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Aphasia in children: a review of literature and an annotated bibliography.

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Thesis

Aphasia in Children: A Review of
Literature and an Annotated Bibliography

Submitted by

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CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

There has been an increasing interest in the disorder known as aphasia in children. Many children placed in institutions for the mentally retarded or in schools for the deaf have been found to have an aphasic disorder. Training methods that work with one child will not work with another who apparently has the same disability. In spite of the recognition of the symptom, some authorities dispute the existence of such a disorder. The literature is very scattered, occurring in journals of education, mental retardation, medicine, psychiatry, speech, and deafness over a span of years from about 1867 to 1960. Consequently, contradictions and confusions result in the description and the terminology. Over two dozen terms are used in the course of the description of the symptoms alone.

The Purpose. The purpose of this thesis is two-fold:

1) to survey the literature on childhood aphasia;
2) to compile an annotated bibliography on the subject.

Justification. Much has been written throughout the country on aphasia in general and on aphasia in adults in par-
ticular. Comparatively little has been written on aphasia in children, and the literature on this subject is very scattered. The American Speech and Hearing Association report on research needs states that relatively little seems to be known on aphasia in children and that much interdisciplinary research needs to be done to even agree on definition.¹ At a time when aphasia, or at least an aphasic-like symptom, is more and more recognized as an actual condition in children formerly diagnosed as deaf, mentally retarded, or emotionally disturbed, it seems fitting to attempt to draw together what is known about this controversial area.

**Scope.** All publications and articles on aphasia in children appearing in journals and magazines (as listed in bibliographies and other reference works) which were available have been read and included in an annotated bibliography. Works in foreign languages are not listed and have not been read. Unpublished theses and dissertations appear on the bibliography under "Other Sources" and have not been read. Other works, unavailable for one reason or another but known to the author, are listed in the bibliography under "Other Sources". A few works in the related areas of brain injury, mental illness, mental deficiency, and deafness have been

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read and annotated, as have works dealing primarily with aphasia in adults. The survey of the literature deals mainly with the most widely held beliefs and widely practiced methods on the nature, description, diagnosis, treatment, and prognosis of children suffering from this condition. Any person under sixteen years of age is considered a child.

Definitions of Terms. The following terms are briefly defined here as they are used in the thesis. No attempt has been made to define aphasia here, because the problem of definition alone comprises a good portion of the theoretical literature.

Agnosia -- "loss of the function of recognition of individual sensory stimuli; varieties correspond with the several senses."2

Agraphia -- "inability to express thoughts in writing due to a lesion in the central nervous system."3

Alexia -- "complete inability to read, characterized by an associative learning disability."4

Apraxia -- "loss of the ability to execute simple voluntary acts; especially loss of the ability to perform elementary units of action in the expression of language."5

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3 Ibid.
4 Ibid.
5 Ibid., p. 50.
Autism -- "absorption in phantasy to the exclusion of interest in external reality."6

Dysphasia -- "same as aphasia."7

Echolalia -- "automatic reiteration of words or phrases, usually those which have just been heard."8

Idioglossia -- "an individual language consisting of an extreme form of mispronounced and ill-expressed conventional language."9

Idiopathic -- "pertains to a pathological condition of spontaneous origin; that is, not the result of some other disorder or injury."10

Language -- the psychic process centered in the cortex which in its widest sense signifies the expression or communication of thoughts, feelings, and ideas.11

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7 Wood, op. cit., p. 55.

8 Ibid.


10 Wood, op. cit., p. 57.

Speech -- the symbolic expression and communication of language through words.\textsuperscript{12}

Word-blindness -- same as alexia.\textsuperscript{13}

Word-deafness -- "congenital verbal-auditory agnosia."\textsuperscript{14}

\textsuperscript{12} Ibid.


CHAPTER II

A SURVEY OF THE LITERATURE

This chapter is an attempt to draw together the predominant trends of thought in the area of childhood aphasia. It is organized into the following areas: Definition, Neurology, Etiology, Incidence, Intelligence, Description of the Symptom Complex, Testing, Training, and Prognosis. In certain cases, conflicting points of view are presented, even though one may not be widely held, because the point of conflict may highlight the lack of clarity in definition or the need for more research in that area.

Definition

Congenital, or infantile, aphasia was first noted in 1867, but was not fully recognized until 1926 when Head published Aphasia and Kindred Disorders of Speech.\(^1\) Aphasia in children is little understood. Most of the literature centers on a description of an existing symptom of which the etiology, pathology, and terminology are in dispute.

Literally, aphasia means the loss of the power of speech or the loss of language. Therefore, Freud (1897) has

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declared that true aphasia, whether of children or adults, involves a disruption of speech that has been already acquired. Carrell and Bangs state that "the diagnosis of aphasia is by definition made only when language function is lost after having once been established." Adherents of this idea declare that such a condition as "congenital aphasia" is inaccurate, and another name should be found for the symptom. Suggested terminology includes: idiopathic language retardation, word deafness, congenital dumbness, idiopathic muteness, congenital auditory imperception, idiophasia, central deafness, and idiopathic audimutis.

Hoffman, however, calls aphasia a specialized linguistic loss, or disturbance of association, which includes all linguistic distortions, expressive or receptive, which are caused by a brain lesion. Linguistic distortions are not aphasia which are due to faulty muscular innervation or control, defective sense organs, or general mental deficiency. This would mean that language need not have been established before the brain lesion occurred.

Most writers, regardless of how they feel about the terminology itself, differentiate types of aphasia. Some dis-

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tistinguish between acquired aphasia and congenital aphasia. The former refers to children who suffer partial or complete loss of speech or language already developed. The latter comprises those who suffer brain damage before the period when speech is normally established (about four years). Eisenson stretches this to include those children whose brain lesions were incurred soon after they began to use language, but before the habit of language usage (verbal symbol behavior) could become firmly established.

Karlin suggests a classification, based on both symptomatic and etiological factors, to be used for diagnostic purposes. This would utilize the concept of "aphasias" rather than "aphasia." This classification is as follows:

<table>
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<td>Chronic, due to injury, hemorrhage</td>
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Another distinction made is that between sensory and motor, or receptive and expressive, aphasia. These rarely exist in pure form, but are usually classified according to the predominant learning difficulties. Children with sensory

5 Carrell and Bangs, op. cit., p. 72.
6 Jon Eisenson, Examining for Aphasia, p. 20.
aphasia can hear, but lack the ability to understand speech. In extreme cases, even gross sounds and gestures may be meaningless. Those with motor aphasia possess an adequate understanding of speech but an inability to use expressive speech. There may, however, be considerable meaningless vocalization. In some cases, both receptive and expressive disturbance is severe and is called global, or mixed, aphasia.

Kasten distinguishes three classifications for aphasia: subcortical sensory aphasia, cortical sensory aphasia, and transcortical sensory aphasia. In subcortical sensory aphasia, there exists an ability to express sounds through speech, but an inability to perceive and repeat them. In cortical sensory aphasia, there is deficient perception and imitation of sounds with unimpaired spontaneous speech. Transcortical sensory aphasia involves an impairment of perception and imitation of sounds and of spontaneous speech. Evidently, she sees little chance for unimpaired perception.

For the purposes of this thesis, "aphasia" will refer to an impairment of language ability, congenital and acquired, sensory and motor, resulting from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. The battle over whether or not

9 Ibid., p. 240.

terminology permits a symptom known as "congenital aphasia" to exist will be left to others. "Acquired", "congenital", "sensory", "motor", and "global", will be used as descriptive terms, indicating the time of onset and the major area of difficulty.

Neurology

Aphasia results from a breakdown in the link between hearing and speech.

The link between hearing and speaking is language, the mind's use of various kinds of symbols. Through hearing, the child receives signals and learns to relate them to various events and meanings. What he perceives through audition becomes a part of him and, in terms of symbolic patterns, becomes a memory and a model. These models control the shifting patterns of his speaking; and in being able to hear his own speech and to compare it with what comes to him from outside, a feedback mechanism is set up. He learns to monitor himself...

Special attention must be centered on the children who, for one or more of several reasons, do not have the capacity naturally to develop this feedback mechanism.11

The system of encoding and decoding messages consists of the conduction of sound, the reception of sound, transmission and dissemination of the encoded signals, perception, and association and interrelation.

We are concerned with a system designed to encode and decode messages. At various stages along this system, various break downs or misdirections can occur, and these can be described, in part at least, as knowable otological and neurological pathologies. These follow the structure of the system....Interference at the level of association and interrelation of the various elements of the sensory-motor cortex lies beyond the auditory system. Children with this difficulty may have only a sensory problem in that sound is meaningless to them in whole or in part; more particularly, speech

sounds, with their implications for language, are meaningless to them. Many of these children are obviously aware of and alert to sound, but do not readily learn the significance of the language sign. For many, this is true of visual as well as of audible cues. In others, the difficulty may center largely in the motor aspects of language....In others, it may be a combination of difficulties, transcortical in effect, and usually with behavioral overtones. These are not auditory, but language disorders, specific or general.12

The exact location and extent of the damage is still speculative, although certain areas and types of injury are quite definite.

Jellinek13 and Hart14 feel that even a moderate decrease in functional behavior in some parts of the brain is enough to cause impairment in receptive and expressive speech function. Nielsen claims that aphasia does not develop in children under five when only one side of the brain is damaged, because an entire cerebral hemisphere can be removed in a child and cause no aphasic disturbance.15 Karlin finds that aphasic arrest is found only in the dominant hemisphere of the brain. He assumes that after birth and until the end of the first year, the two hemispheres act together in all performances so that a functional differentiation between the two does not exist. Speech be-

12 Ibid., pp. 293-294.
Area 17 -- visual cortex
Area 37 -- language formulation area
Area 39 -- visual word area
Area 41 -- auditory area in superior temporal gyrus; also occupies floor of Sylvian fissure and is surrounded by Area 42
Area 42 -- psychoauditory zone
Area 44 -- motor or expression area (Broca's)

gins to emerge at a time when laterality becomes established and there is an interrelationship of development of the higher mental functions, cerebral dominance, handedness, and language function.17

The site or location of the involvement, rather than the pathological nature of the lesion, determines the symptom complex of aphasia.18 When lesions of the middle cerebral artery cause damage to the speech and language areas of the frontal, temporal, and parietal lobes of the brain, aphasia may result.19 Destruction of the visual association area leads to alexia. Brain lesions of the posterior cortex disturb comprehension of speech more than expression, while brain lesions of the anterior cortex disturb expression more than comprehension.20 Penfield and Roberts find that particular deficits in language follow specific cortical removals. The areas for speech, in the order of their importance, are: the posterior temporo-parietal (indispensable for normal speech), Broca's (can be sacrificed), and the supplementary motor areas (removal causes aphasia that disappears in a few weeks). However, it seems likely that a subcortical center plays a most important role in the total mechanism and employs all three cortical speech areas.21 Although

17 Ibid., pp. 753-756.
18 Ibid., p. 756.
19 Sugar, op. cit., p. 301.
20 Hart, op. cit., p. 113.
21 Wilder Penfield and Lamar Roberts, Speech and Brain Mechanisms, pp. 190-205.
Summary of some of the important areas for speech as described in the literature. Not all of them have been mentioned in this thesis, but they may be found in sources cited.

22 Adapted from Penfield and Roberts, Ibid., p. 80.
there is no specific localization for agnosia and apraxia (Penfield and Roberts), the nearer the lesion is to the junction of the parietal, temporal, occipital lobes, the more reading and writing are affected; the more the posterior superior temporal region is involved, the more comprehension of spoken words is affected; and the closer the lesion to Broca's area and the adjacent precentral face area, the more the components of speech are involved. They do not feel that a bi-lateral representation of speech is probable, but it is a possibility.23

Since disturbances in one part of the brain tend to have some effect on other parts of the brain, often both functions are affected even when the major damage occurs only to one. The dysfunction is a central one, and may be cortical or subcortical, with motor or pyramidal tract involvement. Many feel that the defect is in the audito-psychic area or Wernicke's area.24

It has not been definitely demonstrated that the right hemisphere is dominant for left-handers in the same way that the left one is for right-handers. Sometimes all of speech is represented on the right in right-handers, but aphasia is quite rare with involvement of only the right hemisphere. The left hemisphere is usually dominant for speech, regardless of handedness. When a lesion occurs which is large enough to cause

23 Ibid., pp. 72-87.

transfer of dominance, that transfer includes all the components of speech.25

Because recovery of speech occurs following damage of part of the left hemisphere, it does not indicate that the right hemisphere usually takes over the function of the homologous area on the left. Aphasia usually occurs after a second injury to the left half. It seems that if other areas on the left are capable of functioning during speech, they will. After complete removal of the left hemisphere, then the right half is used. If this occurs early in life, speech develops or returns much more readily than if it occurs in adulthood.26

Etiology

Aphasia may have one of several causes. In acquired aphasia, the aphasia is secondary to some definite pathology in the brain, such as infection, tumor, or cerebral vascular accident. These cases show laboratory evidence of brain pathology. The congenital aphasic shows a failure in the development of language without any history or neurological signs of brain injury or disease.27

Most cerebral disorders may result from encephalitis, burns, head injuries, brain tumors, cerebral anoxia, and allergy.28 These may therefore cause aphasia. Aphasia is found in children with cerebral palsy whose conditions frequently include neuromuscular dysfunctions and specific articulatory defects; in

26 Ibid., p. 102.
children with tonic diseases involving the brain cortex, such as encephalitis with measles, whooping cough, and influenza; and in children with malformations of the skull. Aphasia may also result from falls or accidents which involve head injuries.29 There are some who feel that aphasia may result from a severe emotional disturbance,30 but this is generally discredited. There were no pertinent autopsy findings as of January, 1951.31

**Incidence**

There is great variance in the literature as to the incidence of aphasia in children. Guttmann feels that although there are not many cases of infantile aphasia on record, aphasia resulting from left hemisphere lesions in childhood is not rare.32 Nadoleczny (1926) found aphasia in children as a result of head injury rare.33 Worster-Drought and Allen in 1930 reported that there were only fifty cases in the literature over the previous sixty years. This would make it much more uncommon than congenital word-blindness. They suggest some reasons for its rarity:

1) The symptomatology is not as obvious as that of other disturbances such as word-blindness. The incidence may there-

30 Carrell and Bangs, *op. cit.*, p. 69.
31 Ibid.
33 Ibid., p. 205.
fore actually be much greater.

2) Without a suitable environment, aphasic children are likely to become "imbeciles from deprivation."

3) From 1889 on, many cases were described under idioglossia, which is probably the speech complication of congenital aphasia.

4) Psychological and behavioral problems tend to arise as a result of mishandling, and erroneous diagnosis may result.34 No one is convinced of the accuracy of this representation of the incidence.

Aphasia is much more common in males than in females, in a ratio of about five to one.35

Intelligence

Van Gelder, Kennedy, and Lagauite feel that the aphasic child may have any degree of intellectual potential,36 but most of the authorities feel that aphasia, especially congenital, should refer to a speech symptom in children who are intellectually and physically capable of speech. Otherwise, it would become so intertwined with other types of brain injury and mental deficiency that it would be virtually impossible to


36 Van Gelder, Kennedy, and Lagauite, op. cit., p. 49.
differentiate the pathogenesis responsible for the speech symptom.37

Worster-Drought and Allen point out that the aphasic child may become an imbecile from deprivation if there is a poor environment and no attention given to the disability. In some cases, poor environment may lead to antisocial tendencies and delinquencies.38

**Description of the Symptom Complex**

The description of symptoms found in the literature is so diverse, that at times it is difficult to believe that the authors are describing the same disorder. Therefore, this section mentions only those which occur most consistently.

**Perceptual Symptoms**

There is usually evidence of perceptive difficulty in the preschool years, especially in the area of the association of symbols with concrete objects. Most children can perceive sound well, but cannot interpret what they hear. They cannot naturally listen, understand, store, or recall symbolic structures involving a time order and a stress pattern. They may not be able to naturally lipread or do well in gestural or manual language,39 or they may lipread and understand gestures

37 Sugar, *op. cit.*, pp. 303-304.
39 Hardy, *op. cit.*, p. 299.
Some children with sensory aphasia show little response to noises and sounds and show an almost total lack of auditory attention, while their visual attention is acute and visual stimulation an obvious source of pleasure. The essential feature is that spoken language is not understood when spoken in the patient's hearing but out of sight. Sometimes musical sounds, or even cruder sounds, are not understood or appreciated, and sometimes this perception may be normal. The sensory aphasic cannot give his attention to just one sound, and therefore at times he seems not to hear. The child may occasionally respond to sounds, especially brief ones, for a short time.

Some children with congenital motor aphasia do not show the auditory inattention characteristic of the child with sensory aphasia.

Motor aphasics seem to have adequate understanding of

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41 Kastein, op. cit., p. 33
42 Worster-Drought and Allen, op. cit., p. 213.
43 Ibid., p. 215.
speech for their age group. Sensory aphasics show a discrepancy between their ability to hear and their ability to understand spoken language. Therefore, evaluations cannot always be done by conventional procedures. 47

There is present an impairment in concept formation. This is caused by the underlying pathological disturbance rather than a primary impairment of conceptual thinking. 48

There may be a disturbance of spatial relationships. 49

**Verbal Symptoms**

In congenital aphasia, the most pronounced symptom is delayed speech. There is a general inability to communicate normally through speech, characterized mainly by inadequate comprehension of spoken language, failure to talk, and little speech or jargon. 50 In sensory aphasia, there is both a lack of understanding of speech and a lack of expressive speech. Consequently, there is little or no vocalization, jabber, or chatter with inflection, facial expression, or gesture. There may be echolalia or an appropriate use of a limited number of words or phrases with understanding limited to

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49 Carrell and Bangs, *op. cit.*, pp. 68-69.

50 Ibid.
these. However, the child may not recognize them when they are spoken.\textsuperscript{51} The child with sensory aphasia is more affected and disturbed than the child with motor aphasia, for he is disturbed in all types of language. When he cannot understand speech, he cannot learn to use it.\textsuperscript{52} In the child of three or four, there may be no speech. The child of six may have limited or distorted speech.\textsuperscript{53} In some cases, the child can repeat sounds and words he hears, but he cannot repeat a long series of words.\textsuperscript{54} There is a lack of abstract thinking, an irrelevancy of ideas, and a tendency to perseverate.\textsuperscript{55} When lipreading has been learned, the child may be able to understand language easily by sight. There may be some difficulty in appreciating the meaning of written and printed symbols. When the child attempts to write, he shows certain errors which correspond to the errors found in oral speech. Writing from dictation is impossible when the speaker is out of the patient's sight.\textsuperscript{56}

\textsuperscript{51} McGinnis, Kleffner, and Goldstein, \textit{op. cit.}, p. 240.
\textsuperscript{52} Myklebust, \textit{op. cit.}, p. 152.
\textsuperscript{53} Karlin, "Aphasias in Children," \textit{op. cit.}, p. 758.
\textsuperscript{54} Worster-Drought and Allen, \textit{op. cit.}, p. 214.
\textsuperscript{56} Worster-Drought and Allen, \textit{op. cit.}, pp. 216-218.
In motor aphasia, the child does not speak at all, or makes only primitive sounds. There may be some improvement as he grows older, even without special education.\(^5\) There may, however, be considerable vocalization. The pattern of vocalization shows sounds repeated over and over, with facial expression, voice quality, and inflection usually varying appropriately with the meaning of the content. There is use of gesture, and a partial or complete inability to imitate actions or positions of the tongue, lip, and jaw, or to imitate sounds and words. However, there is adequate control of the muscles used in speech or in other acts such as chewing or swallowing. When a word is gotten out, it is usually well-articulated. The child often cannot say words until after three or four years of age. With good training, there may be considerable speech by five or six. A moment after speaking a word, he cannot repeat it. This is determined by his activities, interest, and nervous system.\(^5\)

In acquired aphasia, one never sees a loss of individual parts of speech, but a depression or reduction of the entire speech function.\(^6\) All children under ten, wherever the

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60 Hart, *op. cit.*, pp. 113-114.
lesion, tend to show a reduction of spontaneous speech. When the child is over ten years, there is not always reduction of speech output, and there may even be a hypo-spontaneity of speech. Often these children produce the picture seen in adults.61

**Behavioral Symptoms and Psychological Problems.**

Whatever the type of aphasia, there are certain psychological problems which may be seen: 1) difficulties in patterned behavior in motor, perceptual, emotional, and social areas, with tendencies toward regressed or retarded maturation; 2) a severe, poorly patterned anxiety; and 3) a greatly increased need for human support in all of his areas of adjustment.62 Some children are contented, show an apathetic disregard of their handicap and its results, and are apparently happy in their condition. Others develop a mild paranoid reaction, feel the situation keenly and develop a sense of inferiority and behavior disorders, or demonstrate an emotional blocking of output when anything is demanded of them. Such misbehavior is not caused by the defect itself, but is a consequence of the child's relationship to his environment.63


The child may be ill-tempered, mischievous, spiteful, destructive, nervous, and show a tendency to give up easily. He may have a poor attention span and show a tendency toward solitary play, 64 shyness, social withdrawal, and seclusiveness. 65 He reacts fairly normally to behavior he can understand. He may show aggressiveness and irritation without there seeming to be a normal provocation. 66

The child with sensory aphasia is easily distracted and gives his attention to anything that is before him, whether or not it is important to him at the time. He may be very active and grab things. He cannot separate the important from the unimportant, and he cannot control himself, because he cannot grasp the true meaning of his surroundings and his experiences. However, once he has embarked upon an activity, he has trouble stopping it. He may giggle and laugh compulsively. He cannot wait, because he cannot tolerate having things on his mind and waiting until a logical time to go ahead with them. He is not shy, and makes little distinction between friends and strangers. Development of control of toilet habits is slow, and confusion, misunderstanding, and bewilderment are common. 67

64 Carrell and Bangs, op. cit., pp. 68-69.
66 Ibid., p. 762.
It is apparent that aphasic children may exhibit any number of behavioral characteristics, and therefore behavior cannot be used alone as a diagnostic key. In many cases, the child exhibits characteristics of several disorders.68

**Physical and Motor Symptoms.**

The literature presents a conflicting picture with respect to motor control. Carrell and Bangs describe a general lack of muscular control in games and in handwork;69 Myklebust says that the child is awkward and clumsy in walking or in using his hands;70 and Van Gelder, Kennedy, and Laguaite speak of incoordination, not only of the speech organs, but of other muscular systems as well.71 However, McGinnis, Kleffner, and Goldstein state that there is adequate control of the muscles used in speech and in other acts such as chewing or swallowing, and Karlin states that the child is usually skillful in his movements.73 Carrell and Bangs also find an unusual amount of physical activity, and a prominence of left-handedness.74


69 Carrell and Bangs, op. cit., pp. 68-69.

70 Myklebust, op. cit., p. 153.

71 Van Gelder, Kennedy, and Laguaite, op. cit., p. 49.

72 McGinnis, Kleffner, and Goldstein, op. cit., p. 240.


74 Carrell and Bangs, op. cit., pp. 68-69.
Testing

Any testing program must be many-sided and include intelligence tests, hearing tests, neurological tests, psychological tests, and physical examinations, as well as detailed case histories. The tester must be very experienced in differential diagnosis so that subtle distinctions of the several possible disorders may be ascertained.

Tests.

Intelligence cannot be judged from a test which involves the understanding and appreciation of oral instructions. Instructions should be given in simple pantomime, and there should be no penalty or bonus for performance speed. Only those situations to which a handicapped child can adjust as well as a normal child, and in which no verbal responses are required, should be included.

Tests should be used which employ form boards, objects for sorting, colored blocks, and pictures, all of which are on a perceptual and adaptive level of behavior. They should involve perception and imitation of an action or series of actions. Suggested general tests are: Blum, Burgemeister, and Lorge, *The Mental Maturity Scale for the Motor Handicapped*, and the *Columbia Mental Maturity Scale* by the same authors.

75 Worster-Drought and Allen, op. cit., p. 230.
76 Eisenson, op. cit., p. 20.
The following tests may be used with some adaptations: the Pintner-Patterson Performance Test Series, the Arthur Point Scale of Performance Tests, the Porters Maze Test, and the Leitner International Performance Scale.77

The Gesell Formboard and the Seguin Form Board are useful, not for intelligence testing, but merely to see if the child perceives the relationship between the holes and the inserts. At one year of age, the child should be able to insert the circle correctly, and by two years, the triangle and the square.78

At eighteen months, a child should, unless he has cerebral palsy, be able to build a three-block tower. By two years, he should be able to build a four-block tower out of one-inch cubes.79

The child should be able to do object sorting. The simplest is to distinguish between two groups of objects that are identical except for one aspect, such as color. He should be shown what to do. If he fails, he should be helped once or twice to imitate. At three-and-a-half years, he should be able to succeed at a button sorting test (Form M of Terman and Merrill's revision of the Stanford-Binet). Verbal directions

77 Ibid., p. 21.
78 Ibid., pp. 21-22.
79 Ibid., p. 22.
are used, and a two-minute time limit given. There are twenty buttons, ten black and ten white. Gestures will be necessary if the child is congenitally aphasic. 

The last group of tests mentioned by Eisenson utilize jigsaw puzzles. The picture must be within the child's direct experience and be simple and obvious; the puzzle should have no more than six pieces. First it is demonstrated, and the child is then given several trials. A variation of this is the Mare and Foal Board, which is a subtest of the Pintner-Patterson Scale. 

Many test results must be judged subjectively, such as the observations of vocalizations and the interpretations of responses in relation to behavior observed during hearing tests. Head phones are not used in the objective hearing test, and therefore the free, or sound, method is utilized. Hearing testing should also include a Galvanic Skin Response test. 

The Electroencephalogram should be an integral part of the neurological and physical examination, even though it is often of little use when dealing with cerebral disorders.

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80 Ibid.
81 Ibid., p. 23.
83 Bakwin, op. cit., p. 380.
84 Ibid.
These tests should form a pattern which points to aphasia. No one test can be considered conclusive. Many children come for confirmation of deafness, mental retardation, emotional disturbance, or visual difficulties. Others because of incoordination or inattention are seeking help. The hearing test must rule out deafness as the source of the auditory difficulties; the intelligence test, the ruling out of mental deficiency; and the psychological, the ruling out of emotional disturbance as a primary difficulty. Agnosia is tested by all of the above plus tests of tactile perception. The less verbalization is involved in questions or in responses, the more accurate or valid the results of the tests will tend to be.

**Differential Diagnosis.**

Karlin has suggested certain points of discrimination between mental retardation, schizophrenia, autism, and aphasia. His categories and their components will be briefly enumerated.

**Mental Retardation.** Developmentally, there is a delay in the onset of sitting, walking, and talking. Behaviorally, the child shows little interest in his surroundings, becomes easily tired, has slow and awkward movements, and seems placid or erethic. He may behave like a psychotic. On intelligence tests, he shows an all-pervasive deficiency, although there may be an uneven distribution of abilities. His speech is meager, limited to a few irrelevant words, shows a marked tendency toward echolalia, and demonstrates a scanty
vocabulary and a meagerness of ideas. He will improve with age, but there will not be much change; he generally remains on the same level.

**Schizophrenia.** Developmentally, the onset of sitting and walking is normal. However, the child's behavior is odd and bizarre. He may be seclusive, and show immobility and posturing. He does not pay attention to his surroundings, and his mode of thinking and acting is foreign to normal life. There is general emotional blunting, or else emotional response out of proportion to the external situation. On the intelligence test battery, he may be extremely backward in certain tests and surpass his own age level in others. He may even be confused with children having superior intelligence. His speech may be very limited, sparse, incoherent, or irrelevant; he may use made-up words or odd combinations of actual words. Regression in behavior and interests becomes more marked with age.

**Autism.** Withdrawal tendencies are noted early. The child shows an obsessive desire for the maintenance of sameness. Changes in routine can drive him to despair. He usually shows good relationships to objects, is interested in them, and plays with them, but he does not pay attention to persons or to what people do around him. The child may remain mute, but most acquire the ability to speak. However, the speech does not convey meaning to others. Naming is easy; the child may remember long and unusual names. Delayed echo-
lalia may be present, where a child repeats at a later date a word or sentence he heard a day or two before. Not much change or progress is seen.

**Aphasia.** Developmentally, the onset of sitting and walking is normal, but the onset of speech is late. Behavioristically, the child shows a tendency to shyness and seclusiveness. He reacts fairly normally to stimuli in surroundings he can understand. Due to lack of verbal understanding, he may at times show aggressiveness and irritation. Intelligence tests show a scattered picture: backward in verbal tests, normal in performance tests, and skillful in his movements. Speech may be absent; the child may lipread or understand gestures. Some improvement is seen as he grows older.\(^{85}\)

As may be seen, the characteristics of each category, or disorder, overlap. No one but a skilled observer and clinician can accurately weed out aphasia as distinct from any of the others.

**Training**

There are many theories of the best way to teach the aphasic child, although most of them are more similar than they are different. Carrell and Bangs feel that the initial efforts of therapy should be primarily directed toward the socialization of the child in a situation where no direct

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pressure is placed upon the child to talk. They therefore feel that group therapy is the most desirable. They recommend that two children be included in the group who have considerable language, so that there may be much language stimulation without placing communication pressure on the child. Activities should involve large muscle action. The undesirable behavior of the child should be made much less rewarding. The principle speech work would be on vocabulary, with only incidental work on pronunciation. 86

Many authorities would agree with the sequence of therapy, but disagree on group therapy, feeling that it places too many demands on the child. Some feel that the child must be educated as deaf, 87 while others feel that the child will not learn from many deaf procedures. 88

Hardy advocates diagnostic teaching, wherein various ideas and situations are treated in a consistent effort to assess the relationships between capacity and achievement. So many children have a wide variety of potentials in different areas that it is necessary to consider the training program of each child separately. 89

86 Carrell and Bangs, op. cit., pp. 73-74.
87 Kleinfeld, op. cit., p. 47.
88 Hardy, op. cit., p. 299.
89 Ibid., pp. 300 and 309.
While it is true that many cases of acquired aphasia can improve without special education, usually the only way in which a child may obtain an understanding of speech symbols is to have a course of intensive training.\(^{90}\) There must be an integration of speech and language with academic subjects, particularly with older children.\(^{91}\) Therapy usually produces the best results when it utilizes visual, auditory, and tactile clues simultaneously.\(^{92}\) However, there are some children who seem to respond better to syllable type therapy.\(^{93}\)

Generally, education through the auditory route is not possible, and by the visual route, difficult. Certain goals must be kept foremost: 1) to secure a normal relationship with those with whom the child comes in contact; 2) to provide a means of communication with, and understanding of, his fellows; and 3) to enable him to qualify for some occupation in which he can engage in a manner in line with his abilities.\(^{94}\)

Karlin suggests some general principles of treatment and rehabilitation, to be used primarily with congenital aphasics:

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90 Kastein, \textit{op. cit.}, p. 47.


92 Van Gelder, Kennedy, and Laguate, \textit{op. cit.}, p. 53.


1) The principle of facilitation -- the stimulation of one neuron or an area of neurons may facilitate another area through subliminal stimulation. Stimulation of one performance field may influence the performance of other parts of the same field.

2) Because there is a reduced receptivity, it takes longer for the child to react. Therefore, the child may succeed when given a sufficiently long exposure to the stimulus, but fail when a brief exposure is given.

3) Distracting stimuli must be reduced to a minimum.

4) Parents must be included in the treatment program. They need to understand the defect and to realize that a long period of observation is necessary. They need to realize that the normal process of growth may produce results no one can foretell. The parents should receive education on the normal growth and development of the child.

5) Emphasis in training on the use of unimpaired or relatively unimpaired sensory and motor pathways, as well as on the establishment of new pathways.95

Karlin, too, feels that initial efforts should be on socialization, preferably in a nursery or kindergarten with normally speaking children. The speech sessions should be fun and contribute to the child's regular life activities.

Work should be on the building up of speech patterns, not sound by sound or word by word. Frustration should be avoided.  

Myklebust believes that expressive language must follow, not precede, receptive language, while McGinnis, Kleffner, and Goldstein, using the "Association Method," feel that expression is the foundation or starting point in building language. 

The principles of the "Association Method," as given by McGinnis, Kleffner, and Goldstein, are as follows:

1) A phonetic or elemental approach to learning words.
2) Emphasis on precise articulatory position for each sound. Smooth articulation is not encouraged until it can be accurate.
3) A careful association of each articulatory position and sound with the appropriate letter-symbol(s) of cursive script.
4) Use of expression as the foundation or starting point in the building of language.
5) Systematic sensory-motor association.

Mykelbust gives some other principles of teaching, some

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96 Ibid., p. 765.
99 Ibid.
of which are in contradiction to the above. He states that the training room should be small, uncluttered, and simply decorated. At the beginning, the child should be kept close to the therapist, as the child's attention is kept longest when he is near by. The distance is then gradually increased. Materials must be appropriate, such as concrete objects and drawing which are simply outlined and have simple backgrounds. A language development approach is used, where speech correction is delayed until practical communication is achieved. The symbol must be appropriate to the act. Naming of objects is done. Utterances must be completely accepted without correction.100

Some specific procedures used are: tachistoscope; systematic teaching of sounds, words, phrases, and numbers; phonetic training; use of special abilities; coordination of motor and mental processes; use of motor accompaniment to sounds and speech; imitation of teacher; manual manipulation of child's mouth; use of mirror; auxiliary amplification of tactile and kinesthetic stimulation accompanying production of sounds; building sound units into meaningful sequences; singing; and lipreading.101

Because the cooperation and understanding of the par-


101 Hoffman, op. cit., p. 87.
ents is so crucial, and because they are in constant contact with the child, Myklebust suggests some pointers for the parents:

1) Avoid stimulation. When it occurs, the child must be taken out of the situation and reassured in a calm, patient manner.

2) Help with listening. Play games that depend upon listening and buy toys that produce sounds. Work on one sound at a time. Talk in simple words.

3) Have simple routines for eating. The child should be seated next to the same person at each meal. He may need to eat alone. Serve one food on his plate at a time.

4) Use a specific toilet training routine. It must consist of patience, good timing, consistency, and be simple in demonstration.

5) Encourage language, but do not demand speech. The child should be allowed to use just voice for expressing ideas. Encourage expression in any way, including gestures.

6) Teach the child to play. Use toys that represent daily life and play out daily experiences. One can move from here to more imaginative and abstract play. Pretending is the basis for inner language.

7) Use patient firmness, not punishment. Discipline must be consistent. Anger adds to bewilderment. 102

There must be a repetition, prolongation, and accentuation of the normal process of speech development. The child will profit from speech training only when he wants so much to communicate that he repeatedly attempts some form of communication. Once this attempt has been made consistently, the child will respond to speech training.103

Prognosis

The prognosis corresponds to the severity of the original lesion,104 but most of the authorities feel that with proper training at an early date it will usually be good. Karlin finds that aphasia following convulsions or an attack of migraine may last a few days or disappear in a few hours. In cases of brain tumor or abscess, once the underlying pathology is removed, recovery from the aphasia is usually complete; it may disappear automatically in approximately four weeks. When aphasia is due to hemorrhage or injury, the aphasic symptom may become chronic, and recovery will occur only after special speech therapy.105 The patient responds well to intensive speech therapy using visual, auditory, and tactile clues.106

When lesions occur in children who have not yet begun

103 Hoffman, op. cit., p. 86.
104 Guttmann, op. cit., p. 216.
106 Van Gelder, Kennedy, and Laguiaite, op. cit., p. 53.
to talk or in whom the speech function is not fully developed, complete absence of speech results. In older children, speech loss is not complete, but is quite fractional. In time, the young child with congenital aphasia will often begin to talk just as a normal infant first learning to speak: first inarticulate sounds, then single words, then phrases, and finally short sentences. In some cases, a childish lisp may persist for several years. The brain can compensate for, and recover from, such injury. Every case of aphasia has the possibility for some degree of successful retraining.

Summary

Aphasia has been defined as an impairment of language ability, congenital and acquired, sensory and motor, which results from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. A child is any person under sixteen years of age.

The general consensus of the literature, although there are many points of disagreement, is that there are certain speech and language areas in the brain, injury to which causes some form of aphasia. However, because of the extensive interaction of all parts of the brain, injuries to speech and language centers may affect other functions, and injuries to

other parts of the brain may cause speech and language interference. The etiology may be of many sources, including infection, hemorrhage, and blows to the head. The incidence of aphasia is unknown, but it occurs in males five times more often than in females. Aphasia as the primary cause of speech and language difficulty occurs in children of normal or borderline intelligence.

Many descriptions of the symptom complex are given, and many of them are quite conflicting. Apparently, the child may manifest almost any type of behavior, and he generally presents characteristics of several disorders. Only an experienced diagnostician can discriminate which symptoms are primary indications of the disorder and which are secondary concomitants. A diagnosis of aphasia can be made only after tests are made in many areas, the child has been observed over an extended period of time, and a detailed case history has been compiled.

Training generally follows Myklebust, with an emphasis on the development of inner language initially, paralleling normal language development, or McGinnis, Kleffner, and Goldstein at Central Institute for the Deaf, using the "Association Method." Both methods demonstrate satisfactory results.

Prognosis is in general good, proportionate to the type of etiology and the severity of the injury. With proper early training, the majority of these children can become socially normal individuals.
CHAPTER III

ANNOTATED BIBLIOGRAPHY

This chapter contains a listing and annotation of all sources obtained. Sources known but not obtained are listed after the annotated bibliography under "Other Sources." The author index contains the authors found in both bibliographical listings.

In the annotated bibliography, the articles are listed under the following headings: Definition; Theoretical Aspects; Etiological and Neurological; Language and Verbal Aspects; Behavioral Aspects; Testing and Differential Diagnosis; Teaching and Therapy; General; and Case Studies. No article is listed twice, even though it may cover more than one area; it is listed under the area of its primary emphasis. If a source gives fairly equal coverage to several areas, it is listed under "General."

The sources in "Other Sources" are listed alphabetically by author.

Each source will be given a number, and these will run chronologically from the beginning of the annotated bibliography to the end of the other sources. The author index will be listed alphabetically, with only the numbers of the sources listed after the author's name.
Definition

Definition, description, and diagnosis of aphasia. Presentation of two cases.

A discussion of concepts and classification of aphasia in adults and children.

The nature of the learning difficulty and the learning process in children and in adults. General concepts. Discussion of the appropriateness of the term "aphasia."

Definition and classification of congenital aphasia. Deals with the appropriateness and diagnostic usefulness of the term.

The theories of aphasia from Hippocrates and Thucydides through the first two decades of the twentieth century, with author index.

Essay discussing arguments for and against the concept of congenital aphasia.

Description of what "congenital aphasia" should connote. Mainly theoretical discussion with a few implications for diagnosis and training.
Theoretical Aspects: Etiological and Neurological

Discussion of the possibility of emotional etiology in some aphasic children. Illustrative cases. Implications for therapy and investigation.

A detailed description of the neuropathology of aphasia, particularly as it relates to the speech symptom.

Description and case presentation of encephalitis, burn encephalopathy, and traumatic states. Aphasia is mentioned only as it occurred in illustrative cases of encephalitis and burn encephalopathies. General remarks about prognosis for brain injury in concluding section.

Comparison of acquired and congenital aphasia. Primarily concerned with neurology and prognosis.


Neurological theory. Brief references to cases of children and adults. Suggestion for cure by use of galvanism and ice.
Types of aphasia and definition. Theory of organic process. Presentation of four cases.

General description of physiological and behavioral symptoms of congenital aphasia.

Deals mainly with theoretical aspects of aphasia in adults, but may, in some acquired aphasias, be relevant to aphasia in children.

Description of Rh incompatibility and resultant kernicterous with effects on the neural auditory pathway. Preliminary to the understanding of its role in aphasia. See Cohen, Hannigan, Myklebust, and Rosen.

A keynote address at the 1956 summer meeting of the Alexander Graham Bell Association for the Deaf in Los Angeles. Good background information for the therapist's understanding of the link between hearing and aphasia. Not very valuable for parents. Presents several illustrative cases.

Good for the relationship of agnosia to hearing and to speech. However, one is never sure whether the author feels this is synonymous with aphasia or is distinct from it.


(22) Morrow, J. T., "A Psychiatrist Looks at the Nonverbal Child," Exceptional Children, 25:347-367, 1959. Discussion of several possible etiologies of nonverbalism, such as congenital aphasia, deafness, and psychoses. Primarily concerned with the last.


Individual and group reactions, capacities, and behavior patterns of cats and monkeys before and after the implantation of lesions in ten neo-paleo and subcortical brain areas.

Covers normal brain activity, consciousness, review of literature on the aphasias, handedness, processes and results of cortical mapping and excision, and language training.

Neurological theory. Cases referred to are those of adults, but theory could be applied to children, especially those with acquired aphasia.

Description of language theory in relation to brain areas. Presentation of adult acquired aphasias to illustrate interferences in the various brain areas.

Description of auditory characteristics in the athetoid cerebral palsied child where the etiology is kernicterus. Brief discussion of the relationship to aphasia. See also Cohen, Goodhill, Hannigan, and Myklebust.


Language and Verbal Aspects


(40) Doehring, Donald G., "Visual Spatial Memory in Aphasic Children," Journal of Speech and Hearing Research, 3:138-149, June, 1960. Study at Central Institute for the Deaf "to determine whether children classified as aphasic are defective in certain non-verbal abilities related to visual memory." The accuracy of memory for the spatial location of a visual stimulus was tested as a function of delayed recall, interference with fixation of the visual field, and duration of exposure.

Description of speech symptoms and general prognosis of infantile aphasia. Three illustrative cases of verbal responses. Not very specific.

Description of speech and language abilities and disabilities in children with cerebral palsy resulting from kernicterus. Some implications for training. See also Cohen, Goodhill, Rosen, and Myklebust.

Characteristic speech and language problems of mentally retarded children. Very brief comparison of symptoms with those found in aphasia.


General description of language development, types of language, and characteristic language disturbances of children with other sensory and motor handicaps.

Types of language disorders. Summary of language development. Good for understanding of the processes involved in different areas of language reception and expression.

Outline of differences and suggestions for a general frame of reference for the development of language in any child who presents a problem of language acquisition. It deals only with the receptive aphasic. The article is very general.

For parents and teachers. Definition of language and explanation of language development. Excellent.

Primarily for adults.

Description of child's language and language development. The utilization of linguistics in the training of aphasics. Specific methods are not given.
Aphasia in adults.

Aphasia in adults.

Study at Central Institute for the Deaf comparing aphasic and nonaphasic children in the discrimination of four different kinds of noisemakers of various duration and quality.

No specific mention of aphasia. Study of the causal factors of delayed speech and language development.


Behavioral Aspects

Good for description of etiology and symptomatology of brain damaged children in general. Almost no value for aphasia specifically.

Aphasia in adults.
(60) Cohen, Peter, "Rh Child: Deaf or 'Aphasic'? 2. 'Aphasia' in Kernicterus," Journal of Speech and Hearing Disorders, 21:411-412, December, 1956. Description of characteristics of athetoid cerebral palsied children where the etiology is kernicterus and there is a high incidence of aphasic symptoms. See also Goodhill, Hannigan, Myklebust, and Rosen.


(64) Myklebust, Helmer R., "Rh Child: Deaf or 'Aphasic'? 5. Some Psychological Considerations of the Rh Child," Journal of Speech and Hearing Disorders, 21:423-425, December, 1956. Discussion of mixed problems of deafness and aphasia in Rh children, not necessarily those with athetoid cerebral palsy, as they relate to motoric and social development. See also Cohen, Goodhill, Hannigan, and Rosen.

Very brief description of symptoms and necessary type of treatment.

Discussion of the distinguishing behavioral characteristics of aphasic, psychotic, and mentally retarded children.

**Testing and Differential Diagnosis**

Primarily for adults.

Requirements of, and technique for, clinical testing.

Primarily formal testing principles, procedures, and materials.

Background of concepts of congenital aphasia. Symptomatology, etiology, and certain factors of importance in diagnosis. Testing implications.

Study to establish more definite criteria for differential classification. Etiology, audiometry, neurology. Implications for testing.
Classification of aphasic disorders, review of tests, and presentation of new test. Uses of the test. For clinical therapist or diagnostician. Primarily for adults.


From the Department of Otolaryngology, Columbia-Presbyterian Medical Center, New York. Mainly a description of a successful method of differential diagnosis. For audiologists involved in diagnosis.

(76) Krout, Maurice H., "Is the Brain-Injured a Mental Defective?" American Journal of Mental Deficiency, 54:81-86, July, 1949.
Differential testing. Listing of the many agnosias, apraxias, and aphasias. For the clinical therapist.

Definition of childhood aphasia and description of receptive and expressive syndromes as they bear on testing and therapy.

   Extensive treatment of the components of a neurological examination and their contribution to a diagnosis of aphasia. Extensive bibliography.

   Team approach to differential diagnosis on children with retarded language development. Details for differential diagnosis for aphasia are described.

   Neurology, tests, education, and case history. Primarily geared to adult aphasia, but with many implications for testing and training of aphasic children.

   Considerations in testing aphasics (children or adults) and information necessary in order to develop an effective therapy program for them.

Teaching and Therapy

   Acquired aphasia, pertaining mainly to older children and adults. Teaching and training. For the therapist.

   Description of congenital reading and speech aphasia. Important use of mirror in therapy. Theoretical discussion of axial adaptations in vision and sex-linked heredity.
Definition and types of aphasia, characteristics, and suggestions for training.
Quite specific.

From experience with children with organic brain disease at the Children's Service of the Psychiatric Division of Bellevue Hospital, New York University Medical School.
Limited to "a consideration of the psychology of the traumatic and inflammatory encephalopathies and those congenital motor deviations which are especially closely allied." Good for an understanding and a treatment or handling of the brain-damaged child. No specific mention of aphasia.

Chart of twenty gestures for specific wants developed by an aphasic patient, especially for adult aphasics. May be used with adaptations for children.

Description of the treatment of a speechless child that seemed to be aphasic. Prevalence of behavior problems resulting from inability to express oneself.

Brief treatment of the place of the aphasic-like child in schools for the deaf. Mainly just raises the question. For teachers.

Study at the Lincoln State School and Colony in Illinois "which attempted to analyze the achievement and abilities of a group of educable mentally handicapped children to learn how significant aphasic difficulties were in a group of such children." Of main interest to teachers, especially of retarded children.

Good definitions. Principles of training are outlined and some suggested procedures given. Does not deal with etiology or symptomatology.

Description of cases and methods of therapy with mentally retarded children who demonstrate phenomena resembling the aphasias.

Case study of aphasic, mentally retarded child in terms of progress of therapy.

Report of recent research at Central Institute for the Deaf at St. Louis, and principles and procedures for teaching and training. Primarily for teachers and therapists.

Review of present thought on aphasia and the future educational needs. Particularly for teachers and therapists.
Workshop discussion of recent research at Central Institute for the Deaf in St. Louis, and principles and trends in teaching aphasic children. For teachers and therapists.

Definition, types, prognosis, and teaching procedures used at the Central Institute for the Deaf, St. Louis, Missouri. Deals mainly with severe problems.

Procedures used for teaching aphasic children at Central Institute for the Deaf, St. Louis, Missouri.

Characteristics. The relationship of word-deafness to reading, and mental and social development. Symptoms and teaching. Written for the teacher.

Description of the site and size of facilities. The program and general principles of education. Presentation of cases to illustrate methods and materials.

Report of teaching procedures at the St. Louis Central Institute for the Deaf. Primarily for therapists who work with aphasic children. Detailed explanation of what they have found to be a successful teaching method.
Definition and types, characteristics, and differential diagnosis. Relationship of aphasia to deafness. Testing and teaching program.

Results after using the McGinnis Method for teaching aphasic children.

Individualized educational program completely detailed. Rating of progress and assessment of intelligence. For the teacher or therapist.

Primarily for teachers of the deaf. Recommended program -- case taken through training program. Quite specific in detail.

Description of the treatment of a child with delayed speech that was probably due to aphasia.

General principles and procedures for teaching speech to children with delayed speech of any kind. No specific reference to aphasia.

(109) Sheer, Daniel E., "Is there a Common Factor in Learning for Brain Injured Children?" Exceptional Children, 21:10-12, October, 1954.
General understanding of behavior for the teacher who has a brain injured child in class. Nothing specific on aphasia.
Concerned only with adult aphasics.

General discussion of education principles. No specific mention of aphasia.


Mainly for adults. Workbook designed for use by any untrained person responsible for the rehabilitation of an aphasic person. It is for patients who have difficulty saying, reading, or writing more than ten of the words on the basic word list.

Report of a successful program of aphasia rehabilitation through the counseling of families and friends. General principles outlined, but primarily useful and relevant to the adult aphasic.

The nature and treatment of aphasia. Concerned only with adults.

Presentation of the method of self-correction and an eight-point scale for its evaluation. Useful primarily for the retraining of adult aphasics.
General

Definition, description, therapy, personnel training, and especially research needs in the total field of aphasia.

Describes etiology, behavior, verbal symptoms, classification, and therapy. Illustrative cases included.

Primarily for aphasia in adults due to vascular lesions and trauma.

The functions of the language centers in the brain. Description of symptoms related to specific brain areas. Treatment suggestions with rationale. Applicable to both children and adults.

The whole book gives a general detailed overview of aphasia, using the organismic approach. Forms of disturbance. Illustrative cases. Pages above specifically childhood aphasia, retraining theory.

Excellent for general introduction to aphasia. Many illustrative cases. Based on observations of ten children where etiology was injury, tumor, or abscess. It excludes the question of the relationship between mental defect and aphasia in early acquired or widespread brain damage.


(126) Jellinek, Augusta, "Understanding of Speech," The Nervous Child, 9:15-20, January, 1951. Mainly for a general understanding of hearing and related areas, including aphasia, epilepsy, and others. Is not primarily concerned with aphasia except as it is related or similar to other expressive and receptive disorders.


Good general information in the area of receptive disorders, especially in psychogenic deafness. Not very useful for aphasia.


Language theory, neurological theory, relation of aphasia to asemia (asymbolia), atactic and amnesic aphasia; relationship of brain area and type of injury to type of aphasia. Types of aphasia and symptomatology. Primarily useful to speech pathologists and clinical therapists.


Written for parents and laymen. Would be difficult for many persons who have not had college education. Excellent coverage of description and understanding of behavior and neurophysiological functioning of the brain-injured child. Aphasia is not specifically mentioned.


Study of sixty children at Children's Memorial Hospital, Montreal, Canada, using the method of Myklebust to differentiate the deaf or hard of hearing, the brain-injured, the autistic, and the mentally retarded. Good diagrams. Mainly general principles, including differential diagnosis, for clinical audiologist. Is not specifically pertinent to aphasia.


Fairly general article. Good for an introduction to aphasia, or for general information for persons in contact with, but not directly training, an aphasic child.


Study conducted on children with congenital word blindness presented in case fashion, and from the point of view of its position among the aphasias and agnosias. Especially for the clinical therapist.


Relationships to linguistics and psychology. Definition and types. General statement regarding testing and treatment.


Deals with historical review, neurology, description of symptoms, testing, diagnosis, and education of brain-injured children. Many diagrams and illustrative cases. Not specifically on aphasia, but the general information and principles are pertinent.


Very brief statement of identification and training.


Very good, clear, and reassuring description and explanation of aphasia for the layman, especially in regard to adult aphasics. Certain relationships are not clear. Little mention of childhood aphasia.


Excellent overall coverage of the current beliefs about congenital and infantile aphasia. Includes references for more detailed study.


(148) Worster-Drought, C. and I. M. Allen, "Congenital Auditory Imperception (Congenital Word-Deafness): And Its Relation to Idioglossia and Other Speech Defects," The Journal of Neurology and Psychopathology, 10:193-236, January, 1930. Original paper from West End Hospital for Diseases of the Nervous System. "In the present communication, the condition known as congenital word-deafness is reviewed, the clinical features and consequences of the defect are described, and its relation to speech defects and especially to 'idioglossia' is discussed." Included is an excellent history of the writings previously done in related areas. Mainly of value to clinical therapists and workers with the deaf. 'Aphasia' is not mentioned.

Case Studies

Presentation of cases. Brief discussion of the neurology of acquired aphasia.

A case study, including a description of behavior, and methods of communication and training.

A good illustrative description of a case, emphasizing symptoms and training. Of little theoretical value.

Brief definition of aphasia. Case study including the basis for the diagnosis.

Presentation of a case of childhood aphasia, and a general discussion of aphasia in terms of the case presented. Good description and discussion; not too technical for any but those totally unacquainted with aphasia.

Presentation and summary of six case histories where children showed aphasia following convulsions and where there was not evidence of structural brain lesions.

Presentation of two cases. No discussion.


Other Sources


(169) Davie, Neilson, "Congenital Aphasia and Associated Condition," *Medical Times*, 37:128-132, 1909. (This was the listed reference; either the volume or the date is incorrect.)


(183) Moyer, H. N., "... (unknown)," Chicago Medical Reporter, 15:305-309; 219-223, 1898.


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CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

Because there exists today such conflicting opinion about aphasia in children, and because the material on it is so scattered, the object of this thesis has been to draw together the information about the theory and therapy of childhood aphasia, and to present as complete a listing as possible of the sources of opinion and information about it. One hundred sixty-one sources have been read and annotated, and thirty-one other sources are listed as having been unobtained. The author index lists one hundred eighty-nine authors. Unfortunately, some sources were inadvertently overlooked, and therefore they are not mentioned in this thesis.

Aphasia is defined as an impairment of language ability, congenital and acquired, sensory and motor, which results from a disturbance of function of the central nervous system in certain areas of the brain dealing with speech and language. A child is any person under sixteen years of age. The etiology, neurology, symptom complex, testing criteria and procedures, teaching and therapy principles and procedures, and prognosis are described and summarized. An annotated bibliography with author index forms the second half of the thesis.
Conclusions

Childhood aphasia is difficult to deal with specifically, because the literature is so varied without being specific. On the theoretical side, the most detailed treatments as well as the greater number dealing specifically with aphasia were by and large written before 1945, which, in terms of modern scientific standards, makes them outdated. The articles on therapy, however, are generally more recent, with several noticeable exceptions. There is not, therefore, always an obvious logical relationship between the theory and the therapy. Articles dealing with a definition of the disorder are conspicuous by their absence in recent years. This points up several crying needs:

1) An agreement between the field of speech pathology and the field of medicine on exactly what they are discussing. This would involve a specific definition of the syndrome in terms of neurology, etiology, time of onset, and symptoms. This may mean that new terminology will be found and the use of the term "aphasia" will be abandoned entirely when speaking of the disorder in children.

2) A care on the part of writers to utilize the accepted classification and terminology. The multiplicity of descriptive terms makes it nearly impossible for a reader to know
exactly what is being discussed. If there are errors and misrepresentations of the literature in this thesis, it is because writers have not specified whether the disorder about which they are writing is congenital or acquired, sensory or motor.

3) A description of exactly what happens neurologically in the retraining process.

4) More specific articles rather than ones dealing principally in general principles. Such articles must relate the specific procedure to the general principles and give the rationale for the general principles in terms of organic processes.

5) More discriminatory criteria and procedures in differential diagnosis.

6) More research on the relationship of the different types of aphasia to hereditary factors, handedness, intelligence, and multiple handicaps.

7) A detailed survey of the incidence of the different types of aphasia.

8) Separate works written, in very specific detail, for parents, doctors, therapists, and teachers.

In the light of the literature analyzed in this thesis, there is certainly a need for more information in the area of aphasia in children.