

THE RETARDED READER

William Arendshorst, M.D.

(Given in mid 1960's at
Professional Men's Club)

My first experience in the difficulty of learning to read came about in 1950 when I was in residency in ophthalmology. One of the psychiatrists in pediatric psychiatry got a Rockefeller grant and studied 250 children who had difficulty in reading. These children aged 3-12 years were given a complete physical examination, including going through the department of ophthalmology and the department of psychiatry, of course. Some of the results of this study by Dr. Rabinowitz are incorporated in this paper.

In my practice frequently a child is brought in for examination with the only complaint from the parents that Johnny has trouble learning to read. This again stimulated my interest in the subject through the years and I thought it would be something different for you to think about. Some of the principles of remedial reading which we will discuss here have been applied to the speed reading courses which some of you or your friends have been taking.

Reading and living are practically synonyms in our society. It is very difficult to accomplish anything in our modern day world without the ability to read. All fields of human endeavor make their demand on reading.

In schools at all levels, a high relationship exists between reading ability and scholastic success. The rapid reader is the good student; the retarded reader a poor one.

Reading is a three-step process involving perception, recognition and interpretation. It is not simply a process of extracting meaning from the printed page, but of giving proper interpretation and application to the printed symbols. One child called reading "just talk wrote down."

A brief review of the anatomy and physiology involved in reading should be worthwhile at this point. As you recall, the eye merely sees or takes the picture. The picture or image from each eye is referred along the optic pathways to the back part of the brain where the visual cortex lies. Here the images are perceived. These sensations are then referred to the temple part of the brain, the angular gyrus where conception occurs and "we get the message." From these sensory levels, the motor components-action then may come into play. This may include lip movement, speaking and writing.

Actually the visual development is such that by the age of 3-4 years a child can demonstrate 20/20 vision. However, his auditory vocabulary, his inability to recognize slight differences in symbols, his inability to concentrate for long periods, his lack of experience (memory), make reading a difficult if not impossible task. But examples of children reading at this age are well known. Specialized methods of reading education at pre-school levels have succeeded. But 15% of the beginning students are not ready to read until 7-8 years of age. In the kindergarten, efforts are made to develop concentration, to associate words with pictures, to notice that some words such as fish and fall begin with the same letter and have a common sound. A little later he becomes aware of blends

like "br" and "st" and the foundation of phonics has unconsciously begun. In the third year of school a child begins to break down words into syllables and spot common prefixes and suffixes. This constitutes the foundation of structural analysis. All this time, auditory, visual, writing associations are being used to aid the learning of reading. Thus a child uses much articulation or whispering as he silently reads. But in the third year of school, as a child's reading speeds up, audible reading disappears, and phrasing develops. As he encounters unfamiliar words, he uses his acquired word analysis skills. He uses context clues, structural clues and phonic clues and his dictionary, or his parent or a know-it-all seat companion to help him. These skills develop throughout a person's life.

Originally a child looks at each word so that his eyes stop many times as they travel across the line of print, but as his efficiency and skill improve, the number of stops -- saccadic movements -- are reduced, and reading speed increases. As a matter of fact, Goethe once said in his later years, "The dear people do not know how long it takes to learn to read. I have been at it all my life and I cannot yet say I have reached the goal."

Children vary in reading ability. The current cry of "Why don't the schools teach reading?", does not constitute an indictment of modern schools and their methods of teaching reading. Many studies show that children of today read as well if not better than youngsters of a generation or two ago. One can always expect some variability in

reading skills because of individual differences. Severely retarded readers always will remain with us in spite of skilled teachers, concerned parents and sputniks.

The types of readers can be classified into:

THE DEVELOPMENTAL READER who shows little difference between his mental age (IQ) and his reading achievement. His capacity and achievement are equal. Sixty percent of the pupils fall into this category. They learn to read satisfactorily by any method.

THE CORRECTIVE READER is behind 1-2 years in his reading level, but can in normal classroom situations with standard remedial techniques be returned to grade level. Twenty-one percent of the pupils find placement here.

THE REMEDIAL READER has serious language disability and shows associated learning problems. He doesn't profit from any good teacher or from good teaching techniques. Emotional and personality problems result and many of these constitute the dropouts. This group requires special diagnostic and remedial techniques.

The child falling into this remedial reading class is usually a male child of normal or superior intelligence. There may be ambidexterity, left-handedness and frequently mixed dominance. There is a persistence of the normal childhood tendency to reverse letters and symbols such as "p" for "q", a tendency to reverse words such as "stop" for "tops", and in rarer cases, actually mirror writing and reading. Emotional and personality problems may later develop in this child, reading 2-3 grades below his grade level, but often doing better than average in arithmetic. The remedial reader must be differentiated from the

slow reader. The slow reader reads below grade level, but this reading level is consistent with his intelligence level.

There is no one cause that explains all reading failures. The causes of reading failure are as extenuating as the causes of a headache and to many, the retarded reader is a headache -- one cause.

Reading disorders are a major cause of school failures. As many as 300,000, roughly 15% of the more than 2 million school beginners each year, will be retarded readers. This outranks all other major disorders of childhood. Three of four of these are boys. Ninety-nine percent of first grade and 90% of second grade failures are due to reading difficulties.

Reading failure is the result of a complex combination of factors. These have been classified in many ways, often depending on the field of work in which the discussant is working. At a recent meeting, these factors were listed as Neurological, Psychiatric, Educational, Genetic, Visual and Auditory. It was felt that the first four were by far the most important and the last two practically insignificant.

The Neurological group can best be considered if we think of degrees of brain damage. In lethal degrees of damage we have abortions, stillborns or neonatal deaths. In sub-lethal degrees we find mental retardation, epilepsy, cerebral palsy and in borderline manifestations of brain damage, there may be behavior disorders, speech disorders, reading disabilities. In the last group there may be an indication of the location of the brain damage by one of many possible techniques, but more often none of

the present-day testing methods will reveal any defect. The disability is considered by some to be the result of an imperfect cerebral lateralization of the language process and therefore a result of a lack of cerebral dominance, and by others to be a reflection of a genetically determined dysfunction or a delayed or incomplete maturation of this function in the parietal area of the brain. These people's defects in spatial orientation may be regarded as a disturbance in Gestalt formation -- a parietal lobe function.

This is the case with our problem of reading disability. It is interesting in my field of ophthalmology, that in normal births, something like 30% of the new-born will show retinal hemorrhages. How often may there not be insignificant cerebral hemorrhage, but leaving minimal scar in the angular gyrus area to produce a cerebral dysfunction causing reading difficulty? Sixteen percent of reading problems do have neo-natal distress. Brain tumors, cerebral injuries, small strokes are notorious in producing handicapped readers. In these cases a person knows what he sees, but cannot read and to this type of motor defect, we give the term DYSLEXIA. This word has been used incorrectly as synonymous with the poor or retarded or remedial reader.

Psychiatric factors become important to the young student prior to entering school, when a physical defect has kept him overprotected, secluded and inexperienced; when the death of a parent or a broken home has caused severe family adjustments. After beginning school, emotional upsets in the family, frequent movings, language barriers, sibling rivalry, poorly adjusted parents may cause obstructions in the child's learning abilities, particularly the learning of an abstract thing

such as reading at grades 1 and 2. Examples of the last are frequent in my office. The child whose parents push the child into every activity with a high achievement goal in sight frustrate the little guy until he can't learn to read from anyone.

Educational factors have importance. An immature child will not be ready to learn reading nor will an immature teacher be able to give enough of herself to successfully teach. The teacher must have enough enthusiasm, motivation, to project this feeling to her students to create a genuine interest in reading. And the textbook should accomplish this same motivation. These same things apply to remedial reading. Successful teachers have always employed a variety of methods, children have learned to read in many different ways when the teacher and her material motivate the pupil. One system should never be universally adopted because teachers and students differ.

Until 1925, phonic methods were used, but procedures de-emphasizing phonics -- sight or word picture reading -- emerged and for a time in the late 1940's teachers got the idea that phonics were old fashioned and hence bad. The result was that many of the children who learned to read during the 1930's and 1940's learned no phonics at all or too little to be useful. Some of these are now our teachers today.

It is true that an experienced reader grasps ideas rapidly from words or phrases as a whole, sight reading; he stops to analyze only when he encounters an unfamiliar word. But, to the child learning to read, many words are unfamiliar and a knowledge of phonics is essential.

It is surprising how a child understands what a group of letters means when he can say the word. Phonics should be included in every reading program; and should be begun early. It is not sound for the teacher to postpone phonics until the child needs it because when he needs it, it may be too late or a teacher may not be present to help him.

Some families have definite histories of poor readers in more than one generation. The male preponderance suggests a genetic relationship. Most of the children with a reading problem have perfectly normal eyes. Even when a significant defect is uncovered and is correctable by glasses, exercises or surgery, the reading problem may still be present. If a child is motivated adequately the minor eye problems of refractive error, muscle imbalance, underdeveloped vision in one eye compared to the other, crossed dominance, have little or no effect on the learning process. The subject of retinal rivalry has been thought by some investigators to be a cause since it could conceivably confuse the reader in his fixation movements across a line of print. Retinal rivalry can be demonstrated where one eye views a figure such as a lion and the other eye sees a cage. With the two eyes working simultaneously, the lion or the cage is more definitely seen. In uncertain retinal dominance, the eye opposite the handedness has been occluded. Similar reasoning and treatment has been advocated in cases of a dominant sighting eye being opposite the dominant hand of the reader. All of this is specious reasoning and is not considered sound neurological thinking. After all, many excellent readers have mixed dominance also.

Auditory problems are self-evident. The best example of a completely mixed-up youngster, blind and deaf, is Helen Keller who with her tremendous intellect and great effort, using gifted teachers, developed exceptional reading ability.

It has been mentioned that the most important phase of treatment of those with language difficulty is to diagnose the case early and begin remedial or special methods to help this individual learn to read. An analysis of these affected persons shows, that if remedial programs are begun :

at Grade 2 ... percentage recovery	82% to grade level
Grade 3	46%
4	42%
5	18%
6	8%
7	10%
8	11%
9	6%

The proper procedure in the remedial reading program is to make a complete analysis of the individual and his specific needs. Is he a slow reader, a developmental reader, a corrective reader or a remedial reader? We need to know the I.Q. because this does provide an average by which we can judge the child's potential. A psychological evaluation tells us about the personality of the individual. A physical examination may uncover some difficulty such as hypothyroidism that would inhibit motivation on anything the person attempted. The roles of the educator, psychiatrist, pediatrician, psychologist, neurologist, ophthalmologist and otolaryngologist may all be important in helping the individual and there should be adequate communication between any of these used

specialists so that a common goal is present.

The classroom teacher's most practical instructional approach for these poor readers lies in grouping -- achievement grouping, tutorial grouping, special needs grouping. This permits greater individualization. Teachers have employed a free reading approach during which time a student reads for pleasure where his interests and abilities lie. Sharing of ideas that the student has learned through buzz sessions urges him to read more. Special reading rooms that can be used by small groups who require special help is a good idea. Individual tutoring after school hours enables the remedial reading teacher to tailor the teaching to the individual. Reading Clubs are useful in creating an interest in reading. Reading Clinics at college level use a team of specialists to aid a student. This particular field of teaching is wide open to quackery since there are a fair number of unknown areas. I consider such things as the creeping, crawling trampoline activities along with the giving of window glass spectacles as having no rationale in the treatment of this dyslexia.

Finally, a word about speed reading. You will recall that fixation pauses and frequency of fixation determine our reading speed. A pair of identical and fraternal twins demonstrated a significant similarity in these fixation pauses and frequency of fixation. Training may alter these two variables to a certain degree. The student may show a continued improvement through college level, but often the speed level remains at Junior High level of about 250 words per minute which is the mean reading speed for the adult population. Often the same fixation patterns

held for silent as well as oral reading in the slower reader while a faster reader received more than one word in a fixation. An accomplished reader has a flexible reading rate varying his fixation pause from 0.22 seconds depending on difficulty of the material. A skilled reader can read simple material up to 720-1000 words per minute which is the physiological limit. It takes 0.06 - 0.12 seconds for a light stimulus to trigger a cortical response. This figure may include data processing along the way. A two-word phrase was followed by a 0.125 second pause for the word to be recognized and the longer the word phrase the longer the time element. Adding up conduction time, processing time, long and short saccades, we can see that fixation pause plus a saccade takes about 0.25 seconds. Therefore, there are 240 fixation pauses per minute. One can usually see three average sized words in a saccade and this comes to 720 words a minute. If conduction time, processing time and a greater word group is present, 1000 words per minute could be conceivable. Anyone reading faster than this is skimming.

Speed reading courses attempt to convert oral readers into visual readers and teach the student to pre-survey his material intelligently. An oral reader is converted into a visual reader by forcing. The speeder forces his eyes to stay one step ahead of a pacing device which may be an occluder or one finger moving down the page at a prescribed speed. After enough drill, the eye-brain complex gradually switches to a visual memory form of reading. A tachistoscope does no better. Undeniably these courses increase reading speed because the fixation pause is decreased and words per fixation are increased. With the

increased concentration necessary to accomplish speed reading, comprehension improves in all but the most difficult material.

Probably this whole discussion can be boiled down to the simple fact that learning to read takes a lot of practice using the technique that is appropriate for you. Isn't this true with about any learning process, from getting on with girls to playing water polo?

"The Doctor Eyes the Poor Reader, Chas. Thomas, Publ. Springfield, IL

"Pediatric Ophthalmology" July 1965, 53 Dyslexia & Dominance,
Benton, McCann, Larson

Notes at American Academy, Nov. 1967 - Herman K. Goldberg,
Baltimore, MD

"A Review of Speed Reading" David Miller, American Opth. 62, 334
1966.

J. Bettman, E. Stem, et al "Cerebral Dominance in Development Dyslexia"

H.K. Goldberg, "Reading Difficulties in Children" Internat. Ophthy clinic
Diagnostic Procedures in Pediatric Ophthal. 3 #4 977 (1963)

J.R. Gallagher "Poor Readers and the Ophthalmologist"
Int'l Ophthal clinics Refraction in Children 2, #4 1962 p. 905