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The Use Of The Wechsler Intelligence Scale For Children In Differentiating Among Three Types Of Mental Defectives

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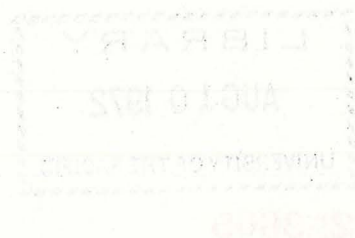
THE USE OF THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN
IN DIFFERENTIATING AMONG THREE TYPES OF MENTAL DEFECTIVES

A Dissertation

Presented to

The Faculty of the School of Education

The University of the Pacific



In Partial Fulfillment

of the Requirements for the Degree

Doctor of Education

by

Edward Gerald Tava

May, 1972

THE USE OF THE WECHSLER INTELLIGENCE SCALE FOR CHILDREN
IN DIFFERENTIATING AMONG THREE GROUPS OF MENTAL DEFECTIVES

Abstract of Dissertation

THE PROBLEM: The purpose of the study was to identify those measured skills contained within the Wechsler Intelligence Scale for Children (WISC) which would differentiate among the organic mental defective, the familial mental defective, and those children misidentified as mentally retarded because of language and cultural differences.

THE PROCEDURE: Data from the Wechsler Intelligence Scale for Children were gathered for a sample of 150 children selected from eight Northern California school districts. Fifty of the children had been previously diagnosed as mentally defective due to neurological impairment, fifty children had been diagnosed as familial mental defectives, and fifty subjects had been misidentified as mentally defective at one time due to differences in culture and/or language. The three groups were classified as organic mental defective, familial mental defective, and pseudo-mental defective.

Data were treated to determine mean scores for nine factors of the Wechsler Intelligence Scale for Children. The factors were identified as: (1) verbal comprehension, (2) visual-motor organization, (3) alertness, (4) comprehension of social situations, (5) concept formation, (6) concentration, (7) Verbal I.Q. minus Performance I.Q., (8) intratest variability, and (9) intertest variability.

A Covariance Analysis - One Way was used to compare the three groups on each of the first six measures. The Full Scale I.Q. score for each subject was used as the covariant in the statistical treatment. An Analysis of Variance - One Way was used to compare the three groups on each of the last three variables. The Newman-Kuels method was then used to make further differentiations among the three groups on each of the nine factors of the WISC.

THE CONCLUSIONS: On the basis of the findings of this study, it would appear that the WISC was an effective diagnostic instrument in separating the organic mental defective, the familial mental defective, and the pseudo-mental defective. The strength of this procedure appeared to lie in the evaluation of language abilities (verbal comprehension factor), perceptual-motor skills (visual-motor organization factor), and the difference between language and non-language skills (Verbal I.Q. minus Performance I.Q.). The procedures outlined in this research appear to be most able to differentiate the organic mental defective from both the familial mental defective and the pseudo-mental defective. It was found that the organic mental defective differed significantly from the other two groups in three major areas. The organic mental defective was found to be strong on the verbal comprehension factor and weak on the visual-motor organization factor. The difference between the Verbal and Performance I.Q. scores was significant in favor of the verbal score.

However, the WISC was not as able to differentiate between the familial mental defective and the pseudo-mental defective partly because these two groups exhibited similar profiles of scores. Both were weak on verbal language subtests and both groups achieved relatively high scores on perceptual-motor tasks. However, the pseudo-mental defective was more extreme in his scores, while the familial mental defective achieved a much flatter profile. Therefore, it was concluded that it was possible to differentiate between the familial mental defective and the pseudo-mental defective based on information from the WISC but the differentiation should be made with caution.

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CHAPTER I

INTRODUCTION

For many years, special education programs for educable mentally retarded (E.M.R.) minors have attempted to use the same teaching procedures for all pupils. These methods were aimed at helping the non-brain-injured retardate and advocated the use of a large variety of learning experiences with a high level of stimulation (Kirk, 1963; Frankel, Happ & Smith, 1966). The main concern of the teacher and the school administrator has been to differentiate between the retarded and the non-retarded child with secondary concern given to the classifications of trainable and educable retardation. Little or no concern has been devoted to further differentiation within the group of educable mentally retarded children.

Contributing to the above situation has been the problem of relying on the I.Q. as the sole criterion of mental retardation. This procedure leads to a correct identification of most mentally retarded children since the total I.Q. merely represents the average of several abilities correctly measured by the test instrument. However, if for any reason, the test instrument underestimates one or more abilities of the testee, the total I.Q. becomes distorted since it does not represent the true average of the child's abilities. Therefore, if the I.Q. is the only criterion used for diagnosis of intellectual ability, certain children can be misidentified as mentally retarded.

I. THE PROBLEM

Statement of the problem. The problem to be investigated in this research is to identify those measured skills contained within the Wechsler Intelligence Scale for Children (WISC) which will differentiate among the organic mental defective, the familial mental defective and those children misidentified as retarded because of cultural differences.

Significance of the problem. The need for devising a method of differential diagnosis for the mentally retarded is to enable the educator to group effectively exceptional children for the purpose of instruction. Historically, it has been assumed that educable mentally retarded (E.M.R.) children compose a homogenous group by virtue of having homogenous I.Q. scores. However, there has been some evidence (Martinson & Strauss, 1940; Strauss & Lehtinen, 1947; Cruickshank, Junkala & James, 1968) that indicated that the brain-injured retardate requires a different educational program from the non-brain-injured mental defective.

In their study, Martinson and Strauss (1940) found the familial mental defective to be very slow in learning new behaviors and new tasks, but very able to work on the same task for long periods of time. The organic mental defectives were found to be lacking in the skills of attention. They were more disorganized, incoherent and distractable than the familial mental defectives.

In another study, Cruickshank, Junkala, and James (1968) found many teachers had experienced failure with a few children placed in their special class for the retarded. Further investigation by the authors

suggested that most of these children were retarded due to certain amounts of brain damage. The authors also pointed out that a different type of educational program was needed for the organic mental defective. Therefore, it has been suggested that two types of programs for the mentally retarded may be needed. However, the trend has been for a single grouping of educable mentally retarded children for purposes of educational instruction (Kirk, 1962).

The need to differentiate between the true mental defective and the pseudo-mental defective would seem obvious. Mass incidents of misidentification of retarded children have been cited. We are currently viewing court cases involving culturally different children who have been diagnosed as mentally handicapped, not because they are retarded, but because their culture and their language are basically different from the standardization population of the WISC. In a survey conducted in Southern California, Palomares and Johnson (1966) found many classes designed for the retarded composed almost entirely of Mexican-American children.

Several studies of the intelligence of minority groups have been done. The Mexican-American and the American Negro have been the favorite targets for most of these studies. Neither of these minority groups have fared well on the measures of ability utilized in these studies. Mercer (1971) tested 180 Caucasian, 180 Negro and 180 Mexican-American children. She found an average I.Q. of only 90 for the two groups of minority children. However, when social-cultural differences between the minority groups and the Anglo group were held constant, there were no significant differences in measured I.Q. Mayeske (1971) found

similar results in the area of academic achievement. His results suggested that a part of the difference (24%) in achievement was associated with the differences in racial-ethnic group membership. However, when social conditions were taken into account, this difference dropped to 1.2%. Therefore, there appears to be a great need for either new test instruments for the culturally different child or better diagnostic methods to separate the true mental defective from the pseudo-mental defective who scores low on I.Q. tests because of cultural-ethnic differences.

Since a thorough case study plus testing in languages other than English have been required for discriminating between the retarded and the pseudo-retarded and because a medical diagnosis has been required for making a discrimination between the brain-injured and the non-brain-injured retardate, many educational institutions have found it difficult to finance such a diagnostic program. However, many school systems employ specialists, such as educational, school or clinical psychologists who are qualified to use a large number of test instruments to make certain educational and/or psychological diagnoses. The psychologist employed in the school should be capable of differentiating among the organic and familial mental defective and the cultural pseudo-mental defective. It is also felt that with proper use, a number of test instruments would be valid for use as described above. However, because of the range of abilities tested and its widespread use and familiarity, the Wechsler Intelligence Scale for Children (WISC) was chosen for this study. The method of differential diagnosis is the remaining problem to be investigated in this study.

Hypotheses. Because of the nature of this study, certain hypotheses concerning behavior tested by the Wechsler Intelligence Scale for Children were developed. The following hypotheses based in part on previous studies of the factors of the WISC (Cohen, 1959; Garms, 1970; Lotsof, 1958; Osborne & Tillman, 1967; Wechsler, 1958) will be investigated. Although specific factors of the WISC were identified and used in this study, it should be noted that the WISC is not a "pure" factorial test. That is, the WISC does not contain any isolated factors, but instead, contains sections which have heavy loadings on certain factors. Thus the WISC will be used empirically in this study to show differences among the three groups of subjects.

The following hypotheses will be tested in this study:

Hypothesis 1: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the verbal comprehension subtests of the WISC (Information, Comprehension, Similarities, and Vocabulary).

Hypothesis 2: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the visual-motor organization cluster of the WISC (Block Design, Object Assembly, and Coding subtests).

Hypothesis 3: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the alertness cluster of the WISC (Information and Picture Completion subtests).

Hypothesis 4: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the subtests of the WISC measuring comprehension of social situations (Comprehension, and Picture Arrangement subtests).

Hypothesis 5: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the subtests of the WISC measuring concept formation (Similarities and Block Design).

Hypothesis 6: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the concentration cluster of the WISC (Arithmetic, Digit Span and Coding subtests).

Hypothesis 7: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the difference between the Verbal I.Q. and the Performance I.Q. of the WISC ($V.I.Q. - P.I.Q.$).

Hypothesis 8: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by an index of intratest variability of the WISC.

Hypothesis 9: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by an index of the total intertest variability of the WISC.

Limitations of this study. This study is faced with the limitations caused by the definitions of the organic mental defective and the familial type mental defective. By using a medical approach for differentiating between the organic and the familial types of mental deficiency, certain inconsistencies of diagnosis will be present. For example, parental pressure could affect the final diagnosis, thereby causing an artificial increase in the number of brain-injured or organic mental defectives. Furthermore, there exists considerable variability of competency for such a diagnosis within the medical profession.

II. DEFINITION OF TERMS

For the purposes of this study, the three subject groups will be defined as follows:

Organic Mental Defective. Each subject in this classification has been diagnosed as having:

- (1) a Full Scale I.Q. of from 50 to 75 on the Wechsler Intelligence Scale for Children,
- (2) no evidence of mental retardation in other members of the immediate family, and either,
- (3) a medical history of pre-natal, natal, or post natal injury to the brain, either of a traumatic nature or due to an inflammatory process, or
- (4) the presence of positive neurological signs of brain lesion as determined by medical records, or

(5) the presence of "soft" neurological signs, such that a medical doctor has strongly suggested neurological damage to the child.

Familial Mental Defective. The children included in this group have been diagnosed as having:

(1) a Full Scale I.Q. between 50 and 75 on the Wechsler Intelligence Scale for Children,

(2) the presence of mental retardation among other members of the immediate family,

(3) the absence of significant factors in the birth history relating to conditions associated with brain injury as determined by medical records,

(4) the absence of positive neurological signs as determined by medical records, and

(5) the absence of significant factors in the developmental medical history relating to deviations from the expected development of the retarded (neurological "soft" signs).

Pseudo-Mental Defective. All subjects in this group are members of culturally different ethnic groups who have been evaluated and discovered to have:

(1) at some time in history, a Full Scale I.Q. between 50 and 75 on the Wechsler Intelligence Scale for Children,

(2) been classified as mentally retarded and placed in a special classroom situation for the educable mentally retarded, and

(3) later removed from the special class setting due to re-evaluation of intellectual behavior with a resultant Full Scale I.Q. of 80 or above on an Individual I.Q. test (WISC or Stanford-Binet).

Culturally Different Child. A subject whose ethnic background is significantly different from the white Anglo culture. For the purposes of this study, this classification will be limited to the Mexican-American and Negro ethnic groups.

III. STATEMENT OF PROCEDURE

The report of this study involves the following procedure. The introductory chapter presents a statement of the problem, hypotheses to be investigated, and the definition of terms. A review of current literature concerning the present study and related studies is included in Chapter II. Chapter III deals with the source of the data used in this study as well as the research design and statistical procedures used in this study. Chapter IV presents an analysis and interpretation of the obtained data. The final chapter concludes the dissertation with a general summary and recommendations for further study.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter will be divided into four sections: (1) literature on the need for differentiating between the organic and familial mental defective; (2) literature on the need for differentiating between the true mental defective and the pseudo-mental defective; (3) literature on the test characteristics of the mentally defective; and (4) literature on the test characteristics of the culturally different child.

I. LITERATURE ON THE NEED FOR DIFFERENTIATING BETWEEN THE ORGANIC AND FAMILIAL MENTAL DEFECTIVE

The differentiation between the organic and familial mental defective formerly referred to as the exogenous-endogenous classification, has proved useful for many years in both medicine and education. One of the first to advocate the use of this system of differentiation was Edgar A. Doll (1943), who suggested that the organic-familial differentiation would lead to future research into the causes of mental retardation. He also felt that it was important to prescribe different educational treatments contingent upon the classification of retardation. This classification would also be useful in parent counseling since it would give parents additional information about their children's problems and the treatment necessary to help the child at home. Lastly, Doll pointed out that the prognosis for improvement should be much better for the familial mental defective than for the organic mental defective. This statement of prognosis was later supported by Windle (1962).

Perhaps the most important reason for making the organic-familial differentiation is to enable the educator to provide more effective instruction based on a diagnostic evaluation. Strauss and Lehtinen (1947) were other early advocates of different educational programs for the organic and familial mental defectives. They suggested an educational program which would result in a reduction of stimulation, both internal and external, for the organic mental defective, whereas, the educational program for the familial mental defective would consist of a great deal of stimulation.

Martinson and Strauss (1940) pointed out that the organic mental defective was found to lack organization, was highly distractable and tended to persevere, while the familial defective showed none of these basic characteristics. Because of these tendencies, they felt the organic retardate would function better in a very structured, controlled and well designed educational program. They suggested a program for the organic retardate consisting of very structured materials, such as the use of programmed texts, allowing the child to count on his fingers, using number lines and making use of such concrete materials as the Chinese abacus. This program would also require the teacher to use very structured teaching methods and to provide a highly organized environment for the student. The authors suggested a very different program for the familial defective. They recommended a very intensive, highly stimulating program, with controlled materials, but still using basic teaching methods. Such a program would tend to distract the organic mental defective and was recommended for use with the familial defective only.

Among the more current educators who advocate the organic-familial differentiation is Dr. William Cruickshank, University of Michigan. Cruickshank, Junkala and James (1968) stated that most teachers of the retarded report general success with most of their students. However, many of these same teachers also report failure with a small number of cases. It was suggested by the authors that one reason for such failure was the result of the teacher's inability to adjust the program to fit the needs of the organic mental defective. Thus, the teaching program which consisted of much stimulation has resulted in meeting the needs of the familial defective, but has also tended to distract and disorganize the organic retardate.

Cruickshank, Bentzen, Ratzenburg and Tannhauser (1961) and Cruickshank (1967) have specifically outlined their suggested program for the brain-injured child. They recommend (1) the reduction of extraneous environmental stimuli, (2) the reduction of space available to each child, (3) the use of a structured school program and life plan in which limitations are set and in which the teacher is consistent with and accepting of the children, (4) the use of teaching materials which have a high degree of stimulus value and (5) an emphasis on concrete materials and concrete learning.

Cruickshank (1966) also considered the use of drugs to control the behavior of the brain-injured child. Although drugs appear to have a definite role in the treatment of the disorganized and disturbed behavior of the organic child, Cruickshank viewed this role to be very limited. It appeared that certain drugs produce some opposite effects with many, but not all, brain-injured children. In many cases, the use of stimulants

has resulted in a reduction of the hyperactivity of the child. However, Cruickshank further stated that although drug therapy can be useful it does not take the place of a carefully controlled program of management for these children.

Other current advocates of separate programs for the organic and non-organic children include Bortner, Gallagher and Kirk. Bortner (1968) recommended the use of perceptual-motor materials, such as those devised by Kephart and Frostig, for use with the brain-injured child, while using the controlled teaching techniques of Cruickshank, Strauss and Lehtinen. Although Gallagher and Kirk (1960) have not advocated special teaching methods, they have suggested the use of many special materials for the organic retardate, including materials to remedy weaknesses in perceptual ability, language, conceptualization, reasoning, quantitative conceptualization and memory.

Thus it appears to be desirable to differentiate between the organic and familial retardate in order to match the child with an educational program. However, such a differentiation has not been made in the public school special education programs, partly because a medical diagnosis has been required in the past to make such a differentiation (Frazeur and Hoakley, 1947) and most schools could not afford or were unwilling to use such medical services. A partial answer to this dilemma would seem to be to devise, if possible, a method of differential diagnosis using psychometric test instruments familiar to most school psychologists. This would not eliminate the need for a medical evaluation, but would generate additional information on which to base better suggestions and more accurate conclusions.

The use of test patterns has long been recognized as an effective method of making clinical diagnoses (Bijou, 1942). It has also been recognized that the true power of discrimination of any test lies not in its total score, which usually represents an average of its parts, but in the use of its patterns of scores (Gaiër & Lee, 1953). Therefore, the Wechsler Intelligence Scale for Children with its several subsections could serve as a good test instrument for pattern analysis in order to differentiate between the organic and familial mental defective.

Although the WISC appears to be an effective tool for differentiating among retarded children, there are some weaknesses in this system which should not be overlooked. One of the weaknesses is that with low I.Q. scores, the resulting scaled scores are also low producing the possibility of little variance on which to base pattern analyses (Baumeister, 1964). However, this problem is not as serious as that of labeling. Several authors have stated that increased use of labels usually results in little effective change. Sarason and Doris (1969) suggested that many professionals are tempted to terminate treatment at the mere mention of "brain-damage", feeling that if the child is truly brain-injured, there is little or no hope for curing them. Kauppi and Weiss (1968) have also advocated the elimination of labels, stating that most labels tend to be dehumanizing. Instead, they have suggested devising new methods for describing the needs of individuals in areas relevant to important functions. With such a system, they felt that remedial efforts would be possible.

II. LITERATURE ON THE NEED FOR DIFFERENTIATING BETWEEN THE TRUE MENTAL DEFECTIVE AND THE PSEUDO-MENTAL DEFECTIVE

The most dramatic need is for a system which would allow the professional to differentiate between the true mental defective and the pseudo-mental defective. However, the need for facilitating the making of accurate diagnoses is so obvious that it does not appear in the professional literature. However, it should remain as one of the most sought-after objectives of psychologists, educators and other workers who make use of test materials.

Until recently many educators felt that if a child was diagnosed as retarded, there was little question of the validity of the statement. However, recent surveys have shown that E.M.R. programs in certain areas, especially Southern California, were almost totally composed of minority and low income children (Palomares & Johnson, 1966; Wakefield, 1964). In the midwest, another survey showed that the majority of the E.M.R. children came from homes considered to be of low socioeconomic status. Furthermore the survey pointed out that children enrolled in the Trainable Mentally Retarded (T.M.R.) program had equal representation from all classes of the community, a situation easily explained by the fact that most T.M.R. children were diagnosed as retarded due to brain injury (Solomons, Cushna, Opity & Green, 1966). Furthermore, T.M.R. children deviate further from the norm than E.M.R. children, making diagnoses simpler and uncluttered with other issues. Thus, a middle or upper class parent would more easily agree that their child was retarded if he deviated severely from the norm (T.M.R.) than if the deviation was mild as in the case of an educable mentally retarded child.

A contributing factor to the above situation is that many intelligence tests have not considered the minority or culturally different child when written or standardized. For example, the standardization of the WISC included only Caucasian children. No Black or culturally different children were included in the standardization population (Seashore, Wesman & Doppett, 1950; Wechsler, 1949).

When studying the effects of the intelligence test with Black and Chicano children, Mercer (1971) concluded that the WISC was basically Anglocentric, that is, the results from this test were influenced by the degree of similarity of the culture of the testee to that of the standardization population. She found that the more the family resembled the socio-cultural model for the test, the higher the I.Q. of the Black or Chicano child. She also found that when socio-cultural differences were held constant, with race as the single variable, there were no significant differences in measured intelligence. However, when socioeconomic conditions were not held constant, the minority children, as a group, scored significantly lower on the WISC than the White control group.

Mercer was not the only researcher who investigated the relationships between intelligence and minority races and between intelligence and socioeconomic status. In a review of the literature, Sarason and Gladwin (1958) found most studies have reported a substantial relationship between intelligence and socioeconomic status (S.E.S.). They found that general increases in most S.E.S. factors resulted in an increase in intelligence. In another study, Littell (1960) reviewed ten years of research studies done with the WISC. He reported a substantial correlation

between the socioeconomic status of parents and the I.Q. of their children. He also stated that this effect was more apparent with the younger, five, six and seven year old, children.

This effect has also been noted by other researchers. In the first of two studies, Estes (1953) found that second grade children from middle and upper socioeconomic homes scored higher on the WISC than children from the lower class. In a following study, Estes (1955) re-tested the subjects from her previous study. She found the significant difference which existed at second grade for the two groups no longer existed at fourth grade. From her findings, she concluded that the heightening influence of the school resulted in the lessening of the effects of socioeconomic status.

In other studies which investigated the relationship between intelligence and socioeconomic status, Cropley (1964), Laird (1957), Marks and Klahn (1961), Seashore (1951) and Valletutti (1971) reported the same findings as the above studies. They concluded that the socioeconomic status of the family directly influenced the measured I.Q. of the child. The higher socioeconomic families had children who scored higher on intelligence tests than children from low socioeconomic families.

Other researchers have bypassed the social status problem and, instead, have used the intelligence test to show relationships between intelligence and ethnic race. Although often misinterpreted as Racists by the overemotional, non-research oriented public, most of these investigators have pointed out the relationship between ethnicity and socioeconomic status. For example, Lesser, Fifer and Clark (1965) and

Shockley (1970; 1971) found a significant relationship between ethnic groups and intelligence. They reported that Blacks, as a group, scored lower on tests of intelligence than Whites. However, they also pointed out that the low socioeconomic class scored lower than higher socioeconomic class and strongly suggested the interaction between socioeconomic class and ethnicity as the main cause for the low I.Q. scores of the Blacks.

The above relationship between race, socioeconomic status and intelligence has also been pointed out by Nalven, Hoffman and Bierbryer (1969). These authors surveyed a group of psychologists and found socioeconomic status and race were usually considered when interpreting the results of I.Q. tests and estimating the "true" I.Q. of a child. They concluded that psychologists generally feel the present intelligence tests underestimated the ability of children from low socioeconomic homes and children of minority races.

The conclusion reached by many of the above authors was that the intelligence test in its present form was not truly applicable for all children. In one such study, Littell (1960) firmly stated that the WISC was not an adequate measure for the intelligence of minority children. Other studies have pointed out the bias of the test, the interpretation of test results according to norms which did not include the minority child in the standardization, and the language used in the test (Adler, 1968; Justman, 1967) as major shortcomings of most test instruments. Because of the vocabulary used on many tests, Darcy (1953) concluded that the minority child suffers a language handicap on mental ability tests and later recommended the exclusive use of nonverbal tests with minority children (Darcy, 1963).

The alternatives to the problem of intelligence testing are several. The most popular alternative has been to simply eliminate the use of the intelligence test in the public schools, as was done in New York in 1964 (Wechsler, 1968) and is presently being considered in other parts of the country. However, a more reasonable and logical alternative approach to this problem would be to devise new diagnostic procedures to be used with the already existing tests.

III. LITERATURE ON THE TEST CHARACTERISTICS OF THE MENTALLY DEFECTIVE

To date, there have been a large number of studies done showing the WISC test patterns of mentally retarded children. Some inconsistencies have been found, although most studies have produced similar results. For example, Silverstein (1968) reviewed ten earlier studies of WISC patterns of retardates and found the greatest strengths of the retardate as measured by the WISC to consistently fall in the performance factor, usually the Object Assembly and Picture Completion subtests. He also found consistently poor results on the Vocabulary and Information subtests (both verbal subtests) and on the Arithmetic subtest (an academic factor).

Several other studies have supported the results of Silverstein's review. Many of these have shown a significant difference between the mean Verbal I.Q. and the mean Performance I.Q. of the WISC, with the Performance I.Q. falling five to ten points higher than the Verbal I.Q. (Alper, 1967; Barclay, 1969; Vanderhost, Sloan & Bensberg, 1953). As was found by Silverstein, several other studies reported that the subtests

requiring nonverbal, concrete abilities (Object Assembly and Picture Completion subtests) produced the highest mean scores (Alper, 1967; Barclay, 1969; Finley & Thompson, 1958; Gallagher & Lucito, 1961; Stacy & Carleton, 1955; Vanderhost, Sloan & Bensberg, 1953).

Only two studies found results which differed from the above. Belmont, Birch & Belmont (1967) found the Block Design subtest to be consistently high for the mentally retarded. However, this subtest also requires nonverbal, concrete abilities similar to those abilities required on the Object Assembly and Picture Completion subtests. A study done by Sandercock and Bulter (1952) produced unusual results. They found the Similarities and Digit Span subtests produced the highest scores for the retardate, followed in order by the three nonverbal subtests, Picture Completion, Block Design and Object Assembly. One explanation for their results is that both the Similarities and Digit Span subtests can be handled through a concrete approach, although the former, also requires a certain level of verbal ability.

Of the studies which have attempted to show WISC patterns for the undifferentiated retardate as reviewed by this investigator, all have supported Silverstein's conclusions as to the weaknesses of the mentally retarded child. Several of these studies produced exactly the same results as Silverstein, with the Information, Arithmetic and Vocabulary subtests yielding the three lowest scores (Alper, 1967; Finley & Thompson, 1958; Stacey & Carleton, 1955). Other studies indicated that these three subtests fell in the four lowest positions with either the Coding, Comprehension or Picture Arrangement subtests as the fourth lowest score (Barclay, 1969; Belmont, Birch & Belmont, 1967; Gallagher &

Lucito, 1961; Vanderhost, Sloan & Bensberg, 1953; Sandercock & Bulter, 1952). A quick review showed that the Comprehension and Picture Arrangement subtest both require verbal abilities and social competence. The Coding subtest requires perceptual speed and planning ability.

A few studies have been done in which the authors have attempted to use the WISC to describe a particular type of mentally retarded child, usually the non-organic or familial mental defective. In such a study, Baroff (1959) compiled a profile of scores on the WISC for the familial retardate. In this profile, the familial child was seen to be weak in two verbal areas (Vocabulary and Similarities) while showing strengths on the nonverbal, more concrete subtests of the WISC (Object Assembly, Block Design, Picture Completion and Coding).

In a cross-validation of Baroff's study, Fisher (1960) found somewhat similar results, but also found some inconsistencies. The familial retardate was again found to have strengths on the nonverbal, concrete subtests (Picture Completion and Object Assembly). The sample group was also found to be weak in the area of verbal language, in particular, the Vocabulary subtest. However, Fisher's results showed the familial child to be very weak on the Arithmetic subtest which differed from Baroff's results. Fisher's results also failed to show the Similarities subtest as a weakness, but instead, placed the results of that subtest near the middle range of abilities.

Other studies of the familial retardate have supported Baroff and Fisher's conclusions that the verbal skills of the familial defective are weaker than his nonverbal abilities. Sloan and Schneider (1951)

selected forty familial retardates and found a nine point difference between the Verbal and Performance I.Q. of the WISC, with the Performance I.Q. being superior.

The results of the few studies done exclusively with the familial retardate have produced results exceptionally similar to the studies done which did not separate the subjects according to etiology. Since an earlier study (Benda, Squires, Ogonik & Wise, 1963) estimated that 80 to 85% of all retardates are of a familial type, it can easily be seen why the results of studies dealing with the familial retardate correlate highly with studies of undifferentiated defectives.

Only a few studies have been done which have attempted to describe the organic type child. In one such study, Beck and Lam (1955) used the WISC in an attempt to predict brain injury in mentally retarded children. Their results indicated that the organic retardate had higher verbal than nonverbal abilities as evidenced by the superior Verbal I.Q. when compared with the Performance I.Q. of the WISC. These results were the exact opposite of the findings of the familial defective. In their study, the authors computed deviation scores for each subtest when compared to the mean subtest scaled score. They then attempted to match the pattern of deviation scores for each subject with the pattern of scores for adults with organic brain diseases as established by Wechsler (1958). They found only one child whose total test pattern matched item for item with Wechsler's pattern. Therefore, they concluded that it was not possible to use the WISC to find a pattern that could predict organicity.

However, the method used in Beck and Lam's study was faulty for several reasons. In their study, they attempted to compare WISC profile scores with a WAIS profile and therefore, failed to use comparable terms for comparisons. Furthermore, the authors did not state how many of their cases compared highly with Wechsler's profile, although not matching perfectly. They also failed to state that Wechsler originally intended that his profile be used as a guide for the characteristics of adult brain injury and not as an absolute criteria of brain injury in children. Therefore, their conclusion that the WISC is not capable of yielding a profile characteristic of the organic child, must be tempered considerably.

Several other studies have been done with brain-injured mental defectives using test instruments other than the WISC which have shown certain characteristics of the organic child. For example, in three studies which used the Wechsler Adult Intelligence Scale (WAIS), the verbal subtests of Vocabulary, Information and Comprehension were found to produce superior scores when compared with other subtest scores, while the nonverbal, perceptual-motor subtests (Digit Span, Object Assembly and Block Design) were consistently low (Allen, 1947; Aita, Armitage, Reitan & Rabinovitz, 1947; Morrow & Mark, 1955). In addition, Morrow and Mark (1955) found definite weaknesses on subtests which measured memory (Digit Span and Coding), computational skills (Arithmetic) and verbal concept formation (Similarities). This profile of scores matches the typical pattern for brain injury as found by Wechsler (1958) and is probably accounted for by the tight controls within their study.

Doubros and Mascarenhas (1969) investigated the relationship between the WISC subtests sensitive to organicity and the Bender-Gestalt test which is also sensitive to brain damage. They reported a significant relationship between the Bender-Gestalt test, using the Pascal and Suttell scoring method, and three of the WISC subtests, only one of which was a perceptual-motor test (Block Design). The other two subtests found to be highly related (at a .01 level of significance) were the Similarities and Digit Span subtests, both of which were considered to be sensitive to organicity (Wechsler, 1958). The study, however, failed to show a significant correlation between the Bender-Gestalt test and the other perceptual-motor subtests of the WISC (Object Assembly and Coding).

To support the hypothesis that the brain injured child suffers from a weakness in conceptualization, Hall and LaDriere (1969) analyzed the results of the WISC Similarities subtest of certain organic children. They found the brain damaged child made more restrictive errors (e.g., "I don't know" or no response) than members of the control group. Since the subjects were able to complete many of the items attempted, the authors then concluded that the organic child in this study was simply lacking in conceptual ability.

Dolphin and Cruickshank (1952) used a picture-object test which utilized both verbal and nonverbal abilities to measure conceptualization of children with and without brain injury. Their conclusions, based on their findings, were that the organic child was very weak in his ability to form concepts, the same conclusions as reached in the previously mentioned study.

Another area investigated was that of the intellectual scatter usually associated with the brain injured child. In one such study using the Stanford-Binet, Wexford (1941) found that significant scatter and intratest variability indicated brain injury in a sample group. However, his sample was limited to a group of only one.

The largest number of studies done which have tried to produce a pattern of abilities for the retarded, have attempted to do so by comparing the organic retardate with the familial defective. Generally, these studies have shown the organic retardate to be superior to the familial retardate on test items requiring language skills, while the familial defective usually scores considerably higher on perceptual-motor tasks.

Using the I.Q. scores from the verbal and performance sections of the WISC, Newman and Loos (1955) attempted to show the verbal superiority of the organic retardate and the nonverbal superiority of the familial defective. Their results showed no significant difference between the Verbal I.Q. and Performance I.Q. of the WISC for the brain injured sample. However, their results yielded a significantly higher Performance I.Q. for the familial retardate, falling eight points above the Verbal I.Q.

The area of perceptual-motor abilities has been researched most in the attempt to differentiate between the organic and familial retardate. Furthermore, although a large number of test instruments have been used, the same conclusion was found by all investigators. Without exception, the familial mental defective has tested superior to the organic retardate on measures of perceptual-motor abilities. The Ellis Visual Designs Test, in which the subjects were required to reproduce designs,

was used in one study (Cassel, 1949). The Marble Board Test designed by Weiner, in which the subjects were required to reproduce designs with marbles, was used by Bensberg (1950). The Bender-Gestalt test was used on several occasions to test the subject's ability to reproduce visual designs using paper and pencil (Bensberg, 1952; Halpin, 1955; Sternlight, Pustel & Siegel, 1968).

Several other studies have been done using special materials produced exclusively for the investigation. Jenkin and Morse (1960) used homemade cardboard squares and required their subjects to match the squares according to size at different distances. Their findings showed the organic mental defective to be inferior to the familial defective on this visual-perception task. Cassel (1949) used a form board and found the familial child to score higher than the organic retardate on form perception as well as motor speed. Other studies which merely reported their results without adequately describing the materials used include Barnett, Ellis and Pryer (1960); Gallagher (1957); Hoakley and Frazeur (1945) and McMurray (1954).

Somewhat related to the above studies of perceptual-motor abilities are two studies dealing with perceptual motion. By using special materials, which produced the illusion of movement, the familial retardate was found to be superior to the organic defective in his ability to see apparent motion (McMurry, 1954; Werner & Thuma, 1942). These two studies add supportive data to the theory that the familial retardate is superior to the organic defective in most perceptual areas.

In an area related to visual perception, Sloan and Bensberg (1951) and Werner and Strauss (1941) investigated the difference in tactile

discrimination between the organic and familial retardates. In the first study, the authors found no significant difference between the organic and familial defectives in their ability to identify familiar objects by touch alone (Sloan & Bensberg, 1951). However, Werner and Strauss (1941) found considerable, although not significant, differences between organic and familial retardates on a tactile task which required the subjects to perceive shapes made with tacks by the use of touch only. The familial retardate had little difficulty with the background materials, while the organic child was highly distracted. The results of these two studies failed to add any significant information as to the strengths and weaknesses of the organic and familial mental defective.

Another area also related with perceptual-motor abilities is that of perseveration. McMurry (1954) used a modified Card Sorting Test in which the subjects were required to identify the manner in which the cards were sorted. He found the organic retardate repeated the same response for several consecutive problems, whereas the familial child did not. Werner (1946) used both auditory and visual tasks to test for perseveration. His results for both tasks led him to conclude that perseveration was highly characteristic of this brain-injured sample.

Another area of abilities receiving much attention in the literature is that of language. Gallagher (1957) found significantly higher levels of verbal imitation and speech production among the brain-injured retardate, while the familial child was better able to find verbal associations between objects. However, this latter skill required conceptual, as well as language ability.

Bijou and Werner (1945) found the brain injured retardate to be able to identify more words, give more complete definitions, more detail and use a wider range of expression than did the familial defective. Their final conclusion was that the organic retardate was superior to the familial defective in language skills, both quantitatively and qualitatively.

In an attempt to explain some of the language differences between the organic and familial defectives, Gordon and Haywood (1969) provided a stimulus-enriched condition to study these differences. They used the Similarities subtest of the WISC in the usual manner and in a modified situation in which five related words were given instead of two. They found that with the increase of stimuli, the familial retardate also increased his level of verbal abstraction, while the organic child showed no improvement. The authors concluded that the low level of abstracting as seen in the familial child was possibly due to a deficiency in informational input rather than a lack of verbal ability. Although this theory has not received much support to date, it correlated highly with the educational ideas of Bereiter and Engelmann (1966) in which they advocated a type of verbal bombardment in which the child would receive a great deal of verbal stimulation.

Related to the studies dealing with language abilities have been those investigations of concept formation skills. These studies have not produced consistent results, although they have generally shown the non-organic child to be superior to the organic retardate in the area of concept formation (Bijou & Werner, 1945; Strauss & Werner, 1942). Sievers (1959) also found the familial child to score higher on tests requiring

semantic connections, which was considered to be highly related to conceptualization ability. The single exception to the conclusion that the organic defective was inferior to the familial retardate in the area of concept formation skills was given by Osborn (1960). He found no significant differences between the two groups of retardates in their ability to recall pictures and organize them conceptually.

In another type of study related to language abilities, Weatherwax and Benoit (1957) tested two groups of retardates on their ability to think abstractly in terms of familiar vocabulary words. Although their results were not significant, the differences in favor of the organic child suggested that a mild difference existed between the two groups in terms of abstract language abilities.

Related to intellectual abilities is the area of academic achievement. The familial defective, with his higher nonverbal abilities, should be expected to achieve at a higher rate in Arithmetic than the organic retardate. This expectation was found to hold in only one study (Gipson, Jephcott & Wilkins, 1959). However, two other studies have shown no significant differences between the organic and familial retardates in terms of academic achievement in arithmetic (Bensberg, 1953; Capobiano, 1954). Furthermore, with their superiority on verbal skills, the organic retardate should be expected to read better than the familial child. However, in their study, Jephcott and Wilkins (1959) found no significant differences in the area of reading achievement between the organic and familial retardates.

Several other studies have been done comparing the organic and familial retardates on different variables. The familial defective has

been found to perform significantly higher than the organic retardate on tasks requiring either auditory or visual memory skills (Hunt & Patterson, 1958). A difference between these two groups in the way each responded to auditory material has also been discovered. The familial defective has been found to function similar to a normal child, although the performance was considerably lower. However, the organic child has been found to produce errors which were not found in normal development. These children simply appeared to function in an unusual manner in response to auditory stimuli, especially those stimuli of a musical nature (Hunt, 1960; Werner & Bower, 1941).

The familial defective was also found to have significantly faster reaction time than the organic retardate on both simple and complex tasks requiring visual discrimination (Bensberg & Carter, 1957). In another type of study, using the Stanford-Binet, Berko (1955) measured the amount of intellectual scatter of children who were diagnosed as either familial or organic retardates. His measure of scatter was accomplished by tabulating the number of items passed between the last consecutive test item passed and the upper limit of the subject's total performance. His results indicated that the organic retardate showed significantly more intratest scatter than the familial defective. He, thereby, concluded that intra-test scatter could serve as an adequate variable to discriminate between the organic and familial mental retardates.

The differences in the behavior and social competence of the organic and familial retardates have also been investigated. The organic child has been described as more erratic, uninhibited, uncontrolled, less socially competent, more fearful, less popular and socially unacceptable

when compared with the familial retardate (Cassel & Riggs, 1953; Gallagher, 1957; Strauss & Kephart, 1940). Furthermore, in a well-controlled study, Slack (1950) tested 27 children diagnosed as either organic or familial using the Thematic Apperception Test. From the results of the TAT he concluded that the familial child was more field oriented and made better use of causal, rather than purposeful relationships in trying to structure his environment. The result, he concluded, was that the familial retardate required a higher level of verbal abilities than the organic defective in order to adequately behave in his environment. On that basis, he suggested that the organic child was better able to cope with his environment, although not necessarily more competent, socially.

An unusual finding, in light of the studies which have shown the organic retardate to be less socially competent than the familial child, were the findings of Doll (1945). In this study, Doll investigated the social status of parents of both organic and familial defectives. He found 96% of the familial retardates came from families of low social status, whereas only 29% of the organic retardates came from the lower status homes. Although the familial mental defective came from a lower social status home, he was more socially competent than the organic retardate.

In summary, it appears that the organic-familial classification can be differentiated according to the following: the familial defective has been found to be superior to the organic retardate on tasks requiring visual perception, visual-motor ability, memory, and other nonverbal skills. He also has been found to be superior to the organic child on

tests of perceptual motion, tactile discrimination, and concept formation. The familial child also appears to exhibit more acceptable behavior and social competence. The organic mental defective appears to be generally superior to the familial defective on tasks requiring abstract thinking and verbal language skills. The organic child has also been found to show considerably more intratest scatter and perseveration than the familial child. Lastly, the organic retardate appears to come from higher social level homes than the familial defective, even though the organic child appears to be less socially competent.

IV. LITERATURE ON THE TEST CHARACTERISTICS OF THE CULTURALLY DIFFERENT CHILD

Although studies of the culturally different child are of relatively recent concern, research of bilingualism and its effects on intelligence have been of interest for some time. One of the earliest studies of bilingualism investigated the effects of English as a second language. Pinter (1932) tested 430 children who came from English speaking or non-English speaking homes. He used two different types of test instruments to measure intellectual ability, a verbal test, the Pinter-Cunnington Test and a nonverbal test, the Pinter Primary Non-Language Test. His results indicated that children from English speaking homes scored significantly higher on language oriented tests than children from non-English speaking homes. While there was no significant difference on the non-language test results, he found the children from non-English speaking homes scored significantly higher on the non-verbal test compared to the verbal tests. From these results, Pinter recommended caution when

comparing the results of the culturally different child on measures of verbal intelligence.

In a different type of study, Fitch (1966) tested twenty-five bilingual first and second graders and twenty-five bilingual fifth and sixth graders matched for I.Q., socioeconomic status and sex. His results showed that the younger bilingual children had a greater discrepancy than the older subjects between the Verbal and Performance I.Q.'s as measured by the WISC. He concluded that the lack of a dominant language in which to communicate concepts was the primary cause of the low scores on the verbal test. He also concluded that as the bilingual child gained in his facility in using the English language, the WISC Verbal I.Q. should increasingly approach the Performance I.Q.

Yamamoto (1964) reviewed several investigations and found monolingual children generally functioned better than bilingual children on tests requiring verbal skills. He also found that the older the children and the more education they had, the less the discrepancy between the two groups. Furthermore, from the results of the nonverbal tests, he concluded that no significant differences existed between bilingual and monolingual children in terms of mental development.

Although the majority of studies dealing with bilingualism and/or the culturally different child were done with either Mexican-American or Negro children, a few studies have been done with other types of bilingual children. For example, a series of studies were done concerning the Puerto Rican child. The general consensus of findings of the studies were that the Puerto Rican child generally scored very low on tests requiring facilities in the English language. Attributing to low scores on the

intelligence tests were the socioeconomic status of the family as well as the bilingualism of the children which made them deficient in both English and Spanish (Anastasi & Cordova, 1953; Anastasi & DeJesus, 1953; Darcy, 1952).

Only one study concerning bilingual children failed to support the conclusions that monolingual children perform better than bilingual children on tests involving verbal skills. In this study, Peal and Lambert (1962) found the bilingual child performed better on the intelligence test than the monolingual. However, the bilingual children in their study were French-Canadian children from upper and middle socioeconomic homes, while the monolingual children were from low income, French speaking homes. The conditions existing in this study were much different from most studies involving bilingual children from low socioeconomic families. However, the results of this study suggest that the cause of the low I.Q. scores of the bilingual child are a result of the low socioeconomic status of the family and not a result of bilingualism.

Of special interest in the area of bilingualism are those studies dealing with the Mexican-American child. Numerous studies have been done assessing the differences in intellectual ability between the Chicano and English-American children in the schools. Generally, it has been found that the Mexican-American child has scored ten to twenty I.Q. points below the Anglo-American control group. Contrary to current opinion, the Chicano child improves very little when given the same test in a Spanish version. The usual improvement has been found to be only two or three I.Q. points. Furthermore, many Chicano children have been found to score higher on the English version compared to the Spanish form mostly because

their language of knowledge had become English even though Spanish was the language of the home. Thus, the Chicano child has been known to develop a third language (Spanglish) based on a combination of Spanish and English with a general language poverty in both languages (Lambert & Gleason, 1971).

Although some authors have attempted to translate English tests into Spanish versions, they have generally not been successful in improving the assessment of the Chicano child. Several studies have shown that due to the many different dialects of Spanish, it is very difficult to translate a test into a form which would be fair to most Chicanos (Lambert & Gleason, 1971). In one such attempt, Keston and Jimeney (1954) used a translated version of the Stanford-Binet with a group of 50 fourth grade bilingual students. The findings of this study were that the Chicano student scored fourteen points higher on the English version of the Binet compared to the Spanish form. The authors concluded that the children in this study had been greatly influenced by the effects of education, and therefore, developed more ability in the English language than in Spanish. A contaminating factor in this study was that the Spanish version of the Binet had been translated at a Spanish university in Madrid.

Other researchers have found different results. Davis and Personke (1968) tested 88 Spanish speaking first graders using the Metropolitan

Readiness Test both in English and Spanish. The Spanish version had been translated into a colloquial dialect. They reported no significant differences in the results of the two tests. They concluded that the Chicano child was not truly bilingual, but rather was non-linguaged, lacking facility in either language.

Lastly, Galvan (1968) and Mitchell (1937) reported results contrary to the above studies. These authors found the bilingual Chicano child performed significantly higher on the Spanish version of the test instrument used in their study. Galvan (1968) also found considerable difference between the Verbal and Performance I.Q. of the WISC when administered in English, with the Verbal I.Q. being lower than the Performance score. However, the Verbal I.Q. of the Chicano child increased considerably when the test was given in Spanish while the Performance I.Q. remained constant. From these results, Galvan recommended the use of nonverbal tests to assess the level of intellectual ability of the Mexican-American child.

In the study by Mitchell (1937), the Otis Group Intelligence Scale was administered to 236 first, second and third grade Chicano students. Directions for Form A were given to half the subjects in English while Spanish was used for Form B given to the other half. Both forms retained the written English for the content of the test. A mean I.Q. of 86.67 was reported on Form A while a mean I.Q. of 96.15 was found on Form B.

Many studies have shown different results between English and Spanish versions of intelligence tests when administered to the Chicano child. Holland (1960) suggested a theory to explain these differences. He concluded that the younger children (about first grade level) generally score higher on the Spanish version of a test while the older children

(fifth grade level) have been found to score higher on the English version of the same test. Holland pointed out that this reversal correlates with the amount of education of the child. He suggested that the process of acculturation for the Chicano child explains why he would score higher on the English test as he grew older.

Other researchers have suggested that the differences found between Spanish and English versions of the same test are somewhat contaminated by the ethnic background of the examiner. In order to control for this variable, Swanson and DeBlassie (1971) used two examiners to test Chicano bilingual children. They hypothesized that the White Anglo-American examiner would tend to arouse anxiety in the minority child and, thereby, lower the score achieved on a test, whereas, there should be no such effect from a Mexican-American examiner. The results of the testing showed no significant difference between the Chicano child tested by the White Anglo-American examiner and those children tested by the Chicano tester. Therefore, the original hypothesis was not supported.

In a somewhat similar study, Palomares and Johnson (1966) randomly assigned referrals to either a Chicano or Anglo examiner for testing. All of the 68 subjects were suspected of being mildly mentally retarded. The results of the assessment showed that the Chicano examiner recommended placement in a special education (E.M.R.) program for only 26% of his referrals compared with 73% for his White counterpart. They suggested that the Mexican-American examiner was more sensitive to the abilities of the Chicano child and, therefore, produced a more accurate evaluation of the child than did the Anglo examiner.

Several studies have attempted to assess differences in intellectual abilities between the Chicano and Anglo-American child without the use of a test translated into Spanish. Although the results have varied, general findings have shown the Chicano child has scored significantly lower than the White child. For example, Carlson and Henderson (1950) found an average difference in favor of the White child from eight to fifteen points depending on the test instrument used. Darcy (1946) also found similar results when a verbal test, such as the Stanford-Binet, was used. However, she reported the opposite results when a nonverbal test was used. Therefore, she concluded that the bilingual Chicano child suffered a language handicap on most tests of intelligence.

In a study by Knapp (1960), the Mexican-American subject scored significantly lower than a group of Anglo-Americans on a "culture free" test (Cartell Culture Free Test). However, the author also reported that the groups differed significantly in socioeconomic status. The Chicanos were found to be of low socioeconomic status, while the White subjects were from higher social levels. Therefore, he concluded that although the Mexican-American child received scores lower than the Whites, the data could not support the conclusion that the differences were due to intellectual differences between the two groups, but rather due to cultural-economic differences.

Of current interest, Mercer (1971) investigated the relationships between intelligence, race and socioeconomic status. Her results indicated that when socioeconomic differences were held constant, there were no differences in measured intelligence between the Anglo and Chicano child. These findings are not new, however. Other researchers have noted similar results. For example, Carrow (1957) administered the Otis Quick Scoring

Mental Ability Test to 50 bilingual and 50 monolingual third grade children. The bilingual children were Spanish speaking Chicanos while the monolinguals were English speaking non-Chicano children. Each group was equally represented in terms of socioeconomic classes. Her results showed no significant differences in intelligence between these two groups when the socioeconomic variable was held constant.

Christiansen and Livermore (1970) tested Anglo-American and Mexican-American children from middle and low socioeconomic classes. Although they found significant differences between both ethnic origin and socioeconomic factors, the difference between social groups was considerably larger than the differences between the ethnic groups. The middle class children scored a mean I.Q. of approximately 113, while the lower class child averaged 95 I.Q. The difference between the Anglo and the Chicano groups was eight points with a mean I.Q. of 108 for the former and 100 for the later. Although this study showed significant differences in intelligence between the two ethnic groups, it was smaller than the amount usually reported when socioeconomic factors were not considered.

To point out the negative effects of the verbal test with the Chicano child, Sanchez (1934) tested a group of second grade Chicanos. He found a median I.Q. of only 72 which is considered to be far below average. During the following two years, these children engaged in intensive remedial training in language and language arts. A retest of these children following this remedial work produced a median I.Q. of 100, a twenty eight point increase for this group. From these results, Sanchez concluded that the Stanford-Binet was not an adequate scale of measurement for the Chicano child. However, he also concluded that the Mexican-

American child was not receiving an adequate education comparable to the Anglo child.

The area of academic achievement has also been investigated in terms of how well the Chicano child has been able to learn in the Anglo-American schools. In one study, Palomares and Johnson (1966) found the Chicano child had achieved significantly below his grade level. They examined 50 Chicano students whose average grade placement was 4.2 and found all but four subjects achieved a higher level in Arithmetic than in Reading or Spelling. Mean achievement levels were reported as 3.1 in Arithmetic, 2.4 in Reading and 2.0 in Spelling. They concluded that the skills required in the non-language area of Arithmetic were influenced less by language than were Reading and Spelling.

Jensen (1970) summarized several of his earlier studies dealing with the Chicano child. He found when the Mexican-American child was paired according to I.Q. with the Anglo child, the Chicano child learned significantly better than his White counterpart. He also pointed out that when I.Q. scores of the Anglo group increased, their learning ability also increased as expected. However, this was not found with the Mexican-American child. Jensen concluded that the intelligence test in its present form was probably underestimating the ability of the Chicano child.

Considerable differences between Chicano and Anglo children were found in terms of academic achievement as reported by Mayeske (1971). However, when social conditions were taken into account, the differences in the levels of achievement was reduced to a nonsignificant amount. He concluded that differences between racial ethnic groups in terms of academic achievement could be explained by factors which were primarily socioeconomic in nature.

Only a few studies have been done using the WISC to compare the Mexican-American with the non-Mexican-American child. In general, scores for the verbal skills contained within the four language subtests of the WISC (Information, Comprehension, Similarities and Vocabulary) have been depressed for children of Mexican-American descent (Altus, 1953; Killian, 1971). Furthermore, the concretely oriented, non-verbal subtests of the WISC (Block Design, Object Assembly and Coding) have produced the highest scores for the Chicano child, yielding mean scores which fell in the average range according to the standardization norms of the WISC (Cate, 1967; Killian, 1971). The results of these studies comparing the Chicano and the non-Chicano child on the WISC have all shown the Chicano to be very weak on the verbal language factor of the WISC, but of equal ability with the non-Chicano child on the non-verbal factors.

Also to be considered are those studies dealing with the Mexican-American retardate. In two separate studies, the Chicano retardate was found to have a verbal I.Q. significantly lower than his nonverbal I.Q. (Bransford, 1967; Shotwell, 1945). In the study by Shotwell, the author reported a fourteen point difference between the results of the Stanford-Binet (primarily a verbal test) and the Arthur Performance Scale (a non-verbal test). Her results showed a mean I.Q. of 69 on the Binet with a mean I.Q. of 83 on the Arthur Performance Scale. She concluded that the Chicano child was considerably handicapped on the typical intelligence test because of the language abilities required.

Another study in this area compared a group of Chicano retardates with a group of non-Chicano familial defectives using the Wechsler scales. It was reported that the Chicano mental defective did as well as the

familial retardate on the verbal comprehension and memory factors of the WISC as well as the Verbal I.Q. and the Full Scale I.Q. scores. According to the studies of the familial retardate reviewed earlier, all the above scores have been found to be depressed for the familial child, thereby, indicating that the Chicano retardate was also very weak on these factors. However, the Mexican-American retardate was found to function significantly higher than the familial subject on the perceptual-motor organization factor as well as the Performance I.Q., thereby providing a factor discriminating between the Chicano and familial retardates.

In summary, the Chicano child has been found to score significantly lower than his White counterpart on most tests involving language skills, regardless of the instrument used. Furthermore, the Chicano child has been found to improve very little, if at all, when the verbal test has been translated into Spanish. When considering specific patterns of test scores, the Chicano children of both average and retarded intelligence have been found to suffer on those test factors requiring language skills. From the results of previous studies, it appeared that the test factors measuring nonverbal, nonlanguage skills produced results most comparable to the child's actual intellectual ability. Thus, one of the primary recommendations from the literature has been for more research in the area of clarifying how the background of the Chicano child effects his pattern of test scores and to devise interpretational methods which would take into consideration the low scores usually expected for the Mexican-American child (Lambert & Gleason, 1971).

Other ethnic groups have been considered in the literature. Probably one of the most researched groups of people are the American Negroes.

Studies of the intelligence of the Black race have been conducted for many years and for a variety of reasons including the support of a theory of racial superiority. Depending upon the individual study and the particular test instrument used, each investigation of the intelligence of the Black child has produced very similar results. The data derived from these studies have indicated that the Black child was significantly lower than the White child on measures of intellectual ability.

For example, Sternlof, Parker and McCoy (1968) tested 34 Black and 54 White children enrolled in a Head Start program in the Southwest. Because the subjects were enrolled in this program, the authors considered all the children to be of low socioeconomic status. The results of the study showed the Black children tested significantly lower than the White children on the Columbia Mental Maturity Test with a difference of about thirteen I.Q. points. However, on the Goodenough Draw A Man Test, the difference between the two groups was found to be only four points.

Other studies have also reported low I.Q. scores for the Black child. Klineberg (1963) in summarizing several studies, estimated the median I.Q. of all Black children to be 85. Kennedy, DanDeRiet and White (1963) reported a mean I.Q. of 80.7 for a large group (N=1800) of Black children involved in a normative study with the Stanford-Binet. Semler and Iscoe (1966) reported a twelve point difference between Black and White children on the WISC. However, their results found the sample of Black children to score an average I.Q. of 93, somewhat higher than reported in other studies.

Without doubt, it can safely be said that most Black children, when taken as a group, will score significantly lower than their White

counterparts on most tests of intellectual ability. However, the conclusions which have followed these results were varied. For example, Klineberg (1963) pointed out the overlap of I.Q. scores between the Blacks and Whites and concluded that this overlap indicated there was no ethnic differences in intelligence.

Probably the most valid conclusion arising from these results has been that the lower socioeconomic status of the Blacks has greatly influenced the average I.Q. attained on tests of intellectual ability. Because of the relationship between intelligence and socioeconomic status and the relationship between race and socioeconomic status, the results of these studies can not be interpreted as showing a significant difference between the races in intelligence (Sperrazzo & Wilkins, 1958).

To help support the above conclusions, Yen (1969) compared Black and White children from low socioeconomic levels. His findings showed that intelligence and developmental pattern of the four year old child, either Black or White, was practically identical. From these findings, he theorized that as new intensified intellectual stimulation is introduced to the child in a poverty community, the I.Q. of the child should then increase.

Further support for the above conclusion can be found in a variety of studies. For example, Gilliland (1951) in summarizing several studies which had used the Northwestern Infant Intelligence Test with Black and White babies, reported no significant difference in measured intelligence between a group of 113 Negro and 543 Caucasian infants. All of the subjects were tested between the ages of six and twelve weeks. The author reported mean I.Q. scores of 102 for the Black sample and 100 for the

White group. The conclusions of this study were that below the age of 36 weeks, socioeconomic status of the parents has little testable influence on the I.Q. of the child. Furthermore, racial differences had no significant influence on measured intelligence below 36 weeks. Therefore, differences in intelligence found at later ages must be attributed to education and other factors.

Pasamanick (1946) studied 53 Negro babies who had been examined by physicians in New Haven, Connecticut and compared his results with findings of studies done with Whites. He concluded that the New Haven Black infant was fully equal in behavioral development to the average New Haven White child. He reported no significant differences between White and Black babies in terms of fine-motor coordination, adaptive behavior, language and personal social behavior. However, he reported that the Black infants performed significantly higher than Whites on gross-motor tasks.

Walters (1967) studied a sample of 51 Black and 57 White infants. He evaluated these children at 12, 24 and 36 weeks using the Gesell Development Schedules. The only significant difference found between the groups was that at 12 weeks the Black babies performed significantly higher in the area of motor development. His results indicated that the majority of differences found between the children were due to differences in socioeconomic status and not to race.

In conclusion, the nature-nurture controversy has been argued in psychology for some time. It is doubtful that one can point to enough significant evidence to support either position. However, from the studies cited above, it appears that the environmental factor must be given strong

weight when considering the apparent differences between Blacks and Whites on measured intelligence. Therefore, the significant feature of the literature to be considered at this time should not be whether the Black child has an I.Q. equal to his White counterpart, but should, instead, focus on the particular characteristics shown by the Negro child on the intelligence test instrument.

In two separate studies, the Black child born and educated in the North was compared with the Negro child born and educated in the South. The Northern subjects were found to be of superior intellectual ability when compared to the Southern children (Garrett, 1947; Teahan & Drews, 1962). In their study, Teahan and Drews also found no significant difference between the Verbal I.Q. and Performance I.Q. of the WISC for the Northern Black children. However, they reported a significant difference of eleven points for the Southern sample. For this group, the Verbal I.Q. was reported as 80.29, while the Performance I.Q. was listed as 68.83. This difference between the measured verbal and nonverbal abilities has also been noted by Caldwell and Smith (1968); Davis (1957); and Young and Bright (1954). In the study by Caldwell and Smith, it was noted that the higher score on the verbal section of the WISC was not produced because of higher scores on the verbal factor of this section, but instead were due to the higher scores achieved on the two nonlanguage subtests (Arithmetic and Digit Span).

In one of the few studies done with Black children that has not been concerned with I.Q. scores, Brown (1968) investigated the language patterns of Black children in terms of how language affected their ability to read. She reported that the sample (N=31) tested produced more errors in reading

of a linguistic nature than actual errors in reading. She concluded that many words these children had originally learned incorrectly interfered with the oral recognition of the word during the reading process.

Using a different framework, Hughes and Lessler (1965) attempted to control socioeconomic differences in their study. They limited their sample to 137 children, both Black and White, who were raised in homes considered to be culturally deprived. Furthermore, all of the subjects were suspected of being mentally retarded and referred for testing. The authors reported a significant difference between the children of these two races in terms of measured intelligence. From their results, they concluded that deprivation caused by low socioeconomic conditions had more severe effects on Black children when related to a comparable White population.

Two separate studies investigated differences of conceptualization between White and Black children. In one of these studies, Goldstein and Peck (1971) examined the differences in concept formation between a group of 52 Negro children and 40 White children. They then separated the groups into two parts, one of which was considered to be functioning at or above the average range in concept formation as measured by the Similarities subtest of the WISC. The other subgroup was functioning below average on this same subtest. Investigating the vocabulary level of each group, they found the Black child to be better able to abstract from his verbal abilities than the White child.

However, in the other study of concept formation, Rayburn (1970) tested 240 Black and White children of middle and low socioeconomic class. She used the Similarities and Block Design subtests of the WISC as measures

of conceptualization. Her final results showed no significant differences between the two groups of children. However, significant differences in concept formation were reported between the different socioeconomic levels. She concluded that the experiential background of the children in her study resulted in a variety of concept formation abilities and that no differences could be suggested due to racial diversity.

Of interest in this investigation are those studies which utilized the Wechsler Intelligence Scale for Children with the Black mentally retarded child. In one such study, Smith and Caldwell (1969) compared two racial groups of retardates on the WISC. They reported very few differences between the Black retardates and the White mentally retarded child. Of the differences found, they reported the White male retardate achieved a significantly higher score on the Digit Span and Coding subtests, while the Black male scored higher on the Comprehension subtest. Also, the White female retardate scored significantly higher than the Black child on the Picture Completion and Coding subtests, while the Black female failed to outscore her White counterpart on any section of the WISC. They concluded that few differences between the races could be found on the WISC when working with the mentally retarded children and that, perhaps, such comparisons were of limited value.

In another study of the Black retardate, Atchison (1955) found that children who scored low on the verbal section of the WISC usually scored low on the performance section. He also reported a significant difference between the Verbal I.Q. and the Performance I.Q. of the WISC. The Verbal I.Q. was found to be eight points higher than the Performance I.Q. for the Negro retardate. From these results, he concluded that the verbal section

of the WISC was the better indicator of intellectual ability for the Black mentally retarded child.

In two longitudinal studies, Bowles (1969) and Webb (1963) reported that when compared with other sample groups, the Black retardate has made more gains in intellectual growth. Bowles (1969) found that young Black retardates from low socioeconomic levels produced more gains on the WISC than did older Blacks or White children. He concluded that the test instrument was not a reliable measure of intelligence for the Black child, especially those from economically deprived areas. In Webb's study (1963), an eleven point group difference was noted between test scores using the WISC and WAIS two years apart. A significant correlation ($r = +.84$) between the two testings indicated that almost all subjects kept their relative rankings during the two administrations and that all subjects improved their scores rather than one or two large gainers. However, the author failed to consider the differences in the standardization populations for these two tests which would explain some of the difference found in this study.

In summary of the studies done assessing the intellectual abilities of the Black child, it can be said that the Negro child usually scores significantly lower than his White counterpart. Furthermore, it appears that the Performance I.Q. of the Black child is depressed more than the measured Verbal I.Q. However, none of the studies listed offered an explanation for this particular phenomena. Also reported were the high correlations between the Negro race and low socioeconomic status and between intelligence and socioeconomic status. The resulting low I.Q. of the Black children, taken as a group, can be directly attributed to

the low socioeconomic status of the Blacks. When the differences of socioeconomic status between Black and White children were held constant, no significant differences in measured intelligence have been attained. Thus, it appears that the low I.Q. score achieved by Black children as a group is simply reflecting their low socioeconomic level. In analyzing the studies using the WISC with the Black child, no outstanding findings have been reported in the literature in terms of patterns of WISC scores. To date, the findings of research studies using the WISC profiles of Black children have been inconclusive.

CHAPTER III

METHOD

I. SAMPLE

Selection of the sample. Eight Northern California school districts were chosen for this study so as to approximate a stratified sample representative of different size communities served by local schools in the United States. The population census of 1970 as reported in The World Almanac and Book of Facts (Long, 1971) was used to determine the population pattern of the United States. This pattern yielded the following data which were used in this study: approximately 27.5% of the population of the United States in 1970 resided in cities larger than 100,000. Almost 57.5% of the 1970 population was living in medium to large towns and suburbs from 10,000 to 100,000 population. The remainder of the 1970 U.S. population was living on farms, in rural areas or in towns smaller than 10,000 people. This represented about 5% of the total population.

To approximate a stratified sample, eight school districts were chosen so as to match the population pattern of the 1970 census and to facilitate the process of data collection. In the first group, Sacramento Unified School District comprised the sample representative of large metropolitan areas. From this school district, a total of forty-five cases (30% of the total sample) were randomly selected. In each case, the test data and medical information matched the requirements as set forth by the definitions of the three groups in Chapter I. If the selected case did not fulfill the

requirements of any of these three groups, it was discarded and another case was selected.

Stockton Unified School District, Lodi Unified School District, Rio Linda Union School District, Lincoln Unified School District and San Juan Unified School District were selected to represent the population of small to medium cities and suburbs. From these five school districts, ninety subjects were randomly selected. This represented 60% of the sample population.

Calaveras Unified School District and Amador Unified School District were used to represent the rural population. A total of fifteen subjects were randomly selected for the study. This group represented ten per cent of the sample population.

Characteristics of the population. The one hundred fifty subjects used in this study fell into the following categories:

1. Fifty subjects were educable mentally defective children due to neurological impairment according to the definition contained in Chapter I.
2. Fifty subjects were diagnosed as familial mental defectives according to the definition in Chapter I.
3. The remaining fifty subjects had been misidentified as mentally retarded at one time due to differences in culture and/or language. These subjects were designated as pseudo-mental defectives according to the definition in the first chapter.

The subjects in the organic mental defective group had a mean chronological age of 9 years, 8 months at the time of testing with a range of 6-0 to 14-7 years. The subjects in the familial mental defective group

had a mean chronological age of 9 years, 6 months with a range of 5-5 to 14-4 years. Those subjects in the final group, the pseudo-mental defective, had a mean chronological age of 9 years, 7 months with a range of 6-1 to 15-3 years.

The mean Full Scale I.Q. on the Wechsler Intelligence Scale for Children for each of the three groups was as follows: 62.66 for the organic mental defectives, 63.80 for the familial mental defectives, and 72.82 for the pseudo-mental defectives.

Because a difference in intellectual ability among the three groups could result in misleading inferences from the data, an Analysis of Variance - one way was computed using the Full Scale I.Q. score of each of the subjects. This technique resulted in an F value of 51.98 which was considered to be significant at the .001 level. Since this F value was significant at the .001 level, the Analysis of Covariance - one way was used in place of the Analysis of Variance in the remainder of this study as a means of statistically equating the I.Q. levels of the groups. The I.Q. score for each subject was used as the covariant in the statistical treatment.

No attempt was made to control for sex differences within each group. However, there were 25 boys and 25 girls included in the organic mental defective group, 23 boys and 27 girls comprising the group of familial mental defectives, and 25 boys and 25 girls making up the group of pseudo-mental defectives.

Ethnic and cultural backgrounds of the subjects was not considered to be an important variable for the first two groups since a definite medical diagnosis of organic or familial retardation was required for

inclusion. The third group, the pseudo-mental defective was composed of 25 Mexican-American and 25 Negro children.

II. PROCEDURE

Data from the Wechsler Intelligence Scale for Children were collected for three groups of subjects, those identified as mentally retarded due to organic impairment, those identified as familial mentally defective and those children who were misidentified as retarded due to differences in language and/or culture. The results of each of eleven subtests of the WISC were used for each group. The Mazes subtest was omitted since its use in practice is limited. The scaled scores for each of the following subtests were used: Information, Comprehension, Arithmetic, Similarities, Vocabulary, Digit Span, Picture Completion, Picture Arrangement, Block Design, Object Assembly and Coding.

Certain subtest scaled scores were combined to yield composite scores measuring common traits or factors as determined by previous factor analysis studies. The scaled scores of the following subtests were added to yield a single score measuring a specific trait:

1. Information, Comprehension, Similarities and Vocabulary were combined to form a factor identified as verbal comprehension (Cohen, 1959; Wechsler, 1958).
2. Block Design, Object Assembly and Coding were combined to yield a factor measuring visual-motor organization (Garms, 1970; Lotsof, 1958).
3. Information and Picture Completion subtest results were added to form a factor identified as alertness (Osborne and Tillman, 1967).

4. Comprehension and Picture Arrangement were combined to form a factor which measured comprehension of social situations (Crockett, 1969; Osborne and Tillman, 1967).

5. The Similarities and Block Design subtest results were combined to yield a factor identified as concept formation (Garms, 1960; Lotsof, 1958).

6. Arithmetic, Digit Span and Coding subtests were combined to form a factor measuring concentration (Osborne and Tillman, 1967; Wechsler, 1958).

The Covariance Analysis - One Way was computed comparing the three groups on each of these six measures. Differences were considered significant if they reached the .05 level. A regression equation was used to adjust the mean scores so as to enable comparisons between groups. For each F value which was significant at the .05 level, the Newman-Kuels test was computed to make further differentiations. The following hypotheses were tested using these data:

Hypothesis 1: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the verbal comprehension subtests of the WISC (Information, Comprehension, Similarities and Vocabulary).

Hypothesis 2: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the visual-motor organization cluster of the WISC (Block Design, Object Assembly and Coding subtests).

Hypothesis 3: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the alertness cluster of the WISC (Information and Picture Completion subtests).

Hypothesis 4: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the subtests of the WISC measuring comprehension of social situations (Comprehension and Picture Arrangement).

Hypothesis 5: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the subtests of the WISC measuring concept formation (Similarities and Block Design).

Hypothesis 6: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the total of the concentration cluster of the WISC (Arithmetic, Digit Span and Coding subtests).

The Verbal I.Q. and the Performance I.Q. of each subject was used for the next part of the study. The difference between the Verbal I.Q. and the Performance I.Q. of each subject was computed by subtracting the Performance I.Q. from the Verbal I.Q. The Analysis of Variance - One Way was computed comparing the three groups of subjects on this measure of the difference between verbal and nonverbal abilities. Differences were considered significant if they reached the .05 level. The Newman-Kuels method was used to determine further differences. The following hypothesis was tested using these data:

Hypothesis 7: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by the difference between the Verbal I.Q. and the Performance I.Q. of the WISC (V.I.Q. - P.I.Q.).

The variance of the scaled scores for the eleven subtests of the WISC was computed for each subject. The value of the variance was used as an index of intratest variability. An Analysis of Variance - One Way was computed comparing the three sample groups. Differences were considered significant if they reached the .05 level. The Newman-Kuels method was used to make further differentiations among the three groups. The following hypothesis was tested using these data:

Hypothesis 8: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by an index of the intratest variability of the WISC.

Lastly, a measure of intertest variability was computed for each subject. Each time a subject completed a difficult problem on the WISC or answered a difficult item after he had previously failed an easier one (scored zero), one point was tabulated. This was done with all of the WISC subtests except Digit Span and Coding. For the Digit Span subtest, an inconsistency was scored when the subject passed an item on the second attempt after failing the first. No measure of inconsistency was attempted for the Coding subtest. If a subject passed two or more items in succession after failing an easier item, a score of only one point was counted. Only the inconsistencies of failure were scored and summed for the measure of intertest variability. The Analysis of Variance - One Way was computed

comparing the three sample groups. Differences were considered significant if they reached the .05 level. The Newman-Kuels method was used to make further differentiations among the three groups. The following hypothesis was tested using these data:

Hypothesis 9: There are no differences among the organic mental defective, the familial mental defective and the pseudo-mental defective as measured by an index of the total intertest variability of the WISC.

CHAPTER IV

RESULTS

This chapter presents the treatment and interpretation of the data obtained in this study. The first two tables present a summary of the uncorrected means and the adjusted mean scores for the nine variables investigated in this study. Tables III and IV present information testing the equality of the three groups on a measure of intelligence. Tables V through XXII present information testing each of the nine hypotheses investigated in this research study. The final table presents a summary of the results of the nine hypotheses tested. Each table is followed by an interpretation of the results. A summary of the interpretations is given at the end of the chapter.

I. PRESENTATION AND INTERPRETATION OF THE DATA

Summary of mean scores. Tables I and II present the mean scores for the nine variables investigated in this study. The mean I.Q. for each group is also presented. Table I presents a summary of the actual mean score for these variables as found in this investigation. Each of these variables will be investigated in more detail later in this chapter.

TABLE I

UNCORRECTED MEAN SCORES, SUMMARY
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

VARIABLE	ORGANIC MENTAL DEFECTIVE N = 50	FAMILIAL MENTAL DEFECTIVE N = 50	PSEUDO MENTAL DEFECTIVE N = 50
Full Scale	62.66	63.80	72.82
Verbal Comprehension	23.06	18.30	20.60
Visual-Motor Organization	11.22	16.40	23.10
Alertness	11.14	10.24	11.94
Comprehension of Social Situations	10.04	9.12	11.76
Concept Formation	10.80	10.48	12.52
Concentration	12.86	15.24	18.72
VIQ - PIQ	+11.30	-1.32	-10.98
Intratest Variability	3.65	2.81	4.58
Intertest Variability	8.00	7.14	6.60

Since the first six variables were all directly influenced by the magnitude of the subject's Full Scale I.Q., each of the group means were adjusted statistically according to a linear regression equation (Winer, 1962). The remaining three variables were not influenced by the size of the I.Q. score and were, therefore, not adjusted. Table II presents the adjusted mean scores for each group.

TABLE II

ADJUSTED MEAN SCORES, SUMMARY
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

VARIABLE	ORGANIC MENTAL DEFECTIVE N = 50	FAMILIAL MENTAL DEFECTIVE N = 50	PSEUDO MENTAL DEFECTIVE N = 50
Full Scale I.Q.	66.43	66.43	66.43
Verbal Comprehension	25.17	19.77	17.02
Visual-Motor Organization	12.80	17.50	20.42
Alertness	11.97	10.82	10.53
Comprehension of Social Situations	11.02	9.80	10.10
Concept Formation	12.04	11.35	10.41
Concentration	14.59	16.45	15.78
VIQ - PIQ	+11.30	-1.32	-10.98
Intratest Variability	3.65	2.81	4.58
Intertest Variability	8.00	7.14	6.60

Full Scale Intelligence Quotient. Table III presents the One Way - Analysis of Variance comparing the three sample groups on the Full Scale I.Q. variable. Table IV presents the information derived from the use of the Newman - Kuels Method for making comparisons between each pair of subject groups on the Full Scale I.Q. variable.

TABLE III
ANALYSIS OF VARIANCE - ONE WAY
FULL SCALE I.Q.
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	3,098.09	2	1,549.05	51.98	.001
Within Groups	4,380.60	147	29.80	-	-
Total	7,478.70	149	-	-	-

The results of this test indicate there was a significant difference at the .001 level among the three groups of subjects in terms of the Full Scale I.Q. score of each of the subjects included in this study.

TABLE IV

NEWMAN - KUELS METHOD
FULL SCALE I.Q.
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	MEAN SCORE	TOTAL SCORE
1. Organic Defective	50	62.66	3,133.00
2. Familial Defective	50	63.80	3,190.00
3. Pseudo-Defective	50	72.82	3,641.00
<hr/>			
TRUNCATED RANGE	r	2	3
q _{.95} (r, 147)		2.79	3.34
q _{.95} (r, 147) $\sqrt{n MS_{error}}$		107.69	128.92
q _{.95} (r, 147)		3.68	4.18
q _{.95} (r, 147) $\sqrt{n MS_{error}}$		142.05	161.35
<hr/>			
	ORGANIC	FAMILIAL	PSEUDO-DEFECTIVE
Organic	-	57.00	508.00**
Familial		-	451.00**
Pseudo-Defective			-

** significant at .01 level

Since the results of the Analysis of Variance test indicated there was a significant difference among the three groups of subjects, a further test (the Newman-Kuels Method) was utilized to determine which of the groups differed in terms of I.Q. scores. The results of the Newman-Kuels Method showed that the pseudo-mental defective scored significantly higher (.01 level) than either the organic or familial mental defective in terms of I.Q. scores. Furthermore, the Newman-Kuels results indicated that there was no significant difference in I.Q. scores between the organic mental defectives and the group consisting of familial mental defectives. The implication of these results was that the scores for each group would have to be adjusted according to the magnitude of the group's I.Q. score. These results dictated the use of the Covariance Analysis using the Full Scale I.Q. of the WISC as the covariate in order to statistically equate the I.Q. scores of each group.

Verbal Comprehension. Table V presents the One - Way Covariance Analysis comparing the three sample groups on the verbal comprehension variable (Information, Comprehension, Similarities, and Vocabulary). Table VI presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the verbal comprehension factor.

TABLE V

COVARIANCE ANALYSIS - ONE WAY
VERBAL COMPREHENSION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	1,237.67	2	618.84	69.48	.001
Regression	1,372.95	1	1,372.95	154.15	.001
Within Groups	1,300.37	146	8.91	-	-

Raw Regression Coefficients

Covariates Within Groups

1 0.56

The results of the Covariance Analysis indicated there was a statistically significant difference at the .001 level among the three subject groups on the verbal comprehension factor. Further differentiation would dictate the use of additional statistical tests.

TABLE VI

NEWMAN - KUELS METHOD
VERBAL COMPREHENSION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	23.06	25.17	1,258.50
2. Familial Defective	50	18.30	19.77	988.50
3. Pseudo-Defective	50	20.60	17.02	851.00
<hr/>				
TRUNCATED RANGE	r	2	3	
<hr/>				
q _{.95} (r, 146)		2.79	3.34	
<hr/>				
q _{.95} (r, 146) $\sqrt{n \text{ MS}_{\text{error}}}$		58.90	70.51	
q _{.99} (r, 146)		3.68	4.18	
q _{.99} (r, 146) $\sqrt{n \text{ MS}_{\text{error}}}$		77.68	88.24	
<hr/>				
	PSEUDO	FAMILIAL	ORGANIC DEFECTIVE	
Pseudo	-	137.50**	407.50**	
Familial		-	270.00**	
Organic Defective			-	

** significant at .01 level

According to the results of the Newman-Kuels test, the organic mental defective scored significantly higher (.01 level) than both the familial mental defective and the pseudo-mental defective on the factor measuring verbal comprehension. Furthermore, the familial mental defective was found to score significantly higher than the pseudo-mental defective, also at a .01 level of statistical significance.

The group of organic mental defectives had an adjusted mean of over twenty-five for the four subtests making up the verbal comprehension factor. This would suggest a mean scaled score of slightly more than six for each of the four verbal comprehension subtests of the WISC. The familial mental defectives had an adjusted group mean of almost twenty points for this factor, which yielded a mean score of almost five points for each of the four subtests. The pseudo-mental defectives averaged slightly over seventeen points on this same factor, a mean of somewhat more than four on each of the four subtests.

The differences between each of these three groups of subjects on the verbal comprehension factor strongly pointed out the differences between the three groups in general language skills. The organic mental defective was strongest in verbal language abilities while the pseudo-mental defective was very weak on tasks requiring language skills. The result was that the verbal comprehension factor of the WISC was one of the best diagnostic indicators to separate the organic mental defective, the familial mental defective and the pseudo-mental defective.

Visual - Motor Organization. Table VII presents the One Way - Covariance Analysis comparing the three sample groups on the visual - motor organization variable (Block Design, Object Assembly, and Coding). Table VIII presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the visual - motor organization factor.

TABLE VII
COVARIANCE ANALYSIS - ONE WAY
VISUAL - MOTOR ORGANIZATION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	1,034.60	2	517.30	56.59	.001
Regression	772.56	1	772.56	84.52	.001
Within Groups	1,334.53	146	9.14	-	
Raw Regression Coefficients					
Covariates	Within Groups				
1	0.42				

The results of the Covariance Analysis indicated there was a statistically significant difference at the .001 level among the three subject groups on the visual-motor organization factor. Further differentiation would dictate the use of an additional statistical test.

TABLE VIII

NEWMAN - KUELS METHOD
VISUAL - MOTOR ORGANIZATION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	11.22	12.80	640.00
2. Familial Defective	50	16.40	17.50	875.00
3. Pseudo-Defective	50	23.10	20.42	1,021.00

TRUNCATED RANGE	r	2	3
q _{.95} (r, 146)		2.79	3.34
q _{.95} (r, 146) $\sqrt{n MS_{error}}$		59.65	71.41
q _{.99} (r, 146)		3.68	4.18
q _{.99} (r, 146) $\sqrt{n MS_{error}}$		78.68	89.37

	ORGANIC	FAMILIAL	PSEUDO - DEFECTIVE
Organic	-	235.00**	381.00**
Familial		-	146.00**
Pseudo-Defective			-

** significant at .01 level

According to the results of the Newman-Kuels test, the pseudo-mental defective was found to score significantly higher (.01 level) than either the organic mental defective or the familial mental defective on the factor measuring visual-motor organization. Furthermore, the familial mental defective scored significantly higher than the organic mental defective on this factor. This difference was also statistically significant at a .01 level.

The pseudo-mental defective had an adjusted mean score of almost twenty and one half points on the factor measuring visual-motor organization. This score would suggest a mean scaled score of almost seven points for each of the three subtests comprising this factor, a score approaching the low average range of abilities. The familial mental defective had an average (mean) score of seventeen and a half for this factor, yielding a mean scaled score of nearly six for the three visual-motor organization subtests. The organic mental defective had a mean score of less than thirteen for this factor, a total which would yield a mean scaled score of four for each of the three subtests.

The differences between the three groups of subjects on the visual-motor organization factor strongly point out a major weakness of the organic mental defective and also a major strength of the pseudo-mental defective. This factor proved to be one of the best diagnostic indicators to separate the three groups of subjects.

Alertness. Table IX presents the One Way - Covariance Analysis comparing the three sample groups on the alertness variable (Information and Picture Completion). Table X presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the alertness factor.

TABLE IX
COVARIANCE ANALYSIS - ONE WAY
ALERTNESS FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	46.65	2	23.33	5.39	.006
Regression	220.24	1	220.24	50.90	.001
Within Groups	631.72	146	4.33	-	-

Raw Regression Coefficients

Covariates Within Groups

1 0.22

The results of the Covariance Analysis indicated there was a statistically significant difference at the .01 level among the three subject groups on the alertness factor. Further differentiation would dictate the use of an additional statistical test.

TABLE X
 NEWMAN - KUELS METHOD
 ALERTNESS FACTOR
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	11.14	11.97	598.50
2. Familial Defective	50	10.24	10.82	541.00
3. Pseudo-Defective	50	11.94	10.53	526.50

TRUNCATED RANGE	r	2	3
1.95 (r, 146)		2.79	3.34
q.95 (r, 146)	$\sqrt{n} MS_{error}$	41.15	49.27
q.99 (r, 146)		3.68	4.18
q.99 (r, 146)	$\sqrt{n} MS_{error}$	54.28	61.66

	PSEUDO	FAMILIAL	ORGANIC DEFECTIVE
Pseudo	-	14.50	72.00**
Familial		-	57.50**
Organic Defective			-

** significant at .01 level

According to the results of the Newman-Kuels test, the organic mental defective was found to score significantly higher than both the familial mental defective and the pseudo-mental defective on the alertness factor. This difference was statistically significant at the .01 level. There was no significant difference found between the familial mental defective and the pseudo-mental defective on this factor.

The organic mental defective averaged almost twelve points on this two subtest factor. Both the familial mental defective and the pseudo-mental defective had mean scores of approximately ten points. The suggested mean scaled scores for each of the subtests on this factor was less than six points for the organic mental defective and somewhat greater than five points for both the familial mental defective and the pseudo-mental defective.

This difference was considered to be statistically significant and suggested that the organic mental defective exhibited more alert behavior, as measured by the alertness factor of the WISC, than either the familial mental defective or the pseudo-mental defective. This factor was able to separate the organic mental defective from the other two groups of subjects, but was unable to separate the familial mental defective from the pseudo-mental defective. Therefore, the effectiveness of the alertness factor for differentiating among the three groups of subjects was somewhat limited.

Comprehension of Social Situations. Table XI presents the One Way - Covariance Analysis comparing the three sample groups on the variable measuring comprehension of social situations (Comprehension and Picture Arrangement). Table XII presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the comprehension of social situations factor.

TABLE XI
COVARIANCE ANALYSIS - ONE WAY
COMPREHENSION OF SOCIAL SITUATIONS FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	37.44	2	18.72	3.83	.024
Regression	290.32	1	290.32	59.36	.001
Within Groups	714.00	146	4.89	-	-
Raw Regression Coefficients					
Covariates	Within Groups				
1	0.26				

The results of the Covariance Analysis indicated there was a statistically significant difference at the .05 level among the subject groups on the variable measuring comprehension of social situations. Further differentiation would dictate the use of an additional statistical test.

TABLE XII
 NEWMAN - KUELS METHOD
 COMPREHENSION OF SOCIAL SITUATIONS FACTOR
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	10.04	11.02	551.00
2. Familial Defective	50	9.12	9.80	490.00
3. Pseudo-Defective	50	11.76	10.10	505.00
<hr/>				
TRUNCATED RANGE	r	2	3	
q _{.95} (r, 146)		2.79	3.34	
q _{.95} (r, 146) $\sqrt{n \text{ MS}_{\text{error}}}$		43.64	52.24	
q _{.99} (r, 146)		3.68	4.18	
q _{.99} (r, 146) $\sqrt{n \text{ MS}_{\text{error}}}$		57.56	65.38	
<hr/>				
	FAMILIAL	PSEUDO	ORGANIC DEFECTIVE	
Familial	-	15.00	61.00*	
Pseudo		-	46.00*	
Organic Defective			-	

* significant at .05 level

According to the results of the Newman-Kuels test, the organic mental defective scored significantly higher than either the pseudo-mental defective or the familial mental defective on the variable measuring comprehension of social situations. The differences were found to be statistically significant at a .05 level. There was no significant difference found between the pseudo-mental defective and the familial mental defective on this variable.

The organic mental defective had a corrected mean score of eleven points on this factor, suggesting a mean scaled score of five and one half points on each of the two subtests making up this factor. The pseudo-mental defective and the familial mental defective had corrected mean scores of approximately ten points, yielding a mean of five scaled score points on each of the two subtests comprising this factor.

This difference was considered to be statistically significant, thus indicating that the organic mental defective was better able to comprehend social situations than both the familial mental defective and the pseudo-mental defective. However, this factor was not able to differentiate between the familial mental defective and the pseudo-mental defective. Furthermore, the actual difference between any of the three groups in terms of scaled score units was rather small. Therefore, the diagnostic value of the comprehension of social situations factor was considered to be limited.

Concept Formation. Table XIII presents the One Way - Covariance Analysis comparing the three sample groups on the concept formation variable (Similarities and Block Design subtests). Table XIV presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the concept formation factor.

TABLE XIII
COVARIANCE ANALYSIS - ONE WAY
CONCEPT FORMATION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df.	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	40.03	2	20.02	3.53	.032
Regression	473.44	1	473.44	83.53	.001
Within Groups	827.15	146	5.67	-	

Raw Regression Coefficients

Covariate Within Groups

1 0.33

The results of the Covariance Analysis indicated there was a statistically significant difference at the .05 level among the three subject groups on the concept formation factor. Further differentiation would dictate the use of an additional statistical test.

TABLE XIV

NEWMAN - KUELS METHOD
CONCEPT FORMATION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	10.80	12.04	602.00
2. Familial Defective	50	10.48	11.35	567.50
3. Pseudo-Defective	50	12.52	10.41	520.50
<hr/>				
TRUNCATED RANGE	r	2	3	
q _{.95} (r, 146)		2.79	3.34	
q _{.95} (r, 146) \sqrt{n} MS _{error}		46.98	56.25	
q _{.99} (r, 146)		3.68	4.18	
q _{.99} (r, 146) \sqrt{n} MS _{error}		61.97	70.39	
<hr/>				
	PSEUDO	FAMILIAL	ORGANIC DEFECTIVE	
Pseudo	-	47.00*	81.50**	
Familial		-	34.50	
Organic Defective			-	

* significant at the .05 level

** significant at the .01 level

According to the results of the Newman-Kuels test, the organic mental defective was found to score significantly higher than the pseudo-mental defective on the concept formation factor. This difference was statistically significant at a .01 level. Furthermore, the familial mental defective was found to score significantly higher (at a .05 level) than the pseudo-mental defective on this factor. There was no significant difference found between the organic and familial mental defectives as measured by this variable.

The organic mental defective had a corrected mean score of twelve points on the concept formation factor, thus suggesting a mean scaled score of six points on each of the two subtests in this factor. The familial mental defective had a corrected mean of eleven and one third, yielding a mean scaled score of approximately five and two thirds points on the two subtests. The pseudo-mental defective had a corrected mean of ten points, yielding a mean scaled score of five on each of the subtests comprising the concept formation factor.

The scores for the organic and familial mental defectives were found to be statistically higher than the score for the pseudo-mental defective, while there was no significant difference found between the organic and familial mental defectives on this factor. These differences point to a weakness in the concept formation ability of the pseudo-mental defective. This weakness was probably related to the pseudo-mental defective's general weakness on most test items requiring verbal language skills.

Although there was a statistical difference among the three groups of subjects on this factor, the actual difference in terms of scaled score units was too small to suggest its use in clinical practice as a diagnostic tool.

Concentration. Table XV presents the One Way - Covariance Analysis comparing the three sample groups on the variable measuring concentration (Arithmetic, Digit Span and Coding subtests). Table XVI presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the concentration factor.

TABLE XV
COVARIANCE ANALYSIS - ONE WAY
CONCENTRATION FACTOR
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	86.38	2	43.19	4.04	.020
Regression	923.64	1	923.64	86.36	.001
Within Groups	1,561.58	146	10.70	-	-
Raw Regression Coefficients					
Covariate	Within Groups				
1	0.46				

The results of the Covariance Analysis indicated there was a statistically significant difference at the .05 level among the three subject groups on the concentration factor. Further differentiation would dictate the use of an additional statistical test.

TABLE XVI
 NEWMAN - KUELS METHOD
 CONCENTRATION FACTOR
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	UNCORRECTED MEAN SCORE	CORRECTED MEAN	TOTAL
1. Organic Defective	50	12.86	14.59	729.50
2. Familial Defective	50	15.24	16.45	822.50
3. Pseudo-Defective	50	18.72	15.78	789.00
<hr/>				
TRUNCATED RANGE	r	2	3	
q _{.95} (r, 146)		2.79	3.34	
q _{.95} (r, 146) $\sqrt{n} MS_{error}$		64.53	77.25	
q _{.99} (r, 146)		3.68	4.18	
q _{.99} (r, 146) $\sqrt{n} MS_{error}$		85.06	96.68	
<hr/>				
	ORGANIC	PSEUDO	FAMILIAL DEFECTIVE	
Organic	-	59.50	93.00*	
Pseudo		-	33.50	
Familial Defective			-	

* significant at .05 level

According to the results of the Newman-Kuels test, the familial mental defective scored significantly higher than the organic mental defective on the concentration factor. This difference was found to be statistically significant at the .05 level. There were no significant differences found between the familial mental defective and the pseudo-mental defective and between the pseudo-mental defective and the organic mental defective on this factor.

The familial mental defective had a corrected mean score of approximately sixteen and one half on this factor, suggesting a mean scaled score of about five and one half on each of the three subtests in the concentration factor. The pseudo-mental defective had a corrected mean of fifteen and three fourths on this factor, suggesting a mean scaled score of five and one fourth for each of the three subtests. The organic mental defective had a corrected mean score of fourteen and one half, yielding a mean of almost five for the three subtests in this factor.

Although the difference between the familial mental defective and the organic mental defective was considered to be statistically significant, the actual difference in scaled score units between any of the three groups was too small to be considered for diagnostic use.

V.I.Q. - P.I.Q. Table XVII presents the One Way - Analysis of Variance comparing the three sample groups on the variable representing the difference between the Verbal I.Q. and the Performance I.Q. for each subject. Table XVIII presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the V.I.Q. - P.I.Q. variable.

TABLE XVII

ANALYSIS OF VARIANCE - ONE WAY
 VERBAL I.Q. - PERFORMANCE I.Q.
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	12,482.98	2	6,241.49	101.76	.001
Within Groups	9,016.36	147	61.34	-	-
Total	21,499.34	149	-	-	-

The results of the Analysis of Variance indicated there was a statistically significant difference at the .001 level among the three subject groups on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q. of each subject. Further differentiation would dictate the use of an additional statistical test.

TABLE XVIII

NEWMAN - KUELS METHOD
 VERBAL I.Q. - PERFORMANCE I.Q.
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	MEAN SCORE	TOTAL SCORE
1. Organic Defective	50	+ 11.30	+ 565.00
2. Familial Defective	50	- 1.32	- 66.00
3. Pseudo-Defective	50	- 10.98	- 549.00
<hr/>			
TRUNCATED RANGE	r	2	3
q.95 (r, 147)		2.79	3.34
q.95 (r, 147)	$\sqrt{n} \text{ MS}_{\text{error}}$	154.51	184.97
q.99 (r, 147)		3.68	4.18
q.99 (r, 147)	$\sqrt{n} \text{ MS}_{\text{error}}$	203.80	231.49
<hr/>			
	PSEUDO	FAMILIAL	ORGANIC DEFECTIVE
Pseudo	-	483.00**	1,114.00**
Familial		-	631.00**
Organic Defective			-

** significant at .01 level

According to the results of the Newman-Kuels test, the organic mental defective scored higher than either the familial mental defective or the pseudo-mental defective on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q. scores of the WISC. These differences were found to be statistically significant at a .01 level. Furthermore, the familial mental defective was found to score significantly (.01 level) higher than the pseudo-mental defective on this variable.

The organic mental defective was found to have a Verbal I.Q. score more than eleven points higher than the Performance I.Q., thus pointing out the weaknesses in perceptual-motor skills of this type of mentally retarded child. The pseudo-mental defective was found to have a Performance I.Q. which fell almost eleven points higher than the Verbal I.Q. score. This large group difference further suggested the weakness in language skills of the pseudo-mental defective. The familial mental defective was found to exhibit a very small difference (less than two points) between the Verbal I.Q. and the Performance I.Q. scores suggesting a dull, but rather even level of abilities.

Intratest Variability. Table XIX presents the One Way - Analysis of Variance comparing the three sample groups on the factor representing the intratest variability for each subject. Table XX presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the intratest variability factor.

TABLE XIX
ANALYSIS OF VARIANCE - ONE WAY
INTRATEST VARIABILITY
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	78.86	2	39.43	8.68	.001
Within Groups	668.01	147	4.54	-	-
Total	746.87	149	-	-	-

The results of the Analysis of Variance indicated there was a statistically significant difference at the .001 level among the three subject groups on the intratest variability factor. Further differentiation would dictate the use of an additional statistical test.

TABLE XX
 NEWMAN - KUELS METHOD
 INTRATEST VARIABILITY
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	MEAN SCORE	TOTAL SCORE
1. Organic Defective	50	3.65	182.50
2. Familial Defective	50	2.81	140.50
3. Pseudo-Defective	50	4.58	229.00
<hr/>			
TRUNCATED RANGE	r	2	3
q _{.95} (r, 147)		2.79	3.34
q _{.95} (r, 147) \sqrt{n} MS _{error}		42.05	50.33
q _{.99} (r, 147)		3.68	4.18
q _{.99} (r, 147) \sqrt{n} MS _{error}		55.46	62.99
<hr/>			
	FAMILIAL	ORGANIC	PSEUDO DEFECTIVE
Familial	-	42.00	88.50**
Organic		-	46.50*
Pseudo Defective			-

* significant at .05 level

** significant at .01 level

According to the results of the Newman-Kuels test, the pseudo-mental defective was found to score significantly higher than the familial mental defective (.01 level) and the organic mental defective (.05 level) on the factor which measured intratest variability. There was no significant difference found between the organic and familial mental defectives on this factor, although the scores were close to being statistically different at a .05 level of significance.

The implications of these results were that the pseudo-mental defective exhibited much variability in his subtest scaled scores, having both very high and very low scores, while the familial mental defective exhibited a flat profile of scores with relatively little scatter. The organic mental defective exhibited a moderate amount of subtest variability as would be expected with his weaknesses in the visual-motor area. However, the amount of variability was significantly less than exhibited by the pseudo-mental defective.

Thus, the amount of variability among the subtest scaled scores appeared to be an effective factor for differentiating among the three subject groups, especially between the pseudo-mental defective and the familial mental defective.

Intertest Variability. Table XXI presents the One Way - Analysis of Variance comparing the three sample groups on the factor representing the intertest variability for each subject. Table XXII presents the information derived from the use of the Newman - Kuels Method for making separate comparisons between each pair of subject groups on the intertest variability factor.

TABLE XXI
ANALYSIS OF VARIANCE - ONE WAY
INTERTEST VARIABILITY
WECHSLER INTELLIGENCE SCALE FOR CHILDREN

SOURCE	SS	df	VARIANCE ESTIMATE	F	P LESS THAN
Between Groups	49.85	2	24.93	3.83	.05
Within Groups	956.02	147	6.50	-	-
Total	1,005.87	149	-	-	-

The results of the Analysis of Variance indicated there was a statistically significant difference at the .05 level among the three subject groups on the intertest variability factor. Further differentiation would dictate the use of an additional statistical test.

TABLE XXII
 NEWMAN - KUELS METHOD
 INTERTEST VARIABILITY
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

	N	MEAN SCORE	TOTAL SCORE
1. Organic Defective	50	8.00	400.00
2. Familial Defective	50	7.14	357.00
3. Pseudo-Defective	50	6.60	330.00

TRUNCATED RANGE	r	2	3
q _{.95} (r, 147)		2.79	3.34
q _{.95} (r, 147)	$\sqrt{n \text{ MS}_{\text{error}}}$	50.30	60.22
q _{.99} (r, 147)		3.68	4.18
q _{.99} (r, 147)	$\sqrt{n \text{ MS}_{\text{error}}}$	66.35	75.37

	PSEUDO	FAMILIAL	ORGANIC DEFECTIVE
Pseudo	-	27.00	70.00*
Familial		-	43.00
Organic Defective			-

* significant at .05 level

According to the results of the Newman-Kuels test, the organic mental defective was found to score significantly higher than the pseudo-mental defective on the factor measuring interest variability. This difference was found to be statistically significant at a .05 level. There were no significant differences found between the organic mental defective and the familial mental defective and between the familial mental defective and the pseudo-mental defective as measured by this factor.

The results of this factor appeared to show relatively little difference among the three groups of subjects. It appeared that this factor has very little value as a diagnostic indicator to differentiate among the three groups of subjects.

Summary of hypotheses tested. Table XXIII presents a summary of the nine tables of Newman - Kuels results which yielded information related to the nine hypotheses investigated in this study. Each factor or variable related to a specific hypothesis is listed. The adjusted mean scores for the first six variables and the actual mean scores for the other three variables are listed for the Organic Mental Defective, the Familial Mental Defective and the Pseudo-Mental Defective. The table is arranged comparing the Organic Mental Defective with the Familial Mental Defective first. The Organic Mental Defective is then compared with the Pseudo-Mental Defective and, finally, the Familial Mental Defective is compared with the Pseudo-Mental Defective. In each of the above comparisons, a significant difference between any two groups of subjects is noted in the table with an asterisk following the second numeral for the pair. The interpretation of this table is contained in the last section of this chapter.

TABLE XXIII

ADJUSTED MEAN SCORES
 NEWMAN - KUELS METHOD, SUMMARY
 WECHSLER INTELLIGENCE SCALE FOR CHILDREN

FACTOR	ORGANIC	FAMILIAL	ORGANIC	PSEUDO	FAMILIAL	PSEUDO
Verbal Comprehension	25.17	19.77**	25.17	17.02**	19.77	17.02**
Visual-Motor Organization	12.80	17.50**	12.80	20.42**	17.50	20.42**
Alertness	11.97	10.82**	11.97	10.53**	10.82	10.53
Comprehension of Social Situations	11.02	9.80*	11.02	10.10*	9.80	10.10
Concept Formation	12.04	11.35	12.04	10.41**	11.35	10.41*
Concentration	14.59	16.45*	14.59	15.78	16.45	15.78
V.I.Q.-P.I.Q.	+11.30	-1.32**	+11.30	-10.98**	-1.32	-10.98**
Intratest Variability	3.65	2.81	3.65	4.58*	2.81	4.58**
Intertest Variability	8.00	7.14	8.00	6.60*	7.14	6.60

* difference is significant at .05 level

** difference is significant at .01 level

II. SUMMARY OF INTERPRETATION OF THE DATA

The design of this study was such that the three groups of subjects, all randomly selected, would not differ significantly in terms of intelligence quotient. However, the results of the One-Way Analysis of Variance of the Full Scale I.Q. indicated that the three groups did, in fact, differ significantly at the .001 level in terms of intelligence. A further analysis, the Newman - Kuels Method, suggested that this difference could be attributed to the fact that the I.Q. of the Pseudo-Mental Defective group was statistically greater than the other two groups at the one per cent level of significance. These results dictated the use of the Covariance Analysis using the Full Scale I.Q. as the covariate to statistically equate the I.Q. of the three groups of subjects. The results of each of the six Covariance Analysis yielded a F score for the Regression factor which was significant at the .001 level. These results further substantiated the use of the Covariance Analysis as the proper statistical test for use in this study.

The ability of the nine factors of the Wechsler Intelligence Scale for Children to differentiate among the Organic Mental Defective, the Familial Mental Defective, and the Pseudo-Mental Defective was evidenced by the consistency of the F value in both the Covariance Analyses and the Analyses of Variance. The F value was found to be significant at the five per cent level in all cases.

The verbal comprehension variable, the visual-motor organization factor and the variable representing the difference between the Verbal I.Q. and the Performance I.Q. proved to differentiate between the three groups better than any of the other factors. All three variables differentiated

between each pair of subject groups at the one per cent level of significance. On the verbal comprehension factor, the organic mental defective proved to score significantly higher than either the familial mental defective or the pseudo-mental defective. Furthermore, the familial mental defective proved to score significantly higher than the pseudo-mental defectives on this variable. The visual-motor organization factor yielded results which indicated that the pseudo-mental defective was statistically superior to the other two groups and that the familial mental defective was significantly superior to the organic mental defective. The variable representing the difference between the Verbal I.Q. and the Performance I.Q. of the WISC indicated that the organic mental defective was significantly higher than the other two groups and that the familial mental defective was statistically higher than the pseudo-mental defective.

The alertness cluster and the variable measuring comprehension of social situations proved to differentiate between the organic and familial mental defectives and between the organic mental defective and the pseudo-mental defective, but not between the familial mental defective and the pseudo-mental defective. The alertness cluster indicated that the organic mental defective was superior on this variable to both the familial mental defective and the pseudo-mental defective with a statistical difference significant at the one per cent level. The factor measuring comprehension of social situations yielded results which indicated that the organic mental defective was statistically superior, at the .05 level, to the other two groups. There was no significant difference found between the familial mental defective and the pseudo-mental defective on either variable.

The concept formation factor and the variable measuring intratest variability yielded results which differentiated between the pseudo-mental defective and the other two groups, but failed to differentiate between the organic

and familial mental defectives. The concept formation factor yielded results which indicated that the organic mental defective was significantly higher on this variable than the pseudo-mental defective with a statistical difference significant at the one per cent level, while the familial mental defective was statistically higher than the pseudo-mental defective with a difference significant at the .05 level. There was no significant difference on this factor between the organic and familial mental defectives. The variable measuring intratest variability yielded results which indicated that the pseudo-mental defectives had significantly more intratest variability than the familial mental defective at the one per cent level of statistical significance and more intratest variability than the organic mental defective with a statistical difference significant at the .05 level. There was no significant difference on this factor between the organic and familial mental defectives.

The concentration factor results indicated that only the familial and the organic mental defectives differed significantly on this variable. The familial mental defective was superior to the organic mental defective with a difference significant at the five per cent level on this factor. There were no significant differences found between the organic mental defective and the pseudo-mental defective and between the familial mental defective and the pseudo-mental defective.

The last variable, which measured intertest variability resulted in no significant differences between the organic and familial mental defectives and between the familial mental defective and the pseudo-mental defective. The results also indicated that the organic mental defective showed significantly more intertest variability than the pseudo-mental defective with a statistical difference significant at the five per cent level.

In summary, the organic mental defective was found to have a pattern showing high scores on the verbal comprehension, alertness and comprehension of

social situations factors and on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q. of the WISC. The organic mental defective also showed very low scores on the visual-motor organization and concentration factors.

The familial mental defective was also found to exhibit a very definite pattern of scores. The familial mental defective yielded low scores on the verbal comprehension, alertness and comprehension of social situations factors and on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q. of the WISC. The familial mental defective also showed high scores on the visual-motor organization and concentration factors.

The pseudo-mental defective exhibited a pattern very similar to that of the familial mental defective, except that the pattern had more extreme deviations. The pseudo-mental defective was very low on the verbal comprehension factor, more so than the familial mental defective. In fact, all variables requiring language skills were greatly depressed including the concept formation factor which involved only one verbal section out of the two subtests. Furthermore, the variable representing the difference between the Verbal I.Q. and the Performance I.Q. was very depressed, with the Performance I.Q. being eleven points higher than the Verbal I.Q. compared to a one point difference for the familial mental defective. Although the alertness and comprehension of social situations factors were low, they differed only from the organic mental defective and not the familial mental defective. The pseudo-mental defective also showed extremely high scores on the visual motor organization factor, with a group mean approaching the low average range. Finally, the pseudo-mental defective yielded a high degree of intratest variability, being significantly higher than both the organic and familial mental defectives.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

I. SUMMARY

It was the purpose of this study to identify those measured skills contained within the Wechsler Intelligence Scale for Children which would differentiate among the organic mental defective, the familial mental defective and those children misidentified as retarded because of language and cultural differences.

A survey of previous studies showed a wealth of information comparing the organic mental defective with the familial mental defective. The general conclusions of these studies indicated that the organic mental defective was found superior to the familial mental defective on tasks requiring abstract thinking and verbal language skills. The organic mental defective was also found to exhibit more intratest scatter and perseveration than the familial mental defective. Furthermore, the organic mental defective was found to come from higher socioeconomic level homes than the familial mental defective, although the organic mental defective was also found to be less socially competent. The familial mental defective was found to be superior to the organic mental defective on tasks requiring visual perception, visual-motor ability and memory. He was also found to be superior to the organic mental defective on tests of perceptual motion, tactile discrimination and concept formation. The familial mental defective also appeared to exhibit more acceptable behavior and social competencies than the organic mental defective.

A survey of the literature indicated that no previous studies have dealt with the problem of children misdiagnosed as mentally retarded due to language and cultural differences. Therefore, literature dealing with test characteristics of the culturally different child was reviewed. Several studies have compared Mexican-American with Anglo-American children. The general conclusions of these studies have shown the Chicano child to score significantly lower than his White counterpart on most tests involving language skills. Furthermore, the Chicano child has been found to improve very little when the verbal intelligence test has been translated into Spanish. When considering specific patterns of test scores, the Chicano child was found to be weak on all test factors requiring language skills while exhibiting typical performance patterns on non-verbal tasks. Thus, it appeared that the Chicano child was handicapped on language tests.

Several other studies were reviewed which attempted to assess the abilities of the Black child. The results of these investigations have shown the Black child to score significantly lower than his White counterpart on tests measuring intellectual ability. Also reported were the high correlations between the Black race and low socioeconomic status and between intelligence and socioeconomic status. The low I.Q. of the Black children, taken as a group, was directly attributed to the low socioeconomic status of the Blacks. When the variable of socioeconomic status was held constant, no significant difference in measured I.Q. was found between Black and White children (Mercer, 1971). The results of these studies imply that the low I.Q. score achieved by Black children as a group was simply reflecting their low socioeconomic level.

The present study employed a sample of 150 children equally divided into three groups. These groups consisted of fifty children diagnosed as mentally retarded due to neurological impairment, fifty children diagnosed as familial mental defectives, and fifty subjects who had been misidentified as mentally retarded at one time due to differences in culture and/or language.

Data were treated to determine mean scores for nine factors of the Wechsler Intelligence Scale for Children. The factors were identified as: (1) verbal comprehension, (2) visual-motor organization, (3) alertness, (4) comprehension of social situations, (5) concept formation, (6) concentration, (7) Verbal I.Q. minus Performance I.Q., (8) intratest variability, and (9) intertest variability.

The Covariance Analysis - One Way was used to compare the three groups on each of the first six measures. The Analysis of Variance - One Way was computed comparing the three groups on each of the last three variables. The Newman-Kuels method was then used to make further differentiations among the three groups on each of the nine factors of the WISC.

The results of this investigation found the organic mental defective obtained higher scores than the familial mental defective on the verbal comprehension, alertness and comprehension of social situations factors and on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q. of the WISC. The familial mental defective was found to score higher on the visual-motor organization and concentration factors.

When comparing the organic mental defective with the pseudo-mental defective, the organic mental defective was found to obtain higher scores on the verbal comprehension, alertness, comprehension of social situations

and concept formation factors and on the variables measuring intertest variability and the difference between the Verbal I.Q. and the Performance I.Q. The pseudo-mental defective was found to score higher on the visual-motor organization and intratest variability factors.

Lastly, the familial mental defective was found to score significantly higher than the pseudo-mental defective on the verbal comprehension and concept formation factors and on the variable measuring the difference between the Verbal I.Q. and the Performance I.Q., while the pseudo-mental defective scored higher on the visual-motor organization and intratest variability factors. The patterns of scores for the familial mental defective and the pseudo-mental defective were found to be very similar. However, the scores achieved by the pseudo-mental defective were more extreme in the amount of deviation from the mean score. The pseudo-mental defective was found to be very low on the verbal comprehension factor, more so than the familial mental defective. In fact, all variables requiring language skills were greatly depressed including the concept formation factor which involved only one verbal section out of the two subtests. Furthermore, the variables representing the difference between the Verbal I.Q. and the Performance I.Q. was very depressed, with the Performance I.Q. being eleven points higher than the Verbal I.Q. The familial mental defective had only a one point difference between the Verbal and the Performance I.Q. The pseudo-mental defective also showed extremely high scores on the visual-motor organization factor, with a mean score approaching the low average range. Furthermore, the pseudo-mental defective produced a high degree of intratest variability, indicating that his scores deviated more than the scores for subjects in the other groups.

In summary, the three groups of subjects each produced a unique pattern of test scores on the Wechsler Intelligence Scale for Children. The outstanding features of each pattern for each group are given below.

The organic mental defective was characterized by the following major points:

1. The organic mental defective was found to have a high score on the verbal comprehension factor. The mean score for this factor was 25.17 which would yield an average of 6.3 on each of the four subtests in this factor.

2. The organic mental defective was found to score very low on the visual-motor organization factor. The mean score for this factor was 12.89 which would yield a mean of 4.3 on each of the three subtests in this factor.

3. The above difference between verbal language and visual-perceptual abilities was also noted in the difference between the Verbal I.Q. and the Performance I.Q. for this subject. The organic mental defective had a Verbal I.Q. which exceeded the Performance I.Q. by 11.30 points.

4. A minor characteristic of the organic mental defective was his somewhat weak score on the concentration factor. The mean score for this factor was 14.59, which would suggest a mean of 4.9 on each of the three subtests comprising this factor.

The familial mental defective was characterized by the following major points:

1. The familial mental defective had a consistent, but dull pattern of scores. The difference between the Verbal and the Performance I.Q. scores was only 1.32. Also, the intratest variability score for the familial mental defective was only 2.81. This variance score would yield a standard deviation of only 1.68 for this subject.

2. The consistently low scores of the familial mental defective were also apparent from the scores on each of the six factors of the WISC investigated in this study. The mean scaled score for each of the four verbal comprehension subtests was 4.9, the lowest average scaled score for the familial mental defective. However, the highest mean scaled score was only 5.8, which was achieved on the visual-motor organization factor. The mean scaled scores for the other four factors fell between these two extremes. Thus, the familial mental defective was found to be consistently dull on all factors investigated in this study.

The pseudo-mental defective was characterized by the following major points:

1. The pseudo-mental defective was found to have a very low score on the verbal comprehension factor. The mean score on this factor was 17.02 which would yield an average of only 4.3 for each of the four subtests in this factor.

2. The pseudo-mental defective was found to score very high on the visual-motor organization factor. The mean score for this factor was 20.42 which would yield a mean of 6.8 on each of the three subtests in this factor.

3. The above difference was also noted by the difference between the Verbal I.Q. and Performance I.Q. for the pseudo-mental defective. The Performance I.Q. exceeded the Verbal I.Q. by 10.98 points for this subject.

4. Furthermore, the pseudo-mental defective was seen as having a great deal of variability among the subtest scaled scores. This was noted by the high score (4.58) achieved on the factor measuring intratest variability and by the large difference between the Verbal I.Q. and Performance I.Q. scores.

II. CONCLUSIONS

On the basis of the findings of this study, it would appear that the Wechsler Intelligence Scale for Children can be used as an effective diagnostic tool for differentiating between the organic mental defective, the familial mental defective and the pseudo-mental defective. However, the exclusive use of the WISC for making such differentiations should not be considered as an adequate substitute for a complete diagnostic battery of tests since the WISC contains test items which sample only limited amounts of behavior, while an effective diagnosis should utilize as much available information as possible. The method described in this study is intended as a diagnostic tool to be utilized as a part of a larger battery of diagnostic techniques. Such diagnostic tests as the Bender Visual Motor Gestalt Test (a test of perceptual-motor abilities), the Illinois Test of Psycho-linguistic Abilities (a test of both language and non-language skills), the Draw-a-Man Test or Draw-a-Person Test (a nonlanguage

test of ability), the Progressive Matrices Test (a nonverbal test of intelligence) plus a case study and observations could be included with the WISC to comprise a battery of tests capable of differentiating between the organic mental defective, the familial mental defective and the pseudo-mental defective. This battery contains sufficient test items to elicit an adequate amount of information on which to base a diagnosis.

Beside the conclusion that the WISC was capable of differentiating between the three groups of subjects, certain conclusions about each of the three subject groups were made. For example, from the results of this study, it was concluded that the organic mental defective differed significantly from both the familial mental defective and the pseudo-mental defective, while considerably fewer differences were found between the familial mental defective and the pseudo-mental defective. It appeared that the organic mental defective was most easily separated from the other two types of children in this study, especially in the areas of language and visual-motor abilities. The data supported the conclusion that the organic mental defective was strong in the areas of verbal language ability while being very weak in the nonverbal, perceptual-motor areas. The organic mental defective scored significantly higher than the familial mental defective and the pseudo-mental defective on the verbal comprehension factor. This factor was basically a verbal language oriented factor. Furthermore, the other two groups scored significantly higher than the organic mental defective on the visual-motor organization factor.

However, the familial mental defective and the pseudo-mental defective showed many of the same test characteristics and differed primarily in degree. The differentiating characteristics between the familial mental

defective and the pseudo-mental defective appeared to be as follows:

(1) the pseudo-mental defective scored near the average range on tasks primarily nonlanguage in nature, (2) the pseudo-mental defective scored extremely low on tasks requiring language skills, (3) the pseudo-mental defective showed a great deal of difference between his verbal and non-verbal abilities, and (4) the familial mental defective did not exhibit the wide differences between verbal and nonverbal abilities as did the pseudo-mental defective and could be characterized as lacking scatter among subtest scores and exhibiting a tendency toward consistent dullness.

Therefore, it appears that the major differentiating point between the familial mental defective and the pseudo-mental defective is the amount of scatter among the subtest scaled scores. The pseudo-mental defective had a large amount of subtest scatter, while the familial mental defective had a relatively flat profile of scores. Furthermore, the pseudo-mental defective exhibited a large difference between the Verbal and Performance I.Q. scores of the WISC, while the familial mental defective exhibited almost no difference between these two scores. The pseudo-mental defective also scored very high, near the average range, on perceptual-motor test items, while scoring very low on test items requiring verbal language skills. The familial mental defective scored low on both types of items and did not exhibit an extreme difference in abilities similar to the pseudo-mental defective.

In conclusion, it may be stated that the WISC was an effective diagnostic instrument in separating the organic mental defective, the familial mental defective and the pseudo-mental defective. The strength of this procedure appears to lie in the evaluation of language abilities (the

verbal comprehension factor) and perceptual-motor skills (the visual-motor organization factor). The procedures outlined in this research appear to be most able to differentiate the organic mental defective from both the familial mental defective and the pseudo-mental defective. The major reason for this result was that the organic mental defective differed significantly from the other two groups in the two major areas which the WISC was most capable of evaluating and which yielded the most difference between groups.

However, the WISC was not as able to differentiate between the familial mental defective and the pseudo-mental defective partly because these two groups exhibited similar profiles of scores. Both were weak on verbal language subtests and both groups achieved relatively high scores on the perceptual-motor tasks. However, the pseudo-mental defective was more extreme in his scores, while the familial mental defective achieved a much flatter profile. The pseudo-mental defective scored significantly lower than the familial mental defective on the verbal comprehension factor. He also scored significantly higher on the visual-motor organization factor. Therefore, it is possible to make a differentiation between the familial mental defective and the pseudo-mental defective based on information from the WISC, but this differentiation must be made with caution for the reasons previously stated.

III. RECOMMENDATIONS

From the conclusions set forth in this study, it can be stated that the Wechsler Intelligence Scale for Children is an effective diagnostic tool which can differentiate between organic and familial mental defectives. However, it is strongly recommended that the procedures set forth in this study be incorporated within a battery of diagnostic tests and not be used as an exclusive determining factor for diagnosis. It must be remembered that an effective diagnosis requires a great deal of information and, while the diagnostic procedures set forth in this study are felt to be effective, they are based upon a limited amount of information.

More important, it is recommended that the Wechsler Intelligence Scale for Children can be used as an instrument to help separate the familial mental defective from the pseudo-mental defective. However, extreme caution should be taken in making such a differentiation since this study has shown the familial mental defective and the pseudo-mental defective exhibit many similar behaviors. Therefore, this differentiation must be based heavily on the amounts of variability among the subtest scores. Furthermore, in addition to the WISC, other information should be utilized in making such a differentiation. It must be recognized that the I.Q. score derived from the WISC can not stand as an accurate estimate of intellectual ability for the pseudo-mental defective. However, when used as a diagnostic instrument, the WISC can yield information on its non-language factors indicating intelligence different from the measured I.Q. With such information, the tester should not misidentify a child as mentally retarded regardless of his measured Full Scale I.Q.

From the results of this study, it is also recommended that the educator of the mentally retarded should give serious consideration to the establishment of separate management and instructional programs for the organic and familial mental defectives. This recommendation does not require separate classrooms for the organic and familial mental defectives, although such facilities appear advantageous to the management and instruction of the organic mental defective. It appears to be possible for a teacher to operate two different types of educational programs within the same classroom setting. However, this would require the teacher to make available a modified environment with special materials and teaching techniques for the organic mental defective while offering a highly stimulating learning situation for the familial mental defective. Since it has been estimated that 80 to 85% of all retarded children are of a familial type (Benda, Squires, Ogonik & Wise, 1963) it would appear that the average teacher of the retarded would need to make special adjustments in her classroom for only two or three children diagnosed as organic mental defectives.

One of the conclusions of this study stated that children misidentified as mentally retarded usually score extremely low on tasks which require language facilities. Since these children will be excluded from special education programs for the retarded, it is apparent they will require remedial or special training in language development in order to remain in the regular classroom. Therefore, it is recommended that a special supplementary, language oriented program be established as an alternative to special education placement for the culturally different child.

Since the results of this research study indicated high similarities between the familial mental defective and the pseudo-mental defectives, it is highly probable that these two groups overlapped in their membership. Therefore, it is recommended that the fifty subjects contained in the familial mental defective group be evaluated to determine whether they were accurately diagnosed or should have been placed in the pseudo-mental defective classification.

Furthermore, since the pseudo-mental defective subjects in this study have all been removed from special classes for the mentally retarded, it would be important to discover how well they have adjusted to a new educational environment. Therefore, it is recommended that a follow-up study be undertaken in which the educational progress of the fifty pseudo-mental defective subjects in this study be investigated in an attempt to discover the changes which have resulted following removal from F.M.R. classes.

It is also recommended that further research be conducted in the area of assessing the intellectual ability of the culturally different child in an attempt to measure more accurately their learning potential and to prepare better instructional programs based on research findings.

From the results of this study, it was apparent that the WISC was not as effective as one would hope in its ability to differentiate between the familial mental defective and the pseudo-mental defective. Therefore, it is recommended that further research be conducted with other test instruments in an attempt to develop a more effective method of differentiating between the familial mental defective and the pseudo-mental defective. The Bender Visual-Motor Gestalt Test, the Illinois Test of Psycho-

linguistic Abilities and the Draw-a-Man or Draw-a-Person tests are some of the test instruments which could contribute additional information which would help differentiate these two groups of children.

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