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EARLY DIAGNOSIS OF LEARNING DISABILITIES

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I. THE EDUCATIONAL SIGNIFICANCE OF LEARNING DISABILITIES

He is not blind, but he cannot seem to see; he is not deaf but he cannot seem to hear; he is not retarded but he cannot seem to learn. He is the learning disability child which authorities tell us comprise up to twenty percent of our classrooms. He is defined by Dr. Jeanne McCarthy[1] as a child with normal or potentially normal intelligence who has disabilities of a perceptual, conceptual or coordinative nature.

During the past few years there has been a great increase in the discussion of children with learning problems that seem to defy classification, in the literature directed toward educators. There seemed to be a pattern of problems, subtle in nature and hard to define, to be found in varying degrees in many children. The child may have progressed quite well to a certain point and from thereon seemed to stand still. He may have made only slight progress rather than to have developed a consistent learning pattern. These problems come to the attention of the teacher, particularly the primary teacher, because of accompanying or secondary problems such as poor self-discipline or hyperkinetic behavior. It is for these teachers, of whom I am one, that I am writing this paper in an attempt to set forth some guidelines by which we can determine if the child who does not learn as well as he should, when compared with his general intelligence, abilities and other factors, could possibly have a learning disability which can be defined and diagnosed, and by application of diagnostic teaching, corrected.

Learning disabilities may be known by many names. In some states, minimal brain dysfunction is used: the first word to compare it to cerebral

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[1] Jeanne McCarthy (Interview) "How to Teach the Hard to Reach," Grade Teacher, (May/June, 1967), Supplement.

palsy which might indicate clinical or institutional care, the second to indicate the area affected, and the third to cover damage as well as genetic developmental or other causes of the problem. California calls learning disability children educationally handicapped and in 1967-68 had 24,000 children in a program providing education suited to them, a number greater than in all the rest of the United States.

Learning disabilities may be present in children with very low I.Q. all the way to those in the genius classification. They may exist in children from low socio-economic homes or come from children in the highest socio-economic level of the community. The learning disability child may exhibit school failure or he may achieve academically but this achievement may make exorbitant demands on the child. Learning disabilities may be accompanied by major disturbances of conduct or they may be internalized so that the child suffers in silence.

> Since the learning disorder is so closely related to the learning function, it becomes a primary problem of education. To meet the needs of these children, the school must learn to design educational presentations with their problems in mind. The basic nature of the syndrome is a disruption in the processing of information and response. The individual's symptoms composing the syndrome (distractibility, hyperactivity, perseveration, detailed response, emotional lability, etc.) can be seen as a specific manifestation of the overall disruption. These children do not spontaneously integrate information and form generalizations as does the child with no learning disorder. It follows that educational presentations must be designed to encourage the development of such generalization to a much greater degree than is necessary with the average child.[2]

One survey of a normal school population[3] investigated the incidence of behavioral symptoms characteristic of learning disorders. This survey

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[2] Newell C. Kephart, Learning Disability: An Educational Adventure, the 1967 Kappi Delta Phi Lecture (West Lafayette, Indiana: Kappi Delta Phi Press, 1968) p. 5.

[3] Robert E. Valett, Programming Learning Disabilities (Palo Alto, California: Fearon Publications, 1969) p. 16.

found that seventeen percent displayed a learning problem in sufficient degree as to cause a noticable reduction in school achievement, or make such achievement extremely costly to the child. A second survey[4] approaching the problem from the opposite direction and investigating neurological symptoms, found a percentage of 20-22 among the normal school population. Therefore, in a class of thirty, five or six find the demands of our curriculum unattainable in terms of discomfort, fatigue or in some cases, well being.

Even without these statistics, each classroom teacher knows that there are children in his or her room that are not learning up to their potential. Often one feels that to wait may solve the problem but as the child gets older seldom does he learn in a more mature manner unless he is specifically taught how to work over or around or through his problems.

This paper will be an attempt to encourage the teacher of young children to begin to determine, or diagnose by informal means, the problems of these children and to refer them to a learning disabilities, usually a reading, clinic if informal diagnosis is not adequate to establish a diagnostic teaching program. The teacher may need in-service training, primarily to become acquainted with the tests available for his use and how to interpret their results if they are to point the way to correction. He will most certainly need experience so that he can determine what is normal for the child and what is considered abnormal in his behavior and learning patterns.

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[4] Ibid., p.17.

DEFINITION OF LEARNING DISABILITIES

A learning disability refers to a specific retardation or disorder in one or more of the processes of speech, language, perception, behavior, reading, spelling or arithmetic. Though a deficiency is specific in one or more areas, the child has some assets in other areas, and the retardation exists in spite of these assets. However, a mentally retarded child can also have a learning disability if he has discrepancies in his abilities.

Valett defines a learning disability as any specific difficulty in acquiring or using information or skills that are essential to problem solving:

> A significant learning disorder exists when the individual's actual performance or achievement in any given ability is found to be far below his capacity or potential. A discrepancy between classroom achievement and mental age of one or more years is usually cause for concern, while a discrepancy of two or more years calls for immediate educational intervention. 'Specific difficulty' implies some disability in one or more of the six major learning areas--gross motor development, sensory-motor integration, perceptual-motor skills, language development, conceptual skills and social skills.[5]

Again, children's learning disabilities have been ascribed to 1)intellectual difficulties, causing a reduction in intellectual vigor, 2)parental rejection or affective neglect, 3)sensory impairment to sight or hearing, 4)brain injury, damage or dysfunction of varying degrees, 5)excessive anxiety generated by parental management, 6)social disadvantages which have impoverished the intelligence, 7)physiologic dysfunction, 8) poor teaching.[6]

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[5] Ibid., p. 3.

[6] Ray H. Barsch, "Perspectives on Learning Disorders:The Vectors of a New Convergence", Journal of Learning Disabilities, 1:1 (January, 1968) p. 13.

CHARACTERISTICS OF LEARNING DISABILITIES

Because the symptoms of learning disability children are frequently so subtle, they sometimes go undetected for long periods of time. No child exhibits all of the characteristics and some may show very few. Conversely, the presence of these characteristics should not be taken to imply the existence of a learning disability. However, learning disability children often do have certain developmental, behavioral and psychological characteristics which can be identified and considered in making judgments. The presence of some traits in a child's developmental pattern means only that there is a need for further study and diagnosis of the problem.

One listing of characteristics is that of Kaluger and Kolson:

I. Developmental Characteristics
   - A. Abnormal birth, as by instrument, breech, long or short birth time, toxemia before birth, rubella during pregnancy
   - B. Absence of some major area of maturational development as crawling or creeping
   - C. Speech abnormality in history, either very late or very early speech

II. Behavioral Characteristics
   - A. Headbanging or unusually rhythmic rocking to and fro
   - B. Either lethargic behavior or hyperactivity
   - C. Normal or precocious preschool learnings
   - D. Often an amplified ability to learn by hearing
   - E. Extreme fluctuation of the child's retention and learning rate

III. Physiological Characteristics
   - A. Sensory "equipment" including acuity, appears normal in the child; I.Q. is average or better; vision, hearing is normal; there are no physical or glandular disturbances
   - B. Cannot perform all of the reading or learning functions in a series as: recognition, language significance, motor response
   - C. Body laterality is not defined and is reflected in mixed and/or crossed dominance[7]

The Third Annual International Conference of the Association for Children with Learning Disabilities found, in a review of the literature, that teachers,

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[7] George Kaluger and Clifford J. Kolson, Reading and Learning Disabilities, (Columbus, Ohio: Charles E. Merrill Publishing Company, 1969) pp. 84-88.

pediatricians, neurologists and psychiatrists agreed on the following list of the characteristics, as reported by Richardson:

1. Poor auditory memory
2. Poor auditory discrimination
3. Poor sound blending
4. Poor visual memory
5. Poor visual discrimination
6. Inadequate ability in visual and visual-motor sequencing
7. Lack or, or weakly established cerebral dominance
8. Right-left hand confusion with problems in laterality and directionality
9. Fine motor uncoordination
10. Non-specific awkwardness or clumsiness
11. Ocular imbalance
12. Attention defect and disordered or hyperkinetic behavior.[8]

The complete listing of characteristics as determined by these three disciplines may be found in the Appendix along with extensive listings by Myers and Hammill and Tarnopol. Though each maintains a certain similarity, the wording of one may mean more to one reader than another and assist in the identification of the specific characteristic found in the child in question.

TYPES OF LEARNING DISABILITIES

In the hierarchy of experience, non-verbal learnings are much lower than verbal learnings and the lowest form of non-verbal learning is that of sensation. Perception, imagery, symbolization and lastly, conceptualization follow in order in both verbal and the non-verbal learnings. Most verbal disabilities fall at the level of symbolization, thus affecting the higher level of conceptualization. Most non-verbal disabilities fall at the level of perception and imagery and therefore constitute a more fundamental distortion of total experience.

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[8] Ibid., p.90.

NON-VERBAL LEARNING DISABILITIES

Deficiencies in non-verbal learning often entail time concepts (hours, days, seasons), directions, relational concepts (fastest, half-full, taller, closer, half-way, later, after a while, too short, too tall). When non-verbal functions are disturbed, usually the remediation process is more complex because the problem necessitates increased learning in basic meanings, taking the child back to manipulatory or actual experiences rather than intrinsic learning. Most interpersonal behavior is non-verbal. Much of what we learn and much of one's everyday functioning is determined by situations, circumstances and feelings that are not and perhaps cannot be wholly verbalized. Experience with children who have deficits in learning reveals clearly that in many instances, their greatest, if not their only, problem is in non-verbal learning. Some children with non-verbal neurogenic learning disabilities who are not withdrawn and obvious to identify may have only slight ability to recognize and identify the attitudes and feelings of others, even when permitted to view facial expressions. These children may not be able to comprehend the significance of many aspects of the environment. They fail to learn the meaning of the actions of others, cannot pretend and anticipate, fail to learn the implications of many actions such as gestures, facial expressions and caresses. One might say they have a deficiency in social-perception.

Disturbances of social perception could be the most debilitating of the learning disabilities because they impede acquisition of basic adaptive patterns of behavior. Verbal facility is of little value if one cannot perform day to day non-verbal activities. Social maturity may remain deficient despite average or above verbal ability. The child may be in danger when he is by himself if

he does not grasp the significance of hazards or danger and thus relate immediate behavior to the future. Rarely do children with non-verbal problems understand the rules and sequences of games unless they are verbalized for them.

If the child has deficits in the monitoring system he suffers from distractibility, perseveration and disinhibition. Distractibility occurs when the child cannot give normal attention to the events and circumstances that surround him. Perseveration occurs when the child attends unduly to an activity without regard to its importance, its pertinence or its suitability. Disinhibition occurs when the child is unable to control ideation processes. In each case the teacher must establish control so that the child can learn to control himself.

VERBAL LEARNING DISABILITIES

Human beings have three verbal systems: spoken, read, written. The spoken word is the most basic because it is easiest to learn. It requires less psychoneurological maturity than the other two systems. Word meaning must be acquired before words can be used to express thoughts. Inner language processes are those that permit transformation of experience into symbols, verbal and non-verbal. Inner language is the language with which we think, the native tongue.

Receptive language is the ability to comprehend the spoken word. It may be visual or auditory. Deficiencies in auditory receptive learning are more consequential to observable behavior problems. It is axiomatic that input precedes output, or in this instance that reading precedes writing. Receptive language includes the ability to blend syllables into words and to divide words into syllables and presupposes an adequate memory. Memory span is often deficient in children with learning disabilities. Sequence

ability, or the ability to follow more than one direction at a time, may be impaired. The next step, expressive language, is verbal or auditory and presupposes reception. To speak, as well as to write, assumes not only ability to recall and to hold words in mind but also the ability to relate these signals to the appropriate motor system, to activate the motor system for the appropriate expressive movements.

The same hierarchy of experience is present with verbal learning as there is with non-verbal. One of the most basic, or lowest forms of verbal learning disabilities is deafness or blindness. Defects in perception may consist of inadequate conversion of sensations into electrical impulses. The child with disabilities at this level is unable to perceive, auditorily or visually, the differences in words such as cold and coal, the letters m and n, or b and d. If there are deficiencies at this level, the child may find the sounds in his environment bewildering. Compared with impairment of visual perception, little consideration has been given to this very important auditory process. Disturbances of auditory perception are of great consequence behaviorally and are of utmost importance in a diagnosis and program of remediation. One of the common symptoms of deficits in auditory perception is misunderstanding: the child misperceives what he hears. Unless he is given proper training in his preschool years, such a child may relinquish all auditory awareness, making it necessary to educate him as a deaf child even though he has normal hearing acuity.

Higher on the hierarchy of experience is the learning disability concerned with imagery, which pertains to sensation or information already received and perceived. It is often characterized by the inability to remember visually or auditorily what was seen or heard. The next highest form of learning disability is that of symbolization or the ability to represent experience.

This ability is unique to the human being. Even though verbal symbolizations are of utmost consequence to human behavior, it is of singular importance to both normal and abnormal behavior that non-verbal symbolic functions not be overlooked.

The highest form of verbal learning is conceptualization or the process of recognizing the relationships among experiences. Children with this problem often have difficulty with multiple word meanings, with proverbs and metaphors. Any brain dysfunction altering learning may obstruct ability to conceptualize. The ability is not to be confused with the ability of abstracting because one can engage in abstraction with conceptualizing but one cannot conceptualize without abstractions.

EARLY DETECTION OF LEARNING DISABILITIES

Early detection of the problem of learning disabilities greatly reduces the frustration of parents and teachers--to say nothing of the benefit to the child. When children with undetected or undiagnosed learning disorders reach adolescence, they are categorized in one of three ways: some slide into the mentally retarded population, some into the emotionally disturbed group, and the rest fall into the "pot" labeled underachievers, nonlearners or dropouts. A fortunate few learn how to learn and how to apply it to school subjects.

With the growing awareness that children's abilities develop in a progressive manner as a result of the interplay of maturation and experience, attempts are now being made to provide the child with a healthy early environment, proper stimulation, and appropriately planned educational experiences. It has finally been recognized by most educators that much prior education, preparation and development are necessary before a child can successfully

learn typical school subjects. Many children with specific learning disabilities have, or had, some sensory-motor and/or perceptual skill dysfunction requiring diagnosis and treatment. These skills are primary developmental requisites for higher forms of learning: before he walks, he must crawl; before understanding what he hears, he must learn to attend and listen; before reading, he must discriminate visually and aurally; before speaking, he must babble; before conceptualizing, he must meaningfully relate varied experiences; before reaching maturity, he must struggle through stages of self and social awareness. Each of these skills must be learned in order of ascending difficulty.

Because many of the etiological factors resulting in learning disorders occur very early in life, learning difficulties are apt to be manifest soon after birth. For this reason, many children with learning disorders will show difficulty at the earliest stage of development, the motor stage. These difficulties are particularly apparent in the areas of relationship to gravity, laterality and overall coordination. "Since basic information originates in motor exploration and is stabilized through a motor referent, such limitations can be expected to interfere with the child's extent of learning and particularly with his ability to organize information in a veridical fashion."[9]

Findings by the Gesell Institute show that from one third to one half of the children in the public schools lack maturity required for the work of the grade in which they have been placed. This occurs because children enter school according to their chronological age. Learning disorder or failure can occur in a child who may have good learning potential simply because the work expected of him is ahead of, or out of phase with, his current level of maturity.

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[9] Kephart, op. cit., p. 83.

Since the essential aspect of a learning disability is a discrepancy between the child's apparent potential and his performance in practice when he has to carry out some essential learning process, readiness for a task plays an important part in learning problems. Although in the normal course of events, the child with mild learning disabilities will develop these skills, he will do so with great effort. Time which could have been spent in more advanced learning will be spent instead in attempting to solidify these techniques of learning. Since not all children eventually mature and become ready to learn, remedial measures should be taken when the child first gets behind, without waiting to see if he will grow out of it. Preventive measures are much better than even early remedial measures. Ilg and Ames[10] and more recently, deHirsch[11] have developed readiness tests based, at least in part on the maturational lag concept. Often early deficiencies in the areas of visual and auditory discrimination ability, awareness of sound-symbol, relationships and blendings, a right-left orientation or the ability to compensate so as to maintain this orientation and a working vocabulary and meaningful concepts may be related to a naturational lag.

Maturation unfolds in continuous interaction with stimulation and one cannot afford to wait for maturation to occur, nor should one expose the child to a kind of instruction that is clearly inappropriate to his particular stage of growth. What is desirable is to match teaching method to the child's specific developmental needs. Recommended is a transition class for those not ready for first grade. Repeating kindergarten would give the child a year to mature but would not provide intensive and specific training that these children need. A transition class would aim at stabilizing the child's

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[10] Francis Ilg and Louise Ames, School Readiness, (New York: Harper and Row, 1964)

[11] Katrina de Hirsch, Jeanette Jansky and William Langford, Predicting Reading Failure (New York: Harper and Row, 1966)

perceptuomotor world through a program in which each step is carefully planned. Teaching methods would be tailored to the pupils's individual needs. More structured activities would help the immature and "scattered" child to function first on a relatively simple and later more complex plane. Small groups would allow the teacher to give massive support to the dependent child who tends to be overwhelmed in a setting which does not provide individual guidance and support.

Identification of high risk children is the first step, placing them at the earliest possible time with an educational approach that will enable them to realize their potential and to become productive members of the community will follow in logical order. "Early identification would have obviated the need for later remedial measures,"[12] in a great many instances.

Readiness is necessary before basic academic skills can be taught successfully. It has been too frequently assumed that readiness is a product of maturity alone and as such is of minor concern to the school. Rather than delaying his entrance into academic learning and waiting for the child to mature, which will most often prolong the problem, Kephart suggests:

> that the school accept some responsibility for the problem of readiness and begin to teach readiness where it is lacking. As the agency concerned with childhood learning, the school should be prepared to offer the child the intensified learning experiences which he has been unable to obtain elsewhere and by which he can develop readiness. Techniques and procedures for aiding development and readiness are being given increased attention by research and are described in the literature. Such techniques might well be made a part of the educational process in the school, particularly at the early elementary grades. The school would then be in a position to offer the child the type of learning experience which he cannot obtain anywhere else. At the same time, by solidifying the developmental foundations underlying learning, many later academic problems might be prevented.[13]

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[12] de Hirsch, op. cit., p. 92.

[13] Kephart, op. cit., p. 37.

Perhaps the primary requisite for teachers of preschool and young primary children is a sound training in the developmental needs of children and a conviction of the importance of early childhood education.

DIAGNOSTIC TEACHING

The general purpose of the educationally oriented evaluation is to determine if learning functions and processes have developed to an optimal level and if not, which are defective. No matter where or when the problem is discovered and diagnosed, the teacher is in the position to work with the child to remedy the disability. Helping him would be the psychologist, language therapist, and other professional specialists. However it is the teacher upon whom the primary responsibility falls. It seems to be valid to assume, then, that the teacher must be informed as to the problems of a disabled learner, how to diagnose the problem and also how to work with the child. Diagnosis and remediation are not separate entities but a hyphenated process. The purpose of diagnosis is not to classify the child nor label him but to establish a program through which he can learn. This program should be grounded at every point through the findings derived from an adequate diagnosis. The child's response to remedial techniques can provide further useful diagnostic information. Careful observation and use of diagnostic tools should provide the teacher with many useful ideas for diagnostic teaching. These tools, or tests, could be the basis for the trained and competent teacher to choose techniques appropriate to the child. In order to do this the teacher must have a general knowledge regarding the area of specific learning disability, evaluation techniques and remedial procedures, all of which must be integrated within a frame of reference and ideally could be presented in schematic or diagrammatic fashion.

As Myers and Hammill state:

> The concept of perscriptive teaching requires the accumulation of information regarding the child's abilities and disabilities, gathered in formal testing and in diagnostic teaching, and requires also the selection of appropriate teaching techniques. The teacher ultimately must be the one who prescribes educational procedures for the child, utilizing both objective and informal test results.[14]

There are several points of view concerning testing. At one extreme there are those who propose that testing is the key to proper teaching. Thus they are attempting to develop better, more specifically diagnostic tests of visual perception, motor function and auditory perception. As this is accomplished they are also attempting to develop a highly individualized, specific teaching perscription for each child, based upon precise knowledge of his ability level in each different learning-related sensory area. At the other extreme there are those who propose that diagnostic testing may be unnecessary because, for example, all children are said to respond best to auditory methods of teaching reading regardless of diagnostic results. Others believe that specific diagnosis in depth is unnecessary since a good teacher will arrive at her own diagnosis and prescription based on experience. Finally, some advocate that it is of more importance to examine and correct the teaching methods if one is to achieve good results. I believe that an informal testing by the teacher in the classroom with standardized tests to follow, if experience can not come to the aid of the teacher, is a middle-ground means of discovering learning disabilities and ultimately correcting them. Many times a psychologist tests but does not come up with ideas or suggestions usable in the classroom. Therefore, if the classroom teacher does the testing, the results and also sample of test items could be used to plan a correction program for the child.

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[14] Patricia I. Myers and Donald D. Hammill, Methods for Learning Disorders, (New York: John Wiley and Sons, 1969) p. 75.

Tarnopol suggests that specific materials or techniques are not the most essential element for teaching children with learning problems. The method of diagnostic teaching and continued evaluation points the way to the choice of techniques and materials. The method then, is one of understanding all behavior of the child and setting the stage for effective learning. He lists the following general suggestions for diagnostic teaching:

1. Decreasing the amount of work expected of the child until he begins to experience success.
2. Increasing the focus on the part to be learned by underlining, color-cueing, using a marker or slot in a paper, using individual earphones and a tape recorder to pronounce words slowly and distinctly as the child reads or writes, or having the child face the wall or a screen with only his own reference charts in view, using a copy directly in front of the child instead of a blackboard some distance away and/or any creative way to help him see the part to be studied.
3. Giving direct and concise instructions verbally and by demonstration.
4. Choosing the remedial instruction needed by the child as the core of instruction rather than exposing him to all sequences of learning generally recommended for children with learning disabilities.
5. Providing a variety of materials and lessons directly related to his area of deficit and his learning method.
6. Keeping the child's level of intelligence and chronological age in mind when choosing materials.
7. Considering the age and ability when talking to the child; be businesslike rather than "fun and games." Praise is reinforcement when deserved.
8. Taking the child as quickly as possible through the concrete and gross steps and arriving at his level of abstraction and fine discrimination and/or motor performance-learning level.
9. Using materials such as lined or squared paper to help the child organize his work. Mark beginnings and direction with color, arrows, to help the child develop insight into the problem before expecting him to remember. Simple adaptation often provide the structure.
10. Defining for the child the reason for the adaption being used. This description should be concise and give a reason if the child is in need of this information.[15]

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[15]Lester Tarnopol, Sc. D. (Editor) Learning Disabilities--Introduction to Educational and Medical Management (Springfield, Illinois: Charles C. Thomas, 1969) p. 361.

It is impossible for one to know what is abnormal if he does not recognize normalcy. Therefore a successful classroom teaching experience is advised before one attempts to diagnose and correct learning disabilities. Diagnostic teaching demands a personality and knowledgeability beyond that required for a classroom teacher. It "assumes the teacher knows how the child learns, ways by which the child can be taught, what the child needs in order to be able to learn and of major importance, the units and elements which make up the skills to be achieved."[16]

Remediation begins with adequate interpretation of the diagnostic results which indicate 1)the type of educational deficit, 2)the existence or absence of a perceptual or learning disorder, 3)the severity of the disorder and possibly, 4)the cause of the disability. One might say that diagnostic teaching is concerned with doing away with bad habits, establishing good habits and bring the child's achievement up to his learning expectancy level.

Dr, Hudson of Kansas University states that the best remedy for learning disabilities is to teach the child in the schools, using precise, very definite objectives, made systematic with rules and constancy, to be success oriented, sequential in what is done and not to blame the child because he didn't learn--look rather at the method used by the teacher, and primarily, keep him in the mainstream of life.

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[16] Kaluger and Kolson, op. cit., p. 169.

II. DIAGNOSIS

Normally a child proceeds through the developmental stages in order, solidifying the activities and generalizations appropriate to each stage before moving on to the next. When this does not occur, growth does not stop to take account of the learning problem. Demands continue as though development had occured. The child finds himself pressured for performance at a level higher than he is ready for. As a result of this pressure, he finds it necessary to temporize, to behave as though he had progressed to the higher level. Confusion develops and difficulties arise which are compounded as time goes on.

In analyzing the problem of any child with learning difficulties, it is necessary to determine the point in the developmental sequence where his achievement has broken down. This point of failure will be manifested either by increasing confusion in performance from this point on or by a lack of integration of subsequent learnings with previous learning. Therapeutic activities can then be presented level by level from this point to the end of the developmental sequence.

LANGUAGE EVALUATION

Evaluation may be done at various levels but can most easily begin with the language level since all children have a basic method of communicating with others. This area is probably the most important one to be covered in an early diagnosis program. It is therefore stressed in this paper as indicative of the possibility that later learning difficulties may be traced to poor learnings in this area.

Language is the first of the communicating skills to be learned by the child. An early check of his abilities will often bring to light a learning

dysfunction in this area. Parents are often the first to notice that the child does not talk as early as others in the family, that he does not seem to make the connections with what is said and what he is to do, or that he is confused by words or actions of others. Delayed or retarded speech and language development has been postulated to be one of the most sensitive indicators of future learning and behavior disorders. A language evaluation is usually done informally but testing may be done if there seem to be unanswered problems.

CHARACTERISTICS OF LANGUAGE DISABILITIES

A child with a deficit in auditory language hears, but he does not fully interpret what he hears. He understands neither spoken words nor environmental sounds. He is unable to structure his auditory world, to sort out and associate sounds with particular objects or experiences. Because he fails to make these associations, he responds inconsistently to sounds and sometimes he is thought to be deaf or hard of hearing. Auditory involvements of this type are considerably more debilitating than those where only verbal comprehension is affected.[16] Since he does not interpret sounds, he becomes more visually and tactially oriented. He may prefer colored and mobile toys rather than those that produce sound. Most children with auditory defects appear quiet and use few vocalizations.

As with all learning, auditory deficits fit into a pattern of reception, comprehension and expression. Children with reception problems were discussed above. Those with auditory comprehension problems hear but do not understand what is being said. However, comprehension is usually better for nouns than for other parts of speech. Most of these children are deficient in auditory

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[16] Doris J. Johnson and Helmer R. Myklebust, Learning Disabilities, Educational Principles and Practices (New York: Grune and Stratton, 1967) p. 67.

skills, including rhyming, discrimination and blending sounds into words. The child must learn 'what means what'--what verbal symbol represents what experience. He may be able to copy but he usually cannot spontaneously formulate good sentences. Comprehension for the child must also include adequate memory span, the ability of the individual to retain information in proper sequence for immediate recall or action.

On the other hand, many children with language disorders have no problem understanding the spoken word but are deficient in using it to express themselves. They can follow instructions and perform successfully except when asked to speak. They have have difficulty in learning to say words or they may be able to say single words or even short phrases but not be able to plan or organize them for the expression of ideas into complete sentences. The primary educational goal for these children is to develop a correct, natural, spontaneous flow of language.

INFORMAL TESTING PROCEDURES

In many instances, the classroom teacher can make an informal diagnosis of language problems by observation of the child or by using specific items from some of the standardized tests. The informal procedures can be as detailed as the examiner's knowledge and understandings of the language functions allow, but only as lengthy as his ingenuity and time permits. In outline form an informal test of language abilities might include:

A. Auditory functions
   1. Decoding
      a. Recognizes environmental noises
      b. Understands parts of speech
      c, Follows one, two or three directions
      d. Recognizes names of colors
      e. Understands story read to him
   2. Association
      a. Matches noisemakers by sounds, as two horns or two whistles
      b. Good speech-sound discrimination--words, nonsense syllables
   3. Closure
      a. Recognizes incomplete words
      b. Auditory blending of sounds to form words
      c. Understands simple analogies

B. Visual functions
   1. Decoding
      a. Recognizes objects and pictures
      b. Recognizes a picture cut in two, three or four parts
      c. Recognizes colors
   2. Association
      a. Matches colors, objects, pictures
      b. Matches objects with pictures
      c. Matches geometric forms, two or three dimensional, with pictures
   3. Closure
      a. Recognizes incomplete pictures
      b. Recognizes incomplete letters, numerals or words

C. Tactile-Kinesthetic functions
   1. Recognizes by touch alone, objects placed in either hand
   2. Matches sandpaper forms by touch
   3. Recognizes simple geometric forms, letters or words when they are drawn on the back of his hand or on his back

D. Vocal functions
   1. Uses words, phrases, sentences
   2. Uses adequate grammar
   3. Uses adequate sentence structure
   4. Tells a story in logical sequence
   5. Mean sentence length is appropriate to his age

E. Motor functions
   1. Repeats series of digits in or not in sequence
   2. Recalls a set of pictures, letters, numerals, words
   3. Recalls a set of objects seen

F. Sequencing functions
   1. Recalls a series of taps, pitches
   2. Recalls a sequence of objects, pictures and forms
   3. Recalls a series of unrelated words, sentences, or series of related words[17]

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[17]Myers and Hammill, op. cit., pp. 51-53.

Most of these tests can be given during the normal teaching and social exchanges of a typical day. If there seems to be a discrepancy in the child's ability to do these things as compared to the level at which he should be performing, further general and specific tests may be given. However, most of these tests need to be given by persons trained in the area. Another drawback for the classroom teacher is the amount of time needed to administer these individual tests. I believe that teachers need to know, at the very least, the types of tests that may be given, the purpose of the test and what the results indicate for diagnostic teaching.

LANGUAGE EVALUATION TESTS

At this time probably the best general language test is the Illinois Test of Psycholinguistic Abilities.[18] "The ITPA has opened a way of bridging the gap between diagnosing and remediating language disabilities which have been found in almost all children with learning disabilities," says Lamb.[19] Other tests of a general nature but with strong auditory items include the Houston Test of Language Development (Crabtree, 1963) and the Verbal Language Development Scale (Mecham, 1959).

More specialized tests include the Auditory Discrimination Test (Wepman, 1958) to determine discrimination of speech sounds and similar tests by Templin (1943) and the Boston University Speech Sound Discrimination Test (Pronovost and Dumbleton, 1953).[20] Probably the best test for auditory perception is the Seashore Measures of Musical Talents. A very new test which could be given by the teacher is one by Goldman, Fristoe and Woodcock

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[18] J. J. McCarthy and Samuel A. Kirk, Illinois Test of Psycholinguistic Abilities, Manual (Urbana, Illinois: University of Illinois Press, 1961).

[19] Tarnopol, op. cit., p. 256.

[20] Myers and Hammill, op. cit.

which uses a series of pictures and a pre-recorded tape. This test was just published and is advertised in the February, 1970 issue of The Reading Teacher. A diagnostic evaluation of a child's vocabulary comprehension and an estimate of his intellectual functioning is derived from the Peabody Picture Vocabulary Test. A similar test with a high correlation is the Full Range Picture Vocabulary Test (Ammons and Ammons, 1948) or one developed by An Alstyne (1959).[21]

A Picture Story Language Test may also be given which measures the adequacy of written language through a scale measuring the amount of written language expressed under given circumstances, a scale measuring the correctness of the sample in terms of syntax, grammar and morphology, and a scale concerned with the content of the sample. This test presupposes the child has progressed to the point of setting his thoughts on paper and could not be used without adaptation for primary children.

READING EVALUATION

The area of reading disabilities is very large and complex and for the purpose of this paper, too complicated to delve into in great detail. Early diagnosis of reading disabilities would prescribe a program of prevention in the early grades, so that extreme disabilities would not develop. Kaluger and Kolson list five categories of reading disabilities causes, all but one having their beginning in the early development of the child. They suggest that one should check: 1)mental factors, as the chronological age compared with mental age; 2)physiological factors, as the sex of the child, visual problems, hearing problems, neural transmission and motor coordination; 3)psychological factors, as the determination if disability is a contributory rather than an initiating cause, relationship between learning problem and

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[21] Myers and Hammill, ibid.

discipline, sibling rivalry, degree of feminity of the mother, home pressures and high level of aspiration of parent or self; 4)environmental factors, as the relationship in the home to learning and encouragement to learn and finally, 5)educational factors as related to the quality and continuity of the school program.[22] The same authors feel that

> The process of diagnosis should proceed from 1)preliminary diagnosis in which the mental ability level and achievement in reading and related subject-matter areas is evaluated, to 2) a differential diagnosis in which it is determined whether an educational deficiency or a perceptual or learning deficit is present, to 3)a therapeutic diagnosis when the exact nature of the reading disability, in terms of skills, is evaluated.[23]

Many of the usual and normal classroom procedures may be used to involve the child in this type of diagnosis. Only when a problem too complicated for the teacher to diagnose is discovered does one need to call for more expert help to give detailed tests.

CHARACTERISTICS OF READING DISABILITIES

The teacher of young children, kindergarten and first grade, will be able to prevent a number of reading disabilities from developing or progressing, since their onset is gradual, if he will be alert in watching for the following problems:

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[22] Kaluger and Kolson, op. cit., p. 114-117. [23] Ibid., p. 118.

1. Inability of the child to work simple prepared puzzles
2. Inability of the child to color or draw within boundary lines
3. Inability to write his name legibly
4. Inability to determine directionality
5. No established hand dominance, some ambidexterity
6. Tendency toward reversal problems
7. Indication of poor visual perception and poor memory for letters or words
8. Indication of poor auditory memory for individual sounds and words
9. Indication of poor recall and reproduction of simple figures
10. Tendency to perseverate
11. Signs of poor motor coordination
12. Inability to speak clearly
13. Tendency toward hyperactivity
14. Indication of limitations in symbolization, abstraction, spatial relationships, conceptualization or reasoning
15. Absence of social and emotional maturity for his age.[24]

Another listing of identifying characteristics which the teacher could consult is one by Kough and De Haun:

1. Is the child unable to think abstractly or to handle symbolic material?
2. Is he unable to understand and carry through directions for assignments?
3. Does he lack the so called "common sense" and reasoning level of the group?
4. Is he unable to understand complex game rules?
5. Is he slow in all areas: academic, social, emotional and physical?
6. Does he break rules of conduct or of games, often without awareness?
7. Is he unable to work independently?
8. Is he easily confused?
9. Has he a short attention span?
10. Is he unable to concentrate voluntarily on academic work?
11. Does he find it difficult, if not impossible, to keep up with the class?
12. Is he behind his normal grade achievement in school?[25]

Because the characteristics of reading disability differ in overt behavior, and even in the terminology which educators use, one may find use of one more listing of symptoms of reading problems, this one by Brueckner and Lewis:

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[24] Willaim H. McClurg, "The Neurophysiological Basis of Reading Disabilities," The Reading Teacher, 22:4 (April, 1969) pp. 615-621.

[25] Jack Kough and Robert F. De Haun, Identifying Children With Special Needs, (Chicago, Illinois:Science Research Association, Inc., 1955) p. 70.

1. Slow rate of oral or silent reading
2. Inability to answer questions about what is read, lack of comprehension
3. Inability to state the main topic of a simple paragraph or story
4. Inability to remember what is read
5. Faulty study habits, such as failure to reread or summarize or outline
6. Lack of skill in using tools to locate information such as index and table of contents
7. Inability to follow simple printed or written instructions
8. Reading word by word rather than in groups, indicating short attention span
9. Lack of expression in oral reading
10. Excessive lip movement in silent reading
11. Vocalization in silent reading, whispering
12. Lack of interest in reading in or out of school
13. Excessive physical activity while reading, as squirming or head movements
14. Mispronounciation of words: gross mispronounciations, showing lack of phonetic skill; minor mispronounciations, due to failure to discriminate beginnings and endings, guessing and random substitutions; stumbling over long, unfamiliar words
15. Omission of words and letters.[26]

In addition to these general problems, or characteristics, which may be found in varying degrees in children with reading disabilities, more specific characteristics of vision or audition may be noted. It has been suggested that reading is a visual symbol system superimposed on auditory language. Johnson and Myklebust state that reading is a symbol twice removed from the realities which they represent.[27] That is, children first integrate nonverbal experiences directly; next they acquire auditory abilities, then later a verbal-visual system which represents both the experiences and the auditory symbol. Therefore, deficiencies in discrimination, interpretation or retention of either auditory or visual symbols can cause problems in reading. These deficiencies may be either a cause or a result of the problems noted above. Johnson and Myklebust list the problems of vision as:

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[26] Kaluger and Kolson, op. cit., pp.93-94.

[27] Johnson and Myklebust, op. cit., pp. 180-181.

1. Visual discrimination difficulties, confuses letters and words that appear similar, as ship, snip
2. Rate of perception is slow, discrimination inaccurate, scrutiny is slow
3. Has reversal tendencies, as dig for big
4. Has inversion tendencies, as u for n, m for w
5. Has difficulty following and retaining visual sequences
6. trouble duplicating a block pattern, arranging letters from a model or from memory
6. Has visual memory disorders, possibly for either verbal or nonverbal experiences but most often in memory of the printed word
7. Drawings tend to be inferior, lacking in detail
8. Problems with visual analysis and synthesis, puzzles, etc., cannot relate the parts to the whole
9. Tests show breakdown of visual skills as related to auditory
10. Often prefers auditory games, may not understand a ball game or how to put a model together unless the directions are read to him.[28]

Auditory problems include those in which the child sees similarities in word parts but does not relate them to their auditory counterparts so that he does not make the generalizations required in learning to read. He does not relate a part of the word to the whole and therefore must learn each new word as a unique entity. Characteristics are:

1. Numerous auditory discrimination and perceptual disorders which impede use of phonetic analysis. It is often common not to hear similarities in initial or final sounds of words. It is sometimes difficult to hear short vowels, and rhyming words are hard to recognize.
2. Difficulty with auditory analysis and synthesis, cannot syllabicate or break word into letter components, may not be able to combine parts of words to form whole.
3. Cannot reauditorize sounds or words. Can read silently better than orally.
4. Disturbances in auditory sequentialization, cannot follow melody pattern, transposes letter sounds or syllables, as aminal for animal.
5. Prefers visual activities, is usually good in shop, wood-working or athletics.[29]

Reading problems do not occur in isolation. Since reading is a result of understanding and using language it is both an auditory and a visual act. Therefore, any of the characteristics discussed in previous sections of this

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[28] Ibid., p. 184.

[29] Ibid., p.185.

paper may be directly or indirectly a cause of reading problems, contribute to ineffective reading development or hinder reading growth at a normal rate. Even though some of these problems may be seen in a normal child, any accumulation of characteristics may well point to a reading disability which needs to be diagnosed and treated to prevent or correct further problems. All symptoms of poor reading must be explored within their context since all are interrelated and none a discrete entity to be studied in isolation.

INFORMAL DIAGNOSIS OF READING DISABILITIES

Waiting for the child to be diagnosed as a retarded reader, which is usually defined to be at least one year behind his grade level, is waiting much too long for any child. If the teacher feels that the child is not progressing as well as he should, the teacher should begin to ask why. One should ask himself:

> Does the child have the mental ability to be more successful?
> What are his learning strengths and weaknesses and how strong or weak are they?
> What is the probable cause or causes of his reading disability?
> What seems to be the disorder pattern, what learning deficiencies are there?
> What is his learning pattern and what sensory modalities can he best use to learn?

Checking the child's general achievement level might be the next step. This may be a regularly scheduled test, the results of which would be in the cumulative file, or an individual test given by the teacher for this specific purpose. Mental age may be established if not done routinely by the school with a standardized intelligence test. Extensive test batteries are too time consuming for the classroom teacher to administer, as well as requiring a specially trained person to administer the test and interpret it. An example of this type of testing may be found in the Appendix.

READING EVALUATION TESTS

Various batteries of tests evaluate silent and oral reading ability. Myers and Hammill emphasize areas of testing rather than academic evaluations of tests. To test silent and oral reading ability and comprehension they recommend tests by Spache (1963), Gates (1963), or Durrell (1955). One may devise or adapt an informal reading inventory for the same purpose, or to establish an instructional level rather than determining the frustration level which is what standardized tests tend to do. For younger children the Monroe Aptitude Tests (1935) and the Metropolitan Readiness Test (Hildreth and Griffiths, 1950) establish a picture of the child's preparations for formal schooling.[30] To determine the area of disability, Myers and Hammill suggest that the teacher can, in regular classroom activities, check the child's abilities by using the following activities:

1. Auditory-vocal: the sound is presented by the examiner and the child responds with the name of the letter
2. Auditory-motor: the sound of the letter is presented and the child responds by writing the graphic form
3. Visual-vocal: the letter is shown to the child and he responds by giving the name of the letter and the sound associated with it
4. Visual-motor: the child looks at the letter, it is withdrawn and the child writes the letter.[31]

All of these tests are a form of readiness to learn. Also included in the area of readiness is specific perceptual training in kindergartens or nursery schools, believes Frostig,[32] because visual perceptual disabilities usually affect reading and writing since they are activities done on a plane surface. Her evaluation program includes the Weschler Intelligence Scale for Children, Wepman Auditory Test and observation and interviewing. Tests for sensory-motor functions, language, perception, thought processes

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[30] Myers and Hammill, op. cit.

[31] Ibid., p. 56.

[32] Marianne Frostig and D. Horn, The Frostig Program for the Development of Visual Perception (Chicago, Illinois: Follett Publishing Company, 1964).

and social and emotional development are given. From observation and tests the conclusion that four abilities: figure-ground perception, constancy, perception of position in space and perception of spatial relationships seem to have particular importance for school learning and are therefore the basis for remedial programs and are not used only to isolate abilities but to evaluate them.

In a study conducted by de Hirsch,[33] results indicated that children mature physiologically and psychologically along forseeable lines and that those children who lag severely in overall maturation can be predicted to fail academically. "Maturation is determined by a variety of factors, inherited patterns, biological growth and the child's specific life experiences--emotional, cultural and educational. The rate of maturation varies and education, if it is to be effective, must take such variations into account."[34]

Working with intelligent four and five year olds, referred because of oral language deficits, de Hirsch found that many developed reading, writing and spelling difficulties several years later. Clinically, these children showed striking immaturity, their performance resembled that of chronologically younger subjects not only in oral language but also in a variety of perceptuomotor tasks. De Hirsch's group used a battery of tests to reflect perceptuomotor and lihguistic status at kindergarten level which proved effective, for that group, in predicting reading and spelling difficulties. Tested were: behavioral patterning, motility patterning, gross motor patterning, laterality, body image, visual-perceptual patterning, auditory-perceptual patterning, reading readiness tests and the style of learning.

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[33] de Hirsch, op. cit.

[34] Ibid., p. viii

A predictive index was developed as a result of these tests and studies conducted in later years to test its correlation indicate that the Index should be given to children in the second half of kindergarten and that first grade entrance be based by and large on a passing score. The Index should assist the teacher in translating judgment of readiness to a more specific assessment of perceptuomotor and linguistic functioning. The validated battery contains tests of pencil use, the Bender Visual Motor Gestalt, Wepman Auditory Discrimination Test, Number of words in a Story Test, Categories (class names for words) Horst Reversal Tests, Gates Wordmatching Test, Gates Word Recognition Test (I and II) and Gates Word Reproduction Test, a combination of ten tests.[35]

TACTILE-MOTOR (WRITING) DISORDERS

Writing is a highly complex process and the last of the language forms to be learned. In analyzing a disorder of written language, the teacher must consider many levels of function, including visual-motor coordination, visual memory, reading, spelling, syntax and formulation ability. Again, observation of the child will uncover many problems in this area.

Any of the disabilities in other areas of verbal behavior can interfere with the acquisition of writing skills, but some are unique to the written form. Nonverbal learnings of a psychomotor nature will produce the most severe disabilities in later writing experiences because these were learnings that should have been incorporated early in the child's experiences. If the child cannot walk a balance beam, for instance, or catch and throw a large ball, if he cannot jump rope or perform other activities indicative of good coordination, he has not developed enough large muscle control to

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[35] de Hirsch, op. cit.

be able to learn control of the smaller hand muscles needed for writing. Most children with disturbances of auditory verbal comprehension have problems with written language. Studies in the area of sensory-motor and perceptual training may be summarized by Frostig's statement that "without good motor coordination, a child is handicapped not only on the playground, but may also be retarded in all his learning. Moreover, difficulties in motor coordination influence also the perceptual development.[36] The area of perceptuo-motor coordination is of great importance to the teacher of kindergarten and first grade children when attempting early diagnosis of learning problems.

Assuming the child has good psychomotor control and can form letters and words correctly, the following types and clinical names of written disorders of language may indicate the characteristics the teacher may discover:

> 1. Dysgraphia--disorder of the visual-motor integration; the person can speak and read but cannot execute the motor patterns for writing letters, numbers or words. He may be able to spell orally but cannot express ideas by means of visual symbols because he cannot write.
> 2. Defect in revisualization--a type of apraxia; the person cannot revisualize words or letter and so cannot write spontaneously or from dictation. He recognizes words when he sees them and thus can read but he cannot evoke the visual image from hearing the spoken form nor can he copy.
> 3. Defect in formulation and syntax--a later manifestation of disability; the child can communicate orally, can copy, can revisualize and spell words correctly, but he cannot organize his thoughts into their proper form for written communication. He does not write the way he speaks; he makes errors in written communication that he does not make in speaking. He does not show a disability until he is asked to read fluently and write stories, letters or examinations.[37]

An informal diagnosis of writing problems can easily be done through observation of the above mentioned coordination or psychomotor activities.

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[36] Valett, op. cit., p. 132. [37] Johnson and Myklebust, op. cit. p. 199.

Watching the child write will give other clues to his problems as listed as characteristics of tactile-motor disabilities. A developmental physical education program with behavioral objectives and activities to meet these requirements will help the child in the early grades a great deal and prevent serious problems from developing in some instances.

As with other learning disabilities, testing may be done to determine the point of earliest disorder. Recommended are the Purdue Perceptual Motor Survey which may be given by the classroom teacher and used as a training device.[38] It tests balance and postural flexibility, body image and differentiation, perceptuomotor match, ocular control and form perception. Kephart's Perceptual Rating Survey[39] is also a visual motor test emphasizing motor coordination and control, and a new test, the Beery-Buktinica Developmental Forms Sequence, not yet published at this reporting, is a simple form copying test to determine visual perception and motor integration. Tests such as these usually help determine the child's balance and rhythm, body-spatial organization, reaction speed and dexterity, tactile discrimination, directionality, laterality and time orientation.

DISORDERS OF QUANTITATIVE THINKING

The acquisition of a number sense is comparable to the developmental stage of inner language in other forms of verbal behavior. In relating the concept of inner language to arithmetic one is concerned with a child's ability to understand experiences which are prerequisite to quantitative thinking, particularly those dealing with relationships of quantity, space, form, distance, order and time.

To discover arithmetic disturbances the teacher must know the level of ability and also the nature of the disorder. Disabilities as the following

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[38] Myklebust and Johnson, op. cit. p.211. [39] Ibid. p. 226.

may be found in varying degrees:

1. Inability to establish a one-to-one correspondence
2. Inability to count meaningfully
3. Inability to associate the auditory and visual symbols
4. Inability to learn both the cardinal and ordinal systems of counting
5. Inability to visualize clusters of objects within a larger group; each object in a group must always be counted
6. Inability to grasp the principle of conservation of quantity; ten cents can be pennies, nickles or dime.
7. Inability to perform arithmetic operations
8. Inability to understand the meaning of the process signs
9. Inability to understand the arrangement of the numbers on a page
10. Inability to follow and remember the sequence of steps to be used in various mathematics operations
11. Inability to understand the principles of measurement
12. Inability to read maps and graphs
13. Inability to choose the principles for solving problems in arithmetic reasoning; can read the words and do the problems if he is given the principle but without assistance can not determine which process to use.[40]

Difficulties in learning arithmetic may be because of inferior teaching, limited intelligence or dyscalculia, the central nervous system's dysfunction. Difficulties may also arise because the child cannot revisualize numbers, cannot form written numbers or cannot remember instructions. These disorders may be summarized as:

1. Auditory receptive language disorders and arithmetic--problem of word meaning
2. Auditory memory and arithmetic--problem of reauditorization, cannot recall numbers, cannot listen to story problems presented orally
3. Disorder of reading and arithmetic--confusion of numerals in rotation, inversion; revisualization may be a problem if the child cannot remember what numbers look like
4. Disorder of writing and arithmetic--cannot write the numbers even though he can answer questions correctly orally.[41]

The same authors who list the above characteristics suggest that dyscalculics are deficient in visual-spatial organization and nonverbal integration. They cannot quickly distinguish differences in shapes, sizes, amounts or lengths. Some cannot estimate distance or make judgments related to

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[40] Ibid. p. 252.

[41] Ibid. p. 255.

visual-spatial organization. A study of case histories show that children with this problem have many nonverbal problems in early life as often they did not play with puzzles, blocks, models or construction-type toys. Many have very good auditory abilities and are great talkers. They often excel in reading vocabulary and syllabication skills but encounter problems at the comprehension level. Some dyscalculics have a disturbance in body image, visual-motor integration and occasionally disorientation. Often they are poor in social perception and in making judgments. Social maturity is usually low since they must rely on adults for many things. Dyscalculics tend to score higher on verbal functions than nonverbal in standardized tests. However, they seldom learn counting other than by rote because they cannot associate the numbers with the appropriate quantity. In contrast, children with deficits in auditory sequentialization cannot learn numbers in a series.

Informal diagnosis of arithmetic problems should be relatively simple in the upper elementary but more difficult to locate in the lower grades. In the primary grades disabilities would be observable in readiness areas and in those general concepts enumerated in the paragraph discussing characteristics. Ideas of size and quantity would also be clues to problems as would the inability to manipulate materials to show numeral processes.

There is little in the literature concerned with testing for quantitative disabilities. For the purpose of early detection in the primary grades, the Metropolitan Readiness Test[42] and the SRA Primary Mental Abilities Test[43] have arithmetic subtests. These are predictive as to how the child will learn as well as indicating what concepts have already been internalized.

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[42] Gertrude Hildreth, Nellie L. Griffiths, Mary E. McGauvoan, Metropolitan Readiness Test, (New York: Harcourt, Brace and World, Inc. 1965).

[43] Thurstron, Thelma Gwinn, Test of Primary Mental Abilities (Chicago, Illinois: Science Research Associates, Inc. 1963).

CONCLUSION

Firmly entrenched in our philosophy of education is the idea that every child should have an opportunity to learn to the best of his ability. The child with learning disabilities presents an educational challenge. In years previous he has not had the opportunity for learning. However, his problems are at the very heart of education and emphasize the basic aspects of learning. Such children exist in our classrooms in sizable numbers. Many educators now believe that with proper facilities, professional personnel, and an adequate curriculum most of these children can be educated in the local school system and most of these in the regular classroom. The teacher in the classroom will need training programs and institutes to keep up on characteristics and diagnostic teaching ideas. With an upgrading of professional skills among teachers, a large number of children will be educated nearer to their potential.

The role of preschool, kindergarten and primary teachers in making a direct personal evaluation of at least those pupils suspected of having learning disabilities cannot be overstressed. It is not enough merely to make general observations of these children and refer them to others for more physical and psychological evaluation. Direct and early evaluation of specific developmental tasks is required, with some attempts at educational intervention, if this is indicated, prior to the time of first grade enrollment. The learning disability child who has this advantage of pre-school and kindergarten attention and experience will have an immeasurably better chance for a more meaningful education during his elementary school years.

The single most important factor in planning for a child with learning disabilities is an intensive, systematic diagnostic study. This child learns

differently from the normal child, and it is only when we understand the specific problems he encounters that we can initiate adequate remedial procedures to give him the help he so desperately needs. Without a comprehensive evaluation of his areas of strengths and weaknesses, the educational program may be ineffective, too general or inappropriate.

The diagnostic study should include measures of sensory acuity, intelligence, academic achievement, language abilities (spoken, read and written), motor function and emotional and social maturity. The very basic role of auditory to language and learning processes seems to warrant complete investigation in children of this aspect of their functioning. Measures of discrimination, memory, analysis and synthesis, reauditorization and auditory sequentialization should be included in the diagnostic evaluation. There is also a need for thorough investigation of the structuring and organizational aspects of the auditory perceptual process. How the individual receives, organizes and makes use of the conglomerate of auditory and visual stimulation in his environment will directly influence the level of language and learning that he can attain. Tests analyzing the ability of these children to perceive sequential events and to reproduce temporal orders may help to explain precisely and more specifically the deficit in functioning which is impeding the learning process.

Recognition of children with learning disabilities has far-reaching implications. The school must make a place for them, professional persons must combine efforts to expand diagnostic and remedial services. Proper programs have a marked effect on the child himself and his self-image; no longer is he classified as slow and lazy. When the problem is recognized and the child and his family realize that remediation is possible, the child's attitude changes as do the attitudes of those around him. Sometimes it seems

that improvement is initiated with diagnosis--before the educational program is even begun.

A plan that purports to solve the problem by merely reducing goals is seriously inadequate since placement in a class for slow learners or lessening homework and other demands is not a satisfactory program for this type of child. Neither is changing the regular program to compensate for a sensory deprivation, as one does for a class of deaf children, because it is necessary to utilize all sensory capacities to effectively benefit the child with a learning disability.

Counseling services designed only to assist these children in learning to live with their problems also are inadequate. They may need counseling to overcome frustrations which follow repeated failure but they also need a positive educational program aimed at overcoming the learning disorder. Similarly, it is a mistake to assume that typical tutoring programs will solve the problem.

The multidimensional approach to the learning disability is essential in order that the educational plan be sufficiently broad in scope. A unidimensional approach leads to a restricted educational plan; if the emphasis is on a specific disturbance without consideration for a broader area of function, the instruction concerns only the development of skills. On the other hand, an approach that considers only generalized deficits in reading and arithmetic is not sufficient to meet the child's needs. A remedial plan which includes both specific and generalized objectives permits the teacher to work on the deficits during periods of individual remedial study and when in a group to teach to the child's sensory strengths. Such teaching depends upon knowledge of the child's specific sensory strengths and deficits from a broad testing situation. A balanced program of diagnosis and remediation

will produce an integrated program that will teach children to better use their average or above potential.

Experience and knowledge--two important tools for the primary teacher--will make the chances for children with potential learning disabilities much better in the school situation. Early diagnosis and the beginning of a remedial,or better still, a preventive, program for the child in the regular classroom means a far better change for the child in later years to work nearer to his learning potential.

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APPENDIX A

Characteristics of children with learning disabilities as listed by 1)teachers, 2)psychologists and 3)pediatricians, neurologists and pychiatrists.

1. Poor visual discrimination and memory for words
2. Poor auditory memory for words or for individual sounds in words
3. Persistant reversals of words, syllables, or letters in reading, writing and speech; rotation or inversion of letters; reverse sequence of letters and syllables; minor writing or transposition of numbers
4. Poor recall for reproduction of simple geometric forms
5. Poor memory for auditory or visual sequence
6. Weakly established handedness
7. Clumsiness and poor hand control
8. Immature articulation
9. Hyperactivity and distractability.

Psychologists generally refer to perceptual-motor problems, inferring the lack of normal functioning of

1. the perceptual intake processes such as visual, auditory or tactile
2. the motor processes such as speaking, writing, manipulating, walking
3. the combination of both.

The implication is that there are signs present of disorganization in the integrative perceptual motor mechanisma of the brain in this listing.

Physical signs were listed by the third group of professionals:

1. Mild tremor, especially on effort; mild choreoform or athetoid movements
2. Hyper-reflection
3. Excessive clumsiness
4. Monocular vision or minor ocular imbalance
5. Disturbance of body image as a)right-left confusion and absence of or weakly established, laterality, b) finger agnosia or impairment of finger-localizing ability, c) impaired spatial concept
6. Impaired form perception
7. Immature articulation
8. Hyperkinetic behavior with distractibility, short attention span, irritability and emotional lability.

From Kaluger and Kolson, p. 88-90.

APPENDIX B

Characteristics of learning disability children (Myers and Hammill)
Disorders of:

I Motor activity
- A. Hyperactivity (excessive mobility: not necessarily bad, just constant)
  1. Restless, unable to sit without shuffling feet, chattering
  2. Engaged in random activity as tapping pencil, doodling
  3. Erratic behavior
  4. Inattentive
- B. Hypoactivity (insufficient motor activity)
  1. Lethargic, quiet
  2. Not given to much enthusiasm in activity
  3. Causes little disturbance in class
- C. Incoordination (physically awkward, poor motor integration)
  1. Does poorly in activities that require motor coordination
  2. Walking gait rigid or stiff
  3. Performs in a sub-average manner in activities as writing, drawing which require fine motor coordination
  4. Appears to experience difficulties in balance as evidenced by frequent falls, stumbling and clumsy behavior
- D. Perseveration (automatic and often involuntary continuation of behavior)
  1. Inability to shift from one topic, word or phoneme to another
  2. Repeatedly writes the same letter incorrectly or spell incorrectly
  3. Continues to pound a nail after it is embedded
  4. Covers an entire page with one color
  5. Draws a circle then continues to draw in a circular motion

II Emotionality
- A. Instability
  1. Seems bright; quiet and obedient, daydreams, cannot read well
  2. High strung and nervous, attention is hard to hold
  3. Has frequent temper outbursts, sometimes for no apparent reason
  4. Won't concentrate for more than a few minutes at a time, jumps from one thing to another, minds everyone's business but his own
  5. Lacks self control, cannot work with other children, picks on them constantly

III Perception

Viewed as a base upon which concept formation, abstraction ability and/or cognitive symbolic behavior is built. Is generally the inability to identify, discriminate and interpret sensation; usually a decoding problem or a receptive difficulty.
- A. Auditory
  1. Inability to recognize tunes
  2. Cannot hear differentiation between sounds
- B. Visual
  1. Inadequate reproduction of geometric forms
  2. Figure-ground confusion
  3. Letter reversals, inversions, rotations
- C. Olfactory (usually not associated with learning problems)
- D. Gustatory (usually not associated with learning problems)
- E. Cutaneous (inability to identify things by touch)
- F. Kinesthetic and Vestibular
  1. Coordination
  2. Directionality
  3. Space orientation
  4. Balance

IV Symbolization

One of the highest forms of mental ability, involved with both concrete and abstract reasoning

A. Receptive - auditory
   1. Poor understanding of spoken symbols
   2. Frequent requests one to repeat
   3. Echolalia
   4. Confusion of directions and commands

B. Receptive - visual
   1. Reads with little comprehension
   2. Subvocalizes during reading
   3. Congenital word blindness

C. Expressive - vocal (formulation of thoughts for speech)
   1. Circumlocations
   2. Inadequate syntax
   3. Dearth of ideas for expression

D. Expressive - motor (formulation of thoughts for writing as well as nonverbal communication such as gestures
   1. Spelling errors, omissions, reversals, poorly formed letters
   2. Whole words may be left out of sentences which have been copied

V Attention

A. Insufficient attention (distractibility, hyperawareness, hyperirritability, short attention span)
   1. Easily diverted from reading task
   2. Intensive daydreaming and periods of mental blocking

B. Excessive attention
   1. Abnormal fixations on unimportant details, disregarding essentials

VI Memory

Ability to make both meaningful and non-meaningful associations

A. Long term memory (as doing complicated math problems or reading for comprehension)
B. Immediate memory (rote learning)
C. Visual memory
D. Auditory memory

APPENDIX C

Test battery recommended by Zigmond (Tarnopol)

Few if any children would receive the complete listed battery or even a large percent of the total tests. Most would use portions of several tests to determine disabilities that were suspected in the individual.

Tests for auditory memory and discrimination would include:

1. Auditory discrimination - the rhythm test from the Seashore Test of Musical Talents (1939). This is a prerecorded tapped pattern test in which the child indicates that the pattern is the same or different after hearing 5,6, or 7 beats in each pattern.

2. Memory for nonsense words - Spencer (1958) with twelve in the series of tests, ranging from 2-6 syllables, repeated one per second and the child is to repeat.

3. Memory for digits - Weschler Memory Scale, Digits Forward Subtest, twelve in the series, 3-8 digits given, one per second, the child is to repeat.

4. Memory for words - Detroit Tests for Learning Aptitude, Auditory Attention Span for Unrelated Words Subtest (Baker-Leland) similar to above, using nouns rather than digits.

5. Memory for sentences - Detroit Tests for Learning Aptitude, Auditory Attention Span for Related Words Subtest, the child is asked to repeat the complete sentence given by the examiner. Sentences vary in length and structure as well as complexity. Test should be discontinued after two errors in three consecutive sentences.

6. Memory for Rhythmic Sequences - Stambak Test of Nonverbal Auditory Memory, given when the child listens to rhythmic sequence, a series of irregularly spaced taps and he duplicates the pattern. The series if of twenty-one rhythmic sequences of from three to eight taps.

Tests for visual memory and discrimination would include:

1. Visual discrimination - Chicago Nonverbal Examination (Brown) Subtest Five, in which the child is asked to match stimulus designs with one of four similar designs.

2. Memory for designs - Revised Visual Retention Test (Benton), tests the child's ability to reproduce figures as seen on ten cards after a ten second study.

3. Coding - Chicago Nonverbal Examination, Subtest One, a digit symbol test to determine visual association learning, symbolic processes. The child is to copy what he sees.

4. Block design - Kohs Block Design Test, seventeen designs in a wide range of difficulty which the child is to construct a copy with blocks in a specified time.

Tests for intersensory action would include:

1. Oral direction - Detroit Tests for Learning Aptitude, the child is to follow directions given by the examiner using printed letters, pictures and forms. There are seventeen forms increasing in complexity and length of directions given.

2. A-V equivalents - Birch and Belmont, consists of matching a visual dot pattern with a corresponding patterning of rhythmic auditory stimulus. There are ten to fifteen items.

3. Memory for visual digits - Weschler Memory Scales, Digits Reversed Subtest, usihg fourteen items ranging from 2-8 digits per series. Each digit is on a separate card and the child is to tell which digits he has seen.

4. Memory for pictures - Detroit Test For Learning Aptitude, Visual Attention Span for Objects Subtest, fourteen series of pictures ranging from 2-8 presented, child is to name as many as he can remember.

5. Syllabication - Gates-McKillop Reading Diagnostic Test, the child is to read and pronounce aloud twenty nonsense syllables. The test measures the ability to break up and auditorize a new, complex group of visual symbols and then combine them.

APPENDIX D

Suggested Techniques for Diagnostic Teaching: Carrow, 1968 (Myers, Hammill)

An assessment of the child's responses in the auditory-vocal areas. From this outline, the teacher may devise procedures for investigating the child's responses in other channels, namely the visual-motor channel.

1. Awareness. Is the child aware of sound: does he respond in any fashion to sound? He may turn, change facial expression, attempt to imitate the sound.

2. Recognition. Determine if the child can recognize a specific sound; evaluation may consist of presenting a sound stimulus and having the child match or select from a series of sounds the one he has heard. Response must be constant. Can he recognize a sound when it is not completely presented or when it is distorted?

3. Identification. Can the child select the source of a sound that has been presented? Must have adequate figure-ground discrimination to do this.

4. Discrimination. Is the child able to discriminate between sounds of varying pitch, loudness, direction or distance? Can he discriminate speech sounds as opposed to environmental sounds or can he differentiate between different speech sounds, for example, b and p. Can he make these kinds of distinctions in the presence of competing background noise?

5. Recall. Can the child recognize the correct sequence as given in a stimulus? Can he recall a sequence of gross sounds or patterns of loudness or rhythm? A sequence of speech sounds or a sequence of words? Can he recall alike and different (may be more difficult if he is allowed to use auditory and visual input but only auditory input system the second time)?

6. Generalization. Can the child generalize sounds, that is, can he perceive categories into which sounds should be classified? Can he recognize that a series of bell sounds can be grouped together and a series of horn sounds can form another, discrete group? Can he select the best classification for a particular sound?

7. Comprehension. An evaluation should be made of the child's understanding of various aspects of linguistic structure: nouns, verbs, adjectives, adverbs; function words such as prepositions and articles; morphological devices such as the "s" of plurals, "ed" for past tense; sentence structure as active and passive voice.

8. Imitation. Can the child imitate the sound produced by the teacher.

9. Recall and Reproduction. Can the child repeat an auditory pattern after it has been presented: in other words, how adequate is his short term memory for auditory sequences? Can he repeat a clapping pattern, a drumbeat pattern, or a series of object names? How long a series of unrelated abstract words or sentences can he repeat? The teacher should know the child performs when both auditory and visual stimuli or auditory stimuli alone is given. One should also check to see if the child can repeat content of stories, if delayed response is as accurate as immediate response.

10. Formulation. What kind of language expression does the child have? Is his sentence length adequate? Does he use compound and/or complex sentences? Does he make grammatical errors? If so, what kind and how consistently? Are there errors of morphological construction in the child's vocal expression? What is the nature and consistency of the errors? Does he circumlocute, that is talk "around" a subject without clearly stating his ideas? Does he seem to have word-finding difficulties?

11. Feedback. Does the child respond to feedback from an external source? Does he discriminate an error if the teacher uses his error in a sentence? When the teacher contrasts the sentence with the error and one without it, can the child select the correct sentence? Can he evaluate his own errors? Can he indicate whether he used the form correctly or incorrectly? Does he monitor his expression only when attention is called to it or does he monitor it all the time? Is he aware that he makes errors?

"The concept of prescriptive remediation requires the accumulation of information regarding the child's abilities and disabilities, gathered in formal testing and in diagnostic teaching, and requires also the selection of appropriate teaching techniques. The teacher ultimately must be the one who prescribes educational procedures for the child, utilizing both objective and informal test results." (p.75)

EARLY DIAGNOSIS OF LEARNING DISABILITIES

by

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AN ABSTRACT OF A MASTER'S REPORT

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In the not too distant past, teachers of young children have become aware of the problems in learning which various children exhibit. These problems are poor learning abilities and behavior traits which seem to form a pattern when compared with other children and their problems. There may be various explanations but the symptoms lead up to the same result: the child is not working up to his ability as one would expect from his previous work or from tests given to determine ability. This report is an attempt to assist the classroom teacher to indentify the child with unexplained learning problems while working with him in the classroom setting. It is the area of early identification that is emphasized in this paper since if the child and his problems can be identified early--in kindergarten or no later than first grade--the correction of the problem will take the form of prevention rather than remediation.

To recognize a learning disability one must first define what one is to look for. One must know what deviant or unusual characteristics or behavior manifestations to be on the alert for in everyday activities with children in the classroom. One must be aware of non verbal as well as verbal disabilities, particularly with young children because many have not advanced far into recognizable verbal disabilities prior to school age. The work of Katrina de Hirsch and her associates has been helpful. They have devised an index of competencies which the kindergarten child should have prior to attempting formal learning activities. There is also a need for diagnostic teaching once the problem has been discovered. Just knowing what is causing the child to have problems with learning will not in and by itself help him. He needs a supportive program to help him correct the learning problem and also to bring him nearer to his potential learning ability by progressing through the steps he missed.

In the section on diagnosis, listings of disability characteristics will help the teacher in an informal observation of the child. Also tests which may be given by the teacher or in some cases a specially trained person, are listed and discussed. Discussion of language evaluation and reading evaluation comprise the largest part of this section since much more work has been done in these areas. Diagnosis seems to be easier in these areas, also, before the child learns to cover up or compensate for those things in which he is least proficient. There are shorter sections in the areas of tactile-motor disorders and disorders of quantatative thinking. Until recently there has been little in the literature about either of these subjects. Also, since these areas are studied in depth later in the child's life they do not play quite as important a part in an early diagnosis program as do those things concerned with reading and language.

Discussed in this paper is the need for teacher training and in-service education if the problems of learning disabilities are to be recognized and dealt with early in the child's school career. It takes a degree of experience, of actually working with children, to recognize problems in the formative stage. It is not enough to know that something is wrong--to help the child the teacher must know how to discover the specific problem and then do something about it. While diagnosis and remediation is the primary responsibility of the classroom teacher, he must be acquainted with special services that are available and then use them. Parents have a definite place in working with these children and the teacher should know how to integrate them into the program. Finally, our school system must recognize the problem of the child with learning disabilities and help the classroom teacher to make a place for him in such a way that he feels comfortable and successful.