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STABILITY OF WISC-III CORE PROFILES FOR A REFERRED POPULATION OF STUDENTS RECEIVING SPECIAL EDUCATION SERVICES

by

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FINAL APPROVAL FORM

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

I. INTRODUCTION

1. Overview

Students referred for Special Education Services in the New York City Public Schools may be seen for psychological testing at several points during their educational careers. Traditionally, all newly referred students are seen for testing as part of an initial evaluation to determine their eligibility for service. For students who are found to be eligible for Special Education Services, program recommendations are generated, based in part, upon psychological test findings.

Students receiving Special Education Services may be seen for re-evaluation, if requested by parents, teachers or other services providers who feel that program modifications may be necessary.

Finally, all students receiving Special Education Services must be reviewed, minimally, every three years to monitor educational progress and determine whether program modifications are necessary.

As the population of students receiving Special Education Services has grown, there has not been a commensurate increase in the number of School Psychologists assigned to the schools. Since passage of the Individuals with Disabilities Education Act (PL 94-142), Psychologists working in the New York City Public Schools have increased five fold, from 200 to 1000 whereas the number of students receiving Special Education Services has increased 7 fold from 20,000 to 140,000. This has created a situation in which, struggling under the burden of ever increasing case loads, School

Psychologists have found it necessary to seek strategies and rationales to avoid repeated testing whenever possible or alternatively utilize abbreviated testing practices.

The present study seeks to develop a paradigm that will guide practicing School Psychologists so they can make informed decisions regarding the necessity for cognitive assessments in specific situations.

This study is motivated by three principal factors:

a. For practicing Psychologists who use psychometric measures of intelligence to make placement decisions regarding appropriate educational intervention settings for students with special learning needs, the concept of IQ constancy has generally been relied upon to support both the reliability and validity of the cognitive data used in this process. Nevertheless, it has always been recognized that the growth curve for individual students may vary from expectation. Therefore, safeguard procedures were put into place requiring periodic reassessment of students receiving Special Education services. Enabling legislation (PL 94-142) made Psychological testing (including administration of a cognitive battery) a mandatory component of every evaluation for Special Education Services. Re-authorizing legislation (PL 99-457) has made certain modifications to these procedures. In an effort to enhance parents' rights, parental consent must now be obtained each time new testing is requested. Furthermore, a meeting must be held in which school-based assessment staff and the parent jointly decide upon specific testing that will be carried out.

To implement these new federal regulations, New York City has created a "flexible assessment" model. The Office of Special Education Clinical Services

Memorandum 14 (1996-1997) delineates new procedures for tri-ennial assessment, a cardinal feature of which is the elimination of the mandate for full psychological evaluation (including cognitive assessment) in every instance. Under these new procedures, members of the School Based Support Team meet to decide collaboratively what evaluation components need to be proposed to the parent to answer the referral question. The team is directed to review the prior evaluation as well as results of city-wide reading and math tests together with progress reports from teachers and/or related service providers. From this set of data, a joint determination is to be made regarding what components are required to complete the triennial assessment. Within the psychological test battery, the inclusion of formal cognitive assessment is at the discretion of the clinician.

This author, working at a District level Committee on Special Education, has observed that, all too often, clinicians are conceding to the demands of heavy case loads and using the new procedures to sanction abbreviated testing procedures.

No doubt, there are a number of circumstances in which an experienced School Psychologist can determine, a priori, that a mandatory triennial psychological assessment is unnecessary since the anticipated results are unlikely, in the presence of other information, to have a determining influence on the decision to terminate, continue, or modify program placement. Nevertheless, there are numerous other circumstances in which assessment results and their impact on program recommendations cannot be anticipated. This may be due to a lack of accuracy, specificity, or availability of other data sources such as teacher reports, the

subjectivity of which has been well documented in the research literature (Galagan, 1985: Ysseldyke, et al., 1983). Pressure from colleagues as well as supervisors to proceed with abbreviated testing in such circumstances can be problematic in that it raises both professional and ethical issues.

The law empowers the Committee on Special Education Review Team to overrule a School Based Support Team decision to "flex" an assessment if it feels that additional information is needed to make a program recommendation. In practice, this authority is rarely invoked for fear of offending a colleague. In addition, pressure from supervisors to complete cases in a timely manner also contributes to the tendency for Review Teams to accept cases as submitted.

It is hoped that data from this study will provide an objective basis for making more informed assessment decisions when determining whether cognitive re-assessments are necessary and appropriate. In this way, a more meaningful system of checks and balances at the Review Team level can be supported.

b. This author has administered the Wechsler Intelligence Scales to assess the cognitive profiles of special needs students over a thirty year period. Originally trained in the psychology of individual differences (Anastasi, 1954,1958), this author's approach to test interpretation has always focused on what the data reveals about a given student's individual learning style.

As the field has evolved, it has become more important to be able to correlate test profiles with various educational handicapping conditions.

Additionally, in reflecting upon the author's own case experience, the similarities across case profiles have become more strikingly apparent than the differences. Yet, the description and elucidation of commonly found profiles could not be accomplished using subjective analytic or intuitive methods.

Thus, the second motivation for this study is to find a quantitative and objective methodology for categorizing WISC-III profiles that would help this author as well as other clinicians organize their case experiences in a meaningful way.

c. Thirdly, changes in the continuum of Special Education Services which are projected to be implemented during the 2001-2002 academic school year will be placing less emphasis on formal assessment as the basis for making program recommendations. Specification of class size and staffing ratios required to meet a student's needs will become a primary consideration when making service recommendations. In many situations, these determinations can potentially be made by administrators and/or supervisors, with minimal input from clinicians. In such an environment, School Psychology, as a profession, must continually demonstrate its relevance to the instructional process in order to maintain a viable presence in the schools.

It is hoped that data from this study will contribute to the preservation and enhancement of the role of Psychologists in the schools in two ways. First, by adding interpretive power, data derived from cognitive assessments will be of greater practical value in defining the educational needs of students. Secondly, by increasing the efficiency of the testing process, School Psychologists will have more

time to engage in prevention, intervention and consultation activities which are both professionally satisfying and are increasingly valued by the pedagogical staff.

II. LITERATURE REVIEW

1. Rationale For and Development of The Core Profiles

The development of an objective paradigm for determining the optimal timing of cognitive re-evaluations depends upon the selection of a methodology for interpreting test data. Historically, many approaches for interpreting WISC data have been advocated (Sattler, 1988, 1992). Some authors suggest that the interpretation of WISC data should be confined to Full Scale IQ, Verbal IQ and Performance IQ since sub-test score variations cannot be interpreted reliably. Nevertheless, the most common method of analysis used by practitioners utilizes a strengths and weaknesses model to interpret statistically significant individual sub-test score differences (Wechsler, 1991).

Kaufman (1979,1994) proposed a seven step method for interpreting WISC-III test data as follows:

1. Interpret the Full Scale IQ (FSIQ);
2. Determine whether the Verbal IQ-Performance IQ discrepancy is statistically significant;
3. Determine whether the Verbal IQ-Performance IQ discrepancy is interpretable- or whether the Verbal Comprehension Index (VCI) and Perceptual Organization Index (POI) should be interpreted instead;
4. Determine whether the Verbal IQ-Performance IQ discrepancy (or VCI-POI discrepancy) is abnormally large;

5. Interpret the meaning of the global verbal and nonverbal dimensions and the meaning of the small factors (Freedom from Distractibility and Processing Speed);
6. Interpret strengths and weaknesses in the profile;
7. Generate hypotheses about the fluctuations in the sub-test profile.

Kaufman further indicates that variations in individual sub-test scores should only be interpreted when significant differences cannot be identified among more global measures.

Several authors advocate the interpretation of combinations of sub-test scores based upon factor analytic studies which group sub-tests reflecting shared mental abilities. Such approaches, including the work of Bannatyne, Guilford, Dean, Prifitera as well as Cattell and Horn have been reviewed by Satler (1988) and Kamphaus et al. in Flanagan et al. (Flanagan, Genshaft and Harrison (Eds.) New York, NY:The Gulford Press.) A summary of sub-test combinations and the cognitive processes they purport to measure is presented in Table 1.

Table 1. WISC-III Subtest Composites Derived From Factor Analytic Models

Ability or Influence	Composite Subtests
Verbal Comprehension	I, S, V, C
Cognition	S, A, V, PC, BD, OA, M
Extent of Outside Reading	I, S, V
Interests	I, S, V
Cultural Opportunities at Home	I, V, C, PA
Acquired Knowledge	I, A, V
Long-term Memory	I, A, V
School Learning	I, A, V
Working under Time Pressure	A, PC, PA, BD, OA, Cd, M
Evaluation	C, PC, PA, BD, OA, Cd
Verbal Conceptualization	S, V, C
Verbal Expression	S, V, C
Fund of Information	I, V
Richness of Early Environment	I, V
Memory	I, A DS
Degree of Abstract Thinking	S, V
Verbal Concept Formation	S, V
Perceptual Organization	PC, PA, BD, OA, M
Reasoning	S, A, C, PA, M
Cognitive Style	PC, BD, OA
Spatial	PC, BD, OA, M
Sequencing	A, DS, PA, Cd
Synthesis	PA, BD, OA
Facility with Numbers	A, DS, Cd
Freedom from Distractibility	A, DS, Cd
Anxiety	A, DS, Cd
Distractibility	A, DS, Cd
Integrated Brain Functioning	PA, BD, Cd, M
Distinguishing Essential/Nonessential Details	S, PC, PA
Visual-motor Coordination	BD, OA, Cd, M
Mental Alertness	A, DS
Attention Span	A, DS
Reproduction of a Model	BD, Cd
Visual Perception of Abstract Stimuli	BD, Cd
Learning Ability	V, Cd
Visual Perception of Meaningful Stimuli	PC, PA, OA
Concentration	A, PC
Ability to Respond when Uncertain	PC, OA, M
Visual Organization	PC, PA
Common Sense	C, PA
Social Judgment	C, PA
Convergent Production	PA, Cd
Holistic Processing	PC, OA
Visual Memory	PC, Cd
Planning Ability	PA, M
Paper and Pencil Skill	Cd, M

Note. I = Information; S = Similarities; A = Arithmetic; V = Vocabulary; C = Comprehension; DS = Digit Span; PC = Picture Completion; PA = Picture Arrangement; BD = Block Design; OA = Object Assembly; Cd = Coding; and M = Mazes.

Kaufman has subsequently incorporated many of these factors into his scheme for interpreting test results (Kaufman, 1979,1994). When multiple factors are identified as being significant, he suggests that hypotheses be generated first on the basis of those sub-test groupings containing the largest number of components. If parsimonious conclusions cannot be drawn, then he suggests looking at smaller sub-test combinations.

Once the sub-test clusters or individual sub-test scores have been selected for hypothesis generation, they are compared with the respective global measures from which they were derived (Verbal IQ, Performance IQ, and Full Scale IQ) to look for significant differences. Kaufman suggests that such significant differences can be defined using the criterion of 3 to 5 IQ points depending upon the reliability co-efficients of the particular sub-tests involved. For the WISC-III sub-tests of Information, Similarities, Arithmetic, and Vocabulary a discrepancy of +/-3 points indicates a significant deviation; for Comprehension, Digit Span, Picture Completion, Picture Arrangement, Block Design, Object Assembly, and Symbol Search a discrepancy of +/-4 points is significant. For Coding, a discrepancy of +/-5 points is significant. This process is referred to as ipsative analysis. (Kaufman, 1994)

Unfortunately, no field based empirical research to test the predictive ability of Kaufman's clustering methodology has been reported. However, a study by Macmann and Barnett (1997) using simulation methods reported disappointing results.

In an attempt to examine the reliability of Kaufman's method, the authors generated two independent samples of 5,000 scores using simulation techniques, creating standard

scores from 1 to 19 based on transformation of random distributions of z-scores. Simulated data reliability estimates were within +/-.02 of the standardization sample. Estimates for content reliability (internal consistency), stability over time, and combined effects (content + time) were computed for all scores. Analyses conducted on the 54 composite indicators derived by Kaufman found that only 14% of the profile patterns identified as significant on the first test would be substantiated on re-test 3 weeks later. Reliability of profile interpretations were found to be influenced by the: (a) reliability of the ipsative composite score; (b) number of cases classified with strengths or weaknesses; and (c) number of sub-tests in the profile. These three factors accounted for 94% of the variance in the reliability of profile interpretations.

Recent researchers, exemplified by Glutting and his colleagues, have been critical of ipsative approaches to sub-test interpretation (McDermott, Fantuzzo and Glutting, 1990). They point out the following shortcomings:

1. Researchers assume that similarly diagnosed subjects represent meaningful and homogeneous categories.

2. Extant research does not preclude the circular use of sub-test profiles for an initial formation of diagnostic groups and subsequent searches for profiles that might define those groups.

3. Pooling sub-test measures across age groups is not justified since considerable measurement error among age groups exist.

4. Profiles are configural, not linear, therefore, they cannot be tested using traditional statistical methods such as analysis of variance, correlation or multiple variance models.

5. Differences between sub-test scores are difficult to interpret since they sum to zero, therefore, as one increases another necessarily decreases.

These criticisms of ipsative methods of sub-test interpretation to identify students' cognitive strengths and weaknesses have been re-iterated and alternative methodology proposed by McDermott, et al.(McDermott, Glutting, Watkins and Baggaley, 1992). Using the WISC-R national standardization sample, they compared normative-based criteria with ipsative data for the 11 sub-tests. They found that normative indicators had higher reliability than ipsative measures as they were more stable over time. The authors focused particularly on the "seesaw effect" which refers to the fact that since the mean of the sub-test scores is simultaneously dependent upon all of the individual sub-test scores, a positive deviation for one score, necessarily implies a corresponding negative deviation for one or more of the others.

Based upon their critical review, the authors continued, in further studies, by describing an alternative to the use of factor based sub-test clusters for interpretation of cognitive profiles. Finding that linear methods of data analysis are not consistent with their understanding of the nature of intelligence which involves the simultaneous application of many abilities to the solution of a given problem, they propose that the use of non-linear methods would be more appropriate. Non-linear methods have the further advantage of being more sensitive to differences in both the level and shape of

identified profiles. Cattell (1948) described the multivariate technique of Q analysis which the authors suggest is more appropriate to the problem at hand as it allows for the examination of individual profiles taking into account both general ability level and component strengths and weaknesses.

Based upon these methods, Glutting, et al. (Glutting, McDermott and Konald (1997) established a set of 8 Core Profiles derived from the standardization sample of the WISC-III. The characteristics of these profiles are summarized in Table 2.