Reprint from February, 1929, The Journal of Educational Psychology.

THE "SIGHT READING" METHOD OF TEACHING READING, AS A SOURCE OF READING DISABILITY

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I feel some trepidation in offering criticism in a field somewhat outside of that of my own endeavor but a very considerable part of my attention for the past four years has been given to the study of reading disability from the standpoint of cerebral physiology. This work has now extended over a comparatively large series of cases from many different schools and both the theory which has directed this work and the observations gained therefrom seem to bear with sufficient directness on certain teaching methods in reading to warrant critical suggestions which otherwise might be considered overbold.

I wish to emphasize at the beginning that the strictures which I have to offer here do not apply to the use of the sight method of teaching reading as a whole but only to its effect on a restricted group of children for whom, as I think we can show, this technique is not only not adapted but often proves an actual obstacle to reading progress, and moreover I believe that this group is one of considerable educational importance both because of its size and because here faulty teaching methods may not only prevent the acquisition of academic education by children of average capacity but may also give rise to far reaching damage to their emotional life. The sight reading method (or "look and say" of the English) has been credited with giving much faster progress in the acquisition of reading facility than its precursors and this statement I will not challenge if the measure of accomplishment be the average progress of a group or class. Average progress of large numerical units, however, makes no allowance for the study of effect in individual, particularly if certain of them deviate to some degree from the others in their methods of acquisition and therefore in their teaching requirements. To the mental hygienist whose interest is focused on the individual and his problems rather than on group progress the results as determined by average accomplishment are of little value whereas the effect of a given method on the individual child is all important.

Outstanding cases of so-called "congenital word blindness"—a complete inability to learn to read—have been recognized and studied for a number of years at first chiefly by physicians. It has also been recognized by teachers and

psychologists that there is a large group of children who have a much greater difficulty in getting started in reading than would be expected from their ability in arithmetic, from then ease in auditory acquisition and from their general alertness. In the past there has been a tendency, at least among medical men, and to a considerable degree among psychologists as well to exclude the minor cases of slow learning in reading from the category of congenital word blindness. This largely derives from the work of Hinshelwood[1] who made the first extensive study of these cases following the pioneer work of Kerr[2] and Morgan.[3] Hinshelwood's statement in this is ". . . the rapidity and ease with which children learn to read by sight vary a great deal. No doubt it is a comparatively common thing to find some who lag considerably behind their fellows, because of their slowness and difficulty in acquiring their visual word memories, but I regard these slight defects as only physiological variations and not to be regarded as pathological conditions. It becomes a source of confusion to apply to such cases as has been done of late the term of 'congenital word blindness' which should be reserved for the really grave degrees of this defect which manifestly are the result of a pathological condition of the visual memory center and which have proved refractory to all ordinary methods of school instruction." Unfortunately, Hinchelwood's criterion is a double one, neither part of which can be looked upon as of sufficient diagnostic accuracy to establish a clear-cut entity. Not only has no pathological condition of the visual memory center yet been substantiated in such cases but there are certain neurological and clinical data which suggest that no such condition exists. Again, the "ordinary methods of school instruction" does not prove to be an accurate measure. Such methods vary widely and our own figures indicate that the number of children who show a significant handicap in reading is to some degrees related to the teaching method in use. Bachmann[4] has called attention to the looseness of the concept of congenital word blindness and related to this the striking variation in the frequency of such cases as recorded by various authors. Without some fairly clear objective symptoms on which to establish the entity, the choice of cases to be included naturally rests on the judgment of the examiner as to the severity of the disability. My own initial work[5] in this field led to a firm conviction that we were dealing here, not with two separate groups—a physiological and a pathological—but that those children who were specifically retarded in reading (thus excluding cases of general mental defect) formed a graded series extending from the normal to the extreme and that they showed consistent characteristic performance which

not only would serve for diagnosis but which also was highly suggestive of the reason for their lack of progress and which gave excellent cues to methods for retraining. I was convinced not only that the specific reading disability formed an entity of much greater numerical importance than had been recognized before but that it was (even in the extreme cases) an obstacle of a physiological nature rather than a pathological condition and that therefore adequate special methods of teaching should correct it.

I can not here go fully into the details of the anatomical background for our present theory of this disability but some presentation is necessary in order to illustrate the basis for the criticism of teaching method which is here offered.

Only a small portion of the retina of the eye is used in acquisition of reading. This is the focus of central vision or the *macula lutea*, so called because it is seen as a yellow spot in ophthalmoscopic examinations. The rest of the retina receives only general and less detailed impressions coming from outside the rather small area to which we are directing our attention. This point is noteworthy because the nervous connections of these two divisions of the retina are quite unlike. The peripheral retina or outer zone has connections with only one-half of the brain (there are some complexities here but these need not concern us). The *macula lutea*, however, which receives impressions with greatest detail and which is hence used exclusively in learning to read, has a double connection with the brain. The nerve fibers arising here divide and one-half of those starting from each *macula lueta* to the visual area of the hemisphere of the brain of the same side and the other half to the corresponding area of the opposite hemisphere. Thus impressions received by either eye, or by both eyes, are relayed simultaneously to both hemispheres of the brain. This double implantation does not give us a double sensation in consciousness, however, as a touch on both thumbs would do. The simultaneous activity of both areas results in our seeing but a single image. The visual sensation, however, is not a unitary function. There is apparently need for the simultaneous or additive activity of several parts of the visual cerebral mechanisms to complete the linkage of a printed symbol with its meaning and the steps in this process arc shown in relief by differential losses such as are seen when certain parts of the back of the brain are destroyed by disease. When all of that part of the brain which has to do with vision is destroyed the individual becomes totally blind. The eyes, however, are not damaged and they can still be moved and

they will turn toward a sudden sound and the pupils will respond by closing and opening to increase and decrease of the amount of light which strikes them. This condition is known as cortical blindness, to differentiate it from blindness due to disease of the eyes or optic nerves. We may, however, see things surrounding us with sufficient clarity to avoid colliding with them, that is to guide our general body movements but without being able to appreciate the meaning of things which we see. This was first demonstrated by Munk in dogs in which much of this part of the brain had been removed. They were able to avoid collisions but did not recognize their master or even food by sight alone, and did not cringe from a whip. To this condition Munk gave the name of mindblindness and its parallel has since frequently been recorded in cases of disease of the human brain. Apparently at the first level the visual area of the brain serves as a very accurate guide to motion and it probably also furnishes the element of awareness of the external origin of a sensation (as contrasted to & memory). In psychological terms it furnishes the pure perceptual element to sensation but simultaneous or additive activity in other higher level visual areas are requisite to attach meaning and again we know that this is not accomplished in one step. If destruction of brain tissue happens in a certain area there results a condition in which the patient not only can see correctly but can also understand the meaning of objects seen, but in which the ability to read the printed or written word is entirely lost. That vision in the ordinary sense is normal, is shown by the fact that such a patient can copy printed material but cannot read either the original or his copy. Thus we see from these differential losses that the process of linking a printed word to its meaning passes through at least three stages of elaboration in the brain before it is completed.

There are differences, however, in the brain destruction necessary to produce losses at these different elaborative levels. Destruction in one hemisphere only is not sufficient to produce either cortical blindness or mindblindness. At these first two levels of elaboration, that is in perception and recognition of the meaning of objects, apparently destruction must involve the areas subserving these functions in both hemispheres before their loss results. The two hemispheres are apparently of equal importance here as it apparently makes no difference which side is affected; i.e., either hemisphere is alone adequate for these functions. Exception must be taken to these statements in the case of peripheral vision but, as noted before, this is not of interest to us here since central vision is used exclusively in learning to

read. When we come to the third plane of elaboration, the situation is strikingly different, this is the level at which the written or printed symbol is linked with its meaning and hence it is variously described as the associative, concept, or symbolic level. Here not only is damage to one hemisphere sufficient to destroy function but it makes a difference which hemisphere is affected. If the hemisphere which is known as the dominant happens to suffer, a complete loss of this function results and the patient becomes word blind. If, on the other hand, the damage occurs in the other hemisphere—the non-dominant—nothing apparently happens. So entirely without result is a destruction here that this area of the brain takes its place with certain others among those which the surgeons called the "silent areas" of the brain. Obviously, the visual records implanted in both halves of the brain are not requisite for reading. This situation also exists in the field of understanding of the spoken word, and of speech and of writing. In all four of these functions destruction in the dominant hemisphere in the so-called language zone is meaningful while destruction in exactly similar parts of the opposite hemisphere is meaningless.

Thus we learn to understand, to read, to speak, and to write words from sensory records or engrams of one hemisphere only. This fact is so striking that we have been prone to overlook what must happen in the inactive side. We believe today that the completed growth and development of nerve coils is largely a result of stimulation. If cells do not receive stimuli they do not reach their full development. The two sides of the brain do not show much, if any, difference in size or complexity and certainly no such difference as we see in function as outlined above. To account for equality of growth we must accept equality of stimulation—equal nervous irradiated of the two sides—and if they are equally irradiated, records must be left behind in each; i.e., engrams must be formed in the non-dominant as well as in the dominant hemisphere. To account then for the difference in effect of damage in the two sides we must assume that the engrams of one side become the controlling pattern through establishment of a physiological habit of use of that set and that the other set of recorded engrams is latent or elided. Variations in the completeness of this physiological selection, i.e., failure of elision of the non-dominant engrams, forms the kernel of my conception of the reading disability. Such a theory conforms nicely to our observations that these cases are not to be divided into two categories, that is, cases of word blindness and cases

of slow acquisition of reading, but that they form a series graded in severity according to the degree of confusion which exists in choice of engrains and it also offers an explanation of certain errors and peculiarities which characterize their performance.

The two halves of the body are strictly antitropic, that is, reversed or mirrored copies of each other. The muscles and joints of the right and left hand, for example, are alike but reversed in arrangement. This is also true of the groups of nerve cells in the spinal cord which control the simpler motor responses (spinal reflexes) and also of the cells in the brain which combine or integrate these simpler spinal units into more complex acts. The movements of the left hand, therefore, which are the exact counterpart of the right will give a mirrored result. Thus, the movements of sinistrad (mirror) writing with the left hand are exactly comparable to those of dextrad writing with the right hand and it seems therefore highly probable that the engrams which are stored in the silent areas of the non-dominant hemisphere are opposite in sigh, i.e., mirrored copies, of those in the dominant. If then these opposite engrams are not elided through establishment of consistent selection from one hemisphere we would expect them to evince themselves by errors or confusion in direction and orientation and this is exactly what we find in cases of delayed reading.

This description is really "putting the cart before the horse" as our observations of tendency to reversals came first and the theory developed therefrom but this method of presentation has been adopted for the sake of clarity. Many workers with word blind children have noted their tendency to reversals but none, so far as I am aware, have offered an adequate explanation of it.

My original studies in a small group of cases convinced me that there were certain “symptoms” in reading disability which seemed to characterize the whole group and these were confusions between lower case b and d and between p and q, uncertainty in reading short pallindromic words like was and saw, not and ton, and on and no; a tendency to reverse parts of words or whole syllables as when gray is read as gary, tarnish as tarshin and tomorrow as tworrom; a greater facility than usual in reading from the mirror, and frequently a facility in producing mirror writing. These observations have been adequately supported in an extended study of a much larger group of cases. Many other types of errors are to be found in the performance of retarded readers but they appear to me to be secondary effects due to the failure of association which has resulted from the obstacle presented by confusion in direction. The relation of the cardinal symptoms to the theory as

above outlined is obvious and I think has direct bearing on the teaching method. Visual presentation will, hypothetically at least, result in the implantation of paired engrams and certain other factors must determine which of these is selected for associative linkage. What these factors are as a whole, we can not consider here although it may be well to suggest that heredity probably plays a part in the establishment of dominance here comparable to that which it plays in stuttering and in left-handedness. Undoubtedly training influences may be brought to bear on this process of choice, however, and from the theoretical standpoint the most promising of these should be that of kinesthetic training by tracing or writing while reading and sounding and by following the letters with the finger (a method under taboo today) to insure consistent direction of reading during phonetic synthesis of the word or syllable.

Under a grant from the Rockefeller Foundation, an extended field study was carried out in 1926-27 in Iowa by the organization, as a part of the research work of the State Psychopathic Hospital, of a Mobile Mental Hygiene Unit to visit schools in various communities and a Laboratory Unit to study selected cases more intensively. Fuller reports of these studies are to appear elsewhere but certain observations may be quoted here. In my original group of reading disability cases, I was surprised at the large proportion of these children encountered. Fifteen out of one hundred twenty-five children sent by their teachers to our experimental field clinic for a variety of problems[6] seemed to me to show evidence of this trouble. In our extended work we have found in every community visited no less than two per cent of the total school population to be retarded readers showing this characteristic picture. Our studies were not carried out as a survey and hence these figures probably fall far below the actual numbers. There was however a difference in the numbers of cases encountered in certain communities which seemed to bear directly on the subjects here considered. Of two communities of about the same constituent population, in one we found about two per cent of the school population to be retarded in reading to a significant degree and to show symptomatic evidence of the specific disability, while in the second we found more then double this percentage. In the community with the lesser number of cases, sight reading methods were employed but when children did not progress by this method, they were also given help by the phonetic method. In the town with the larger number, no child was given any other type of reading training until he or she had learned ninety words by sight.

Aside then from theoretical considerations, this strongly suggests that the sight method not only will not eradicate a reading disability of this type but may actually produce a number of cases. Moreover, our retraining experiments[7] seem to indicate clearly that such children can be trained to read properly with adequate special methods devised to eradicate the confusion in direction and in orientation and this has also been borne out by the remedial efforts of other workers.

Our studies of children with reading disabilities has also brought to light certain other aspects of the problem which are of educational importance but which can not be elaborated here. Among these were notably the effect of this unrecognized disability, upon the personality and behavior of the child. Many children were referred to our clinics by their teachers in the belief that they were feeble-minded, others exhibited conduct disorders and undesirable personality reactions which upon analysis appeared to be entirely secondary to the reading defect and which improved markedly when special training was instituted to overcome the reading disability.

In brief, while "sight reading" may give greater progress when measured by the average of a group, it may also prove a serious obstacle to educable children who happen to deviate from the average in the case of establishment of a clear-cut unilateral brain habit. These physiological deviates form a graded group extending in severity from the normal to extreme cases (congenital word blindness). They can be detected by appropriate examinations and trained to overcome their handicap by specific methods of teaching. While the number of children who suffer from such a severe grade of the disability as to be practically uneducable by ordinary methods is quite small, the number in whom the disability exists to a sufficient degree to be a serious handicap to school performance and to wholesome personality development probably is of real numerical importance and moreover there seems to be reason to believe that even those who make a spontaneous adjustment without special training, and thus learn to read, may never gain a facility in this accomplishment commensurate with their ability in other lines.

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Edited by Donald L. Potter on 5/31/03 from an OCR scan of a Reprint.
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