing homes
- Day care centers
- Speech improvement programs
- Extended care homes
- Offices of private practitioners

The assistant's salary will depend upon the type of employment facility, the level of skill required for job performance, and local demand for services. Your chances for salary increases and promotions also will depend upon your personal qualifications, employment background, previous experience, and work record. This is one reason it is important to maintain a cooperative and helpful attitude.

Dynamics of Employment

Your designation as a speech pathology assistant means that direct supervisory responsibility is in the hands of a professionally trained and certified individual. This person - the speech pathologist - takes the ethical, legal, and moral responsibility for *all* services to patients under her/his supervision.

The speech pathologist subscribes to a code of ethics that reflects a standard of acceptable professional behavior. This code concerns performance and patient treatment and is subscribed to by all speech pathologists who are members of the American Speech and Hearing Association.

There is no code of ethics for the speech pathology assistant; however, there are some guidelines you should follow. The future expansion of the speech pathology assistant program will be influenced greatly by you and other graduates. You should do as much as possible to protect and promote this new health career. How you conduct yourself will determine whether or not supportive personnel can continue to be important members of the health team rendering speech pathology services.

Your First Day of Observation

Today the speech pathologist will begin to help you understand her/his duties and responsibilities. From this you will be able to understand better what your role will be.

Your Observation Assignment for the First Day

Before you begin your first day of observation, read the following questions.* You should be able to answer them in writing by the end of the day. The questions are designed to help you focus your attention on the general duties of a speech pathologist.

1. Did the speech pathologist talk to any parent groups or give out information such as pamphlets on "How to Prevent Stuttering" or "How to Help Your Child Develop Good Speech and Language?" Does the agency ever conduct programs on speech conservation or prevention of speech disorders in an effort to *inform the general public*?

2. Did the speech pathologist conduct any screening programs for speech problems *outside of the regular place of work*? Some agencies participate in Healthoramas or other civic drives to detect speech and hearing problems. Does the speech pathologist or agency ever do this as part of a service of the agency?

3. Did the speech pathologist conduct one or more evaluations of people to assess the scope, frequency, or severity of possible communication problems? Does she/he ever diagnose speech problems, or does someone else on the staff do this?

4. Did the speech pathologist accept a referral (from a physician, school psychologist, special education teacher, etc.), follow up a referral, or refer any clients to other professionals, departments, or agencies? Does she/he ever do this?

5. Did the speech pathologist talk with a classroom teacher, psychologist, physician, parent, or public agency about one or more of her/his clients? Does she/he ever do this?

6. Did the speech pathologist follow up the status of one or more former clients who had been discharged from therapy in the past?

7. Did the speech pathologist conduct individual or group therapy sessions with clients? How many sessions did you see? What do you *think* the problems treated during these sessions were?

8. Did the speech pathologist write reports, enter information on daily "logs," or attend a staff conference about a client?

9. Does the speech pathologist ever function as part of a therapy (or rehabilitation) team? Who else is on the team?

---

*Some of the questions concerning the duties of a speech pathologist were freely adapted from information in the *CARF Survey Manual*. Permission to incorporate such information has been given by the Commission on Accreditation of Rehabilitation Facilities, Chicago, Illinois.

10. What duties does the speech pathologist consider a part of her/his daily routine other than those listed above in questions 1 through 9?

Characteristics of Normal Speech

As a speech pathology assistant you will be helping a speech pathologist treat speech handicapped people. In order to understand why speech may be abnormal or defective, it is important to have knowledge of normal speech. Below is a description by the British writer, Somerset Maugham, of good writing. It has been adapted to characterize aspects of normal speech. While you read this, try to recall some of the people you have observed and remember whether they possessed or lacked some of the qualities Maugham specifies.

- **Intelligibility** Good speech is clearly understandable to the listener under normal conditions: where noise levels are within reasonable limits, where the hearing of the listener is unimpaired, and where the speaker and listener share the same language, dialect, and common culture.

- **Efficiency** Good speech is pleasing to hear if the speaker has mastered verbal techniques so that: articulation is correct and seems effortless; voice is controlled without apparent strain; and suitable rhythm gives a comfortable flow in time to what is being said.

- **Inconspicuousness** Good speech keeps the listener's attention focused on the intended thought and not on the speaker. The "message" is simple and direct, uncomplicated by distractions such as stage fright, hesitations, or evidence of physical, emotional, or mental difficulties. In other words, the actual techniques of speaking are unnoticed. They are inconspicuous.

Good speech by its very nature (intelligibility, efficiency, and inconspicuousness) is something we take for granted. We are conditioned to ignore good speech as we ignore breathing or walking until something goes wrong.

What is Defective Speech?

On your rounds with the speech pathologist, you have been exposed to children or adults whose speech is considered defective. Some of these children have names attached to their speech problems, such as "articulation disorders," "stuttering," "vocal nodes," "cleft palate speech," "cerebral palsy speech," and so on. Forget the specific labels temporarily and try to recall the actual speech patterns of some of these people you observed. Was the speech unintelligible in any way? Did the person speak with obvious difficulty? Was something about the speech itself conspicuous because it deviated from the skills you normally take for granted? During one of your demonstration labs this week, listen carefully to a tape recording of a person with a speech or language disorder and discuss what you hear with your lab instructor. Which standard or combination of standards was violated? Can you understand why the person was referred for therapy in the first place?

Study this definition of a *speech defect* by Robert Millisen. Is it consistent with what we have said so far?

> A speech deviation refers to any demarcation from the assumed 'normal or standard speech pattern.' A speech *defect* refers to a deviation which at any moment is sufficiently extreme to attract attention to the process of speech, to interfere with communication or affect adversely either the speaker or listener.*

As you continue your training, you will become increasingly aware of speech and language defects, but the final decision as to whether or not a speech problem is sufficiently severe to need professional intervention must be made by a speech pathologist. The speech pathologist may seek your advice and respect your input of information about a particular client, but the speech pathologist takes the ultimate responsibility for:

- The identification of a defect, including the establishment of a diagnostic label when appropriate
- The assessment of the severity and complexity of the communication problem
- The decision as to whether or not professional treatment is feasible
- The estimate as to the possible duration and outcome of the treatment (short of guaranteeing any "cure")
- The choice of strategies or methods of treatment, including decisions to alter or discontinue strategies; and
- The decision concerning when or under what circumstances treatment should be terminated

You probably will be exposed to many different terms related to what the speech pathologist does: "speech correction," "speech therapy," "speech rehabilitation," and "speech teaching" are among the most widely used. The preferred descriptive term is "speech pathology services," and this is the term you should adopt. When someone asks you what you do, an appropriate response would be, "I assist the speech pathologist in providing speech pathology services."

Code of Ethics

You probably have met a number of speech pathologists and observed them while they were at work. You may have noticed certain things about their behavior towards their clients. Some of this behavior results from the fact that they follow a *code of ethical behavior* while delivering speech pathology services. Your instructor may give you a copy of this code. Below is an interpretation of the most important points.

1. The first consideration of speech pathologists while on duty must be the welfare of their patients.

---

*Millisen, Robert. "The Incidence of Speech Disorders," *Handbook of Speech Pathology*. Ed. by L. E. Travis. Princeton, New Jersey: Prentice Hall, 1957, p. 248.

2. Speech pathologists must not guarantee the results of any speech evaluation or clinical procedure. Obviously, when clinicians agree to take on a client in therapy they expect the process to be beneficial to the client. The client harbors the same hope, reinforced by the clinician's action. But there must be no stated or implied promises of "cure."

3. Speech pathologists must not diagnose or treat clients with speech problems by correspondence or telephone. This would seriously limit the clinician's freedom to collect data for responsible decision-making and would jeopardize the client's welfare and safety.

4. Speech pathologists must not transmit confidential information obtained from a client or collected with the client's cooperation unless the client gives permission to pass along such information to an authorized person.

5. Speech pathologists may not accept persons for treatment unless there is a reasonable expectation that direct benefits will follow. They may not continue the client in treatment beyond the point where progress no longer occurs. They may not charge fees inconsistent with their general practice or the practice of other comparable professionals in the local area.

6. Speech pathologists must take every precaution to avoid injuring the person they serve.

7. Speech pathologists should conduct themselves in such a way as to promote harmonious relationships with members of other professions.

8. Speech pathologists must avoid conflicts of professional interest. This means that they may not accept gifts or money from a manufacturer or dealer for recommending any particular testing device, tape recorder, programmed instruction package, or hearing aid.

9. Speech pathologists may not advertise their services in publications such as a local newspaper. However, they may have a business card and a dignified classified listing in the phone book.

10. Speech pathologists have a professional obligation to inform the public about speech, language and hearing problems. They should speak at PTA meetings, appear on television "talk" shows, write articles, and contribute in every way possible to the education and enlightenment of the community.

As a speech pathology assistant you must know this code because you will be directly involved in the serious business of helping the speech pathologist enforce it.

Work Sheet

You have observed a speech pathologist at work in a clinical setting. You undoubtedly have gained some knowledge of the duties of a speech pathologist. Also, after your observations, you probably wonder about certain things. Writing answers to the following questions will help you organize your thoughts.

1. What are the duties and responsibilities of the speech pathologist?

   a.

   b.

   c.

2. What things did you observe the speech pathologist doing that she/he did not explain to you?

   a.

   b.

   c.

3. Write the questions you have after observing the speech pathologist at work. Give the list to her him so that she/he may answer them for you.

4. You have been made aware, in this training manual, of the characteristics of good speech. Write down the three essentials for good speech, and explain them as fully as you can.

   a.

   b.

   c.

5. You have observed some clients who have speech problems. (At this time, do not pay any attention to labels such as "cleft palate," "aphasia," and "cerebral palsy." In the cases you observed, which of the three essentials for good speech were not characteristic of the client? Describe to the best of your ability what you felt made the client difficult to listen to.

   a.

   b.

   c.

   d.

   e.

   f.

   g.

6. The speech pathologist has done an involved personal inventory of your voice, speech, and language behavior.

   a. What kinds of things did she/he observe in your speech?

   b. Do you feel the assessment was correct?

   c. How do you feel about your own speaking habits?

   d. How would you rate your voice, speech, and language?

      _____ Excellent

      _____ Good

      _____ Poor

      _____ Fair

7. What are some of the important ethics that a speech pathologist must obey?

8. What are the ethics that a speech pathology assistant must obey?

If questions arise from doing this exercise, do not hesitate to take them to your instructor or supervisor. She/he will be helpful and give you insight into how to prepare yourself to become a speech pathology assistant.

REFERENCES

Boone, Daniel R. "Professional Responsibilities and Code of Ethics", *The Utilization of Supportive Personnel in Speech Correction in the Public Schools* (Jerome G. Alpiner, Project Director Title VI). Denver: University of Denver, 1968.

Commission on Accreditation of Rehabilitation Facilities. *Standards for Rehabilitation Facilities.* Chicago: Commission on Accreditation of Rehabilitation Facilities, 1973.

Ham, Richard E. (Ed.). *Training and Utilization of Supportive Personnel for Speech Therapy in the Public Schools.* Athens, Ohio: Ohio University, 1968.

Moncur, John P. (Ed.). *The Utilization of Teaching Assistants as Articulation Clinicians in the Public Schools.* Houston: Texas Education Agency Title VI, 1969.

Nose, William A. *A Six Phase Feasibility Study for Recruiting, Training and Placing Supportive Personnel in a Seven County Project Area in Southeastern Ohio.* Athens, Ohio: Ohio University, 1971

Nose, William A. "The Utilization of Supportive Personnel in Public School Speech Therapy Programs." Paper Presented at the National Conference on Vision, Hearing, and Speech Conservation, Athens, Ohio, 1972.

PROGRAM MODULE II: THE BASES OF SPEECH

MODULE II-A: STRUCTURE AND FUNCTION OF THE SPEECH MECHANISM

Objective:

- To understand the basic structure and functions of the speech and hearing mechanisms

MODULE II-B: LANGUAGE DEVELOPMENT

Objectives:

- To understand the normal process of speech and language acquisition
- To understand the components of language
- To understand the characteristics of language

MODULE II-C: PHONETICS

Objectives:

- To understand the fundamentals of phonetics and its use in speech pathology
- To understand the production of normal and deviant phonemes

II-A STRUCTURE AND FUNCTION OF SPEECH MECHANISM

The human body was not originally designed for speech production; however, over a long period of time, humans evolved in many ways which helped make speech possible. These changes, which took millions of years, involved *the brain, voice box (larynx), mouth, and lungs*

This module will cover the speech-producing mechanism, primarily concentrating on the brain, voice box, mouth, and lungs. It is very important that you understand this information because many of your patients will have speech problems due to damage in one or more of these parts of the body.

The Lungs and Larynx

When infants are born, their *lungs* are collapsed, much like the flat plastic sponges sold in a supermarket. Also, the infant's first breath doesn't completely fill the lungs. Sometimes it is only after two or three days of breathing that babies are able to expand their lungs to capacity.

As adults we normally carry a three-quart reserve supply of air in our lungs. Inhaling brings in an additional pint; we exhale about the same amount. When we are not talking (or thinking about breathing) we usually breathe once every five seconds. It takes about as long to inhale as it does to exhale. Breathing for speech has quite a different time table. Although the lungs perform an extremely vital function (exchanging oxygen for carbon dioxide in the blood), they are no more active in the inhaling-exhaling process than two wet paper bags. The lungs have no muscles.

The quick intake of air for speech is accomplished by the *diaphragm*. The diaphragm is the largest muscle in the human body and separates the chest cavity from the abdominal (stomach) cavity. When the diaphragm moves, it presses down on the intestines and other organs in the abdomen, causing the abdomen to expand. At the same time, a vacuum is created in the chest cavity, causing the lungs to expand outward and downward so that air rushes into them.

Exhalation for speech is accomplished by the muscles in the abdomen and also by the diaphragm. These muscles work together to compress the lungs and viscera (intestines, etc.) so that air travels through the *voice box* (larynx) and *mouth*. Steady, controlled pressure against the lungs results in a column of air passing through the *wind pipe* (trachea), the *larynx*, and the *mouth*.

In the larynx there are structures called the *vocal cords*. The vocal cords are two bands of tissue attached to cartilages in the larynx. The vocal cords are normally parted. When they are parted, there is an opening between them. This opening is called the glottis. A drawing of the larynx, including the vocal cords, the two cartilages to which they are attached, the glottis, and the trachea is on the next page.

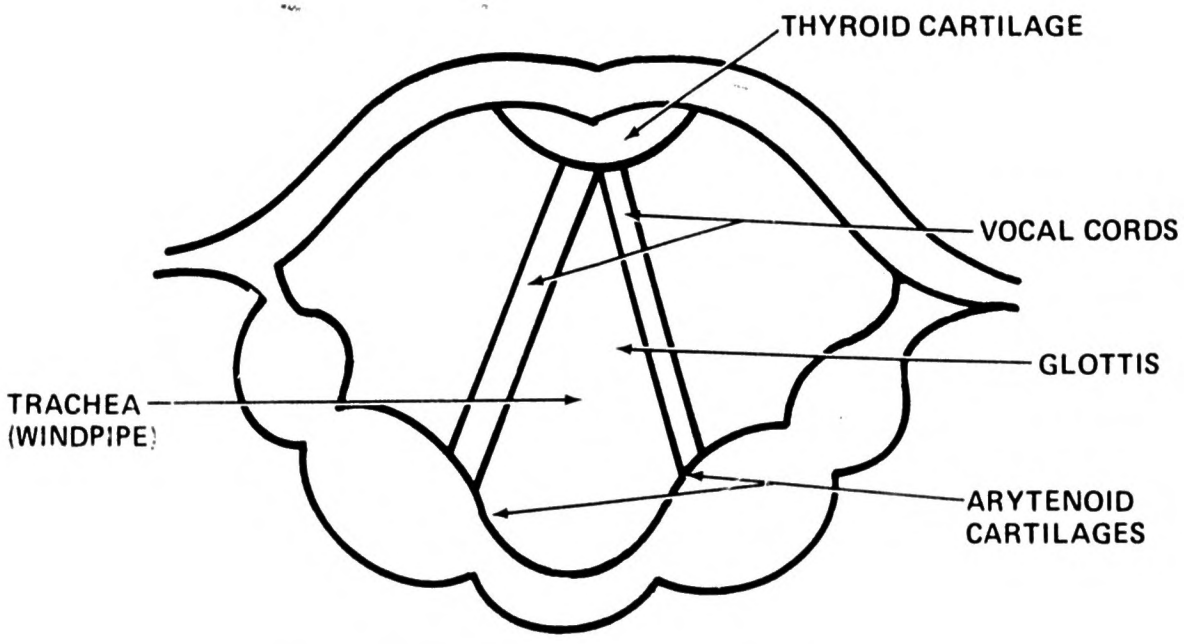


Figure 1. A drawing of the larynx as it would appear if you looked down through it

The human larynx is in the front portion of the neck. It is made up of tendons, ligaments, sets of muscles, and cartilages (tough but flexible bones). The largest cartilage is the thyroid (shield), which protects the larynx from injury. (See Figure 1.) You can feel your own thyroid cartilage by locating your Adam's apple with a finger. Notice the "V" notch at the upper tip of your Adam's apple. Keep your finger on the "V" while you swallow. The notch will move upward and out of reach under your chin. The larynx is a very flexible organ suspended between the base of your tongue and the top of your wind pipe (trachea).

The front ends of your vocal cords are attached to the thyroid cartilage just below the "V" notch. The back ends of the vocal cords are attached to rotating levers of cartilage called the *arytenoids*. The arytenoids move the vocal cords close together during speech. When air from the lungs is forced through the vocal cords, it becomes very turbulent and unstable. This air turbulence causes the vocal cords to vibrate in a wave-like motion. This vocal cord vibration is what we hear as *phonation* (voice).

Whenever air from the lungs vibrates the vocal cords, voice is the result. Furthermore, as air moves upward, the voice is affected by the size and shape of the cavities above the larynx: namely the *pharynx* (throat), *mouth*, and *nasal passage*. These cavities are called resonators because they change the sound and quality of the *voice*.

The Nose

Layers of skin conceal the architecture of the nose. The upper part (near the eyes) is hard bone, whereas the lower part has a more flexible structure. On either side of the nose

are two openings called *nares* (nostrils). Muscles in the face can slightly close and slightly open the nares. Just inside the nares are short hairs that protect the nostrils from dust, small bugs, etc.

Behind the two nasal passages is a single cavity called the *naso-pharynx*. The nasal cavity is separated from the oral cavity by a structure called the *palate*. The palate has two parts: a hard part, which is called the *hard palate* (the roof of the mouth), and a movable part with muscles in it, which is called the *soft palate*. Immediately in front of the hard palate is the gum ridge, which is called the *alveolar ridge*.

The Mouth

The *mouth* is one of the more important parts of your speech mechanism. It is the part that gives meaning to the sounds that come through your *larynx*. These sounds are modified by the tongue, lips, teeth, and palate (both the hard and the soft parts).

Remember, the soft palate stops the sound from going through your nose and enables it to go through your mouth instead. The tongue, by coming into contact with the teeth, palate, gum ridge, or lips, can produce speech sounds to form words. Certain types of movements produce certain types of sounds, all of which have specific names. These will be discussed later when we study phonetics.

What Goes Wrong

Some people cannot produce meaningful speech because they do not understand how to use the mouth. The problem with other people is that the mouth itself is abnormal.

You observed some speech defective individuals during your initial orientation with the speech pathologist. Probably you observed children who could not produce sounds correctly; therefore, their speech was not understandable. Some of them may have had cleft palates, missing teeth, or other structural mouth problems that altered their speech sounds so that you couldn't understand them. What you have learned about the structure of the oral, nasal, and laryngeal (larynx) cavities, should help you understand why these patients have so much difficulty.

Other individuals you observed probably had perfectly normal speech mechanisms but still had speech problems. They are among the large group of speech handicapped individuals who for some reason never learned to use the speech mechanism properly.

Still others may have suffered some damage to the brain that causes problems in moving the muscles that control the speech mechanism. The brain will be discussed later.

This brief description of the speech mechanism should help you understand how important it is in communication. Your instructor will give you more information to supplement this quick overview. Ask her/him to show you pictures of the speech mechanism so that you can visualize what has been discussed.

The Peripheral Nervous System

Whenever you move a part of your body, information is sent back to your brain for processing. Throughout the human body there is a complex system of "telephone lines" that carry information to and from the brain. These lines serve two purposes:

- The sensory function – they carry information from the brain so that you know what is happening.

- The motor function – they carry information from the brain to groups of muscle fibers in order to produce a muscle movement.

The "telephone lines," whether their function is sensory or motor or both, are part of the peripheral nervous system. Some peripheral nerves originate from the base of the skull. Others come out of the spinal column in pairs. Those pairs at the bottom of the spinal column serve the feet and legs; those at the top serve the upper body, including the head and arms.

The Brain

The brain is very important in speech. It can be considered the coordinator of all the functions of the body. Speech is one of these functions.

At the time of conception, a child consists of only a single cell. Nine months later the child's brain consists of 20 billion cells. This means that 24,000 nerve cells per minute were created in the womb just for the brain alone! These cells, which are called *neurons*, are the basic units of the nervous system. They may be sensory or motor.

Do you still have your 20 billion brain cells? Probably not. Between the ages of 20 and 70 you lose one to two billion neurons – that's about 50,000 neurons per day! Don't worry. You have plenty to spare.

Ask your instructor to show you a model or a chart of the brain. Notice that it is divided into two separate parts with a connecting bridge. These parts are called *hemispheres*. The *left* hemisphere controls the right side of the body, and the *right* hemisphere controls the left side. In right-handed people the left side of the brain usually becomes the fully developed side. Many people believe that it is the left side of the brain that contains the "language center."

The blood supply to the brain goes primarily to the outer layer, which is called the *cortex*. When you look at the cortex, it seems to be separated by deep folds (fissures) into four parts (lobes) on each side of the brain. The front section is called the *frontal lobe*. Behind and above the frontal lobe is the *parietal lobe*. Below the parietal lobe is the *temporal lobe*, and behind these two lies the *occipital lobe*.

The deep fold that separates the frontal lobe from the parietal lobe is called the *fissure of Rolando* and is extremely important. Along this fissure are the motor areas that control movement of the larynx, palate, tongue, jaw, face, etc. On the frontal side of the fissure of Rolando is the section of the brain that sends action signals to the speech mechanism in order to produce movements of the muscles. On the parietal side of the fissure of Rolando

is the section of the brain that receives sensory signals from the larynx, palate, jaw, tongue, etc.

In order for the lobes of the brain to operate efficiently, the nerve fibers in them must be insulated. The covering that accomplishes this purpose is called the *myelin sheath*. It serves much the same function as the coating on a telephone wire. The myelin sheath helps keep nerve signals (comparable to telephone messages) from short circuiting and stopping short of the brain. Some mentally retarded children don't have enough myelin. When these children try to answer a question, their response may be delayed or may never occur.

Lobes of the Brain

The lobes of the brain have specific functions. The *temporal lobe* is the center for understanding what you hear. The *parietal lobe* is the center that receives sensations of touch, feeling, etc. The *occipital lobe* is the center for understanding what you see. The *frontal lobe* is the center for intelligence, abstract thinking, and other important functions.

The points where these various lobes meet are thought to control important functions. Mental processes involved in reading, writing and speaking all occur at places where the various lobes of the brain touch each other. Ask your instructor to point out the parts of the brain that control these specialized functions.

When parts of these brain lobes are damaged, speech may never develop or the ability to speak may be lost. Persons to whom this happens are said to be *aphasic*. Sometimes the brain is damaged so badly that speech problems are accompanied by inability to walk or to control other bodily movements. People who experience these symptoms often are victims of *cerebral palsy*. Sometimes the damage to the brain is in the intelligence center and prevents full development of intellectual capabilities. This is called *mental retardation* (these people are said to be mentally retarded).

Ask your instructor to show you the *cerebellum*, which lies just beneath the *occipital lobe*. The cerebellum controls muscle tone and coordination of the voluntary muscles of the body. It is very important for posture, equilibrium and the performance of learned movements. Certain types of cerebral palsy involve the cerebellum and cause speech problems. If you drink too much alcohol and begin to lose your balance, it is because your cerebellum has been affected.

There are many other types of brain damage that may occur and produce speech and language disorders. Ask your instructor to discuss these with you in detail when you get to the module on communication disorders.

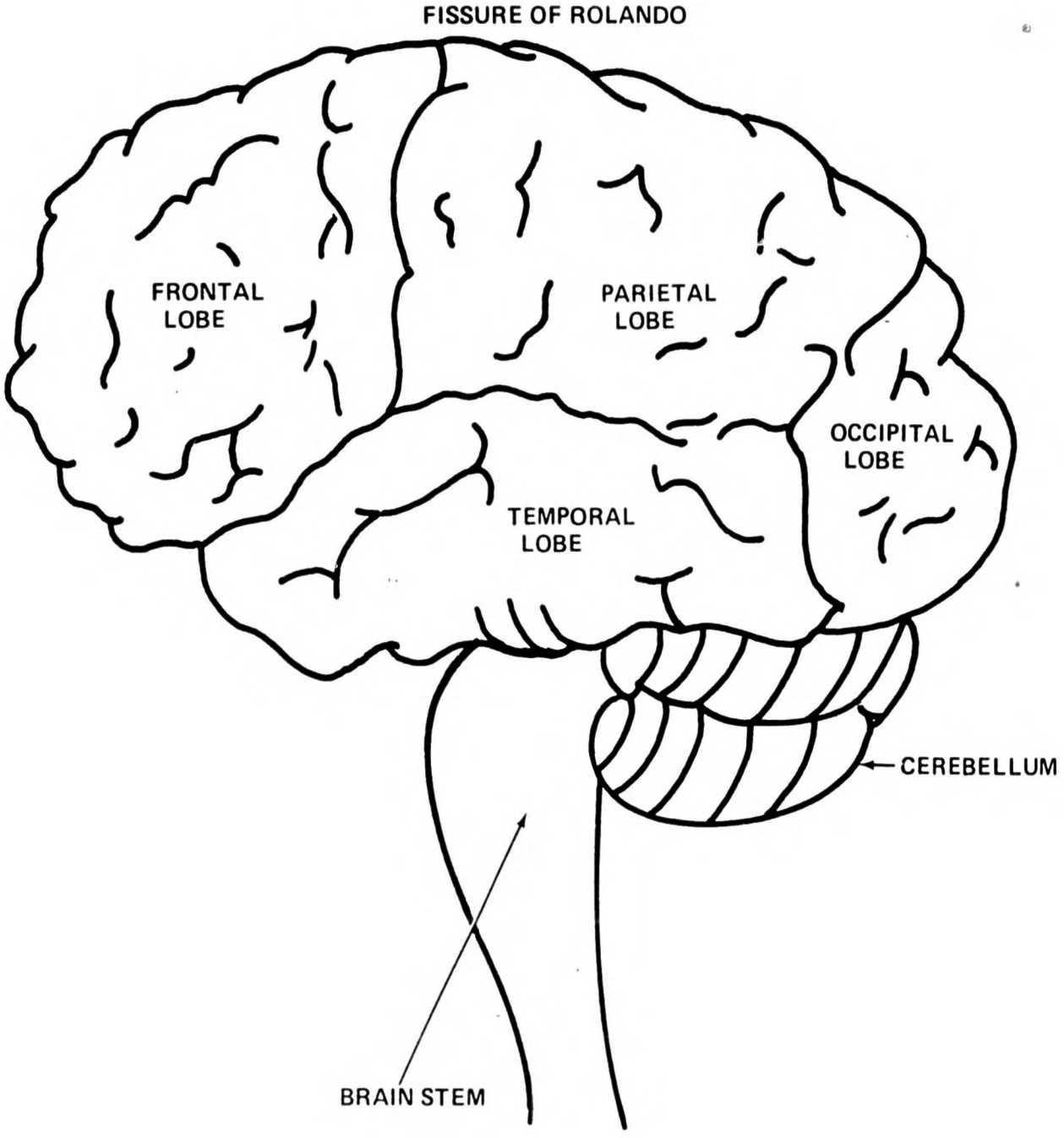


Figure 2. Side view of the brain.

II-B LANGUAGE DEVELOPMENT

By the time a child reaches five years of age, all the foundation and groundwork necessary for communication have been established. The child acquires basic skills that are needed by observing adults, repeating adult speech behavior, and experimenting with language independently.

The child goes through very definite stages before being able to produce full-fledged adult speech. The typical sequence of events has been described by many researchers. In this module you will learn the characteristics of each stage. At the end of this module is an outline of milestones in the development of language from the time of a child's birth up to the age of 8 1/2 years. This outline will be useful in your new occupation. Later you may wish to add other information to it.

Language can be divided into two categories. One is *receptive language*; the other is *expressive language*. Receptive language is *produced* by someone else and *understood* by you. Expressive language is what you produce when you *speak* or *write*. You understand (receptive) many more words than you use (expressive).

A young child in the very early stages of speech development acquires considerable understanding of language; however because of physical and mental immaturity the child doesn't speak. The speech mechanism is not mature enough. Also, the child really doesn't understand everything others say because the hearing mechanism and the brain are immature.

Reflexive Vocalization

1 - 3 weeks
Undifferentiated Crying

When a baby is born and comes into contact with the outside world, she/he attempts to express displeasure. This communication takes the form of crying. A baby cries a great deal during the first three weeks of life, and all of this crying sounds alike. Regardless of whether the baby is hungry, wet, angry, or sick, there is really no difference in the manner of expression.

3 - 6 weeks
Differentiated Crying

About the 4th week, parents begin to notice that the baby cries much less and only at specific times. These cries, in some instances, are different from one another and reflect differing stages of hunger, discomfort, and/or pleasure. This is called differentiated crying. It occurs when the baby attempts to communicate feelings in specific ways rather than in the general way typical of the first three weeks of life.

Babbling Stage

6 weeks - 6 months

Beginning in the 7th week, the child explores her/his body. You may observe the baby playing with her/his feet, hands, mouth, eyes, etc. The child begins to discover herself/himself as a real live human being. At the same time the child learns that the mouth can be used to produce sounds. The baby begins to coo, burp, sigh, and randomly make noises that are pleasurable to her/him. The baby begins to repeat sounds over and over, varying the loudness and the pitch. Some researchers believe that a child in the babbling stage produces all of the sounds in every language; however, because only some of the sounds are present in the child's environment, she/he keeps on producing only those that are appropriate for the language she/he hears. Deaf babies do not progress from the babbling stage to the next stage of development. In time they even stop babbling. Children babble because it is pleasurable to feel and to hear sounds. Deaf children don't receive this gratification via the hearing mechanism so they cease babbling.

Lalling

6 - 9 Months

The next stage is *lalling*. The child's hearing mechanism has matured, and her/his motor coordination has improved. During this stage, the child begins to produce both vowels and consonants. During this stage, all the vowels and consonants the child uses are produced at the front of the mouth. Toward the end of this stage the child begins to combine sounds in order to duplicate what she/he hears from adults. This transitional activity marks the beginning of the next stage of language development.

Echolalia

9 - 12 Months

The *echolalic* stage is characterized by the child's attempts to *echo* the sounds made by adults. Attempts to echo (imitate) often results in enunciation of words. Even though these words may have no meaning to the child, the parent rewards the child's early echolalic attempts at language. This reinforcement is pleasurable, so the child continues to produce combinations of sounds. In order to understand how echo responses become meaningful, think about this example: *A mother plays with her baby. She says, "Say mama." The child sees the lips come together and hears the sound that is emitted. The child struggles to produce the word, "mama" accurately. When the child says it right, the mother hugs and kisses the child. She says, "mama" again. The child repeats this word again. The child receives more hugs and kisses. This is a pleasurable experience for the child, who now knows that saying "mama" is a way of getting affection. Later, this same child lies in a crib and wants attention. The child remembers all the affection she/he received producing the word "mama." The child says this and the mother comes. The child begins to associate the word "mama" with the person who cares for her/him. The word takes on meaning. What it means is a loving, caring, affectionate person.*

Admittedly, the processes by which meaning develops are more complicated than this. However, in the early stages of a child's development this is essentially what occurs. Remember that the child is still maturing intellectually. When combinations of sounds begin to have meaning for the child as well as meaning for the parents, we say that the child is producing true speech.

True Speech

12 - 18 Months

This stage starts when the child associates meanings with the sounds she/he makes. The child is reinforced by the parents for producing words (combinations of sounds). However, the child still indulges in lalling, echolalia, and some babbling. Why?

Well, the child still has not mastered all of the sounds in the language. Usually this takes 7 1/2 to 8 1/2 years. Meanwhile, the child continues to experiment in order to learn sounds correctly, associate meanings with words through imitation, and learn to modify what she/he says by actively listening to herself/himself.

The child usually uses one word sentences at this stage of development and is rewarded for them. The child says "mama" and mother comes. The child says "cookie" and daddy brings him a cookie. The child says "go" and mother and daddy take the child outside.

The child learns to produce more and more combinations of sounds in a string. These strings become phrases, then sentences. Usually, they are composed of those words that have the most meaning for the child.

Your instructor has a tape that demonstrates various stages through which a child progresses. Listen to the recorded voices. See if you can recognize various stages of language development.

At the end of this module is a developmental schedule describing the first 7 1/2 years of a child's life. There are many more milestones than have been described so far. Take a look at the schedule, and add some of the information that your instructor has given you in class.

What to Look for in the Child From Birth to Age Three Months: General Behavioral Milestones

- Eye movements: tries to follow bright, colorful objects
- Change in breathing rate or gross body activities when exposed to loud sound
- Smiles when stimulated or when there is stomach "gas"
- Reflexive crying: total body response "distressed all over"
- Sighing and cooing sounds: more relaxed and specific

- Sucking sounds: become rhythmical when successful
- Soft volume reflexive babbling sounds: random without much continuity
- Holds head up briefly when lying in a prone position
- Head held steady in sitting position at three months
- Simian grasp: bends hands at the creases to grasp; does not use fingers
- Moro reflex: contraction of limb and neck muscles when jolted or dropped a short distance
- Sucking reflex: sucks when lips or cheeks are stimulated
- Rooting reflex: searches for food when hungry
- Can swallow pureed foods
- Coordinated sucking-swallowing-breathing
- Sleeps 4 - 10 hours at night with frequent naps during the day
- Quieted when picked up
- Looks at mother's face
- Gets attention by crying
- Begins to "wiggle" around
- Complete state of narcissism and self-interest
- Mother does not yet exist as a differentiated person
- All activity is primarily oral: biting and spitting
- No bladder or bowel control
- Attitudes of trust/mistrust may be developing
- Begins to develop an awareness of the basic boundary limits of his body

What to Look for in the Child From Six Months to Eight Years: Language Development Chart

These are central tendencies in language development not absolutes. No child is exactly the same as any other child, and individual variations are perfectly normal. This outline is based on various research studies done over a period of years.

6 Months
Babbling

1. Vocalization with intonation
2. Responds to her/his name
3. Responds to human voices without visual cues by turning head and eyes
4. Responds appropriately to friendly and angry tones

12 Months
True Speech

1. Uses one or more words with meaning (This may be a word fragment.)
2. Understands simple instructions, especially if vocal or physical cues are given
3. Imitates sounds and sequences of sounds in the environment
4. Practices inflection
5. Is aware of the social value of speech
6. Some echolalia

18 Months

1. Has vocabulary of approximately 5-20 words
2. Vocabulary made up chiefly of nouns
3. Some echolalia
4. Much jargon with emotional content
5. Is able to follow simple commands

24 Months

1. Can name a number of objects common to her/his surroundings
2. Uses at least two prepositions, usually two of the following: *in, on, under*
3. Combines words into short sentences largely noun-verb combinations (Average length of sentences is 1-2 words.)

4. Approximately 2/3 of what the child says should be intelligible.

5. Vocabulary of approximately 150-300 words

6. Rhythm and fluency often poor

7. Volume and pitch of voice not yet well-controlled.

8. Uses at least two pronouns correctly, usually two of the following: *I, me, you.* Often *me* and *I* are confused. *My* and *mine* are beginning to emerge.

9. Responds to such commands as, "*Show me your eyes* (nose, mouth, hair)."

36 Months

1. Uses pronouns *I, you,* and *me* correctly

2. Uses some plurals and past tenses

3. Knows at least three prepositions, usually *in, on,* and *under*

4. Knows chief part of the body and should be able to indicate these if not named

5. Handles three-word sentences easily

6. Vocabulary of approximately 900-1,000 words

7. Nine-tenths of what the child says should be intelligible

8. Verbs begin to predominate.

9. Understands most simple questions dealing with her/his environment and activities

10. Relates her his experiences so that they can be followed within reason

11. Can reason out answers to such questions as, "What should you do when you are sleepy (hungry, cold, thirsty)?"

12. Should be able to give her his sex, name and age

13. Should not be expected to understand all questions even though she/he understands what is expected

48 Months

1. Knows names of familiar animals

2. Can use at least four prepositions or can demonstrate understanding of their meanings when she/he is given commands

3. Names objects commonly found in picture books or magazines
4. Knows one or more colors
5. Can repeat four digits that are given slowly and usually can repeat words of four syllables
6. Definitely understands the concepts of *one* and *more than one*
7. Demonstrates understanding of *over* and *under*
8. Has most vowels and diphthongs and the consonants *p, b, n, w,* and *h* well established
9. Often indulges in make-believe
10. Extensive verbalization as she/he carries out activities
11. Asks many questions chiefly those with "why?"
12. Understands such concepts as *longer* and *larger* when a contrast is presented
13. Readily follows simple commands even though the stimulus objects are not in sight

60 Months

1. Can use many descriptive words spontaneously both adjectives and adverbs
2. Knows common opposites: *big-little, hard-soft, heavy-light,* etc.
3. Understands number concepts at least up to *four*
4. Can count to ten
5. Speech should be completely intelligible in spite of articulation problems.
6. Should have all vowels and the consonants *m, p, b, h, w, k, g, t, d, n, ng,* and *y* (as in yellow)
7. Should be able to repeat sentences as much as nine words long
8. Should be able to define common objects in terms of use e.g., *hat, shoe, chair*
9. Should be able to follow three commands given without interruption
10. Knows coins and has some idea of their relative worth
11. Should know her/his age
12. Should have simple time concepts: *morning, afternoon, night, day, later, after awhile, tomorrow, yesterday* and *today*

13. Should use fairly long sentences and also some compound and some complex sentences

14. Speech on the whole should be grammatically correct.

At Six Years

1. In addition to the above consonants, these should be mastered: *f, v, sh, zh, th,* and *l.*

2. Should have number concepts of *seven* or more

3. Speech should be completely intelligible and socially useful.

4. Should be able to tell a rather well connected story about a picture, expressing relationships between objects and happenings

At Seven Years

1. Should have mastered the consonants *s-z, r,* voiceless *th, ch* and soft g (as in George)

2. Should understand opposite analogies easily: *girl-boy, man-woman, blunt-sharp, short-long, sweet-sour,* etc.

3. Understands such terms as *alike, different, beginning,* etc.

4. Should be able to tell time to the quarter of an hour

5. Should be able to do simple reading and to write or print many words

6. Should be able to add simple number combinations

At Eight Years

1. Can relate rather involved accounts of events, many of which occurred at some time in the past

2. Should be able to use complex and compound sentences easily

3. Should have few lapses in grammar - tense, pronouns, plurals

4. All speech sounds, including consonant blends' should be established.

5. Should be reading with considerable ease and writing simple compositions of several sentences

6. Social amenities should be present in his speech in appropriate situations.

7. Control of rate, pitch, and volume generally are well and appropriately established.

8. Can carry on conversation at a rather adult level

9. Follows fairly complex directions with little repetition

10. Has well-developed time and number concepts

REFERENCES

Editor's list selected from the following sources:

Bernard, Kathryn E. *Washington Guide to Promoting Development in the Young Child.* Seattle: University of Washington School of Nursing (mimeographed).

Hopper, Robert and Rita C. Naremore. *Children's Speech: A Practical Introduction to Communication Development.* New York: Harper and Row, 1973.

Hundziak, Marcel. "Development of the Normal Child." In Betty Hunt Bradley, Marcel Hundziak, and Ruth M. Patterson. *Teaching Moderately and Severely Retarded Children.* Springfield, Ill.: Charles C. Thomas, 1971.

Illingworth, Ronald S. *The Normal Child* (2nd edition). Boston: Little, Brown and Company, 1957.

Yale University. *The First Five Years of Life.* New York: Harper and Row Brothers, 1940.

II-C PHONETICS

The purpose of this module is to help you understand how the speech pathologist describes the sounds a client produces. In order to describe these sounds, the speech pathologist uses phonetics. *Phonetics* is a method of assigning symbols to represent all of the sounds of a particular language. (Do not get this mixed up with *phonics*, which is a method of teaching reading.)

Usually there are more sounds in a language than there are letters in the alphabet used to write that language. There are only 26 letters in the written English language, but when we speak we produce over 48 sounds. Sounds are combined to produce words; words are combined to produce sentences; sentences convey thoughts.

Different types of sounds depend upon the way we use the parts of the body that make up the speech mechanism. The speech mechanism includes:

- tongue
- lips
- teeth
- palate
- nose
- larynx (vocal folds)
- pharynx (throat)

One way of differentiating sounds is to call them consonants, vowels, or diphthongs. Some of these sounds are produced while our vocal cords are vibrating and therefore are called *voiced* sounds. Other sounds are produced while our vocal cords are *not* vibrating, and therefore are called *voiceless* sounds. All vowels are voiced, which means they are produced while the vocal cords vibrate. Diphthongs are combinations of two vowels. Since vowels always are voiced, diphthongs always are voiced. Some consonants are voiced, but some are voiceless.

All languages are made of sounds. These sounds are called *phonemes*. The word *phoneme* may be defined as a member of a family of sounds. When you describe phonemes you may call them voiced phonemes or voiceless phonemes depending upon whether the vocal cords are vibrating or not vibrating when the sounds are produced.

When you are writing and you want to distinguish a sound from a letter in the alphabet, you use / / and put the sound between the slash marks. Symbols for sounds are never capitalized.

Manner of Articulation

Consonants and vowels sound different because they are produced differently. All sounds begin with a stream of air coming through your vocal cords. To produce the wide variety of sounds that constitute a language, your speech mechanism modifies this stream of air in many ways. According to the manner in which the air stream is affected by the speech mechanism, sounds produced have characteristic qualities. On this basis, names are assigned to groups of sounds that are all produced in the same manner. These names are:

- nasals
- plosives
- fricatives
- affricates
- laterals
- glides

Below, the manner of articulation for the six groups of sounds is described. Each sound is listed. Some are voiced; others are voiceless. The phonetic symbols are shown along with a word in which the sound is used. Fill in the blanks with your own examples of words that contain each sound. Underline the letters that produce the sound. When you have finished, ask your instructor to check your work.

Nasals

Sometimes the stream of air that causes the vocal cords to vibrate comes out of the nose rather than the mouth. When this happens you produce an /m/, /n/, or /ng/. (An "ng" sound is indicated by the Symbol /ŋ/.) These sounds are called *nasals*. Why? You guessed it: because the sound goes through the nose. The vocal cords vibrate when nasals are pronounced, therefore nasals are always voiced.

voiced	/m/ as in *m*ore	_____
voiced	/n/ as in *n*ow	_____
voiced	/ŋ/ as in si*ng*	_____

Fricatives

Suppose you send the air out of your mouth (oral cavity) instead of your nose. When you produce a /s/ sound, the air goes out of your mouth slowly through your teeth. Try it. Do you hear the *friction*? Because they are produced this way, the /s/ sound and all other friction-like sounds are called *fricatives*.

The /s/ sound is voiceless. Can you guess why? The vocal cords do not vibrate when you say /s/. Therefore, you call /s/ a voiceless fricative. If you vibrate your cords and try to produce the /s/ sound, do you know what comes out? The /z/ sound. The /z/ sound is the voiced counterpart of the /s/. The two sounds are like brother and sister.

There are many fricatives. The symbol for each fricative is written below along with a word that uses the fricative sound. The letter or letters underlined represent the fricative sound. Whether the sound is voiced or voiceless is also indicated.

voiceless	/f/ as in *f*ive	_____
voiced	/v/ as in *v*ery	_____
voiceless	/θ/ as in *th*in	_____
voiced	/ð/ as in *th*at	_____
voiceless	/s/ as in *s*un	_____
voiced	/z/ as in *z*ipper	_____
voiceless	/ʃ/ as in *sh*oe	_____
voiced	/ʒ/ as in vi*s*ion	_____
voiceless	/h/ as in *h*elp	_____
voiced	/w/ as in *w*itch	_____

Plosives

Sometimes when you are speaking you produce sounds that are *explosive*. They literally explode out of your mouth. This happens because of what you do with the sound. Follow these directions and you will see. Send a stream of air through your vocal cords, but don't vibrate them. Now, let the air come to your lips, but close your lips tightly so that the air can't get out. Feel the pressure? Okay, open your lips quickly and let the air out. Did you hear the pop? Like an explosion? The sound you just produced is the /p/. Sounds that explode this way are called *plosives*.

voiceless	/p/ as in *p*et	_____
voiced	/b/ as in *b*um	_____
voiceless	/t/ as in *t*he	_____
voiced	/d/ as in *d*ie	_____
voiceless	/k/ as in *c*an	_____
voiced	/g/ as in *g*um	_____

Affricates

Affricates are another group of sounds. An affricate is a combination of a fricative and a plosive. Suppose you combine a /t/ as in *t*in and an / ʃ / as in *sh*oe; the new sound is /t ʃ / as in *ch*in. Similarly, if you produce a /d/ as in *d*ie and a / ʒ / as in vi*s*ion, the new sound is /d ʒ/ as in *g*e.

voiceless	/t ʃ / as in *ch*ew	_____
voiced	/d ʒ/ as in *J*oe	_____

Laterals and Glides

The last two groups of sounds are called *laterals* and *glides*. Laterals are so named because the air moves out of the mouth and over the tongue in a side to side manner. Glides are so called because the air glides over the tongue and out of the mouth. (Something similar happens when you pronounce a vowel. Technically, glides are combinations of vowels.)

Below are the sounds, represented in the same fashion as before.

Laterals

voiced	/l/ as in *l*ove	_____
voiced	/w/ as in *w*ay	_____

Glides

voiced	/j/ as in *y*oung	_____
voiced	/r/ as in *r*ed	_____

Place of Articulation

The part of the mouth that is used to produce a consonant helps to determine the name of the consonant. Mouth structures used to produce sounds are the *lips*, *teeth*, *palate*, and *tongue*. If you bring both lips together to produce a sound, it is called *bilabial* (*bi* means two, and *labial* refers to *lips*). If the teeth are involved in production of a sound, it is called *dental*. If the tongue is involved the sound is called *lingual*. Various parts of the palate may also be used to produce sounds. The palate is divided into three parts. The *alveolar* part is just behind the teeth. Feel it with your tongue. Next, move the front of the tongue upwards. Do you feel how the tongue rises? At the highest point is the hard palate and this part of the mouth is called *palatal*. If you could move the tip of your tongue all the way back in your mouth, you could touch the soft palate. That's hard to do, so use your finger instead. See how soft the tissue feels? The soft palate is called the *velum*. This part of the mouth is the *velar* portion. Think of the roof of your mouth. In front is the *alveolar* part; in the middle is the *palatal* part; in the back is the *velar* part.

Now, instead of just calling sounds just plosives, fricatives, etc., you also can describe what structures are involved in their production. For example, what is a *voiced bilabial plosive*? Think about what the terms mean, and try to make such a sound. If you do it right, you will produce a /b/. The /b/ sound is produced by vibrating the vocal cords (voiced), stopping and building up pressure behind the two lips (bilabial), and exploding the air out of your mouth suddenly (plosive).

All sounds can be discussed in terms of their place of articulation. This book will not go into that in detail, but your instructor undoubtedly will teach you how the system works. The combinations of oral structures that are used in consonant production are described by the words written below:

Description of Sound	Structures to Produce Sound
bilabial	two lips
labiodental	lips and teeth
linguadental	tongue and teeth
linguaalveolar	tongue and front of palate
linguapalatal	tongue and middle of palate
linguavelar	tongue and soft palate

To describe a phoneme accurately, all you have to do is indicate how the vocal cords are used (voiced or voiceless); how the air stream comes out (plosive, affricate, fricative, etc.); and what mouth structures are involved (labiodental, linguavelar, etc.). All three types of information should be provided when you talk about a consonant sound.

Figure three shows all of the consonants, the structures involved in their production, and the manner in which they are produced.

At the end of this module are practice sheets to help you learn to use phonetic symbols. Your instructor will provide additional work sheets.

Vowels and Diphthongs

Vowels are always voiced. They are produced with vocal cords vibrating, and the sound travels through the oral cavity and out of the mouth. Vowels are not impeded as consonants are. Vowels are made by altering the shape of the mouth and the tongue. For example, the lips may be rounded or widened. The tongue may be arched, may lie flat in the mouth, or may be grooved down the center. Combinations of these movements made simultaneously, alter the sound of vowels. Because of these movements, vowels are described in terms of the lips being *rounded* or *unrounded* and in terms of how the tongue is arched: in the *front*, *middle*, or *back*. Also, just as the tongue may be relaxed or tense, so a vowel may be *relaxed* or *tense*.

Diphthongs are combinations of vowels, usually one tense (stressed) vowel plus one relaxed (unstressed) vowel. Sometimes stressed vowels are called *long vowels*, and unstressed vowels are called *short vowels*.

The vowels and diphthongs are in the back of this module for your understanding. The symbol used for a particular vowel sound is to the left. The word with the vowel is to the right. The description of the vowel is also placed here for your information.

Figure five shows the vowels and how they are produced. A key word is provided so that you may understand how the particular vowel sounds in the word. At the end of the module are practice sheets to help you learn to describe vowel sounds phonetically.

Language Structure

Speech pathologists are interested in linguistics—the study of the structure of languages, but they are most concerned with those facts of linguistics that describe how spoken language develops in children. There are four areas of linguistic science which deal with different aspects of language development: (1) semantics; (2) syntax; (3) morphology; and (4) phonology.

1. *Semantics*: Consider for a moment the word "light" in the following sentences:

   Turn out the *light*.

   Will you *light* the fire?

   That is *light* enough for him to carry.

   He made *light* of his misfortune.

   Did you notice the meaning of the word "light" changed from sentence to sentence? Semantics is the study of word *meaning* and how words acquire meanings for people.

2. *Syntax*: Look at the next group of sentences. This time the meaning of the word "light" remains the same, but something else changed:

Turn out the light!	(command)
Did he turn out the light?	(question)
He did turn out the light.	(statement)
Didn't he turn out the light?	(negative question)
No, he did not turn out the light.	(negative statement)

   Notice that the structure of the *sentences* change so that we can make positive statements, ask questions, give commands, and even make negative statements. The construction of sentences and the rules for word order are part of what we call syntax.

3. *Morphology*: We have already discovered that the meanings of the words can change. Word forms can also change. Look at our old friend "light" again:

Light the *lights*.

He *lit* a match.

I like indirect *lighting*.

My car is *lighter* than your, but his is the *lightest*.

Don't take it too *lightly*.

Morphology is the study of how words change their forms when we make them work for us in different ways.

Before we discuss phonology, check to see if you have a practical understanding of the first three areas of linguistic science. Examine each of the following sentences to see if you can correctly diagnose the error as semantic, syntactic, or morphologic. (The correct answers are written to the right; cover them with a piece of paper and then check your answers later.)

1.	Doesn't he like to singing a song? _____	1.	Morphology (the word form of "sing" is wrong)
2.	Albert's blue fire walks quickly. _____	2.	Semantic (meaning is violated)
3.	I do want not to go! _____	3.	Syntactic (the word order is wrong)
4.	He ranged the door bell. _____	4.	Morphologic (wrong form of "rang")
5.	Him and me are brothers. _____	5.	Morphologic (Why?)
6.	That is me favorite record. _____	6.	Morphologic
7.	My brother is twenty-three years tall. _____	7.	Semantic
8.	We having a good time. _____	8.	Syntactic or morphologic
9.	I live in a white big house. _____	9.	Syntactic

If you interpret sentence number 8 "We *are* having a good time," the error is one of syntax; if you interpret it as "We had a good time," the error is one of morphology.

Now return to the fourth area of linguistic science.

4. *Phonology*: Often, if you *change even one small sound* in a word, you change its meaning

"*l*ight,"..... "*n*ight," ....."*f*ight,"
"*l*i*gh*t,"..... "l*a*te," ....."l*o*t,"..... "l*oo*t,"
"ligh*t*,"..... "l*i*ne," ....."li*k*e,"..... "li*f*e,"

Phonology is the study of speech sounds that are put together to form spoken words in a meaningful way.

You have already learned about phonetics prior to this part and you understand how sounds form words, words form sentences, and sentences convey thoughts. You've also gotten an appreciation for syntax, morphology, and semantics and how they affect meaning. This module is very important because when you study children with language disorders you'll find some with syntactical problems, semantical problems, morphlogical problems, or phonological problems.

Difficulties in one or more of these areas cause problems in conveying one's thoughts and feelings; therefore, language disorders are very handicapping. They may affect school performance, employment opportunities, and day-to-day relationships with people.

As you progress through this manual, you will begin to understand how much we depend upon communication. Too often we take it for granted until something goes wrong.

Your instructor will provide you with additional material for this section of the manual.

Also, included in the back of this module are two charts.

REFERENCES

Avery, Elizabeth, Jane Dorsey and Vera A. Sickels. *First Principles of Speech Training* (2nd edition). New York: D. Appleton-Century, 1937.

Bronstein, Arthur. *Pronunciation of American English.* New York: Appleton-Century-Crofts, 1960.

Denes, Peter B. and Elliot N. Pinson. *The Speech Chain.* Baltimore: Williams and Wilkins Company, 1963.

Goldman, Ronald and Macalyne Fristoe. *Test of Articulation.* New York: American Guidance Service, Inc., 1961.

Hopper, Robert and Rita C. Naremore. *Children's Speech: A Practical Introduction to Communication Development.* New York: Harper and Row, 1973.

Irwin, Ruth B. *Ohio Tests of Articulation and Sound.* Pittsburgh: Stanwix House, 1973.

Kantner, Claude E. and Robert West. *Phonetics* (Revised edition). New York: Harper, 1960.

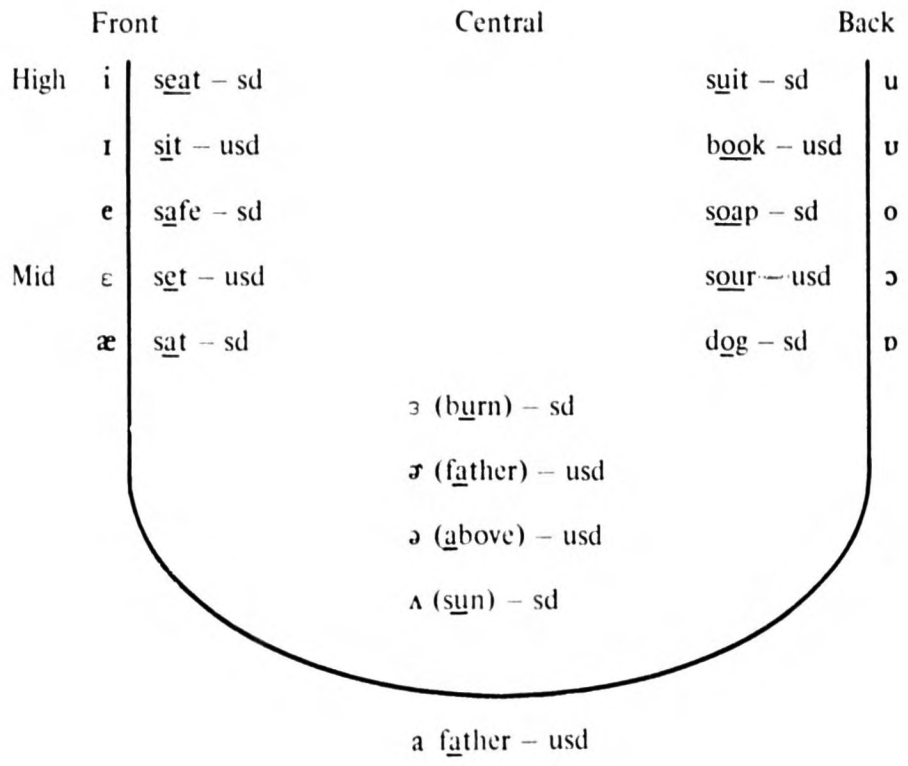
McDonald, Eugene. *Articulation Testing and Treatment: A Sensory Motor Approach.* Pittsburgh: Stanwix House, 1964.

Wise, Claude Merton. *Applied Phonetics.* Englewood Cliffs: Prentice-Hall, 1957.

Manner of Articulation	Place of Articulation (Vs = voiceless; V = voiced)											
		Bilabial		Labiodental		Linguadental		Linguaalveolar		Linguapalatal		Linguavelar	
		Vs	V	Vs	V	Vs	V	Vs	V	Vs	V	Vs	V
	Plosives	p	b					t	d			k	g
	Fricatives			f	v	θ	ð	s ʃ	z ʒ				
	Nasals	ʍ	m						n				ŋ
	Laterals & Glides		w						l		r j		
	Affricates							tʃ	dʒ				

Figure 3. Consonant Classification According to Place of Articulation

sd = stressed (tense tongue)
usd = unstressed (relaxed tongue)



diphthongs

aʊ – cow

eɪ – late

aɪ – kite

oʊ – go

ɔɪ – boy

The letter or letters that the vowel symbol represents are underlined.

Figure 5. Classification of Vowels According to Tongue Position

Vowel and Diphthong Transcription Practice

leaf	l_____f	bell	b___l
key	k____	apple	____pəl
keys	k____z	bat	b____t
sheep	ʃ____p	lamb	l_____m
zebra	z____brə	cat	k____t
teeth	t____θ	kite	k____t
pig	p____g	eves	_____z
pin	p____n	five	f____v
fish	f____ʃ	pie	p____
Indian	____ndiən	tie	t ____
ring	r____ŋ	pipe	p____p
dish	d____ʃ	car	k____r
thimble	θ____mbəl	father*	f_____ð
witch	w____tʃ	calm*	k____m
bridge	br____dʒ	avocado	___vək___dou
ship	ʃ____p	watch	w____tʃ
cage	k____dʒ	log	l___g
vase	v____s	dog	d____g
rake	r____k	ball	b____l
chain	tʃ ____n	saw	s____
bed	b_____d	fork	f_____rk
umbrella	əmbr_____lə	door	d_____
egg	_____g	rope	r_____p
giraffe	dʒ ər____f	comb	k_____m
hat	h____t	soap	s_____p

Vowel and Diphthong Transcription Practice (Continued)

bone*	b____n	hear*	h____ɝ
hotel*	h___tɛl	book	b____k
fan	f___n	full*	f____l
man	m____n	foot*	f____t
lamp	l____mp	house	h____s
shoe	ʃ____	cow	k____
moon	m____n	mouth	m____θ
zoo	z_____	oil*	____l
cup	k____p	boy*	b____
bus	b____s	join*	dʒ____n
gun	g____n	few*	f____
tub	t____b	beauty*	b_____t
thumb	θ____m	new*	n_____
duck	d____k	jug	dʒ____g
sun	s____n	umbrella	əmbr____lə
nut	n____t	Indian	Ind____n
zebra	zibr_____	girl*	g____l
sofa*	souf____	work*	w____k
pearl*	p_____l	chair	tʃ____r
earn*	____rn	fare*	f____r
air*	____r	deer*	d____r
year*	j____r		

PHONETIC TRANSCRIPTION PRACTICE OF WORDS COMMONLY USED IN MANY PICTURE ARTICULATION TESTS FOR CHILDREN

wheel	playing	hand	four	thumb
tree	taking	that	door	shovel
key	chasing	carrot	telephone	much
sleeping	jail	glasses	window	brushing
seat	cage	catch	stove	glove
teeth	skate	laugh	soap	truck
needle	yellow	knife	going	pajamas
bees	feather	light	nose	Santa
leaf	pencils	five	cone	zebra
whistle	bed	valentine	book	zipper
Christmas	web	white	blue	finger
swing	Jerry	tie	loses	covers
chicken	very	pie	tooth	mother
fishing	egg	fire	smooth	house
fish	engine	car	church	mouse
scissors	bread	garage	thirteen	mouth
this	Beth	dog	squirrel	noise
ring	Jack	yawns	shirt	boy
ricky	bat	saucer	cup	vacuum
pig	wagon	orange	jumping	music
bridge	lamp	floor	brush	
ship	flag	Claus	gun	
plane	matches	ball	bathtub	
they	rabbit	saw	drum	

ANSWER SHEET FOR PHONETIC TRANSCRIPTION PRACTICE

ʍil	pleɪŋ	hænd	foɚ	θʌm
tri	teɪkɪŋ	ðæt	doɚ	ʃʌvəl
ki	tʃeɪsɪŋ	kærət	teləfoun	mʌtʃ
slipɪŋ	dʒeɪl	glæsɪz	wɪndou	brʌʃɪŋ
sit	keɪdʒ	kætʃ	stouv	glʌv
tiθ	skeɪt	læf	soup	trʌk
ʍidəl	jɛlou	naɪf	gouɪŋ	pədʒæməz
biz	fɛðɚ	laɪt	nouz	sæntə
lif	pɛnsɪlz	faɪv	koun	zibrə
ʍɪsəl	bɛd	væləntaɪn	buk	zɪpɚ
krɪsməs	wɛb	ʍaɪt	blu	fɪŋgɚ
swɪŋ	dʒɛrɪ	taɪ	luzɪz	kʌvɚz
tʃɪkən	vɛrɪ	paɪ	tuθ	mʌðɚ
fɪʃɪŋ	ɛg	faɪɚ	smuð	haus
fɪʃ	ɛndʒɪn	kɑr	tʃɝtʃ	maus
sɪzəz	brɛd	gərɑʒ [or gərɑdʒ]	θɝt	mauθ
ðɪs	bæθ	dɒg	skwɝəl	nɔɪz
rɪŋ	dʒæk	jɔnz	ʃɝtin	bɔɪ
rɪkɪ	bæt	sɔsɚ	kʌp	vækjum
pɪg	wægən	ɔrɪndʒ	dʒʌmpɪŋ	mjuzɪk
brɪdʒ	læmp	flɔɚ	brʌʃ	
ʃɪp	flæg	klɔz	gʌn	
pleɪn	mætʃɪz	bɔl	bæθtʌb	
ðeɪ	ræbɪt	sɔ	drʌm	

50

MODULE III: HEARING

Objectives:

- To learn the relationship between hearing and the speech and language processes
- To learn those disorders of speech and language attributable to hearing impairment
- To learn the types of hearing impairment encountered in children and adults
- To understand the rudiments of hearing assessment (screening procedures, threshold and suprathreshold tests pure tone, speech)

Both in theory and in practice speech and hearing are closely related disciplines. The speech pathologist is keenly aware of the importance of hearing to the development and maintenance of speech and language skills. Hearing is the sensory pathway most vital for oral communication.

Audiology is the study of hearing. One of the most important goals of audiology as a profession is to maximize hearing for purposes related to speech. Audiologists assess the adequacy of hearing for speech. And audiologists conduct aural rehabilitation programs in order to train clients to make the best use of sound and visual cues to understand speech.

Audiology and speech pathology are separate professions, but they are very closely related. Speech clinicians often are involved in public school and community hearing conversation projects. Ever since the establishment of the first formal professional standards, course work and practicum in measurement of hearing and aural rehabilitation have been required training for speech pathologists. Correspondingly, persons educated as audiologists must do course work and practicum in basic speech pathology.

Places where communication disorders are treated usually are called *speech and hearing centers* (or hearing AND speech centers). Two of the nationwide associations concerned with communicative disorders are the American Speech *And* Hearing Association (ASHA) and the National Association for Hearing *And* Speech Action (NAHSA). State associations without exception combine both speech and hearing professionals in one organization.

Many clinicians are certified and/or licensed in both speech pathology and audiology. This is called dual certification and/or dual licensure.

Several years ago NAHSA published a training manual for audiometric assistants. That book and the book you are reading are companion volumes. The book for audiometric assistants has in it some information about speech pathology, but not nearly as much as what you have already learned from this book. However, there is a great deal of information

about audiology that will be useful to you. Your instructor will obtain a copy of the book for you. It is called *Audiometric Assistant: Training Guide.** What follows is an outline of the material you will wish to examine. References are to page numbers in the *Guide*.

1. The ear, hearing, and common hearing disorders

    a. Function and anatomy of the ear, the nature of sound, and hearing disorders

        * Discussion based on *Guide* pp. 8-31, 61-70, and 33-43

        * Lab experience: with models and charts of the ear and tapes or records of simulated hearing problems

    b. Discussion of how hearing affects speech production

2. Overview of basic audiometric testing and instrumentation

    a. Discussion of pure tone audiometry, speech audiology, and screening procedures based on *Guide* pp. 82-114

    b. Lab experience with pure tone, speech reception threshold and PB-Max tests

3. Hearing aids and auditory rehabilitation

    a. Discussion based on *Guide*, pp. 116-119 and 52-58.

    b. Lab demonstration of hearing aid fitting and basic checks for performance; auditory training techniques; speech reading techniques; and basic manual communication (finger spelling and signs)

**Audiometric Assistant: Training Guide*, U.S. Department of Health, Education, and Welfare, Office of Education, Division of Manpower Development and Training, by the National Association for Hearing and Speech Action in cooperation with the Department of Defense, 1971.

MODULE IV: COMMUNICATION DISORDERS

MODULE IV-A: ARTICULATION DISORDERS

Objectives:

- To understand articulation defects and possible causes for them
- To understand the process of evaluation and therapy for articulation defects

MODULE IV-B: LANGUAGE DISORDERS

Objectives:

- To understand language disorders and to familiarize the trainee with possible causes
- To learn medical syndromes that entail language disturbances
- To understand behavior modification techniques used in language disturbance therapy
- To understand common approaches in language rehabilitation
- To become sensitive to associated handicaps that clients may exhibit

MODULE IV-C: STUTTERING

Objectives:

- To help the trainee identify stuttering behavior
- To help the trainee understand some possible causes for the stutterer's behavior
- To demonstrate for the trainee approaches to evaluation and therapy

MODULE IV-D: VOICE DISORDERS

Objectives:

- To help the trainee identify parameters of good voice
- To familiarize the trainee with common voice disorders
- To demonstrate for the trainee approaches to evaluation and therapy

Introduction to Communication Disorders

The first part of this book for the most part presents information about normal aspects of speech and language. This module consists of four sections, each dealing with a communication disorder. The four disorders are:

- Articulation Disorders
- Language Disorders
- Stuttering
- Voice Disorders

Each of these will be defined and described. You also will learn about possible causes for these disorders and treatment procedures used in therapy to correct them.

These disorders are separated and discussed as distinct entities for diagnostic and evaluative purposes. However, in reality communication is such an integrated process that it is difficult to determine, for example, when articulation ends and voice begins; when voice intonation patterns begin and language syntax ends; when stuttering behavior begins and articulation ends. When we provide therapy to help a client develop certain skills that we choose to call articulation, voice rhythm, or language, we are using labels to describe phenomena that are not separate entities but rather inseparable components of the total process of speaking.

IV-A ARTICULATION DISORDERS

Articulation means joining two or more structures together. For example, your upper arm and lower arm articulate (join together) at the elbow. In speech, the term articulation refers to the joining together of structures in the mouth in order to produce sounds. These sounds are combined to produce words. These words are combined to produce sentences. These sentences convey thoughts.

Sometimes a speaker does not join the mouth structures properly. When this occurs, the speaker *misarticulates*. A person who misarticulates a sound is said to have an *articulation defect*. Articulation defects are the most common types of speech problems. When a person fails to articulate a sound correctly, she/he may fail to convey the thought she/he wishes to the listener.

Recording Speech Errors

There are four types of misarticulations: (1) substitutions, (2) omissions, (3) distortions, and (4) additions. You should be able to recognize each one and know how to prepare written records that describe a client's speech errors. There is more than one way to record an error. Some methods are simple. Others are more complex. You should be guided by the preferences of your supervisor.

An *omission* occurs when the client fails to produce a sound in a word and does not produce another in its place. For example, suppose you are testing the client on her/his production of the "s" sound in the word "bus." Suppose the client says only "bu" when you show her/him a card with a picture of a bus. The client in this instance has omitted the "s" sound. To record the error, you might put it down as "bu" for /bus/, indicating that the client omitted the "s" sound.

The second type of error a client may make is an *addition*. This occurs when the client adds an extra sound to a word. For example, suppose you may show a client a picture of the sun and ask her/him to say the word that the picture represents. The correct response would be "sun". However, if the response is /sand/, the client has added the "d" sound incorrectly.

There are a number of ways you could record this error. One simple method is to describe the client's utterance first and the correct utterance next. For example: /sand/ for "sun".

The third type of error is called a *substitution*. This occurs when the client produces one phoneme in place of another phoneme. For example, if the client says the word "wabbit" instead of "rabbit," she/he is substituting a "w" for the /r/. The error may be recorded as "wr" or "w" for "r", or waebit for raebit.

The fourth type of articulation error is a *distortion*. This occurs when the client distorts a phoneme so that it doesn't resemble any of the 48 phonemes in the English language. For example, suppose a client is asked to produce the /s/ sound in the word "sun". Instead, she/he distorts the "s" sound. You could record the response as distortion of "s" or as /dist s/.

Articulation errors may be described in more complex and complete ways. Your instructor is familiar with several methods, and she/he will discuss some of them with you.

Articulation Tests

Tests of articulation have been published and are on the market. All of them require the person taking the test to say representative sounds in one or more word contexts. Some tests concentrate on the sounds most commonly misarticulated. A few examine all the phonemes of the language.

Phonemes Most Often Misarticulated

The phonemes and phoneme clusters most commonly misarticulated in units of meaningful speech are listed below. Experts disagree about which errors are most frequently made, but this list will give you a clear idea of what to expect. In descending order of frequency with which they are misarticulated, the phonemes to watch are:

1. r and the "r"-colored vowels /ɚ/ and /ɝ/
2. s , z , d , /θ/, and /ð/
3. l
4. t , /ʧ/ , /ʃ/ , v , and /f/
5. j , and /ʤ/
6. g and k

Errors increase sharply when these phonemes occur in consonant blends: /br , /gl/, /fl , kr , fr , /lz/, /lv , sk , str , /skw , spr , /spl/, and so on.

Etiology of Articulation Errors

Etiology refers to the science or study of the causes of disorders. In spite of the prevalence of articulation disorders in the population, specific single causes are difficult to establish in the majority of cases.

As you discuss the following "causes" of articulation errors with your instructor, bear in mind that each may be a possible contributing factor but not necessarily the exclusive initial or the maintaining cause. Among the reasons for articulation errors are:

1. Intellectual deficit I.Q.: significantly below 70
2. Hearing loss:

a. peripheral hearing deficit in both ears

b. chronic hearing deficit during critical development stages

3. Emotional or personality factors that render the child or adult motivationally disadvantaged

4. Structural abnormalities:

a. lips

b. teeth and alveolar ridge

c. hard palate

d. velopharyngeal insufficiency (as in cleft palate)

e. tongue and "tongue thrust syndrome"

f. lower jaw (mandible)

g. nasopharynx or oropharynx

5. Fine motor coordination deficits:

a. peripheral nerve lesions (as in Bell's palsy and bulbar polio)

b. central nervous system disorders (as in cerebral palsy and Parkinsonism)

6. Auditory memory, auditory closure, and auditory discrimination deficits

7. Imitation of faulty models

8. Developmental delays and other language deficits

Methods and Goals of Therapy

The therapy techniques used to correct articulation disorders will be demonstrated in your laboratory and practicum sessions. Tape recordings, videotapes, and films of therapy sessions are helpful, but nothing can take the place of a "live" speech pathologist working with a "live" client.

Your instructor will discuss various approaches to articulation therapy. The speech clinicians involved in your training may have different preferences for one technique or another. The chances are good that each clinician will have used all the various techniques or at least the modifications of them, at one time or another.

Each of the techniques your instructor will discuss has been reported as clinically successful at one time or another when administered by a competent professional person. Each of the techniques also has been questioned and criticized in the literature by

individual practicing speech pathologists. Perhaps the important thing for you to remember is that each approach includes activities that can be carried on by the Speech Pathology Assistant under appropriate supervision. The limitations on how much a Speech Pathology Assistant can do lie not so much in the difficulty of the techniques as in:

1. The status of the client at any given point in therapy

2. The willingness of the speech pathologist to delegate responsibilities, and

3. Your demonstrated proficiency with the technique in question

As a Speech Pathology Assistant most of the work you do with clients probably will be articulation therapy. The greatest opportunities for direct services by Speech Pathology Assistants lie in this area.

It is recommended that the following audio-visual aide be used for training in recognition of articulation defects.

1. O.S.U. Test for the identification of Misarticulations Form A and B. Each film is approximately 20 minutes long and trains listeners to recognize articulation defects.

2. Articulation: Evaluation
   Film shows different ways to evaluate articulation. These films can be rented from:

   Department of Photography and Cinema
   156 West 19th Avenue
   Columbus, Ohio 43210

REFERENCES

Ainsworth, Stanley Humphreys. *Speech Correction Methods.* Englewood Cliffs: Prentice-Hall, 1948.

[Backus, Ollie L.] "Group Structure in Speech Therapy." In Lee Travis (Ed.), *Handbook of Speech Pathology.* New York: Appleton-Century-Crofts, 1957.

Backus, Ollie L. and Jane Beasley. *Speech Therapy with Children.* Boston: Houghton-Mifflin, 1951.

Barker, Janet O. "A Numerical Measure of Articulation." *Journal of Speech and Hearing Disorders* 25 (1960).

Berry, Mildred F. and Jon Eisenson. *Speech Disorders: Principles and Practices of Therapy.* New York: Appleton-Century-Crofts, 1956.

Byrne, Margaret C. *The Child Speaks.* New York: Harper and Row, 1965.

Darley, Frederic L. *Diagnosis and Appraisal of Communication Disorders.* Englewood Cliffs: Prentice-Hall, 1964.

Froeschels, Emil. *Speech Therapy.* (Joseph Noyes Haskell, translator). Boston: Expression Company, 1933.

Goldman, Ronald and Macalyne Fristoe. *Test of Articulation.* New York: American Guidance Service, Inc., 1968.

Irwin, Ruth B. *Speech and Hearing Therapy.* Pittsburgh: Stanwix House, 1969.

Irwin, Ruth B. and Musselman, B. W. "A Compact Picture Articulation Test." *Journal of Speech and Hearing Disorders* 27 (1962).

McDonald, Eugene T. *Articulation Testing and Treatment.* Pittsburgh: Stanwix House, 1964.

Sanders, Lois J. *Procedure Guides for Evaluation of Speech and Language Disorders in Children* (3rd edition). Danville, Ill.: Interstate, 1972.

Sloane, Howard N. and Barbara D. MacAulay. *Operant Procedures in Remedial Speech and Language Training.* Boston: Houghton-Mifflin, 1968.

Van Riper, Charles Gage. *Speech Correction: Principles and Methods* (4th edition). Englewood Cliffs: Prentice-Hall, 1963.

West, Robert W., Merle Ansberry and Anna Carr. *The Rehabilitation of Speech* (3rd edition). New York: Harper and Row, 1957.

Young, Edna Hall and Sara Stinchfield Hawk. *Moto-Kinesthetic Speech Training.* Stanford: Stanford University Press, 1955.

IV-B LANGUAGE DISORDERS

In linguistic terms, a language disorder could be a disturbance of phonology, morphology, syntax, or semantics. Usually, however, a language disorder is defined as a disturbance in the ability to understand symbols. The client may have difficulty acquiring a meaningful verbal vocabulary, combining words into phrases and sentences, using words with connective functions properly, or using the correct forms of words.

Words have four basic functions in our language: (1) to *name* or *designate* objects, people, ideas, qualities, etc. (these are nouns and pronouns); (2) to *assert* actions or state of being (these are verbs); (3) to *describe* objects or actions (adjectives and adverbs); and (4) to *connect* or *show relationship* among grammatical units (these are conjunctions and prepositions). A fifth function is non-grammatical and designates sudden surprise or strong feeling (interjections).

Language disorders occur in children and adults. The manifestations are different in a child than in an adult, because children are in the process of developing the language skills adults have mastered. The child with a language disorder has problems acquiring language. The adult with a language disorder has lost language abilities that already were established. Language disorders in children and adults differ in terms of etiology (cause) and treatment.

Language Disorders in Children

The four most common causes of language disorders in children are brain damage, hearing disabilities, environmental deprivation, and emotional deficiency. Depending on the cause of the disorder, the speech pathologist will use various labels to identify the child.

Possible Causes	Possible Labels
brain damage	minimal cerebral dysfunction (learning disability)
	cerebral palsied
	traumatic brain-injured
hearing disabilities	deaf
	hard of hearing
environmental deprivation	educationally deprived
	lack of adequate sensory stimulation
emotional deficiencies	infantile autism
	emotional immaturity

Children whose language disorders are caused by such factors as are listed above may display some of the following behavioral characteristics:

1. short attention span
2. emotional outbursts
3. distracted by objects or people in a room
4. no established dominance child does not prefer one hand to the other
5. hyperactivity child is overactive, cannot sit still
6. perceptual problems visual, auditory
7. motor coordination problems difficulty walking, grasping
8. sounds and words omitted in conversation
9. difficulty with reading, and
10. articulation problems

How does a speech pathologist attempt to help a child who has a language disorder? It would be misleading to say that the diagnosis determines which therapeutic approaches will be employed. For one thing, it is often very difficult to establish a diagnosis until after a great deal of clinical work has been done with a child.

Common approaches to therapy for children who are language handicapped are listed below and should be described and discussed further by your instructors and supervisors. The facility where you are being trained will teach you the approach they use most often for language therapy. Among the basic concepts are these:

1. Behavior modification
2. Cognitive approaches:
    a. **multisensory approach**
    b. **concept-oriented approach** emphasizes meaning as a key to language acquisition
    c. **situational approach** provides a structured environment (a make-believe supermarket, for example, or a real-life situation such as a meal) in which the child can develop language skills, and
    d. **developmental approach**.
3. Structured approach presents language as a system, formation of sounds and proceeding to combination of sounds to form syllables, syllables to form words, etc.
4. Role-playing

5. Saturation verbalization requires that the clinician bombard the child with a flow of oral language that serves as a running commentary on present activities, feelings, observations, questions and the like

Your instructor will show you different language stimulation materials.

Language Disorders in Adults

It is possible for adults who have enjoyed a good command of all aspects of language to lose some or all of their language abilities. When this happens, the cause is usually some sort of damage to the brain or spinal cord. However, brain damage does not always cause a language disability. Many adults suffer strokes without any apparent loss of language skills, especially when the damage caused by the stroke is on the right side of the brain. In the majority of individuals language function seems to be controlled by the left side of the brain.

When language deficits do result from brain damage, the complex of problems involved generally is called *aphasia* or *dysphasia*. Aphasia literally means "loss of speech," whereas dysphasia means "a disturbance of speech function." The primary symptom of aphasia is loss of the ability to associate symbols with appropriate functions.

The technical term for stroke is cerebrovascular accident. Most professionals refer to this as a "C.V.A." The normal flow of blood to the brain is disrupted.

Below are some symptoms or behaviors an aphasic stroke victim may exhibit. Not all the symptoms described occur in every person who has aphasia.

1. euphoria seriousness of illness not recognized by patient; always happy

2. exaggerated mood changes from extreme happiness (pink cloud outlook) to extreme depression (uncontrollable crying)

3. perseveration repetition of a response long after it has ceased to be appropriate; sounds, words, or non-verbal behaviors may be involved

4. loss of ability to deal with abstractions, even though able to cope with concrete problems and the "here and now."

5. amnesia loss of memory of certain events (usually recent happenings)

6. anomia loss of ability to say the name of a person or thing, even though the client patient knows the correct word

7. verbal apraxia loss of ability to use speech musculature voluntarily to say speech sounds, even though the muscles are functional

8. agraphia loss of ability to write or print, even with the non-affected hand

9. acalculia loss of ability to do arithmetic problems

10. aphonia—loss of ability to produce speech sounds voluntarily, even though able to whisper, sing, or cry

11. echolalia—inability to repeat expressions other than momentarily preceding ones

12. agnosia—loss of comprehension of sensory data

    a. auditory agnosia - inability to understand speech (might as well be listening to an unknown foreign language)

    b. visual agnosia - inability to recognize objects or people, even though they are seen clearly

    c. tactile agnosia - inability to organize signals from the sense of touch (cannot recognize objects held in the hand)

    d. amusia - loss of ability to recognize musical themes

13. dysarthria - inability to use speech musculature because of damage

REFERENCES

Berry, Mildred F. *Language Disorders of Children.* New York: Appleton-Century-Crofts, 1969.

Eisenson, Jon. *Aphasia in Children.* New York: Harper and Row, 1972.

Kanner, Leo. "Early Infantile Autism." *Journal of Pediatrics* 23 (1944), 214-217.

Kirk, Samuel A., James J. McCarthy, and Winifred D. Kirk. *Illinois Test of Psycholinguistic Abilities.* Urbana: University of Illinois, 1968.

Luria, Alexander. *The Mentally Retarded Child* (Brian Kirman, translator). Oxford: Pergamon Press, 1963.

McGinnis, Mildred A. *Aphasic Children.* Washington, D.C.: Alexander Graham Bell Association for the Deaf, 1963.

Schlanger, Bernard B. *Mental Retardation.* Indianapolis: Bobbs-Merrill, 1973.

Sloane, Howard N. and Barbara D. MacAulay. *Operant Procedures in Remedial Speech and Language Training.* Boston: Houghton-Mifflin, 1968.

Wepman, Joseph M. *Recovery from Aphasia.* New York: Ronald Press, 1951.

IV-C STUTTERING

Disorders in rate and rhythm (nonfluencies) can occur in speech development any time after a child begins to utter two or more words as phrase units. When he ceases to rely upon one word for purposeful speech, word-order syntax becomes important. The initial symptoms of non-fluency are repetition of words, repetition of syllables, and/or prolongation of sounds. Any therapy begun at this point is aimed at keeping such repetitions and prolongations natural for the child. The child may be conscious of them but not conscious of any unpleasantness resulting for listeners or for himself. Parents usually are counseled to simplify demands upon the child and upon themselves as parents. So called non-fluent interludes commonly occur at age 2 1/2 and again at 3 1/2 and 5 1/2 years if they occur at all.

Sooner or later non-fluent utterances become frustrating and anxiety-producing for some children. Such a child tries to return to fluent communication by means of various strategies. These strategies vary for each individual child.

The child strives consciously to eliminate or avoid non-fluencies. The following types of behavior are typical:

1. Facial grimaces (tensing the lips, jerking the jaw, blinking the eyes, or closing the eyes tightly) become apparent and frequent.

2. Body movements (stamping a foot, snapping the fingers, pounding a fist on a table, etc. become exaggerated)

3. Child omits words she/he fears will be difficult to say or substitutes words with similar meanings.

4. Child says very little, becoming almost non-verbal. When she/he must talk, speech is telegraphic, e.g., "I go town."

Most of these strategies are forms of struggle behavior. The child tries to *force* fluency. Struggling may be exactly the opposite of what the child should do in order to facilitate fluency. Therapy for very young stutterers aims at offering alternatives to struggle behavior and minimizing the frustration and anxiety feelings of the child (and the guilt feelings of the concerned parents).

When the struggle to stop stuttering fails, the child may develop an elaborate group of mannerisms and gestures to ward off stuttering. These defenses serve to exaggerate the non-fluent (stuttering) aspects of the child's speech. The stuttering is now painfully obvious to all—including the child-as-speaker. Guilt and discomfort may be added to the frustration and anxiety the child already feels. Therapy now must deal with all aspects of the problem.

Possible Causes of Stuttering

1. Stuttering is "diagnosed into being" when parents label the normal non-fluencies of children during the process of communication. (Johnson)

2. An attitude develops in the child (brought on by normal non-fluencies and reinforced by parents) that speaking is a difficult process and that she/he must work hard at it. (Bloodstein)

3. Excessive non-fluent behavior cannot be prevented by the child at a certain point in language development, but the child tries to stop non-fluencies anyway. The child concludes that his *struggling* brought back his temporary fluency. (Eisenson)

4. The child reacts to the approach-avoidance conflict with fixations and oscillations. Stuttering is a compromise solution whereby the child both speaks and refrains from speaking. (Sheehan)

5. Stuttering is a conscious acting out of an unconscious battle to both conceal and express forbidden feelings or thoughts. (Travis and Glauber)

6. The stutterer constitutionally has a low boiling point insofar as convulsive behavior is concerned; the act of communicating can trigger "convulsions," and secondary struggle behavior is triggered by the resulting speech failure. Stuttering has one primary cause, which is organic, but many complex precipitators. (West)

7. Delayed development of myelin sheaths in the cortex of the brain causes neuromuscular limitations that are manifested as stuttering. (Karlin)

In real life, however, stuttering is not such a simple matter as the brief descriptions above imply. Experts disagree violently about the actual causes, precipitators and maintainers of stuttering behavior. What starts it and what keeps it going for some children and not others?

THERAPY TECHNIQUES

There are two basic approaches to therapy for stuttering behavior. One is to teach the stutterer new ways to deal with non-fluent moments. The stutterer is encouraged to substitute these new ways for old "sets" until the learned behavior becomes more or less automatic, leading to greater fluency and ease in speaking. This type of symptomatic therapy or behavior modification has been gaining wide acceptance in recent years.

Another approach is to exploit stuttering behavior as a vehicle for some form of counseling or psychotherapy. The aim is to develop new insights into the factors that precipitate or maintain stuttering behavior so that fluent speech dominates the communication events in the client's life.

It is safe to say that both approaches are utilized by most stutterers regardless of the tactics employed by the clinician who treats them. Clinents in symptomatic therapy gain insight about themselves and their stuttering behavior one way or another, and clients in successful psychotherapy find opportunities to experiment with new patterns of fluency. Indeed, the relaxed, fluent speech patterns of the psychotherapist may provide a model for the stutterer to imitate.

Below is a list of the traditional therapies that you should discuss with your instructor:

1. Densensitization therapy

   a. Neutralize the client's emotional reactions to the act of stuttering

   b. Neutralize the client's fear of certain words or phonemes

   c. Neutralize the "magic" the client may imagine in interpersonal relationships

2. Relaxation therapy

   a. Instruct the client in systematic relaxation of all parts of the body, including the speech musculature

   b. Re-introduce controlled muscle tonus for sighing, humming, speaking, reading aloud, etc.

3. Create a climate of free and open expression in which the client may discover ways of monitoring symptoms as she/he feels free to face them with the positive, permissive support of the clinician

4. Teach the client to duplicate objectively her/his own stuttering symptoms for deliberate negative practice

5. Encourage the client to stutter voluntarily, without struggling against it, and to let the repititions "bounce along"

6. Devise a planned regimen of psychotherapy coupled with periodic speech therapy (i.e., symptomatic treatment)

7. Encourage deliberate stuttering so that the client can face the problem objectively while stuttering and then can learn cancellation and pull-out techniques

8. Utilize role-playing and "psychodrama"

9. Make use of operant conditioning techniques (usually applied to symptomatic behavior but also have been applied to attitudes and emotional responses)

10. Alter syllable rates and rhythms by using metronomes or more sophisticated electronic pacers

11. Improve fluency directly by working on voice or articulation problems or language skills when cluttering is also a problem

Therapy for the stutterer is almost always a long-term investment of time and effort on the part of both client and clinician. Many of the strategies used in symptomatic therapy can be carried out by a speech pathology assistant after the speech pathologist has determined what should be done.

REFERENCES

Berry, Mildred F. and Jon Eisenson. *Speech Disorders: Principles and Practices of Therapy.* New York: Appleton-Century-Crofts, 1956.

Bloodstein, Oliver. *A Handbook on Stuttering.* Chicago: Easter Seal Society for Crippled Children and Adults, 1969.

Bryngelson, Bryng, Myfanwy F. Chapman, and Orvetta K. Hanson. *Know Yourself: A Workbook for Those Who Stutter.* Minneapolis: Burgess, 1950.

Eisenson, Jon (Ed.). *Stuttering: A Symposium.* New York: Harper, 1958.

[Goldiamond, Israel.] "Stuttering and Fluency as Manipulative Operant Response Classes." In Howard N. Sloane and Barbara D. MacAulay (editors), *Operant Procedures in Remedial Speech and Language Training.* Boston: Houghton-Mifflin, 1968.

Gregory, Hugo H. *Stuttering: Differential Evaluation and Therapy.* Indianapolis: Bobbs-Merrill, 1973.

Johnson, Wendell. *People in Quandaries.* New York: Harper and Brothers, 1946.

Johnson, Wendell, Frederic L. Darley, and D. C. Spriestersbach. *Diagnostic Methods in Speech Pathology.* New York: Harper and Row, 1963.

Luper, Harold L. and Robert L. Mulder. *Stuttering Therapy for Children.* Englewood Cliffs: Prentice-Hall, 1964.

Van Riper, Charles Gage. *The Nature of Stuttering.* Englewood Cliffs: Prentice-Hall, 1971.

[Williams, Dean.] "Stuttering Therapy for Children." In Lee E. Travis (ed.) *Handbook of Speech Pathology.* New York: Appleton-Century-Crofts, 1957.

Wyatt, Gertrud L. *Language Learning and Communication Disorders in Children.* New York: Free Press, 1969.

VOICE DISORDERS

Voice is produced by sending a stream of air through the opening between the vocal cords. This opening is called the glottis. The stream of air causes the vocal cords to vibrate. When you produce a high-pitched voice, the vocal cords vibrate rapidly. When you produce a low-pitched voice, the vocal cords vibrate slowly. These changes of pitch are produced when muscles attached to the vocal cords change length and width. The movements of the muscles cause the cords to tense or relax and result in high or low pitches of the voice.

The scientific name for pitch is frequency. Pitch may be defined as the number of vibrations a vibrator makes in one second. In this case, the vocal cords are the vibrator.

When you are in a noisy room and wish to be heard above the noise, you usually try to talk louder. In order to increase the loudness of your voice, you may try to increase the amount of air going through your vocal cords and you may modify the sound produced by using your oral cavity (mouth) and your pharynx (throat). Opening the mouth wider and changing the shape of the throat alters sound to make the voice louder or softer.

The scientific word for loudness is *intensity*. Intensity is dependent upon (1) the frequency or pitch; (2) the amount of air going through the vocal cords; and (3) changes in the size of the throat and mouth. These changes make the sound louder or softer and also alter the *resonance* of the sound. Resonance occurs when a sound is changed so that it has a different quality.

This explanation of voice can be expanded upon by your instructor. What you have read here provides the foundation for understanding how a person produces and modifies her his voice.

Voice Problems

Voice problems can result from misuse or abuse of the larynx, specifically the vocal cords. When you send a burst of air through your vocal cords, instead of a steady, even stream, it literally blows them apart. However, once blown apart, the cords do not stay apart; they come back together and touch. The harder they are blown apart, the harder they come together and touch. When this happens too often, it causes the vocal cords to become irritated and to swell.

This irritation and swelling, if left untreated while you continue to send gigantic bursts of air through the vocal cords, will cause the formation of little knots, called *vocal nodules*, or *vocal nodes*. These nodules develop on the edges of the vocal cords and cause the cords difficulty in vibrating. As a result, your voice will begin to sound hoarse or harsh. You may also begin to whisper. This condition is common among people who scream and shout often.

Can you think of people who have this problem? Let's name a few of them: cheerleaders, children, singers, teachers, policemen, lawyers, mothers, and fathers. These people sometimes tend to misuse their voices and are prone to develop some type of voice problem.

A speech pathologist treating a person who is afflicted with a voice disorder will always recommend that the individual should be seen first by an otolaryngologist, a physician specializing in ear and throat problems.

In some cases, the person with a voice disorder needs only to be counseled on how to rest his/her voice and how to produce a nice, steady tone while speaking. Sometimes, this treatment will suffice. The nodules will disappear and the hoarseness and harshness of the voice will end.

However, in some cases, the otolaryngologist may have to remove the nodules surgically. And after that, it is still necessary for the speech therapist to advise the individual on how to avoid abusing or misusing her/his voice in the future. Such counseling is important in order to prevent the nodules from recurring. If the individual is not fully informed she/he may need voice therapy again because generally people who get nodules and have them removed will get them again unless they are made aware of how nodules are caused.

Sometimes voice disorders are caused by organic problems. A person may have cancer that necessitates removal of the larynx; or an individual may have paralysis of one or both vocal cords. These are serious problems.

The person without a larynx seemingly cannot produce voice. However, there are ways of teaching such a person to speak. In therapy, the person without vocal cords is taught to capture air in the esophagus (the gullet, a tube about nine inches long extending from the pharynx to the stomach) and belch it through the mouth. The belched air is modified by the structures in the mouth to produce meaningful speech. This process is called *esophageal speech*. (Your instructor will explain more fully.)

Some people cannot learn to use the esophagus to produce speech. For such people, there are mechanical devices that can help. One of these devices is called the Voice-bak. A number of people believe it is better to use the Voice-bak than esophageal speech. The Voice-bak has its own vibrator and when the air comes through it, vibration occurs in the esophagus. The person wearing a Voice-bak needs only to talk. There is no necessity to stop and capture air in the esophagus.

Another mechanical aid that makes it possible for people without vocal cords to speak is the *artificial larynx*, an electronic device developed by Bell Laboratories. This instrument is about the size of half a banana. It is equipped with batteries and a vibrator. The top of the instrument is placed upon the throat. Then the *artificial larynx* is turned on by pressing a button, causing the vibrator to operate. When the wearer of the device speaks, the vibrator produces sound which is modified by the mouth and speech is produced.

However, there are some problems associated with the use of the *artificial larynx*. The instrument must make the right sort of contact with the throat of the wearer in order to be fully effective in producing speech. A second problem is that some people think the *electronic larynx* produces very mechanical and abnormal sounds.

Paralysis of the vocal cords can occur because of disease or infection. Paralysis hinders or halts vibrations of the vocal cords. The particular form of therapy that is appropriate in such cases depends in large measure upon how much movement of the vocal cords the person can achieve in spite of paralysis.

Finally, voice disorders may be caused by emotional problems. A very severe emotional experience may cause a person to experience shock which, in turn, results in the loss of voice. If the otolaryngologist is unable to find any organic reason for the loss of voice, psychotherapy and speech therapy usually are combined to help the individual regain her/his voice.

This brief discussion of the voice and voice disorders will be expanded by your instructor because there are many other types of problems that result from the misuse and abuse of the voice.

MODULE V: DIAGNOSTIC EVALUATION AND CLINICAL MANAGEMENT PROCEDURES

Objectives:

- To understand how a speech pathologist reaches a decision about the nature and extent of deviant speech and language abilities
- To learn how a speech pathologist establishes a behavorial base for communicative functioning
- To learn how a speech pathologist determines and develops a therapeutic program

Diagnosis is a decision-making process which, from the point of view of speech pathology services, attempts to answer these questions about a person:

1. Does this person have a speech or language problem that can be considered disabling in the context of her his general development or life style?
2. What are the discernible causes or conditions that contributed to or are now helping to maintain the problem?
3. Is the scope or severity of the problem measurable in terms of the quality and kinds of involvement?
4. Is there evidence in the history or the current behavior of the client that indicates the direction or extent of possible improvement of speech or language skills?
5. Can the problem be summarized and categorized in terms of present clinical knowledge and practice?
6. What recommendations immediate and long-term best serve the welfare of the client?

Although diagnosis should be determined during the first interaction between the speech pathologist and the client, it is not limited to the first contact. Diagnosis is usually an on-going process that is not completed by the speech pathologist until the client is formally discharged. Sometimes diagnosis is primarily "developmental"; insights may not become clear until a trial program of therapy has been started.

Under no circumstances should the speech pathology assistant be assigned the responsibility of diagnosing voice, speech, or language disorders. This decision-making process must always be carried out by the speech pathologist, who is legally and ethically responsible for individuals seeking speech pathology services. Then why, you might ask, should diagnostic information be included in a training manual for speech pathology assistants? There are two very practical reasons:

1. The speech pathology assistant in certain job settings may be called upon to assist in the screening of a *normal population*. In this case the function of the speech pathology assistant is to identify individuals who should be referred to a speech

pathologist for diagnosis. The speech pathology assistant like the classroom teacher, the school psychologist, the pediatrician, and other professionals appropriately can *verify normal speech function*. The SPA can be trained to administer and score various screening tests as long as the tests simply verify or fail to verify the acquisition of normal speech skills. By definition, diagnosis involves decisions concerning *pathology*; diagnosis and pathologies are strictly in the domain of the licensed or certified speech pathologist.

2. The SPA may help the speech pathologist collect some types of data relevant to diagnosis. The decision as to what data may be collected by the SPA must, of course, be made by the individual speech pathologist responsible for the diagnosis. For example, some speech pathologists insist upon administering their own articulation tests in person. Others prefer to have an assistant *administer* the test while they observe and keep score. Still other speech pathologists allow assistants to *score errors*. There is no one method that fits the needs of all clinicians.

The SPA should be ready to collect case history data when called upon, to observe clients and specific behavior patterns of clients when called upon, and to administer various diagnostic and "carry over" tests when called upon. Additionally, much of the information that the speech pathologist requires in order to diagnose a patient's disorder may be provided by the family doctor or specialists in allied health fields.

The following professional persons may be consulted by the speech pathologist to secure information that she he is unable or unqualified to obtain:

otologist	for knowledge about the health status of the client's ears
laryngologist	for information concerning the client's vocal mechanism, i.e. vocal cords and larynx
psychologist	for an assessment of the client's intellectual capabilities and emotional maturity
family physician	for an assessment of the client's overall growth and development and information about any significant infections that may or may not have contributed to the client's problems
audiologist	for an assessment of the client's present hearing capabilities
parents and the client	for pertinent information that may not have been available to any of the professionals mentioned

After all this information has been gathered, the speech pathologist's decision to do formal or informal testing depends, in large measure, upon the client's capabilities, age, and overall development.

Formal testing by the speech pathologist is likely to involve:

1. *Hearing tests* - Using an audiometer to:

   a. measure the lowest level at which the client can hear a sound

b. measure the client's ability to repeat words spoken to her/him at very low hearing levels

c. measure the client's ability to repeat words spoken to her/him at high hearing levels

2. *Articulation tests* - An articulation test assesses the client's capabilities in producing sounds in words and in conversational speech. The types of tests that a speech pathologist may use or have you use include:

   a. Fisher-Logemann

   b. Goldman-Fristoe

   c. McDonald Deep Test of Articulation

3. *Language* - A clinician may want to assess the client's capabilities in using vocabulary, grammar, and word order correctly. Some of the tests that may be employed are:

   a. Illinois Test of Psycholinguistic Abilities

   b. The Houston Test of Language Development

   c. The Utah Test of Language Development

   d. Northwestern Screening Syntax Test

   e. The Zimmerman Preschool Language Test

There are also others that the speech pathologist may employ. Your instructor undoubtedly will explain the ones listed and some of the others in detail.

4. *Psychological development* - The speech pathologist may refer the client to a psychologist in order to get an idea about the client's learning capabilities and emotional maturity. This information is especially valuable if the client is a child.

5. *Voice* - The speech pathologist undoubtedly will obtain a tape recording of the client's conversational speech. This helps in understanding the client's articulation patterns, language patterns, and voice quality. Tape recording is a key element in the diagnostic process.

Besides all the formal tests that a speech pathologist employs, she/he also obtains information from informal observation of the client's behavior. Some of the factors observed are:

1. What is the physical appearance of the client?

2. How does the client walk? (gross motor skills)

3. What is the client's handedness? Is she/he right- or left-handed?

4. How does the client grasp objects? (fine motor skills)

5. Can the client coordinate hand movements with eye movements when she/he traces an object? (eye-hand coordination)

6. Does the client bump into things?

All of these observations that the speech pathologist makes concerning the client are important in diagnosis and treatment. There are tests of motor and visual skills that can be used to formalize these observations.

Additionally, if the client is a child, the clinician observes interaction between the child and her his parents in order to note any fears or frustrations that may contribute to the client's problem.

The information that is collected in these various ways is called data. Data note that the word is plural are recorded and analyzed by the speech pathologist and also by supportive personnel such as you.

A number of specialists may be called in for consultation. Evaluation of diagnostic information is very important. The professionals who do it must make decisions about what treatment the client is to receive. They want to be sure that all the information they have is accurate and correct and that nothing of significance has gone unnoticed.

Finally, decisions about appropriate therapy are made in terms of questions such as these:

1. What are the client's problems?

2. What factors contribute to these problems?

3. What method of treatment would be best?

4. What results can be expected from this treatment?

5. What other treatments might be appropriate?

None of these decisions are answered hastily. The speech pathology assistant plays an important role in the process. You help obtain some of the information about the client, and your opinions about this information are important. As a speech pathology assistant you are valuable and helpful to the speech pathologist when she/he finally decides on the course of treatment for the client. Remember, you undoubtedly will be involved in the treatment, so it is very important for you to be involved in the evaluation.

The information that is collected about a client is written up in a formal report. The client (and if appropriate the client's parents) are informed of the diagnosis and the recommendations for treatment. This final stage is the most important, because the client (or the client's parents) must decide whether or not treatment is necessary, on the basis of the evaluation results.

Your instructor will show you various types of case history forms and observation forms used in the treatment facility.

MODULE VI: ETHNIC AND CULTURAL DIFFERENCES

Objectives:

- To understand ethnic and cultural differences in speech and language
- To learn to discriminate between such a difference and a speech disorder

Throughout this program for speech pathology assistants, the emphasis has been on practical exposure to speech and language services provided by the speech pathologist. The academic lectures and lab sessions have been tailored to interpret and reinforce the practical experiences arranged for the trainee. No training manual can anticipate all the needs of a community, because services to people vary from one place to another, from one training center to another. Perhaps the most critical variables are ethnic and cultural differences.

In a few weeks you will enter the phase of your training that is oriented primarily to providing direct services to people with communication problems. If a significant number of these people come from ethnic or cultural backgrounds different from your own, it would help you to serve their needs more efficiently if you had some idea of the differences. For example, if your agency serves black or Spanish-speaking clients who live in an economically depressed area, you should receive instruction from someone thoroughly familiar with the dynamics of:

1. language development and usage within the community
2. attitudes and beliefs respected or rejected by the community
3. economic problems and aspirations
4. value systems as they relate to family life, community involvement, celebration of special events, aesthetic and religious preferences, personal self-esteem, and relationships with other ethnic groups

These four points are very important. Remember, the materials you use to diagnose and test for a speech problem were developed for one *dialect*. This dialect is standard English. But not all Americans speak standard English. Many Americans speak a variation of standard English, depending on ethnic, geographic and other factors. When you use tests of articulation, language development, or even voice, and these tests are based on standard English, you run the risk of misdiagnosing a client who does not speak standard English.

Remember, the client needs therapy if her/his speech is defective, not if it is different. Differences are not defects. By the same token, don't fall into the trap of thinking that a difference is never defective. Sometimes it is. The key point is that you must understand what is an acceptable dialect difference and what is an unacceptable dialect.

Hopefully, your instructor will be able to give you more information because of her/his experience in working with individuals who are culturally and linguistically different from the majority.

MODULE VII: EXCEPTIONAL CHILDREN AND ADULTS

Note

Centers emphasizing special language and communication disorders may wish to concentrate additional training in specific areas.

Objective:

- To understand the limitations and capabilities of exceptional children and adults

The training facility where you are taking this course may be a rehabilitation hospital that specializes in working with clients who are "exceptional." It is also possible that you will work, sometime in the future, in an institution devoted to special education. Wherever you obtain employment, from time to time you will encounter clients who are not like other people in many respects. These clients may have trouble walking, following directions, talking, feeding themselves, dressing themselves, and doing other basic things that you take for granted.

These individuals are called "exceptional." The word "exceptional" means "different"; it does *not* mean "better" or "worse." An individual with an intelligence quotient (I.Q.) of 150 is "exceptional"; when you are in a classroom full of handicapped children and you are not handicapped, you become "exceptional" because you are the one who is different. Exceptionally is defined according to what the majority represents in a specific context. We could say that you are "exceptional" today because you are one of very few people in the United States who are now in training to become a speech pathology assistant.

The exceptional individuals that a speech pathologist treats may have many labels attached to their conditions. Some of these labels you've heard already. A few are listed below:

- cerebral palsy
- cleft palate
- mental retardation
- learning disabilities
- traumatic brain damage
- laryngectomee
- aphasic

There are also many other types of exceptional individuals, but these are the ones you certainly will recognize. You may notice that these people have difficulty walking, talking, eating, thinking, hearing, or understanding. They may have trouble dressing themselves. Some may be in wheelchairs; some may be on crutches; and some may have special braces.

You have probably wondered how these individuals became exceptional. Well, it's an involved process that is different for each person. An individual with cerebral palsy may have had brain damage while she/he was still in the womb; one cause of brain damage before birth is infectious disease that hinders brain growth. Cerebral palsy also can be caused by events after birth. A child who falls or is dropped early in life may become cerebral palsied.

Persons who are mentally retarded, who have cleft palate, or who have learning disability, all could have suffered some form of damage while they were in the womb that impaired the growth of body parts necessary for normal speech, hearing, and language development.

The laryngectomee and the aphasic may have developed some condition later in life that caused them to lose their speech abilities. Most laryngectomees have had cancer of the larynx which made it necessary for a physician to remove the vocal cords and other laryngeal structures. In the module on voice disorders, you read about this condition and learned what sort of treatment helps the laryngectomized individual regain speech.

The aphasic individual usually has sustained brain damage that hinders her/his ability to speak or use language in other ways. This condition can be very frustrating to the client because she/he has lost communication skills that she/he has taken for granted for a long time.

All of these exceptional individuals can benefit from speech and language therapy. You will learn specialized techniques that are useful in helping the exceptional person realize her/his maximum potential in all communication areas.

Your instructor will give you much more information relative to exceptional individuals. This information will be helpful when you are called upon to assist the speech pathologist to diagnosis and treatment.

MODULE VIII: CLIENT FOLLOW-UP PROCEDURES

Objectives:

- To learn reasons for the positive and negative responses clients make
- To understand why clients do not keep appointments

During your observation of therapy with speech handicapped persons, you saw some who were progressing well in therapy, some who were achieving moderate progress, and some who were not progressing at all. The limited success that some clients experience is of great concern to the speech pathologist.

She/he discusses any lack of success with fellow professionals, looks back over diagnostic materials, and if appropriate confers with parents. This is done in order to identify factors that are interfering with effective treatment.

Usually factors that contribute to treatment failure fall into three broad categories:

1. *Client-related factors* - The treatment process may be hindered by factors such as the client's economic situation, transportation difficulties, feelings of frustration and failure. The client may not have enough money to pay for treatment and therefore may fail to show up. The client may be unwilling to lose a day's pay by taking off to receive treatment. It may be difficult for the client to arrange transportation to and from the treatment facility. The client may feel frustrated. It may be that parents and others in the client's home are not helping the speech pathologist by encouraging the client to practice. This lack of reinforcement may cause the client to experience failure.

2. *Clinician-related factors* - The speech pathologist may be contributing to the client's lack of success. Because the speech pathologist is a professional and recognizes her/his limitations, she/he will readily admit that:

   a. therapy may be inappropriately planned and executed.

   b. it may be that the client is being managed inappropriately because parents, consultants, and others are not involved enough in treatments.

   c. it may be that the client (and the client's parents) are expecting too much because treatment procedures and the likelihood of success were not fully explained.

3. *Client/Clinician-related factors* - In any type of human interaction, the participants may for some reason fail to get along well with each other. In the therapeutic process in which you and the speech pathologist are involved, being able to get along with the client is very important for effective treatment and future client success. If a breakdown occurs in this client-clinician relationship, immediate steps should be taken to isolate what is occurring that interferes with therapy. Until this is done, you will find that treatment is not effective. Identifying interpersonal problems is just as important as therapy and can make therapy a success or a failure. The major categories of factors

that have been discussed all relate to why the treatment process is sometimes ineffectual. Client follow-up also involves other matters. For example, follow-up also includes:

- obtaining information about the client from various professionals who have worked with the client in one setting or another
- involving the parents, friends or relatives in the treatment program when appropriate
- finding agencies to assist the client if he moves out of town and cannot finish the treatment program
- contacting agencies that might be willing to help the client with financial, psychological, or other problems
- assessing the client's rehabilitation status from time to time after treatment has ended

If the client is to become an effective communicating individual, thorough follow-up is a must. Your full participation is essential. Your instructor will explain follow-up procedures in detail.

MODULE IX: WORK EXPERIENCE

Objectives:

- To develop skill in assisting with diagnosis of and therapy for the communicatively handicapped
- To gain a variety of work experience that will enhance your ability as a speech pathology assistant
- To seek advanced or specialized training in the field of speech pathology

This is the last module. It consists of on-the-job training. Successful completion of this part of the program will qualify you for a certificate. Accordingly, one purpose of this module is to test your capability as a speech pathology assistant.

The following materials are intended as guidelines for you and the people who teach and supervise you. The methods and forms used may vary from one place to another, but the basic rationale and purpose will remain the same. The samples published here will give you an idea of what to expect.

Liaison With Cooperating Clinicians

You will spend approximately three months getting your on-the-job training. During this period of time you will be able to practice what you have learned so far. The speech pathologists who will supervise you are referred to as "supervising clinicians." It is very important that the instructors who are responsible for your classroom and laboratory work maintain close and constant liaison with the supervising clinicians who provide your practicum experience. The term liaison is not to be interpreted casually. Specific steps should be taken:

1. Supervising clinicians should be invited to participate in some aspects of formal group instruction in the classrooms and in the lab.
2. Instructors should visit practicum facilities to observe and to participate in the clinical training of the speech pathology assistant.
3. Supervising clinicians should periodically evaluate the progress of the trainees and enumerate experiences provided in their facilities to the trainees.
4. Supervising clinicians should be directly involved in the "clinical examination" of the speech pathology assistant at the end of the didactic-practicum period of eight weeks. Clinicians will be expected to evaluate individual trainees, and these evaluations may become a part of the trainee's credentials.
5. Instructors should contact supervising clinicians periodically to discuss instructional goals and emphases and to solicit advice as to areas of information or demonstration that may need additional stress.

6. Instructors will negotiate with supervising clinicians, when feasible, to implement supportive experiences for the speech pathology assistant trainee within the practicum facility.

Each week during your three months of on-the-job training, the supervising clinician will report in writing to the training program director (or her/his designated official) about your progress and performance.

The training program director is the person who has final responsibility for making sure that you learn everything you need to know in order to be a speech pathology assistant. From time to time the training program director (or her/his designated official) will visit the place where you get your on-the-job training. The training program director will prepare a final detailed summary of your progress and will send a copy to the supervising clinician in the work experience setting.

Periodic Reports

Your progress during the final phase of training will be recorded in several ways. You will be asked to describe your own activities.

In addition, the speech pathologists you work with will rate your performance. It will be helpful to you to be aware of the qualities your supervisors will look for. Although your supervisors may use different report forms than are published here, the basic purpose of their reports will be the same.

These reports will be useful in helping to improve your skills as a speech pathology assistant so that you can qualify for a certificate.

PRACTICUM
TRAINEE'S REPORT OF PROGRESS

NAME OF TRAINEE _____

FACILITY _____

COOPERATING CLINICIAN _____

TIME PERIOD _____

1. Without naming clients, list types of problems and approximate ages of clients observed:

2. What diagnostic tests and therapy procedures have you observed? Please describe briefly.

3. What additional clinical activities did you observe or assist?

4. What procedures did you initiate or carry to completion under supervision?

5. What procedures have you learned which supplement or seem to contradict information gained in formal class work and lab sessions?

6. During practicum hours, what questions have arisen which should be discussed in class or lab sessions?

PRACTICUM
CLINICIAN'S REPORT OF TRAINEE'S PROGRESS

NAME OF TRAINEE _____

FACILITY _____

COOPERATING CLINICIAN _____

TIME PERIOD _____

Total number of hours spent in facility during time period: hours.

Activities (to the nearest half hour) within the facility:

1. Assisting preparation of clinician materials _____
2. Assisting in diagnostics _____
3. Assisting articulation therapy _____
4. Assisting voice therapy _____
5. Assisting stuttering therapy _____
6. Assisting language therapy _____
7. Assisting in other clinical activities _____

(Describe 7) _____

_____

1. Observing preparation _____
2. Observing diagnostics _____
3. Observing articulation therapy _____
4. Observing voice therapy _____
5. Observing stuttering therapy _____
6. Observing language therapy _____
7. Observing other clinical activities _____

(Describe 7) _____

_____

1. Clinically related "errands" _____
2. Reception room duty _____
3. Preparation of clinical materials _____
4. Written report preparation _____
5. Carry-over articulation therapy _____
6. Carry-over voice therapy _____

Other experiences in clinical facility are described below:

Experiences: _____ Hours

_____

_____

_____

_____

_____

7. Carry-over stuttering therapy _____

8. Carry-over language therapy _____

9. Other therapy (describe) _____

_____

_____

Evaluation of personal and professional behavior of SPA Trainee

Promptness	_____	Conduct	_____	Thoughtfulness	_____
Efficiency	_____	Friendliness	_____	Sophistication	_____
Discretion	_____	Objectivity	_____	Independence	_____
Cooperation	_____	Stability	_____	Additional comments (see other side)	_____

_____

WORK EXPERIENCE
CLINICIAN'S EVALUATION OF
TRAINEE

NAME OF TRAINEE _____

SUPERVISING CLINICIAN _____

TIME PERIOD (dates) _____

FACILITY _____

Please comment on the work habits of the Trainee: Absenteeism _____

_____

Promptness _____ Discretion _____ Cooperation _____

Efficiency _____ Initiative _____ Stability _____

Friendliness _____ Objectivity _____ Independence _____

Demonstrated knowledge of required tasks

Please log number of hours worked during time period _____ Hours

_____

Please comment on the present capabilities of the trainee as an assistant to clinicians in the following areas:

Articulation therapy _____

Voice therapy _____

Stuttering therapy _____

Language therapy _____

Therapy with special problems or groups (describe) _____

_____

Diagnostics _____

Please comment on the present capabilities of the trainee for carrying out assignments independently but with supervision:

Case history taking _____ Testing _____

Screening _____ Carry-over therapy _____

Other duties (please describe) _____

_____

Serious weaknesses noted in training preparation:

Trainee's commendable strengths as Speech Pathology Assitant:

GLOSSARY

ADDITIONS refers to adding extra sounds in a word.

AFFRICATE the combination of a plosive and a fricative.

AGNOSIA the inability to recognize objects through the senses, even though the peripheral mechanism is intact.

AMNESIA loss of memory.

ANOMIA difficulty in attaching names or labels to familiar objects.

APHASIA a language disturbance caused by brain injury which alters the individual's ability to understand or produce language.

APHONIA literally means no phonation.

APRAXIA the loss of previously learned functions, such as tying shoes, holding a pen. The inability to purposefully manipulate tools.

AUDIOLOGY the science of hearing.

AUDITORY CLOSURE the ability to fill in the missing information in a word or sentence as a result of past experience.

AUDITORY DISCRIMINATION the ability to differentiate via the hearing mechanism between sounds or words.

AUDITORY MEMORY SPAN the ability to remember sequence of stimuli obtained via the hearing mechanism.

AUTISM an emotional disorder characterized by a preoccupation with fantasy and little if any relating to reality.

BABBLING the period of 6 weeks-6 months where the child experiments with his vocal mechanism, through cooing, gurgling, and producing an abundance of sounds, both familiar and unfamiliar.

BELL'S PALSY a paralysis which displays itself in the facial muscles.

BULBAR POLIO a type of polio where the infection affects the brain stem.

CEREBELLUM an organ located inferiorly to the occipital lobe whose chief function is the coordination of muscle movements.

CEREBRAL PALSY a term used to label a group of individuals who sustained some brain damage and have characteristic motor patterns.

CONSONANT – a speech sound which may be voiced or voiceless and is produced by obstructing the air stream with the articulators.

DIAGNOSIS – to explain a condition which is abnormal by delineating the cause.

DIALECT – a part of the predominant language which is spoken in a particular region and varies in meaning, word order, and phonology from the predominant language.

DIFFERENTIATED CRYING – a period in the reflexive vocalization stage whereby the child cries differently for different states of discomfort. (3-6 weeks)

DIPHTHONG – a combination of two vowels; one is stressed, the other unstressed.

DISTORTION – refers to the faulty production of a sound in a word.

DYSARTHRIA – refers to disturbed articulation which results from peripheral damage.

ECHOLALIA – the period from 9-12 months where the child repeats sounds, syllables, and words that he hears, however, he does not attach any meaning to it.

ESOPHAGEAL SPEECH – speech which is produced by using the esophagus as the vibrator instead of the vocal folds.

ETIOLOGY – the study of the cause of an abnormal condition.

EUPHORIA – a feeling of well-being when there is no reason to exhibit this behavior. In this context it is an emotional disorder.

EXPRESSIVE LANGUAGE – what a person speaks.

FLUENCY – a smooth flowing speech pattern which is free of repetitions, hesitations, and distracting behavior.

FREQUENCY – the number of cycles a vibrator makes in a specific unit of time. It is a physical measure.

FRICATIVE – a speech sound which is produced by forcing the air stream through such a narrow orifice that a high frequency sound is produced.

FRONTAL LOBE – the center for intelligence, abstract thinking ability, and moral behavior. Located in the front of the cortex.

GLIDES – vowel-like consonants.

GLOTTIS – the opening between the vocal folds.

LALLING – the period from 6-9 months where the child monitors what he speaks with what he hears.

LARYNGECTOMEE – an individual who has his larynx removed.

LARYNX sometimes called the voice box. Part of the respiratory mechanism that houses the vocal cords.

LATERALS air moves out of mouth and over the tongue in side-to-side manner.

LOUDNESS the psychological evaluation of intensity. A sound may be soft or loud according to the perceiver.

MENTALLY RETARDED – an individual whose intellectual deficiency is a result of organic rather than environmental causes.

MISARTICULATE the improper production of a speech sound.

MORPHOLOGY the study of endings on words to effect a change in meaning.

MOTOR NERVES refers to nerves which activate a muscle or gland.

MYELIN covering over nerves which aid in the conduction of neural impulses.

NASAL a speech sound which is produced by letting the air stream pass through the nose rather than the mouth.

NASOPHARYNX that part of the pharynx that joins with the nasal cavity.

NEURON a nerve cell which is composed of an axon, and dendrite.

NONFLUENCY a disturbance of the pattern of speech characterized by repetitions, prolongations, and hesitations of syllables, sounds, or words.

OCCIPITAL LOBE visual center in the brain, located in the posterior portion of the cortex behind the parietal and temporal lobes.

OMISSION refers to leaving out a sound in a word. For example, fooball instead of football.

OROPHARYNX the part of the pharynx that joins with the oral cavity.

PARIETAL LOBE sensory center in the brain, located on the lateral superior aspect of the cortex.

PARKINSON'S DISEASE a degenerative disease of the central nervous system characterized by an inability to control or inhibit muscle movements.

PATHOLOGY the study of a disease state.

PERSEVERATION a continuation of a response in the absence of the appropriate stimulus.

PHONEME – a speech sound.

PHONETICS the study of speech sounds whereby a symbol is used to represent a particular sound.

PHONOLOGY a branch of linguistic science concerned with the sounds in a language.

PITCH the psychological evaluation of frequency by the person. Such as, the pitch is high or low.

PLOSIVE – a speech sound that is produced by impounding or blocking the air stream until sufficient pressure is built up, then it is suddenly released.

RECEPTIVE LANGUAGE what a person understands.

REFLEXIVE VOCALIZATION – a period from birth to six weeks whereby the child uses crying to respond to his environment.

REINFORCEMENT to stabilize a behavior by reward or punishment.

RESONATORS the nose, mouth, and throat. These structures modify the quality of the tone that is produced by the vocal cords.

SEMANTICS the study of meaning.

SENSORY NERVES refers to nerves which receive sensations.

SUBSTITUTION refers to an articulation error whereby the individual produces an incorrect sound in a word in place of the correct sound. For example, wabbit for rabbit.

SYNTACTIC the study of word order in a language.

TEMPORAL LOBE hearing center in the brain, located posterior to the frontal lobe and inferior to the parietal.

TRACHEA the windpipe; the part of the respiratory mechanism immediately below the larynx.

TRUE SPEECH the stage 12 months and above where the child attaches meaning to what he hears and to what he says.

UNDIFFERENTIATED CRYING a period in the reflexive vocalization stage whereby the child cries in the same manner irrespective of the stage of discomfort.

VELOPHARYNGEAL CLOSURE the ability to valve off the nose by bringing the soft palate and pharynx into contact.

VOCAL CORDS the two narrow bands of muscle and membranous tissue which produce a tone when set into vibration.

VOICED a sound that is produced while the vocal cords are vibrating.

VOICELESS a sound that is produced and the vocal cords do not vibrate.

VOWEL a voiced speech sound which passes through the oral cavity unobstructed by the articulators.