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Review of research on kindergarten screening for the early identification of children with learning disabilities

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A REVIEW OF RESEARCH ON KINDERGARTEN SCREENING FOR THE EARLY IDENTIFICATION OF CHILDREN WITH LEARNING DISABILITIES

by

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CHAPTER I

INTRODUCTION

Kindergarten screening has become a more technical approach toward preventive education for students. It has become an effort to promote preventive education in a more scientifically delineated form which would attend to the issue of early identification of learning problems. Such screening operates on the basic assumption that early detection of students with learning problems will lead to earlier and more appropriate treatment. This is usually accomplished through the assessment of perceptual, cognitive, and motor abilities in children.

The interest in kindergarten screening continues to grow and bring with it a variety of instruments and combinations of instruments to accomplish the task. Questions develop as to the effectiveness of such screening and the actual diagnostic procedures undertaken in the name of screening with early prevention and early treatment, the seemingly desired outcomes of such procedures.

The author presents an investigation of research on kindergarten screening procedures used during the period of 1968-1975. This review of research for the early identification of children with learning disabilities includes an examination of kindergarten screening procedures undertaken by professionals in the fields of medicine, language, education, and psychology. A review of specific kindergarten screening instruments developed during this period is also included.

Statement of Purpose

The purpose of this paper was twofold (a) to review the research on kindergarten screening for the early identification of students with learning disabilities and (b) to review kindergarten screening instruments developed during the period of 1968-75.

Definition of Terms

Following are terms which necessitate a definition to maintain clarity in this research paper and help the reader establish the intended meaning of the author.

Cyanosis	Dusky bluish or purplish discoloration of skin or mucous membranes due to deficient oxygenation of the blood either locally as in certain vasomotor disturbances or systematically as in some congenital heart defects.
Learning Disability	"Children with special learning disabilities exhibit a disorder in one or more of the basic psychological processes involved in understanding or in using spoken or written languages. These may be manifested in disorders, of listening, thinking, talking, reading, writing, spelling, or arithmetic. They include conditions which have been referred to as perceptual handicaps, brain injury, minimal brain dysfunction, dyslexia, developmental aphasis, etc. They do not include learning problems which are due primarily to visual, hearing or motor handicaps, to mental retardation, emotional disturbance, or to environmental disadvantage."[1]
Screening	A means of surveying a students' abilities and/or disabilities for the purpose of identifying specific strengths and weaknesses which are indicative of possible learning disabilities.

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[1] The First Annual Report of the National Advisory Committee on Handicapped Children, (Washington, D.C.: Office of Education, U.S. Department of Health, Education and Welfare, 1968).

Summary

An attempt was made to acquaint the reader with the idea of kindergarten screening as a preventive means of dealing with possible learning disabilities students. Reference was made to the fields of medicine, language, education, and psychology which have undertaken research in this area and have developed an ever increasing number and variety of screening instruments to accomplish this task.

CHAPTER II

REVIEW OF RESEARCH

The author attempts to focus on efforts in medicine, speech pathology, education and psychology in looking at recent research and trends in kindergarten screening as they relate to early identification of children with learning disabilities. Concern is directed toward preventive methods which will identify in a reliable fashion those characteristics which will most consistantly identify learning disabled children. Each area seems to have followed its separate path only to come to a crossroad indicating the overlapping of priorities, mutual identifiable characteristics of learning disabled children and a new emerging comradeship as each discovers the direction of others' efforts in early identification and prevention. One is confronted with formal versus informal methods of identifying learning disabled students.

Experimentation since the 1960's has brought forth many forms of early identification and screening of learning disabilities. Efforts have compared profiles of normal development as set forth by Gesell,[1] Freud,[2] Piaget,[3]

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[1]Arnold J, Gesell and Catherine S. Amatruda, Gesell Developmental Schedules (New York: Hoeber-Harper, 1947).

[2]Sigmund Freud, A General Introduction to Psychoanalysis, (New York: Washington Square Press, 1960).

[3]Jean Piaget, Science of Education and the Psychology of the Child, (New York: Viking, 1970).

Hunt,[1] and Bloom.[2] Case histories of handicapped children's development have been reconstructed to help identify characteristics which may be indicative of characteristics of learning disabilities.

Considering the task of screening, one is faced with the need to identify highly predictive information. Screening programs have been implemented from the neonate period through school years. Areas chosen for examination include physical, neurological, psychoneurological, perceptual, linguistic, cognitive, social-emotional, socio-cultural, and criterion-referenced academic considerations.

Screening devices are composed of various combinations of predictive tests, checklists, interviews, and observations. Difficulty arises in attempting to identify distinctive, reliable forms of early identification of learning disabilities. As a result one is left to identify target behaviors and techniques to identify and assess these behaviors.

Professionals from various fields, following their own interest and research have closely examined normal and abnormal development in an attempt to identify significant symptoms and behaviors.

Medical

The physical development and general health of young children is of particular interest to the medical profession. The interdependence of physical and psychological development had encouraged coordinated efforts between physicians and developmental psychologists. Gesell[3] has supplied norms for

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[1]Joseph McV Hunt, Intelligence and Experience, (New York: Ronald Press, 1961).

[2]Benjamin S. Bloom, Stability and Change in Human Characteristics, (New York: Wiley, 1964).

[3]Gesell, Gesell Developmental Schedules.

physical behaviors at various chronological age levels. Physical and neurological development is evident especially when the significance of birth complications are investigated in relation to later learning development. Knobloch and Pasamanick[1] examined 1000 normal and abnormal children at age 40 weeks and again at age 3 years to find a high correlation between early neurological status and later intellectual potential. The Infant Neurological Indices[2] and other instruments of early identification continue to solicit varied opinions concerning their significance. Complications are evident with the many compounding variables identified in physiological and neurological perspectives.

Mary S. Hoffman[3] has developed a Learning Problem Indication Index (LPII) which she feels chould enable a physician to identify, as early as age 2, the child with low learning potential and distinguish children whose academic failure results from a neurological dysfunction.

The LPII presents a list of perinatal and developmental events which may be used as learning problem indicators.

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[1]Hilda Knobloch, and Benjamin Pasamanick, "The Developmental Behavioral Approach to the Neurologic Examination in Infancy," Child Development 33 (1962): 197.

[2]E. Denhoff, P. Hainsworth, and M. Hainsworth, "Learning Disabilities and Early Childhood Education: An Information-Processing Approach." In H. Myklebust (ed.), Progress in Learning Disabilities, Vol. II. (New York: Grune & Stratton, 1971), p. 121.

[3]Bobbie L. Wilborn and Don A. Smith, "Early Identification of Children with Learning Problems," Academic Theraphy 9 (Spring 1974): 364.

Learning Problem Indication Index (LPII)
Score one for each positive point
(abnormality in a child's history)

Perinatal History
- Prematurity
- Prolonged labor
- Difficult delivery
- Cyanosis
- Blood incompatibility
- Adoptions
- *Problems during pregnancy
- *Low birth weight (less than six pounds)

History of Developmental Abnormalities
- Creeping (late or abnormal)
- Walking (late)
- Tip toe walking prolonged
- Speech (late or abnormal)
- Ambidexterity (after the age of 7 years)

Interpretation of Score:
- 1 or 2 Suspicious
- 3 Deserves more study
- 4 or more Further study mandatory

*Revised LPII[1]

Data from the Hoffman[2] and Wilborn[3] studies indicate that the presence of birth and/or developmental abnormalities can be used as a screening instrument to check for possible learning disabilities. The definitive data from both studies indicated that the LPII can be effective in differentiating potential learning disabled children early in their development.

This index can be used as a screening device by not only physicians but also school personnel. Schools could require personal and developmental histories on students and thereby screen large numbers of children with ease.

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[1]Ibid., p. 369.

[2]Mary S. Hoffman, "Early Identification of Learning Problems," Academic Theraphy 7 (Fall 1971): 27.

[3]Wilborn, "Early Identification of Children with Learning Problems," p. 364.

Used in conjunction with personal observation the LPII can be utilized to determine which students appear to warrant further study for specific learning problems.

Lefford[1] suggests that in many subjects disturbances in finger awareness or agnosia are associated with deficiencies in scholastic skills--learning disabilities. From his study it is possible to conclude that an early evaluation of digital competence may be another basis upon which to base early identification of learning problems.

Goodwin and Erickson[2] developed a study to determine whether certain teeth may be better detectors of developmental problems than others. The study was inconclusive and in need of replication to corroborrate findings that some teeth are better discriminators than others. It is known that teeth and the nervous system originate from the same germinal layer during embryological development. It is also believed that the effect of prenatal insults is increased for those organs undergoing rapid change at the time of insult. The possibility exists that a specific insult could affect development of the brain only at the specific time which correlates with idiosyncratic differentiation of the brain.

Hoffman[3] suggests the physician must try to anticipate the possibility of scholastic failure being the only professionally qualified person with the opportunity to discover a potential problem prior to a child entering school.

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[1]A. Lefford, "Perceptual and Cognitive Bases for Finger Localization and Selective Finger Movement in Preschool Children," Child Development 4 (June 1974): 335.

[2]William C. Goodwin Jr. and Marilyn T. Erickson, "Developmental Problems and Dental Morphology," American Journal of Mental Deficiency 78 (September 1973): 199.

[3]Hoffman, "Early Identification of Learning Problems," p. 35.

A physician should examine each child to determine possible physical and/or emotional impairment and whether this handicap is severe enough to make it difficult or impossible for a child to compete academically with his peers. Hoffman[1] viewed the identification of children with potential learning disabilities as a greater problem than identification of the very bright or very dull. She alluded to the many methods devised to determine normalacy of a child's development directing criticism toward methods which are too long and detailed; too cumbersome to be practical as a screening process.

More important than a full electroencephalograph (EEG) is an investigation of a child's motor functioning which can be done using a portable EEG machine to obtain electropolymyographs which will help determine any muscle dysfunction which is attributable to neurological dysfunction.

Some neurologists are beginning to suspect that the fifth and sixth week of gestation may be a crucial period in the development of a child, and a crucial period in terms of preventive efforts which may possibly eliminate later symptoms indicative of learning disabilities. At present it has been suggested that pediatricians can identify potential learning disabled children at three weeks and neurologists are claiming to be able to identify children as early as 18 months.

Tarnopol[2] suggests that physicians should develop an Index of Suspicion from all clues, no one of which will lead to a diagnosis of specific learning

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[1]Ibid., p. 27.

[2]Lester Tarnopol, ed., Learning Disabilities: Introduction to Educational and Medical Management (Springfield, Illinois: Charles C. Thomas Publisher, 1969), p. 120.

disorders but the total of which could lead to a significant profile.

Attention was directed to the consideration of these points:

1. Sex--males are more vulnerable

2. Family history of reading, speech or spelling disorders

3. Illness or difficulty of mother during pregnancy, including bleeding or toxemia

4. Birth history--prematurity, prolonged or precipitious labor or unusual delivery, perinatal anoxia

5. Neonatal course--sucking ability and general activity compared to that of siblings; history of poor sucking, excessive sleeping, apathy or increased irritability may indicate deviations in the CNS (Central Nervous System)

6. Developmental milestones in comparison to siblings, especially speech development and large and small motor coordination. History of delayed speech development, difficulty in academic language skills, problems in large muscle coordination, history of awkwardness and clumsiness as preschoolers and at school-age, poor ability in sports which require skill coordination, awkwardness and/or disinterest in coloring

7. Illness or accidents that cause central nervous system insult or injury (CNS infections, severe dehydration in infancy)

8. Hyperkinetic syndrome--hyperactivity, distractibility, short attention span, emotional liability, cyclic behavior, low frustration tolerance, poor impulse control, overreacting to excitment, temper outbursts, clumsiness

9. Chronic illness and physical handicaps

10. Unrecognized seizures--petit mal and psychomotor masquerade as inattention, day dreaming, temper outbursts and bizarre behavior

11. Cultural factors--different native tongue or dialect, different behavior

12. Dysfunctional home environment

Physical examination should include a general as well as neurologic look at a child when suspicions have been aroused. One would suggest that this would include developmental growth patterns as well as the above mentioned indicators.

Tarnopol[1] described an Arm Extension Test developed by Paul Schilder which distinguished 74% of 150 children with reading disabilities and none of the controls. The test consists of both arms being extended with the eyes closed and the fingers spread. One hand tends to be higher than the other. It was found that the hand opposite the one used in writing tended to be raised higher in children with reading disabilities. This had been interpreted to suggest that clear cut cerebral dominance had not yet been established. Another 18% of the reading disability group held both hands level indicating possible lack of dominance in either hand and therefore in either side of the brain.

Language

The language variable is interwoven with the educational, psychological and medical characteristics of learning disabilities. Early detection efforts focus particularly on the development and use of language. Every major screening instrument directly or at least indirectly taps a child's skills in language.

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[1]Ibid., p. 14.

Travis[1] indicated that screening must be forthcoming from a variety of disciplines. If the child's disability is marked severely influencing comprehension or utterance of spoken word, parents will seek diagnostic assistance soon after the age at which speech is expected, usually between ages 1 to 3 years. Dyslexia is rarely suspected until after the child is in the third or fourth grade. Auditory language is the first verbal system acquired so deficits in this area frequently become troublesome in the prekindergarten years. It is common for parents to express concern as to the child's eligibility for school entrance because of his limitations with spoken language. The use of auditory language is in fact an accepted readiness step for kindergarten and first grade. The most crucial time for identification is during the preschool years. It is unlikely that all children with language problems will be discovered before school-age. Case findings indicate identification of language problems in early life is most sucessful with children having severe problems.

Mecham[2] alludes to evidence in the literature which strongly suggests a sensitivity for language facilitation before which it is practically impossible to teach oral or audio language and after which acquisition becomes increasingly more difficult with the advancement of age. Most authors place the period between ages 3 and 6. The best time for optimal dividends in language remediation is between 4 and 8 years of age and the earlier in that period the better.

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[1] Lee Edward Travis, ed., Handbook of Speech Pathology and Audiology (New York: Appleton-Century-Crofts, 1971), p. 1203.

[2] Merlin J. Mecham, J. Dean Jones, and J. Lorin Jex, "Use of the Utah Test of Language Development for Screening Disabilities," Journal of Learning Disability 6 (October 1973): 524.

Screening procedures are commonly used especially in the medical profession as indicated earlier. Through brief assessment procedures, children are identified as having problems and are referred for more extended testing to determine the exact nature of strengths and weaknesses in a particular problem area. Screening is an efficient way to avoid the necessity of testing large numbers of children merely to determine where each child falls on the continuum of problem/nonproblem.

Some school systems rely on teacher referrals, whereas the majority of the public school disticts over the country conduct annual or biannual speech and learning screening surveys to identify students in need of the help of speech and language clinicians.

Most screening tests used by speech and hearing clinicians in public schools measure only articulatory or phonatory aspects of oral language. Some tests which assess a child's mastery of other aspects of language such as the ITPA are too long and complex to serve as efficient screening devices.

Recent emphasis has placed early identification in the foreground in importance. This emphasis has created a need, especially for screening tests of language which are sensitive to the presence or absence of delayed speech.

In a study by Mecham[1] the Utah Test Of Language Development was discussed as a language assessment tool designed to measure the onset and progressive maturation of developmental milestones in children's language. The study further delineated a brief of the test which when administered took only two and one half minutes as opposed to a total test administration time of thirty minutes. Results indicated a 100% agreement with the total Utah Test of

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[1]Ibid., p. 525.

Language Development (UTLD) in screening out 163 kindergarten children who had language age equivalent scores of one year or more below chronological age. The screening subtests of the UTLD included items 19, 21, 24, 26, and 18.

Once again the idea of screening is prevalent in the literature. The ability to assess language functioning is not in question, what is of major concern is to establish procedures which will accurately identify language delay with a minimum of time and high effectiveness rate. The UTLD subtest seems a possible solution in meeting the criteria of speed and accuracy in the initial identification of language concerns.

One is alerted to a speech and language concern if the child is not using words by age two and if speech is not reasonably intelligible by age four years. A thorough assessment in speech production and language behavior would include audiometric screening, assessment of articulation, voice quality and rate, and a thorough appraisal of the receptive integrative and expressive aspects of language.

Of 31 variables measured in the Haring[1] study, the most significant were language related variables.

Education

Attempts at early identification of high risk children have taken many directions as professionals in the field attempt to develop effective efficient methods of screening. Much overlapping occurs with the psychological variables which will be discussed in greater detail later in this paper. Screening

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[1]N. C. Haring and R. C. Ridgway, "Early Identification of Children with Learning Disabilities," Exceptional Child 33 (June 1967): 393.

attempts have been made using observational checklists, established test instruments, combinations of test batteries, self-constructed tests and/or batteries, task analysis, developmental scales questionnaires and examinations of anecdotal records.

In a study by Maitland[1] a survey of a representative sample of school districts in the United States indicated that the majority of school districts do screen and that there is a great variability in measures they employ. The purpose of the Maitland[2] survey was to determine whether schools used tests lacking data considered essential for test development, to find out the prevalence of school screening procedures, to identify specific tests employed, and to determine the uses of test results. Results indicated that only 11% of the districts, which do screening, examine vision and/or hearing without testing readiness; 55% of the respondents did some type of readiness for academic instruction; 72% of the 55% used only one measure rather than a composite of tests or test parts.

The measure most often used was the Metropolitan Readiness Test (MRT), (36%). After the MRT the next most commonly reported measures are those developed by the local school district (18%). Reasons for selection of a particular readiness measure was: the professional staff had recommended it; the test's comprehensive nature and ability to predict future school achievement; cost and ease of administration. It was indicated that once a school district committed itself to screening, it tended to adopt a total program of vision, hearing and readiness. When making decisions about children most

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[1]Suzanne Maitland, J. B. E. Nadeau, and Gretchen Nadeau, "Early School Screening Practices," Journal of Learning Disabilities 7 (December 1974).

[2]Ibid., p. 645.

districts tended to view teacher judgement as more important. Test results became more important than teacher judgement only when screening was done on entrance to kindergarten or first grade. Tests made maximum contributions when given early. The Maitland[1] study concluded that there exists a great variability in screening measures employed in the United States. It was suggested that school districts would derive maximum benefit from the MRT if they developed local cutoff scores and administered the test prior to first grade rather than at the end of kindergarten.

Humes, Hiles, and Savage[2] indicate from their studies that diagnostic instruments alone are not sufficient to separate learning problems from the more specific learning disability.

Considerable time and effort are expended on the screening of children in kindergarten or beginning first grade in order to identify learning disabled children. In addition to widespread use of standardized readiness, perceptual or intelligence tests, many experimental test batteries, scales and questionnaires have been used for this purpose with varying degrees of success.

Early identification is not only desirable but in many states it is now mandatory to screen all kindergarten entrants to pick up high risk children early.

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[1]Ibid., p. 649.

[2]Charles E. Humes, Patricia Hiles, and William Savage, "Early Learning Disabilities Identification: A Report," Academic Theraphy 10 (Summer 1975): 424.

Badian[1] indicates a need for different predictive measures for boys and girls. She also found that the Bender predicts more accurately for children of low than high socioeconomic status.

Traditional screening which alluded to discrepancies between academic achievement and potential discrepancies between verbal and nonverbal ability, intratest scatter and inferior performance on a visual motor copying test, have proven inadequate for younger children. This technique originally was set up for children in third and fourth grade. The time from ages five to seven is a period of rapid perceptual and cognitive development. According to Badian,[2] there is no consistent pattern for verbal/nonverbal intellectual pattern for normal or high risk children at age 5 or 6. Hagin[3] found no consistent Wechsler Preschool and Primary Scale of Intelligence (WPPSI) subtest pattern to characterize a high risk group. Haring and Ridgway[4] reported that there were few common identifiable learning patterns among the kindergarten children identified as potential learning disabilities and that their study indicated no identifiable patterns on the WPPSI or the Illinois Test of Psycholinquistics (ITPA) to differentiate best and worst reading. ITPA profiles of the best and worst readers, when compared, indicated good readers showed much greater inter-subtest variability than poor readers. A question was raised as to whether or not too much stress has been put on scatter as an

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[1]Nathlie Badian and Blanche Serwer, "The Identification of High Risk Children: A Retrospective Look at Selection Criteria," Journal of Learning Disabilities 8 (May 1975): 286.

[2]Ibid., p. 285.

[3]Rosa Hagin, Archie Silver and Carol Corwin, "Clinical Diagnostic Use of the WPPSI in Predicting Learning Disabilities in Grade 1," Journal of Special Education 5 (Fall 1971): 230.

[4]Haring and Ridgway, "Early Identification of Children with Learning Disabilities," p. 388.

unfavorable sign. A concern indicated that a high risk child may in fact be one with less severe perceptual or psycholinquistic disabilities but only moderate strengths to counterbalance.

Badian and Serwer[1] indicated that there is considerable evidence that the Bender test given to kindergarteners is a fairly good indicator of later achievement. Since visual-motor and cross-modal skills are in ascendancy at kindergarten age it is likely to be more related to achievement than later developmental skills such as language variables.

The Badian and Serwer[2] study compared best and worst readers on approximately sixty variables, WPPSI, ITPA, Frostig Developmental Test of Learning Aptitude, the Wepman Auditory Discrimination Test and screening tests. Only five of these significantly differentiated the group at .05 level or higher. Three of the five variables were number subtests:

PMA Primary Mental Abilities Test--Numbers
Detroit Number Ability
Metropolitan Readiness Test--Numbers
Metropolitan Readiness Test--Alphabet
Detroit Orientation

On the basis of this study it would seem that a kindergarten child's understanding of number concepts may be one good predictor of achievement. No evidence of the effectiveness of visual-motor copying was indicated for the early identification.

Educational evaluation entails a detailed analysis of academic abilities including achievement assessment for details of levels and methods of skill acquisition, e.g., in reading, computation, spelling and writing.

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[1]Nathlie Badian and Blanche Serwer, "The Identification of High Risk Children: A Retrospective Look at Selection Criteria," p. 285.

[2]Ibid., p. 286.

Honig[1] found experienced teachers' forecasts on student ability had as high a predictable value as reading readiness tests.

Cowgill, Friedman, and Shapiro[2] designed a study to determine whether learning disabled children could be predicted from kindergarten anecdotal reports. Teachers in kindergarten may be one of the more sensitive methods of determing which children may later display learning disabilities. Teachers have the advantage of sampling a large universe of behavior and have extensive contact with children to develop a framework for integrating and evaluating behavior observed. There has been limited success with present rating scales due to the number of factors. Children may at early points display quite diverse characteristics while trait rating scales that are highly focused may end up missing many children.

It has been suggested that rating scales need to be relevant to classroom activities. In Cowgill's[3] examination of anecdotal records, he demonstrated that learning disabilities can be predicted by teachers' general impressions about children and by specific traits which characterize particular behavior. The traits most evident were inability to do work due to lack of attention or inability to attend to directions, inability to comprehend or remember verbal instructions, poor motor control, and/or poor attention.

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[1]A. Honig, Infant Development Research: Problems in Intervention, paper presented at Merrill Palmer Institute Conference, Detroit, Michigan, EDRS acquisition No. ED062008, PS005593, February 1972.

[2]Mary Lu L. Cowgill, Seymour Friedland, and Rose Shapiro, "Predicting Learning Disabilities from Kindergarten Reports," Journal of Learning Disabilities 6 (1973): 577.

[3]Ibid., p. 578.

Haring[1] indicated that individual behavior analysis done by teachers may prove a more effective procedure than group testing in identification. When teachers were provided with a structured guide to observe kindergarten children they could select children who had developed retardation by specific areas of performance--eye hand coordination, auditory memory, language and visual memory.

Keogh[2] indicated in 1974 that the majority of the more recent studies contained evidence that teachers were surprisingly accurate predictors of future successes and problems. They recognize children not adjusting to the academic or social environment of school. One questions their ability to accurately differentiate among high risk children--emotionally disturbed or learning disabled. The possible identification of high risk children is compounded further by possible cultural or socioeconomic status influences which are reflected in school performance. Keogh[3] questions whether similar behaviors and learning characteristics are indicative of high risk in middle and low socioeconomic status schools. More agreement was noted among teachers in the middle socioeconomic status schools than those from the low socioeconomic status.

Keogh[4] concluded that there was a consensus among teachers as to perceptions of high risk characteristics of kindergarten and primary grade children.

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[1]Haring and Ridgway, "Early Identification of Children with Learning Disabilities," p. 394.

[2]Barbara K. Keogh, "Teachers' Perceptions of Educationally High Risk Children," Journal of Learning Disabilities 7 (June 1974): 372.

[3]Ibid., p. 371.

[4]Ibid., p. 371.

The EH (Educationally Handicapped) descriptors were[1]:

Short attention span
Hyperactive
Disruptive, talking, noise making
Demands a great deal of teacher time
Health, physical problems
Shows emotional problems, disturbance
Aggressive
Withdrawn
No sense of responsibility or self-discipline
Poor interpersonal relationships
Problem due to home conditions

The results of an experiment by Ferinden[2] indicate that the kindergarten teacher can select with extreme accuracy those children who will experience difficulty at the first grade level.

Ilg and Ames[3] obtained high correlation between kindergarten ratings and sixth grade achievement. Keogh and Smith[4] found teacher ratings consistantly significant when correlated with achievement scores in grades two through six.

Experience with preschool education over the past few years has indicated a sign of patterns of interacting between children and other people in their environment, notably parents. Mother-child interactions have been introduced into early screening procedures.

In 1967 Haring and Ridgway[5] made a statement that no one to date had reported on research concerned with the identification of children with learning disabilities prior to school years. This trend has changed.

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[1]Ibid., p. 371.

[2]William E. Ferinden Jr., S. Jacobson, and N. Linden, "Early Identification of Learning Disabilities," Journal of Learnin Disabilities 3 (November 1970): 590.

[3]F. L. Ilg, and L. B. Ames, School Readiness: Behavior Tests Used at the Gesell Institutes, New York: Harper & Row, 1964, p. 110.

[4]B. K. Keogh and C. E. Smith, "Early Identification of Educationally High Potential and High Risk Children," p. 372.

[5]Haring and Ridgway, "Early Identification of Children with Learning Disabilties," p. 388.

Various screening devices are presently being developed and/or marketed. Tests and Measurements In Child Development: A Handbook[1] indicates that guides to measure a child's behavior and development not available from test publishers include tests of various types. The majority fall into three categories: individually administered paper and pencil tests, performance tests, and rating scales. These largely take into account measures which are individually administered performance tests or structured observations.

Psychology

Many professions have chosen to concentrate on one or more psychological behaviors in early detection. General screening devices reflect appreciation for integration of physical, neurological and psychological development.

Getman[2], Barsch[3] and Kephart[4] give particular attention to integration of the visual-motor systems. This emphasis seems to have resulted from the apparent problem of school-age learning disabled children in performing tasks requiring this coordination.

A number of perceptual and perceptual-motor tests are used to detect learning disabilities early. The Bender Gestalt, the Frostig Developmental

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[1]Orval G. Johnson and James W. Bommarito, Tests and Measurements in Child Development: A Handbook, (San Francisco: Jossey-Bass, Inc., Publishers, 1971).

[2]G. N. Getman, E. R. Kane, and G. McKee, Developing Learning Readiness Programs, (Manchester, MO: McGraw-Hill, 1968).

[3]Ray H. Barsch, A Moviegenic Curriculum, (Madison, Wisconsin: Department of Public Instruction, Bureau for the Handicapped, 1965).

[4]Newell Kephart, The Slow Learner in the Classroom, (2nd ed.), (Columbus, Ohio: Charles E. Merrill, 1971).

Test of Visual Perception and the Developmental Test of Visual Motor Integration are three instruments which have been used.

Each of these tests have been used with varying degrees of success. Keogh and Smith[1] found changes in predictability of performance on the Bender Gestalt for reading performance in grades one through six. Badian[2] claimed that the Bender predicts more accurately for children of low than of high socioeconomic status. According to Tarnopol,[3] a study of 150 children with reading disabilities indicated 92% of the group were found to have visual-motor defects on the Bender Gestalt Test. On the Draw-A-Person Test, 80% of the children with reading disabilities had deficits.

Boyd and Randle[4] indicated that the Frostig Developmental Test of Visual Perception measures essentially one general visual perceptual factor. It questions content validity and suggests that the Perceptual Quotient be used as a unitary measure of perceptual functioning rather than a cumulative of five independent visual perceptual abilities. The authors suggested checking the Perceptual Quotient with the IQ for discrepancy and possible predictive value. Bannatyne[5] suggests the Frostig DTVP is valuable for visual-spatial ability and visual perception in 2-dimensions.

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[1]Keogh and Smith, "Early Identification of Educationally High Potential and High Risk Children, p. 372.

[2]Badian and Serwer, "The Identification of High Risk Children: A Retrospective Look at Selection Criteria," p. 285.

[3]Tarnopol, ed., Learning Disabilities: Introduction to Educational and Medical Management, p. 15.

[4]Larry Boyd and Kenneth Randle, "Factor Analysis of the Frostig Developmental Test of Visual Perception, Journal of Learning Disabilities 3 (May 1970): 18.

[5]A. Bannatyne, "Diagnosing Learning Disabilities and Writing Remedial Prescriptions," Journal of Learning Disabilities 1 (April 1968): 243.

Bannatyne[1] further suggests the test of finger agnosia by Kinsbourne and Warrington will pick up any tactile or haptic disorders.

Haring and Ridgway[2] indicates that the relationship, that current and past literature suggests exists between area physical and intellectual performance, may have little predictive value in identifying children with learning disabilities.

Hagin[3] found no consistent WPPSI subtest pattern to characterize her high risk group. Haring and Ridgway[4] reported there were few common identifiable learning patterns among kindergarten children identified as potential learning disabled children.

The Slosson Intelligence Test (SIT) posed some question when used as a screening instrument. Swanson and Jacobson[5] suggested that the correlation of the SIT IQ with the WISC or WAIS Performance IQ may be dependent upon the age of the subject.

Results from the WPPSI to study patterns of intellectual functioning differed considerably from findings of a number of studies utilizing the WISC.

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[1]Ibid., p. 345.

[2]Haring and Ridgway, "Early Identification of Children with Learning Disabilities," p. 394.

[3]Rosa Hagin, Archie Silver and Carol Corwin, "Clinical Diagnostic Use of the WPPSI in Predicting Learning Disabilities in Grade 1," p. 230.

[4]Haring and Ridgway, "Early Identification of Children with Learning Disabilities, p. 394.

[5]Merlyn Swanson and Anita Jacobson, "Evaluation of the S.I.T. for Screening Children with Learning Disabilities," Journal of Learning Disabilities 3 (June 1970): 319.

Bannatyne[1] has used subtests within the WISC to analyze spatial, conceptual, and sequencing abilities by adding together the scaled scores of three performance subtests under each area. The breakdown is as follows[2]:

Spatial score--picture completion
block design
object assembly

Conceptualizing score--comprehension
similarities
vocabulary

Sequencing score--digit span
picture arrangement
coding

The composite mean standardized scaled scores expected for each of these groupings of three subtests is thirty. Deficit areas are determined from these area scores.

The Directory of Facilities For The Learning-Disabled and Handicapped[3] lists those institutions that were willing to provide information about themselves. Of the thirteen Wisconsin diagnostic facilities mentioned in the text the following tabulation could be made:

Test Name	Frequency of Use
WISC	10
WAIS	7
Bender Gestalt	7
MMPI	5
Rorschach	5
TAT	5
WRAT	4
Frostig	3
ITPA	3
S-B (L-M)	3

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[1]Bannatyne, "Diagnosing Learning Disabilities and Writing Remedial Prescriptions," p. 243.

[2]Ibid., p. 243.

[3]Careth Ellingson and James Cass, Directory of Facilities for the Learning Disabled and Handicapped, (New York: Harper and Row Publishers, 1972).

Forty different tests were mentioned with 3 institutions not listing diagnostic information. From this alone, one is led to the conclusion that many varied combinations exist in attempting to diagnose learning disabilities.

A preliminary assessment of visual-motor coordination could include[1] having a child do the following:

1. Draw the best man he can
2. Copy a circle already drawn (at age 3 years)
3. Copy a + in imitation (at age 4 years)
4. Copy a square (at age 5 years)
5. Copy a triangle (at age 6 years)
6. Copy a diamond (at age 7 years)

Attention is also given to the significance of auditory perceptual skills. DeHirsch, Jansky and Langford[2] found that the Wepman Auditory Discrimination was at least a useful predictive device for kindergarten screening. Finkenbinder[3] has suggested certain weaknesses in a similar instrument the Goldman-Fristoe-Woodcock Test of Auditory Discrimination.

Other

Environmental factors in a child's development are so critical that situational variables are often used to detect learning disabilities.

Economic and other deprived environment signal the possiblity of poor development in children. Preventive programs have been directed particularly

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[1]Tarnopol, p. 121.

[2]Katrina DeHirsch, J. J. Jansky and W. S. Langford, Predicting Reading Failure, (New York: Harper & Row, 1966), p. 121.

[3]R. A. Finkenbinder, "A Descriptive Study of the Goldman-Fristoe-Woodcock Test of Auditory Discrimination and Selected Reading Variables with Primary School Chidren, Journal of Special Education 7 (1973): 130.

toward children living in impoverished conditions. The research of Skeels and Dye,[1] Skeels,[2] and Kirk[3] indicate the possibility of reversing the development of learning disabilities by environmental improvement. It appears easier to assess the child's learning environment than assessing the child himself. Screening efforts are relying more on the perceptions of teachers and parents--an appreciation for environment and situational variables which may be precipitating the learning disability.

DeHirsch, Jansky and Langford[4] composed the Predictive Index for a study of many tasks and tests with potential usefulness in kindergarten screening. Variables which proved predictive were[5]:

pencil use
Bender-Gestalt
Wepman Test of Auditory Discrimination
number of words used in a story
categories
word matching
recognition tests

The most interesting aspect of this approach is the resemblance of the task items to actual classroom behavior.

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[1]H. M. Skeels and H. B. Dye, "A Study of the Effects of Differential Stimulation on Mentally Retarded Children," Convention Proceedings American Association of Mental Deficiency, 1939, p. 31.

[2]H. M. Skeels, "Adult Status of Chidren with Contrasting Early Life Experiences," Monographs of the Society for Research in Child Development 3, 1966, p. 135.

[3]Samuel A. Kirk and W. D. Kirk, Psycholinguistic Learning Disabilities: Diagnosis and Remediation, (Chicago: University of Illinois Press, 1971).

[4]Tarnopol, p. 187.

[5]Ibid., p. 187.

A Preschool Readiness Estimate For Pupils About to Receive Education has been developed by Smith and Solanto.[1] The device consists of a parent questionnaire which deals with physical development, health information, home-child relationships, play habits, skills, attitudes, and independence; and a formal evaluation of vocabulary skills, number skills, visual-motor skills, intelligence, new learning ability and psychosocial maturity. Future kindergarten teachers are then informed of the results and taught how to observe and build a related program.

Bronfenbrenner[2] found that early intervention programs produced a substantial gain in IQ as long as the programs lasted. He also found that the experimental groups do not continue gains beyond one year with intervention, the effects tend to wash out after the programs are terminated. DiLorenzo[3] found significant differences between experimental and control groups where highly structured, cognitively-oriented programs were used. The programs produced the most pronounced long-term effects. A Karnes[4] study indicated that it is not the structure per se but the structured program with emphasis on verbal and cognitive training.

Hayes and Grether[5] found that during the summer vacation children from advantaged families tend to hold their own ground or gained while black disadvantaged groups would reverse direction and lose ground.

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[1]Stanley Smith and Joseph Solanto, "An Approach to Preschool Evaluation," Psychology in the Schools 8, 1971, p. 142.

[2]Urie Bronfenbrenner, "Is Early Intervention Effective?" Teachers College Record 76, (December 1974): 279.

[3]Ibid., p. 288.

[4]Ibid., p. 288.

[5]Ibid., p. 289.

Early more intense mother-child stimulation has resulted in greater IQ gain according to Bronfenbrenner.[1] The enduring effects of home intervention programs of mother-child stimulation has its greatest gain when the child is two years old. The affects tend to be smaller with older preschoolers; negligible when not enrolled until age five. Bronfenbrenner[2] further states that younger siblings benefit more than target children and the parent intervention group sustained gains longer than group centered children.

Gilmer[3] suggests parent intervention programs the first two years of life followed by group programs for preschool and early school years. Gordon's[4] study indicated the following:

1. General parent intervention has more lasting effects the earlier it is begun and extending it into the first year of life

2. When parent intervention precedes group intervention there are enduring effects after the completion of preschool programming

3. The addition of group programs after parent intervention doesn't result in additional gains--it may even produce a loss

Radin[5] focuses attention on the interaction between parent and child around a common activity. The benefit of parent interaction is substantial if it is introduced before the child enters school. The effect is reduced if the home involvement is not begun until kindergarten.

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[1]Ibid., p. 288.

[2]Ibid., p. 289.

[3]Ibid., p. 294.

[4]Ibid., p. 294.

[5]Ibid., p. 294.

Smith and Solanto[1] indicated that the optimal time for parent intervention is in the first three years of life. However intervention programs which place the major emphasis on involvement of parents directly in actually fostering a child's development are likely to have a constructive impact at any age--the earlier the better.

Bronfenbrenner[2] proposed a long term intervention program:

1. Preparation for parenthood-child care nutrition, and medical training

2. Before the children come--a need for adequate housing and economic security

3. First 3 years of life--establish child parent relationship of reciprocal interaction centered around activities of challenge to the child, home visits, group meetings to establish the parent as the prime agent of intervention

4. Ages 4-6--exposure to cognitively oriented preschool program along with a continuation of parent intervention

5. Ages 6-12--parental support of child's educational activities at home and school. The parent remains the primary figure responsible for the child's development as a person.

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[1]Smith and Solanto, "An Approach to Preschool Evaluation," p. 296.

[2]Bronfenbrenner, "Is Early Intervention Effective?" p. 301.

A Review of Screening Tests[1]

Name	Type	Age or grade range
A Process for In-School Screening of Children with Emotional Handicaps (Bower & Lambert, 1962)	Social-emotional	Grades 1-12
A Psychoeducational Inventory of Basic Learning Abilities (Valett, 1968)	Perception, language conceptual, and social	Ages 5-12
Bender Visual-Motor Gestalt Test (Bender, 1938)	Copying test	Ages 5-10
Boehm Test of Basic Concepts (Boehm, 1971)	Verbal concepts	Preschool and older (primarily for younger children)
Denver Development Scale (Frankenburg & Dodds, 1970)	Personal-social, fine motor language, and gross motor	Ages birth-5
Detroit Test of Learning Aptitude (Baker & Leland, 1955)	Language number, social adjustment, auditory attention, motor speed, etc. (nineteen subtests)	Ages 3-14+
Early Detection Inventory (McGahan & McGahan, 1967)	Social-emotional behavior readiness, motor development, and personal history	Preschool-kindergarten
Evanston Early Identification (Landsman & Dillard, 1967)	Draw-a-person	5-0 years-6-3 years
First-Grade Screening Test (Pate & Webb, 1969)	Numerous areas	Kindergarten-grade one

[1]Gerald Wallace and James A. McLoughlin, Learning Disabilities Concepts and Characteristics, (Columbus, Ohio: Charles E. Merril Publishing Company, 1975), pp. 293-295.

Name	Type	Age or grade range
Frostig Developmental Test or Visual Perception (Frostig, Lefever, & Whittlesey, 1964)	Factors in visual perception	Ages 3-8
Goldman-Fristoe-Woodcock Test of Auditory Discrimination (Goldman, Fristoe, & Woodcock, 1970)	Factors in auditory discrimination	4 years-adult
ITPA (Kirk, McCarthy, & Kirk, 1968)	Ten areas of information processing	Kindergarten and up (ages 2-10)
Meeting Street School Screening Test (Hainsworth & Siqueland, 1969)	Language, perceptual-motor	Kindergarten-grade one
Metropolitan Readiness Test (Hildreth, Griffiths & McGauran, 1965)	Reading readiness	Kindergarten-grade one
Minnesota Preschool Scale (Goodenough, Maurer, & Van Wagenen, 1940)	Vocabulary, comprehension, and numerous other areas	Preschool-grade one
Preprimary Profile (Schiff, 1966)	Social, language skill development, self-care and others	Preschool-first grade
Preschool Inventory (Caldwell, 1967)	Numerous areas	Ages 3-6
Pupil Rating Scale (Myklebust, 1971)	Language, orientation, social behavior, and motor ability	Grades 3 and 4
Screening Test for the Assignment of Remedial Treatment (Ahr, 1968)	Visual and auditory functions	Ages 4½-6½ years
Screening Test for Identifying Children with Specific Language Disabilities (Slingerland, 1962)	Reading, spelling, handwriting, and speaking	Grades 1-4

Name	Type	Age or grade range
Vineland Social Maturity Scale (Doll, 1953)	Self-sufficiency occupational, etc.	Ages 3 months-25 years
Wechsler Preschool and Primary Scale of Intelligence (Wechsler, 1967)	Numerous areas	Ages 4-6½

Summary

The author has summarized research in the fields of medicine, language, education, and psychology with a look at socioeconomic influences as they relate to the task of kindergarten screening. A review of specific kindergarten screening instruments developed during this period was presented in this chapter.

CHAPTER III

CONCLUSION

As one reads through the studies, research, and screening attempts which have been developed since 1968, one is left with the though of bringing together the relevant, weeding the unuseable and refining for the future, those combinations of techniques and tools which are consistently accurate predictors of identifying children with learning disabilities. The research tends to support the idea of refining techniques within each profession concerned with the issue and using the expertise and skills of one another to verify the concern. As one looks at each field, he can see the narrowing of attempts to define as singularly as possible a tool of relevant tasks and checks to discern those children with specific learning disabilities. The field of neurology is making continual strides in identifying at an earlier period those characteristics and/or conditions which may be hindering development. Pediatricians are looking more closely at developmental conditions which can identify more clearly children of normal development from those with abnormal developmental processes or delayed development. The field of education seems caught in traditional methods of identification which are not in fact being supported by research as effective, efficient methods of identification, specifically when one focuses on the very young. Recent research seems to reflect this concern as new screening tests and techniques are being developed. Once again we are faced with the issue of time, the time needed to produce reliable measures in terms of new testing instruments.

Confronted with these issues, much research has investigated the development of checklists, the design of questionnaires, the design of tests and structured observational efforts of parents and teachers. Each profession began it's concern and involvement from some point of child contact, contact which developed concerns, concerns which led to further observation, concerns and questions of normals vs. abnormal development. The parent, neurologist, pediatrician, social worker, psychologist, teacher and speech pathologist all display an overlapping of interests with the interplay of professions dependent upon the detection of significant characteristics noted in a child's development and/or performance.

One is left with the need to follow the research, utilize present ideas and techniques, refine observational techniques and seek to identify patterns of behavior developed on local norms.

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