

Evaluation and Treatment of Reading
Deficits in Aphasic Patients

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In the development of a normal child's linguistic system, receptive control precedes productive control. Before a child is able to use certain language forms, he understands them. More specifically, auditory processing abilities such as discrimination and retention appear to be essential to the normal development of speech. With the addition of an intermediate system of visual symbols, the child learns to read, and later, to produce words in written form. The process of language acquisition is generally considered to be completed by the age of 12 to 15 years.

Subsequently, damage to the language areas of the brain results in aphasia, a deficit in language processing which is disproportionate to the impairment of other intellectual functions. The abilities to read, write, speak, and understand the spoken word are all affected to various degrees, although the specific pattern of impairment depends upon the location and extent of the brain lesion. Individuals who have had relatively normal language systems but have incurred auditory comprehension deficits exhibit comparable deficits in reading comprehension. For example, a patient with Wernicke's aphasia has a posterior lesion involving the auditory association area in the dominant hemisphere of the brain. He generally has severe difficulty understanding spoken language. His reading disability is comparable in degree to his auditory disability, for reading is the written representation of speech, which has lost its meaning for him. The patient with Broca's aphasia who has an anterior cerebral lesion has more obvious difficulty with the output modalities of speech and writing. However, he also has some difficulty with the comprehension of speech and similar difficulty with the comprehension of reading.

In fact, virtually every aphasic syndrome includes some kind of a reading deficit but little reference to this particular sub-group of language-disabled persons can be found in the literature about developmental reading and learning disabilities. This paper, therefore, will discuss diagnostic reading techniques, the selection and use of reading tests, interpretation of results, and considerations for reading treatment

planning which are relevant to the aphasic patient.

Treatment programs which improve auditory processing skills result in a shift across the entire language continuum because of the relationship of auditory functions to all other language skills, including reading. However, reading skills can and sometimes should be tested and treated separately from the overall deficit.

One reason for the use of reading tests is to obtain additional data to demonstrate language change over time. Another is to assist the clinician in selecting appropriate treatment materials. A third reason is to determine whether the patient's reading level is functional. For example, in the absence of functional literacy, results of psychological testing may not be valid. Some kinds of vocational retraining also may not be successful.

Functional literacy is defined as the ability to read and understand commonly available adult reading materials. The comprehension level of most newspapers and magazines ranges between the fifth and seventh grade, which represents the reading ability of most adults. Therefore, an adult reading below the fifth or sixth grade level is not a functional reader. To put these facts into perspective, the average adult in the state of Minnesota has completed 11 ½ years of school, and the national average is about 9 ½ years. The average high school graduate reads at a grade level of 9.5 or 10. To pass the G.E.D., which is the national test for obtaining a certificate of high school equivalency, a minimum reading level of grade 9.2 on the Nelson Reading test is required. Academic success in post-high school courses also requires a minimum reading level of grade 9.2.

The term "reading grade levels" refers to scores which are obtained on standardized reading tests and compared with normative data obtained with large groups of elementary and secondary students. The term "reading" itself has been defined as getting meaning from the printed page. Briefly, the reading process consists of identifying a series of single words within a unit such as a phrase or sentence, and obtaining from the combined meanings a message which is more than the simple sum of the words. Reading comprehension, therefore, consists of at least three components: the meaning of individual words, the relationship of ideas, and a reasoning factor which includes induction, deduction and evaluation. It is the level of reading comprehension which indicates whether a person functions as literate or illiterate.

Judgments of reading ability have sometimes been made solely on the basis of a person's ability to read aloud. However, this ability depends only on the oral production of the words, much as one might read a series of nonsense syllables. It is merely the pronunciation of words without comprehension or retention of meaning. Because many aphasic patients have difficulty with

speech production, the effort involved in saying the words aloud may diminish the ability to remember the meaning. But other observations can be made from oral reading, such as the occurrence of paraphasic errors, omissions or substitutions of word endings, or errors that suggest the presence of a visual field defect.

Reading comprehension is tested more accurately with a silent reading test. Standardized silent reading tests are most useful in determining the upper limits of reading ability in terms of scores which yield grade level equivalents. The ideal reading test should consist of separate timed sections dealing with the meaning of individual words and the comprehension of sentence-length and paragraph-length material. Each section should contain items of increasing difficulty. The time allotted for each section should be more than a few minutes to avoid penalizing the aphasic patient, who often has difficulty getting into the response set. Tests of this kind which have timed sections and items of increasing difficulty sample both reading rate (speed) and complexity level (power) at the same time. These tests may also be administered without a time limit in order to test the patient's ability to comprehend increasingly complex reading materials without penalizing him for his slow rate. However, the findings must be interpreted with caution when the test is not administered under standard conditions.

Standardized tests have directions which are to be read to the testee verbatim. For the aphasic patient, it is often necessary to change the wording so that the content of the instructions is retained, but the directions are shorter, simpler, and more redundant. Frequently, sample test items are shown so that a demonstration can also be given. However, once the patient understands the directions, the test should proceed as specified in the test manual.

When using tests which have separate score sheets for marking the answers, caution is advised. The aphasic patient may be unduly confused and distracted by a complicated system of blank spaces to be filled in or numbered. He will then be penalized for his problems with following directions in ways that did not hinder the norm group in taking the test. To avoid loading the test against him and to test reading comprehension rather than test-taking ability, cover each sheet of the test booklet with an acetate cover. Instruct the patient to circle the correct answers with a grease pencil, and later transfer his answers to a score sheet or to a sheet of plain paper.

Frequently an aphasic patient can comprehend sentences at a higher grade level than he can paragraphs. As the length and complexity of the material increases, the limitations of his short-term retention span are reached, and performance declines. In contrast, comparatively higher scores on paragraphs are generally seen when the reader is lacking skills required for

adequate single word identification but has a normal retention span. This reader can compensate for occasionally missed words when they are within the normally redundant context of the paragraph. The pattern of lower reading level on sentences and higher reading level on paragraphs is seldom seen in aphasic patients.

Two types of error patterns may be seen in test results. The patient answers initial test items with relative ease but as the items become more difficult, his performance breaks down and he may say that he is only guessing or he may reject the rest of the items, indicating that he has gone beyond the limit of his reading competence. In other cases the error pattern will be sporadic almost from the outset. Discovering the reasons for the erratic pattern of performance requires further examination by informal methods. The patient may have an intermittent pattern of perception, or may have difficulty monitoring his responses.

The handout contains a list of some reading tests which are suitable for use with aphasic patients. Notations indicate the time allotted for each subtest, the range of reading levels tested, and so on.

The results obtained on these standardized tests indicate the patient's maximum reading ability, or the upper limit of his comprehension. When a patient's score is equivalent to a grade level of 6.0 for example, this means he can read as well as the average student taking the test at the beginning of grade 6. It does not mean that he compares with that average student in conceptual ability, intelligence, maturity, or in any other way except his present reading ability. Since these test results indicate maximum reading ability, the patient's instructional reading ability is about one grade level lower; in this case about fifth grade level. At this level the patient can comprehend 75% or more of the material, as determined by percent of comprehension questions answered correctly. (The instructional level represents the fulcrum of his reading ability curve). His independent reading level is about one grade level below that; in this case, at fourth grade level where 90% or more of the material is comprehended, and he can read independently with success, and therefore with enjoyment.

Oddly enough, not all aphasic patients seem to be aware that they have a reading deficit. Some, usually more severely involved, can be seen reading newspapers and magazines, and when asked, declare that they can read. They lack the feedback to realize what they have misunderstood or missed. Recognition of the deficit may not come until they take reading tests, if at all. Some very high level patients read at a functional level but say that the rate is slower than before or that they need to reread some parts to grasp the meaning.

To determine the degree of the patient's reading deficit, his scores on a reading test may be compared with his premorbid

reading level as estimated on the basis of his educational and vocational achievement levels. If the patient is a good prospect for reading treatment, he can give valid answers to questions about his educational and vocational backgrounds, including 1) highest grade completed; 2) kind of school, i.e., college preparatory, country, etc.; 3) kind of class: special, vocational, remedial, or accelerated; 4) school achievement level: average, marginal, or top student; 5) subjects favored, especially English when compared to mathematics; 6) attitudes toward school and especially toward reading; 7) premorbid attitudes toward reading; 8) premorbid reading habits; and 9) reading level required for premorbid employment.

When the aphasic reading deficit has been estimated, decisions about offering treatment can be made. Higher level patients often initiate the request for help with reading. The most important factor is the degree of the patient's interest, since he will work on reading independently most of the time. (If his skill level does not permit independent work, it is often best to postpone work on reading comprehension in favor of other kinds of treatment). Remedial reading materials at the patient's instructional level serve as an overall guide for treatment. At the outset, a full treatment session may be used to introduce the material and the techniques for its use. A feedback system should be employed; an answer strip or key should be used immediately after each unit, both during treatment sessions and for independent practice. Wrong answers should always be reworked promptly to improve skills. Individual treatment sessions can continue to deal primarily with auditory and perhaps verbal deficits, with a short time period set aside to review reading progress and to discuss the problems encountered. The patient can demonstrate his work methods, along with a short oral reading. The lesson will serve as an informal diagnostic test to pinpoint the kinds of errors made in processing.

The reading process begins with the identification of single words. It is essential that the aphasic patient master this process before working on longer strings of words. Any string of words is too long for the patient to comprehend if his struggle with word identification causes him to forget the meanings of the other words. Words may be identified by sounding them out letter by letter, by identifying familiar segments or morphemes within the word and sounding it out by segments, or by recognizing the total visual configuration of the word. Normal readers use various combinations of these methods. Note whether the patient makes visually related errors, such as substituting the letter "d" for the letter "b" or if he substitutes or omits word endings. He may have difficulty identifying the word or getting the meaning of the word. He may be unable to get the inferential meaning from a string of words. He may have trouble remembering stated facts, or getting the main idea. Examples of comprehension questions testing these skills can be found in the New Practice

Readers listed on the handout. Basically, the same principles used for treating any speech and language disorder apply to treating reading disability; treatment plans are made on an individual basis, with material at the level where the patient can usually respond correctly but makes some errors. The length and complexity of the material is gradually increased as improvement takes place. As specific processing problems are identified, additional practice material may be designed to deal with them.

Auditory skills play a vital part in reading comprehension. They appear to be necessary but not sufficient for success in reading. Schuell, in a factor analysis, found a high relationship between auditory processing ability and virtually all other language functions. Clinically, we have found that when treatment consists solely of auditory processing tasks, gains in auditory comprehension are very often accompanied by corresponding gains in reading comprehension. For many patients we have worked out programs consisting mainly or entirely of large numbers of gestural tasks, using such visual stimuli as pictures of objects with or without printed names, action pictures representing various verb tenses, printed words or phrases, objects, etc. We have also designed and constructed similar programs for the Language Master for patients to use for independent practice. Further investigation might reveal that an efficient way to treat reading disability is to work directly on auditory processing skills at appropriately graded levels of length and complexity.

In summary, reading comprehension deficits are frequent if not invariable concomitants of aphasia. Patients with specific aphasic syndromes are likely to have reading patterns which reflect their auditory impairments. Reading deficits may be evaluated by the use of standardized tests to determine maximum, instructional, and independent reading levels. Prior to and during treatment informal tests may be used to analyze the kinds of errors made and to select specific techniques and kinds of materials for use in treatment. The principles of treatment for reading disability are basically those used for other speech and language disabilities. Retesting provides a measure of gains made during treatment and a measure of functional literacy. Treatment of auditory processing deficits may facilitate reading comprehension skills.

Reading Tests

Houghton Mifflin Co., Boston, 1962

Nelson Reading Test Range: Grade 2.0 - 10.5

1. Vocabulary: 100 items, consisting of sentences which are completed by choosing one of five words. Items increase in difficulty. Administration time: 10 minutes.
2. Paragraph Comprehension: 75 items; Each reading comprehension paragraph is followed by three multiple-choice questions relating to general significance, details, and predicted outcomes. Items increase in difficulty. Administration time: 20 minutes.

Harcourt, Brace and World, Inc., New York, 1943

Iowa Silent Reading Tests, New Edition, 1943

Elementary Test Range: Grade 1.9 - 10.3

1. Word Meaning: 55 items, consisting of stimulus words, each matched to one of four other words. Items increase in difficulty. Administration time: 9 minutes.
2. Sentence Meaning: 27 questions, such as "Will a difficult task be performed easily?", answered by marking "yes" or "no". Items increase in difficulty. Administration time: 3 minutes.
3. Paragraph Comprehension: 30 items: each reading comprehension paragraph is followed by three multiple-choice questions relating to the main idea and detailed information given. Items increase in difficulty. Administration time: 7 minutes

The Secondary Test is similar, and tests a range of grade 4.3 - 13.0.

Teachers College Press. Teachers College, Columbia University, New York, 1965

Gates-MacGinitie Reading Tests

Primary C: Range: Grade 1.3 - 7.1.

1. Vocabulary: 12 items, matching one of four words to a picture. 40 items, matching one of four words to the stimulus word. Items increase in difficulty. Administration time: 20 minutes
2. Comprehension: 48 items; each short paragraph is followed by two multiple-choice questions relating to conclusions and stated details. Administration time: 30 minutes.

There are several other tests in the series, ranging from Readiness through grade 12.

Materials for Reading Practice

McGraw-Hill Book Company: Programmed Reading for Adults, a Sullivan Associates Program.

Webster Division, McGraw-Hill Book Company: New Practice Readers.

Teachers College Press: McCall-Crabbs Standard Test Lessons in Reading.

Barnell Loft, Ltd.: Specific Skills Series.