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ABSTRACT

This paper discusses early identification of children with developmental handicaps, a subject highlighted recently through the creation of federal and state sponsored Early Periodic Screening Programs (EPSDT). The Minnesota Child Development Inventory (MCDI) provides a systematic means of obtaining parental (usually maternal) information about the child's current development. The presentation discusses the validity of the MCDI and the development of other inventories focused on the assessment of school readiness (Minnesota Preschool Inventory--MPI) and the assessment of infant development (Minnesota Infant Development Inventory--MIDI). The MIDI attempts to integrate developmental and educational concepts and to provide guidance to the mother regarding the development and stimulation of her infant. (Author)

SYMPOSIUM: Assessing the Development of Children by Parental Report

PAPER: The Minnesota Child Development Inventory--Some Possibilities

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Involving parents in the assessment of their young child's development is increasingly recognized as valuable for diagnostic purposes and necessary for intervention. This need has been highlighted recently by the development of Early Periodic Screening programs under both federal and state auspices. The old dichotomy between parental subjectivity and professional objectivity no longer seems as clear-cut. The questions now are "How can parental information about a child's development be obtained?" "What validity does such information have?" And finally, "Can developmental information be obtained and summarized in an efficient manner requiring minimal time of professionals?"

Alternatives for obtaining developmental information from parents include interviews, either informal or structured, ala the Developmental Profile;[1] questionnaires and inventories; and parent testing of children. Our research and clinical experience has been with the inventory format, beginning with the Minnesota Child Development Inventory. First I will describe the concept, purpose and format of the inventory and briefly present some normative and validity data. Then I want to talk about how one thing leads to another; that is, about additional concepts that we have utilized as we focused on more specific areas and problems. These new interests include school readiness assessment and assessment of infant development.

Minnesota Child Development Inventory (MCDI)[2]

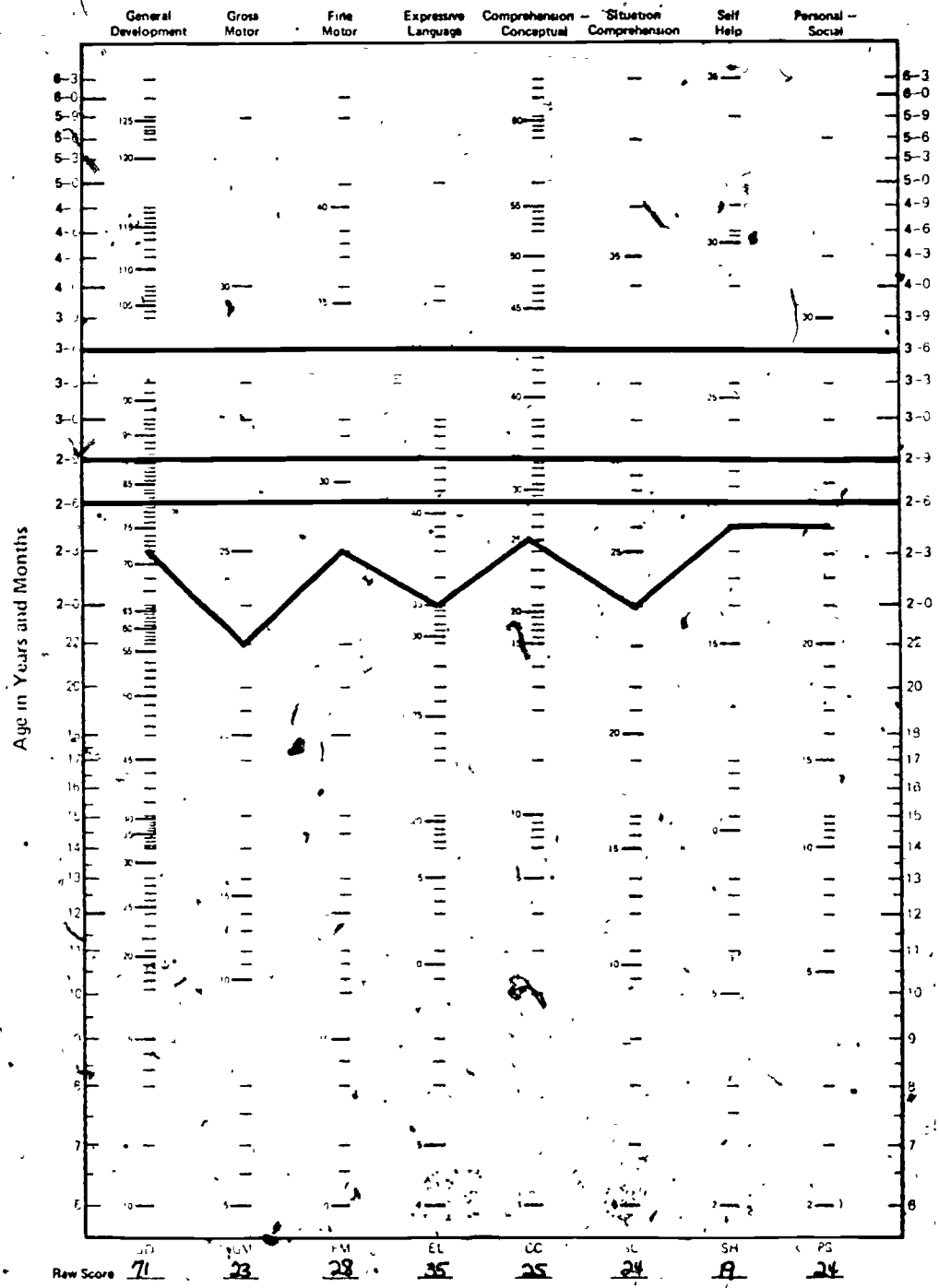
The MCDI was devised to furnish clinicians with a systematic means for evaluating a young child's development with minimal expenditure of professional time. The research began on the basis of the clinical observation that parents' reports of their child's current developmental functioning were generally consistent with the results of psychological testing. We developed considerable respect for parents', especially mothers', knowledge of their children and some faith in their ability to provide a valid report of their child's current behavior.

The MCDI is a standardized instrument for using the mother's observations to measure the development of the child. The inventory is appropriate for children 1 to 6 years. The purpose of the inventory is to assist in the preliminary identification of children whose development is suspect. The inventory consists of a booklet and answer sheet for the mother and a profile based upon her replies. The booklet contains 320 statements that describe the behaviors of children in the first 6 years of life. The mother responds yes or no to each statement to describe her child's present behavior. Scoring is a clerical task involving the use of templates. Scores are summarized graphically on the MCDI profile. The eight scales of the profile include: general development, gross motor, fine motor, expressive language, comprehension-conceptual, situation comprehension, self-help and personal-social. These scales were not derived by factor analysis. Scores are interpreted in reference to age norms for each sex as developmentally retarded, borderline or within normal limits.

(see figure, page 3)

Minnesota Child Development Inventory Profile

Harold R. Ireton and Edward J. Thwing



CASE 1 Male, age three years, eight months. Interpretation: all scores within the developmentally retarded range. Consider possible mental retardation. Psychological evaluation: mentally retarded child with a Stanford-Binet IQ of 55

The norms of the MCDI profile were established on a sample of 796 white suburban children 6 months to 6 1/2 years of age (395 males and 401 females). The sample was obtained in Bloomington, Minnesota, a suburb of Minneapolis with a population of 80,000. Socioeconomic and family data for the sample indicate that the parents were relatively well educated (fathers' mean, 14.1 years; mothers' mean 13.1 years). Many of the fathers were occupationally successful (professional-managerial, 43%; domestic, service, labor, 8%). Nearly all families were intact. We utilized this population because we wished to be reasonably assured of maternal cooperation and comprehension. In this we were successful. These norms should be generalized with caution. The effect of limited maternal education on comprehension and validity remains to be determined. Such studies are in progress.

A subsequent clinical study evaluated the validity of the MCDI for identifying children with developmental disorders[3] by comparing MCDI results with the results of psychological testing. The subjects for the validation study were 109 white preschool-age children who had been referred to the Child Psychology Clinic at the University of Minnesota Health Sciences Center for evaluation regarding a variety of developmental problems.

MCDI results for each scale were classified as normal, borderline or developmentally retarded. The profile as a whole was classified as normal if all scores for the scales were within normal limits, as borderline if any scores were borderline and none were retarded, and as retarded if any scores were retarded. Psychological test results including IQ, fine motor and expressive language scores were classified in a similar fashion.

A number of comparisons were made: (1) fine motor scale to fine motor rating, (2) expressive language scale to expressive language rating, (3) comprehension-conceptual scale to IQ, (4) general development scale to the criterion array (IQ plus fine motor rating, plus expressive language rating), and (5) MCDI profile as a whole to the criterion array.

Deviation from normality on the general development, fine motor, expressive language and comprehension-conceptual scales, and on the MCDI profile as a whole are all associated with higher rates of deviation on psychological evaluation than is shown in the base rates for this clinical population. Retarded MCDI scores are associated with high rates of criterion deviation: 100% for GD scale; 91% for the FM scale; 97% for the EL scale; and 89% for the MCDI profile as a whole. Deviation on the comprehension-conceptual scale is significantly associated with intellectual retardation, but may as well reflect expressive language problems; a CC scale score in the normal range tends to contra-indicate intellectual retardation. In most cases where MCDI results and criterion results do not agree, one measure or the other is classified in the borderline range.

Turning to others' research, Ullman and Kausch[4] utilized the MCDI to describe two populations of children, a Head Start group (N=72; mean age about 4.4) and a nursery school group (N=62; mean age about 4.5). The Head Start MCDI results were also related to teacher ratings obtained three months after enrollment. The Head Start and nursery school groups differ in ways that might be expected, with the Head Start children lagging in most areas of development except self-help skills, where they appear to be competitive.

For the Head Start group, MCDI and teacher classifications of the children were in agreement about two-thirds of the time. In only 2% of cases were developmentally retarded children classified as normal by the MCDI.

In another study, Colligan[5] utilized the MCDI in the prediction of kindergarten success. MCDI data, obtained at the kindergarten roundup, correlated well with academic status at the end of kindergarten, measured by the Wide Range Achievement Test. (See table below)

Correlations Between Prekindergarten MCDI scales and Postkindergarten WRAT (59 Subjects)

MCDI scales	WRAT Reading	WRAT Arithmetic
General Development	62**	52**
Gross Motor	06	06
Fine Motor	48**	33*
Expressive Language	33*	14*
Conceptual Comprehension	59**	48**
Situation Comprehension	25	36*
Self-Help	11	22
Personal-Social	20	39**
Letters	75**	55**
Numbers	51**	56**

Correlation significant: decimals omitted for clarity; **$P < 0.01$; $P < 0.05$.

Minnesota Preschool Inventory (MPI)[6]

Having developed some confidence in the MCDI, and with Colligan's research in mind, we moved on to the problem of assessment of school readiness. At this point, we broadened our concept of what needed to be assessed to include symptomatic/problematic behaviors as well as developmental skills. In so doing, we were attempting to provide a double measure of the child's developmental maturity or competencies plus a measure of the child's "symptomatology" and degree of maladjustment.

The first part of the MPI consists of 107 developmental items taken from the MCDI that describe the competencies of 2- to 6-year-old children. The second part of the MPI consists of 63 items describing symptoms and behavioral problems of children. These items tap the following areas: motor symptoms, language symptoms, immature behaviors, conduct problems, hyperactivity, personality problems, eating problems, sleep problems, physical complaints and sensory problems. The developmental items are grouped in the following scales: fine motor, expressive language, verbal comprehension, memory, letter recognition, number recognition, self-help and general readiness. The adjustment items are grouped in the following scales: immaturity, conduct problems, hyperactivity and personality. Motor, language, somatic and sensory symptoms are reported individually. Total problems constitute the final scale. Results for the major scales are reported in profile form according to percentile norms. Norms are provided for specimen purposes only; the users are instructed to develop local norms for their school system that identify those children who deviate in their population on one or more scales. Deviation on a scale is defined by a score below the

fifth percentile.

We are currently studying the relationships between mothers' MPI reports obtained at the time of kindergarten roundup and teachers' ratings at the end of kindergarten.[7]

Data are for 360 kindergarten children from six schools in Bloomington, Minnesota. Preliminary results are as follows: (1) Correlations between MPI scales and the teachers' ratings range from a high of .56 for the letter recognition scale to only .07 for the self-help scale. (See table below) Correlations for the adjustment scales are

Prekindergarten Developmental Status (MPI)
and Kindergarten Performance (Teacher Rating)

Developmental Scale	Correlation+
Letter Recognition	.56***
Memory	.51***
Comprehension	.44***
Fine Motor	.41***
Number Recognition	.24***
Expressive Language	.20***
Self-help	.07
General Development	.40***

+Pearson product-moment correlation
***significant at .001 level

generally quite low (maximum correlation of .12 for the hyperactivity scale; total symptoms scale correlation .06, NS).

The utility of the MPI for identifying individual children who are at risk for poor kindergarten performance can be better shown by the correspondence between MPI classification and teacher classification of children as deviant or nondeviant.

Deviation on the MPI is defined by performance below the fifth percentile on the MPI scales and in kindergarten by being identified as among the bottom 5% of students. We are presently analysing this data to determine the number and percentage of deviant students identified by the MPI and also the overall hit rates for the MPI with this population (data available at APA Symposium).

Minnesota Infant Development Inventory (MIDI)[8]

As we gained experience with the MCDI and MPI through our work and that of others, we became more clear in our thinking and also broadened our objectives. We have turned our attention to the documentation of infant development and are working on a format that has educational implications for both clinicians and mothers. The Minnesota Infant Development Inventory, or MIDI, again provides a means of obtaining and summarizing the mother's observations of her baby's development. In addition, the format provides a guide to clinical observation. It can also be used to stimulate the mother to learn more about child development and to better interact with the course of her child's development.

The inventory items, pertaining to the first 15 months of life, are grouped into five major areas of development: gross motor, fine motor, language, comprehension and personal-social. Within each area, items are ordered in monthly intervals showing the developmental steps

in that area. The instructions orient the mother to this developmental framework.

The results are represented in a profile which is used as a basis for discussion with the mother about the child's current development and about what to expect behaviorally as the child matures. We are just beginning to gather data about how this thing works. We are enthusiastic about the possibilities for integrating developmental and educational concepts and increasing parental involvement through this methodology.

I have covered a lot of ground, perhaps too much. I did want to convey the course of our work and to generate interest in research and clinical practice along these lines. We have left some loose ends and many unanswered questions along the way, more than we have time or ingenuity to answer on our own. I hope that some of you find the questions sufficiently interesting to grapple with them yourselves.

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