COGNITIVE FUNCTIONING ON THE RORSCHACH AS A DIAGNOSTIC TOOL

by

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Abstract

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The purpose of this study was to be an exploratory investigation of the effects of diagnosis, ethnicity, sex, and age on developmental levels of functioning as measured by the Friedman Developmental Level Scoring System for the Rorschach Ink Blot Test. The protocols of 321 children between the ages of five and eight were scored using this system. All responses were scored for their genetic level based on the perceptual organization of the blot. Individual response scores were analyzed separately and in combination in order to determine developmental differences between minimally brain dysfunctioned (MBD) and emotionally disturbed (OTHER) children, Blacks and Whites, males and females, and ages five, six, seven, and eight.

Analyses of Variance were run in order to include interaction effects. The majority of the significant results were interaction effects. The significant differences fall into four categories. Sex differences

were minimal and occurred in only two places. The developmental levels of the diagnostic groups were significantly different with the MBD Ss performing more immaturely on an overall DL score. On the individual scores the MBD subjects performed at a developmentally lower level than the emotionally disturbed subjects with few exceptions.

There were significant developmental differences between the ethnic groups. White Ss performed at a higher developmental level on the overall DL score and some of the individual scores; Black Ss performed at a higher developmental level on other scores. More than one interpretation of the data was possible and is discussed. While there were some general age differences, interaction effects were predominant. The White and Black subjects had significantly different developmental patterns. White subjects tended to produce higher level responses with age in a linear manner while Black subjects appeared to peak at age seven. Seven year old Black subjects appeared to function at a higher developmental level than all other groups.

These differences in developmental stages are of particular importance to the clinician. Age appropriate behavior can be misinterpreted when incorrect assumptions about developmental stages are present. While there were

insufficient data to establish this system as an effective diagnostic instrument, it seems evident that this could be accomplished with further research.

DEDICATION

This dissertation is dedicated to my family (including those members where the bonds are created by love alone) and especially to my parents for all the reasons they already know.

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I would like especially to thank Dr. David Ricks whose advising has magnificently survived all the difficulties created by the problems of a student in another state; Dr. Alvin Gerstein who helped in the development of the research issues and who trained me in the scoring technique; Dr. Harold Wilensky whose comments helped to clarify early research questions; Dr. Ethel Weiss who served as the reader for my dissertation under most confusing circumstances; and Dr. Alfred Glixman whose statistical advice was invaluable.

I would also like to publicly thank my husband, Jaime Taaffe, who did constant and valiant battle with many computers in order to get my data into manageable form. These thanks must also include the computer technicians and statistical analysts at both the City University of New York and Temple University (particularly Anka Wagner at Temple) who were helpful to us at various times.

And finally I wish to acknowledge the consideration and helpfulness of the Irving Schwartz Institute for Children and Youth and my own clinic, Life Guidance Services, Inc., whose support has been endless.

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CHAPTER I

INTRODUCTION

The clinician's need for diagnostic tools is immediate and constant. With the increasing public desire for mental health services and the decreasing budget for mental health personnel, lengthy diagnostic procedures are becoming impracticable. Increasingly the clinician must make diagnostic and treatment plan decisions quickly. This thesis provides information about one potential tool, the Developmental Level Scoring System devised by Friedman for use with the Rorschach Ink Blot Test. To date, this system has been used primarily with adults where it effectively distinguishes between diagnostic categories; however, there was no similar information pertaining to children. In the following chapters, I propose to provide such information.

The thesis deals only with clinic populations and the efficacy of this technique in differentiating between various subgroups. The reasons for the decision were twofold. Primarily, it was because the clinician is concerned with an in-clinic population and is looking for tools to help make therapeutic decisions. The inclusion

of a "normal" group would also add prohibitive experimental difficulties as all non-clinic subjects would have to be screened for Minimal Brain Dysfunction as well as for emotional disturbance. This is particularly true since the current assumption is that 5 percent of all school children have some form of this syndrome.

The two diagnostic categories which are compared in this thesis are Minimal Brain Dysfunction, MBD, and emotionally disturbed children, OTHER. MBD was chosen because it is a relatively new category which is still being diagnostically defined. There has been overgeneralization and confusion and this thesis attempts to provide some specific information about the functioning of individuals assigned to this category. It is of particular importance to the clinician to be able to distinguish between these two groups because the behavior of the MBD child is difficult to differentiate from the behavior of other disturbed children. This similarity masks basic differences which require radically different forms of therapy. Treatment appropriate for one group may be not only ineffective but destructive for the other group. For instance an MBD child needing help in learning how to create structure would not profit from an unstructured fantasy oriented therapy. Similarly, the child who needs to work out emotional issues in fantasy oriented play therapy might become increasingly disturbed with an

emphasis on concrete, success oriented tasks.

While the diagnosis of OTHER combines several categories of emotional disturbance, these are frequently not clearly delineated for children, who are often diagnosed less stringently than adults. It seemed most useful to distinguish the child who is impaired emotionally from the child who is impaired organically. Therefore, the OTHER category includes children who were diagnosed as neurotic, character disorders, adjustment reactions, etc., but excludes children who were diagnosed as psychotic. The role of organicity in psychosis remains unclear.

Prior studies have established differences between age groups; however, it was uncertain whether those differences would occur in clinic populations. The previous studies had also been limited, with one exception (Wilson, 1954), to White male children. This left unanswered the question of whether the acquired information was applicable to females and to other ethnic groups. The ethnic groups are included because the issue of their similarity is still unresolved.[1] In order to answer these questions, this thesis examines the Friedman DL system as it is

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[1]This comparison of ethnic groups is also important because there is some possibility that Black children may be incorrectly diagnosed as MBD because of language or style characteristics different from those of White examiners.

applied to four age groups, five through eight, two diagnostic categories, MBD and OTHER, both sexes, and two ethnic groups, Whites and Blacks.

CHAPTER II

HISTORY

Friedman's (1952) developmental level system is based on Heinz Werner's (1948) theory of cognitive development. This theory provides a conceptual framework within which various behavioral patterns can be characterized in terms of developmental levels of perceptual functioning. Werner states that development "proceeds from a state of relative globality and lack of differentiation to a state of increasing differentiation, articulation, and hierarchic integration."[1] Immature functioning is distinguished from mature functioning along the following continua: "(1) syncretic-discrete; (2) diffuse-articulated; (3) indefinite-definite; (4) rigid-flexible; (5) labile-stable."[2] Werner describes immature functioning as undifferentiated, diffuse, syncretic, labile, and rigid.

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[1]"The concept of development from a comparative and organismic point of view." In D. B. Harris, ed., The Concept of Development, p. 126, quoted in Marvin R. Goldfried, George Stricker, and Irving Weiner, Rorschach Handbook of Clinical and Research Applications (New Jersey: Prentice-Hall, 1971), p. 20.

[2]Heinz Werner, Comparative Psychology of Mental Development (New York: International Universities Press, Inc., 1948), p. 53.

The immature perceiver tends to view the world synaesthetically and to relate to the totality of situations. This way of perceiving leads to labile behavior as each modification of an element of the situation is seen as creating an entirely new situation demanding a new response. When this leads to perception of different situations as being the same, the individual's behavior may be described as rigid.

The mature individual is characterized by flexibility of functioning, the ability to perceive the elements from which the totality is created, and the skill to organize these elements from a position of "centrality." This ability to organize hierarchically implies a concurrent ability to differentiate clearly among the perceptual stimuli, responding to the parts as well as to the total construct. The ability to recognize similar or dissimilar elements of situations permits the mature individual greater flexibility of response.

Maturation is not considered to take place in a smoothly continuous manner, rather shifts occur "according to the principle of abrupt, discontinuous change."[1] At any developmental stage, an individual will function variously along each of the continua characterized by the

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[1]Laurence Hemmendinger, "Developmental Theory and the Rorschach Method" in M. A. Rickers-Ovsiankina, ed., Rorschach Psychology (New York: John Wiley, 1960), p. 59.

paired comparisons. Unless a limiting factor exists, however, there is a general and continuing shift with age in the direction of greater articulation and flexibility. Maturity is characterized by "a high degree of variability of functioning"[1] and the ability to put earlier levels of development to use appropriately.

Friedman's developmental level scores were designed to "reveal the nature and quality of the individual's integrative efforts at various genetic levels."[2] Analysis of the Rorschach was chosen because the test was developed so that "the interpretation of the chance forms falls in the field of perception and apperception."[3] Friedman felt that investigation of the area of perceptual functioning would be most "fruitful . . . because perceptual tests can be analyzed with greater precision and because they provide more readily quantifiable data."[4] The scores which deal with the

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[1]Ibid.

[2]Edward Siegel, "Genetic Parallels of Perceptual Structuralization in Paranoid Schizophrenia," Journal of Projective Techniques 17 (June 1953): 152.

[3]Hermann Rorschach, Psychodiagnostics: A Diagnostic Test Based on Perception, trans. and ed. Paul Lemkau and Bernard Kronberg (New York: Grune and Stratton, Inc., 1964), p. 16.

[4]Howard Friedman, "Perceptual Regression in Schizophrenia: An Hypothesis Suggested by the Use of the Rorschach Test," Journal of Genetic Psychology 81 (1952): 63.

formal perceptual aspects of a response are listed briefly here with the inclusion of the Rare Detail responses added by Hemmindinger and used by Siegel and Pẽna. (For a more detailed description of the scores see Appendix A. The reader may wish to detach Appendix A and keep it with him for reference while reading the Results and Discussion chapters.)

> W++ A response in which a unitary blot is perceptually articulated and then reintegrated into a well-differentiated unifying whole, the specific form of which matches the blot.
>
> W+ A response in which all the discrete portions of a broken blot are combined into a unifying whole, the specific form of which matches the blot.
>
> Wm A mediocre response in which the gross outline and articulation of an unbroken blot are taken into account so that the specific form implied matches the blot.
>
> W- A response in which the content produced requires a definite specific form, which, however is not provided by the blot.
>
> Wa An amorphous response in which the shape of the blot plays no determinable role.
>
> Wv A vague response in which there is a diffuse general impression of the blot.
>
> DW Rorschach's confabulatory response in which "a single detail, more or less clearly perceived, is used as the basis for the interpretation of the whole picture. . . "
>
> FaC (FabC) A Fabulized Combination in which two or more acceptably interpreted areas are combined, on the basis of spatial relationship, into one absurd percept.
>
> CoR (ConR) A Contaminated Response in which two interpretations to the same area are fused into one.[1]

The Usual Detail responses, D++, D+, Dm, D-, Da, Dv, DdD,

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[1]Howard Friedman, "Perceptual Regression in Schizophrenia: An Hypothesis Suggested by the Use of the Rorschach Test," Journal of Projective Techniques 17 (June 1953): 173-174.

are similarly defined.

> Dd: The ordinary Rare Detail response.
> (Dd): These are non-scorable Rare Details, heretofore considered only as card description.
> dDd: Descriptive Rare Details are scorable.
> pDd: Physiognomic Rare Details are also scorable.[1]

While the majority of the scores were developed by Friedman for his investigation of regression in schizophrenia, three other investigators utilized and added to the scoring system within the first year after his study. These four studies provide the nucleus of data about the scoring system to which later examiners continuously refer. All four investigators used similar data gathering techniques so their results would be comparable. These studies will be briefly discussed in the following pages so as to provide some background for the present research.

Friedman (1952) hypothesized that "schizophrenic patients, in the structural aspects of their perception, function at a genetically lower level, similar to, but not identical with, that of young children."[2] He assumed that the differences would be due to vestiges of higher level functioning which would be present in the

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[1]Larry Hemmendinger, "Perceptual Organization and Development as Reflected in the Structure of Rorschach Test Responses," Journal of Projective Techiques 17 (June 1953): 163.

[2]Friedman, Journal of Genetic Psychology, p. 63.

schizophrenics but not in the children. According to developmental theory, regression is an accentuation of genetically lower levels of perceptual functioning. His procedure consisted of the analysis of Rorschach Test protocols of thirty normal children ages three to five with no indication of emotional or physical illness, and thirty patients diagnosed as hebephrenic, catatonic, or hebephrenic/catatonic schizophrenics with no other neuropsychiatric or major medical conditions. All subjects were American-born White males with no significant differences in IQ or age for the adults. The reliability of the criteria for the scoring system was checked through the use of three additional scorers and the percentage of agreement ranged from 89.7 percent to 95.5 percent. The results were analyzed by means of the Chi-square test with the "cutting point" being defined as the median point of the combined distributions of the two groups being compared. Friedman's study supported his theory of regression as schizophrenics were shown to be similar to children and different from adults in their perceptual functioning which was "predominantly of a global, diffuse, syncretic, rigid, and labile nature"[1] while some remnants of higher genetic functioning were apparent in the perceptual discreteness and plasticity evidenced by the

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[1]Ibid., p. 96.

schizophrenics but not by the children.

Siegel (1953) and Pêna (1953) used this scoring system to extend the comparison respectively to the functioning of paranoid schizophrenics and patients with cerebral pathology. Siegel used the three subject groups already mentioned plus five additional groups of children ages six through ten for comparison with his experimental group of paranoid schizophrenics. Patients whose diagnosis indicated any other factors were eliminated. The developmental level scoring system was used with the addition of Rare Detail (Dd), Human Detail (Hdx), and Animal Detail (Adx) responses. The paranoid group was compared with all other groups through use of the Chi-square test. The paranoid schizophrenics appeared to function further up the developmental scale than the hebephrenics and catatonics. Their functioning was most similar to children between the ages of six and ten although this similarity "should not be construed as indicating an identity of perceptual operation in the two groups; actually paranoid perception is a combination of genetically early and genetically late characteristics."[1] The perception of the paranoids appeared to be closer to that of the normal adults in that it was more differentiated while still lacking integration.

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[1]Siegel, p. 161.

Pêna (1953) compared a group of thirty White male adults with cerebral pathology to the same groups of children, normal adults, and hebephrenic-catatonics, but not to the paranoid schizophrenics. The patients were placed in this category by the joint diagnoses of a neurologist and neurosurgeon who considered them to be "suffering from moderate or severe cerebral pathology"[1] while free from psychological disturbances of neurotic or psychotic proportions and from medical disorders not directly connected to the brain damage. In addition to the scores used by Siegel (1953), Pêna added a Range-of-perseveration score, a form score, and two content scores. The data were analyzed in the same way and the overall functioning of the cerebrally damaged patients was also reflective of a mixture of genetic levels. Whereas they were not distinguishable from normal adults in their ability to analyze and organize a Whole blot, they were distinctly less flexible with respect to content and tended to perseverate in a manner similar to young children. Their ability to differentiate and integrate resembled that of the older children.

Hemmendinger (1953) investigated the perceptual

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[1]Cesareo D. Pêna, "A Genetic Evaluation of Perceptual Structurization in Cerebral Pathology: An Investigation by Means of the Rorschach Test," Journal of Projective Techniques 17 (June 1953): 187.

processes of children at different ages. He compared groups of twenty male, White children, ages three to ten, with each other and with Friedman's normal adult group. All children came from average socioeconomic backgrounds and were of average intelligence (85-120). The Friedman Developmental Level Scoring System was used with the addition of the four Rare Detail scores and the Hdx and Adx scores. He found that the proportion of Whole responses decreased significantly from ages three to seven and then increased minimally with adulthood, supporting the theory that young children tend to react to their environment in a global manner. There was a significant increase in Dd perception beginning at age six and continuing through age nine before dropping out with adulthood. The number of Usual Details increased up to ages seven to eight, and then remained the same apparently indicating that children respond first globally, then to large details and finally to smaller details, while with adulthood, perception becomes less fragmentary and more integrated. The genetically high scores increased regularly with age as was expected and the proportion of immature responses decreased with age; however, the changes were "not completely gradual and regular . . . Development seems rather to occur in leaps and bounds."[1] By the time

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[1]Hemmendinger, Journal of Projective Techniques, p. 167.

adulthood was reached, perceptual material was responded to selectively in a primarily mature way. Adults did not just respond to stimuli, they analyzed situations and then integrated those parts which were selected for their purposes.

The investigations by Friedman, Siegel, Pẽna, and Hemmendinger established Werner's genetic theory as a useful conceptual framework for explaining behavior and Friedman's scoring system as a useful technique for delineating cognitive and perceptual functioning. Wilson (1954) continued the study of developmental levels into adolescence with the prediction that some regressing would take place as a consequence of the nature of this period. Her date supported the hypothesis of a temporary regression during adolescence as all subject dropped to a genetically earlier level of functioning.

While the theory of genetic levels was being refined and explored, investigators in other areas were working to define a new diagnostic syndrome which finally came to be labeled Minimal Brain Dysfunction.

> The diagnostic categories subsumed under the rubric of minimal brain dysfunction refer to children of average or above general intelligence with learning and/or behavior difficulties ranging from mild to most severe, which are due to subtle deviations arising from genetic variations, biochemical irregularities, perinatal brain insults, and/or illnesses and injuries sustained during the years critical for the development and maturation of

> those parts of the central nervous system having to do with perception, language, inhibition of impulses, and motor control.[1]

Some of the complications which ensue when diagnosing MBD exist because the symptom pattern is wide and varied. In the past, it was frequently misdiagnosed and either mistreated or untreated. When recognized, parents were often told that their child would "outgrow" it. It is only recently that it has been recognized not only for its effect on children, but also as the precursor of many adult psychiatric disorders (Ricks and Berry, 1970; Wender, 1971).

A great variety of behaviors may be indicative of MBD, including several in the perceptual-cognitive area. While no consistent patterns for MBD on intelligence and perception tasks have been proven, some difficulties in the visual-motor area such as rotations, letter reversals, and some combinations of sub-tests seem to occur more often with the MBD child. These children frequently have trouble in screening out stimuli so that all input has equal weight and demands equal attention. This can lead to distractibility, short attention span, trouble concentrating, and

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[1]Sam Clements, Laura Lehtinen, and Jean Lukens, "Children with Minimal Brain Injury," a Symposium, National Society for Crippled Children and Adults, Chicago, 1964.

the "inability to integrate hierarchically."[1] If the cognitive-perceptual factors are a part of the MBD syndrome, as they appear to be, then it would be expected that the Developmental Level Scoring would help particularly to distinguish differences between this group and others.

Hurwitz (1957) may have touched on an investigation of this syndrome in his study comparing hypo- and hyper-active boys. The children were divided into these two groups on the basis of parent, teacher, and therapist observations over a period of time. As hyperactivity often occurs with MBD, it is possible that some members of this group could also have been classified as Minimally Brain Dysfunctioned. Hurwitz hypothesized that his hypo-active group would score higher on the genetically mature scores (he combined W++, W+, D++, and D+ percentages) and this hypothesis was supported. He concluded that these results were due to the fact that inhibition of direct motor activity increased ideational activity and created an earlier resolution of subject-object fusion.

With the exception of Wilson and Hurwitz, all

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[1]Paul Wender, Minimal Brain Dysfunction in Children, Wiley Series on Psychological Disorders (New York: Wiley-Interscience, a Division of John Wiley and Sons, Inc., 1971), p. 15.

other investigators (Lane, 1954; Phillips and Framo, 1954; Fowler, 1957; Becker, 1959; Wilensky, 1959; Levine, 1960; and Goldfried, 1962 to cite a few) have used the scoring system to gain information about pathology, intellectual ability, creativity, behavior patterns, predictability of behavior, and distinguishing diagnostic categories in adults. The fact that studies with children have been limited to those already mentioned, while examiners continue to refer to the original experiments for comparison purposes, restricts the applicability of the Developmental Level Scoring System. Patient populations are composed of females, as well as males, and include various ethnic groups; without appropriate normative data, it is unclear whether research conclusions may be generalized. This thesis provides some of these data for clinic populations by addressing the following questions:

1. Are there differences between the diagnostic groups of MBD and OTHER?

2. Are there differences between Blacks and Whites?

3. Are there differences between Males and Females?

4. Are there differences between four ages--five, six, seven, and eight?

CHAPTER III

METHODS AND PROCEDURES

Subjects

All subjects were selected from the patient records of two Philadelphia child guidance clinics. While an attempt was made to gather all subjects from the cases at the Irving Schwartz Institute for Children and Youth (ISI), an active clinic, only 192 patients met the requirements. An additional 129 subjects were collected from the stored records of a clinic, the Child Study Center (CSC), which had ceased operating several years earlier due to funding difficulties. This particular clinic was chosen because it used the same diagnostic and record keeping systems as those at ISI, in fact, many of the employees from CSC had transferred to ISI where they continued to function according to prior procedures.

In order to maintain homogeneity between the two clinic populations, only subjects who had been tested after 1960 and before 1974 were used. During this time period, the clinics served similar populations comprised of residents of Philadelphia and its environs. Because of the clinic reputations and sliding fee scales, patients

were drawn from all socioeconomic levels. Eventually ISI became a community clinic restricted to certain catchment areas; however, through 1973 these included both urban and suburban sections so the patient population continued to be integrated socioeconomically and racially.

Each subject was considered in terms of four basic questions: diagnosis, age, ethnicity, and sex. Age and sex were simply determinable while the ethnic category was limited to those individuals who had either two Negro or two Caucasian parents. Other racial groups and individuals with mixed racial backgrounds were eliminated. The present distinction between Caucasians and Negroes of American birth is ethnic-cultural rather than racial although the terms are used interchangeably in this thesis. One can refer to racial differences; however, the two groups are not racially pure nor are the differences between them attributable to genetic-biological characteristics. While some psychological differences may be connected to physiological sources, these are so interwoven with cultural and socioeconomic factors that they cannot be separately delineated for either group. Furthermore, the establishment of racial category for this sample was based on each subject's self-identification.

Diagnosis was determined by that listed in the chart as a consequence of the Diagnostic Conference.

This meant that the diagnosis was based on one or two interviews with each patient, a history of the family, a developmental history of the child, two diagnostic interviews with the child, psychological testing of the child, and for all pre-school age children six group observations. During the conference, all the professionals involved with the family met to determine diagnosis and treatment plan. For this study, individuals were divided into those diagnosed as MBD and those diagnosed as OTHER, i.e., emotionally disturbed but not psychotic. In those cases (106 before screening, 50 included) where the diagnosis included both MBD and emotional factors, these rules were followed:

1. If it is stated that the problem is primarily MBD and secondarily emotional, then the subject is categorized MBD.

2. If it is stated the problem is primarily emotional and secondarily MBD, then the subject is classified OTHER.

3. If the diagnosis is mixed or confusing, then the subject is eliminated from the study.

4. If a treatment plan is mentioned at the time of diagnosis, then it can be used as information in helping to determine which aspect is being emphasized, i.e., recommendations for management and structured

treatment indicate MBD; recommendations for unstructured therapy indicate emotional difficulties.

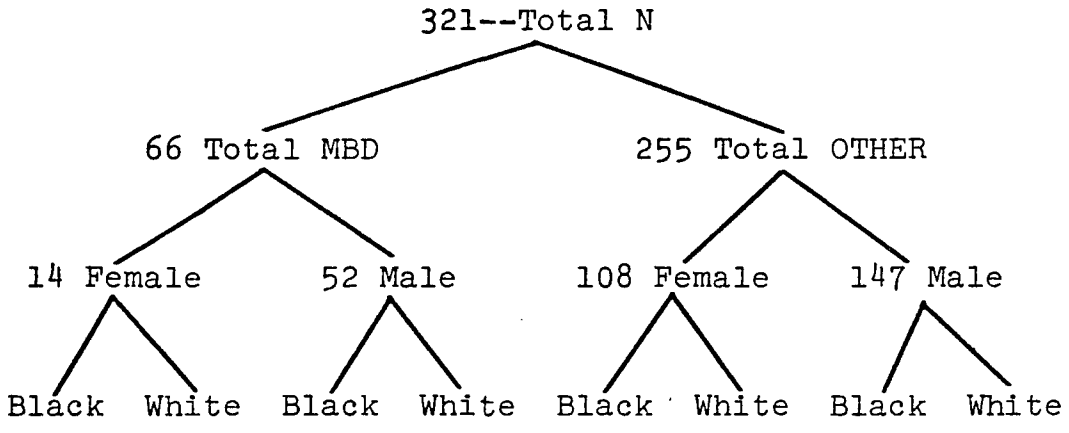
5. When a child is diagnosed "ego-impaired" and it is not clear whether this is emotional or MBD, check the recommendations and the section of the psychological report dealing with the Bender-Gestalt. If that information is not sufficient to resolve the issue, the subject is eliminated.

Once the rules were established, the records were searched for appropriate subjects who were then assigned to one of the thirty-two categories. One reason both of these clinics were used was their system of keeping the raw testing data separate from the general charts. This helped to minimize the possibility of Experimenter error. Each S was assigned to a diagnostic category and then by race, sex, and age within that category (see Chart 1).

The frequency results will be discussed here rather than in the following chapter because of their relevance to the subject pool. While an original goal of ten subjects for each category was established, this was found not to take into account the realities of the clinic populations. The research requirements were filled by 321 patients, but these were not evently distributed. While there were abundant White males and females

CHART 1

SUBJECT BREAKDOWN BY DIAGNOSIS, SEX, RACE, AND AGE



5	2	3	6	9	4	17	16	21
6	1	2	1	13	5	21	13	19
7	0	3	2	7	7	25	18	19
8	0	3	6	8	9	20	23	18
n	3	11	15	37	25	83	70	77

and Black males to fill all age groups within the OTHER category, this was not true for the MBD category. This was particularly striking with the Black female group where only three MBD patients could be located in both clinics. There were 255 S in the OTHER category; 66 S in the MBD category. Of the 199 males, 114 were White and 86 were Black. Of the 122 females, 94 were White and 28 were Black.

For whatever reasons, Black girls are not brought to clinics for treatment or evaluation. This may reflect a greater tolerance for their behavior at early ages, less emotional distress, or the fact that girls are more likely to enter treatment in adolescence. The fact that more White children are in therapy may reflect a difference in cultural values or in the socioeconomic status of the patients despite apparent similarities. When the ratio of MBD to OTHER S's is inspected for each group, it is seen that the ratio for both Black and White females is 1 in 8; however, it is 1 in 5 for Black males. The ratio for White males is unclear because so many children were appropriate for the OTHER category that a cut-off point of twenty-five S before protocols were pulled was established. All other categories include all the children in the two clinics who met the requirements. It can be speculated that the ratio for White males which is 1-2 in this study actually falls between 1-3

and 1-5 in the clinic. The difference between the incidence of MBD in males and in females is consistent with the findings of other investigators. MBD either does not occur as frequently in females or the symptom pattern is such that it is often left undiagnosed. It is likely that the latter is true with girls showing less hyperactivity or behavioral disturbances so that the MBD is undetected. There were no noticeable differences between the different ages although there may be a tendency for fewer children to enter therapy at ages six and seven than at ages five and eight.

The IQ range was between 67 and 149. A lower limit of 70 was set; however, investigation of the testing records showed that three S fell below this level (IQ: 69, 68, 67). They were retained because they did not have diagnoses of Mental Retardation, each S was described as showing higher functioning at another time, and they were in three different categories. The mean IQ was 103.56; the mode was 112; and the median was 104.08. The mean IQ for each category is listed in Appendix D.

Rorschach Scoring

After the subjects were chosen, it was necessary to arrange for the E to rescore the Rorschach protocols from the initial diagnostic testing while remaining ignorant of the subject's category. A list of numbers from

1 to 370 was generated randomly by a computer. (Although 370 subjects were originally gathered, only 321 protocols were located.) This list was matched to an alphabetized list of the subjects and code numbers were assigned accordingly. The Experimenter did not take part in assigning the code numbers or in locating the protocols. Two other individuals went to the clinics, pulled the Rorschach protocols from the testing charts, xeroxed them with all identifying information removed, numbered the copies, and returned the original protocols to the charts. The copies were delivered to the E who scored them in numerical order except for especially difficult to read protocols which were put aside to be scored after the rest were completed.

The Rorschachs were scored using Friedman's Developmental Level Scoring technique. As this technique was new to the Examiner, she was taught the system by Dr. Gerstein who is an expert with it. The learning process involved reading those instructions which were available (Goldfried, Stricker, and Weiner, 1971), joint scoring of thirty-three protocols, and developing a set of rules (see Appendix B). The E and Dr. Gerstein would score five to seven protocols at a time and then meet to discuss their agreements and disagreements. When a situation arose which was not covered by the general scoring

techniques, a specific rule was established to cover similar situations. In addition, while scoring the data for the study, the E made note of some working decisions in order to maintain consistency throughout the scoring.

Reliability

The original reliability goal was set for .95 agreement which is slightly higher than the mean percent of agreement found in most of the studies. The range of agreement in previous studies was from 89.7 percent to 96.0 percent. The one exception to this high interscorer reliability was a study by Margolis, Engelhardt, Freedman, Hankoff, and Mann (1960) which reported only 70 percent agreement, possibly because some of the scorers were unfamiliar with the Rorschach. While 95 percent agreement was reached on some of the practice protocols, the overall agreement based on the final ten protocols was .85 which was considered by both scorers to be highly acceptable. It was decided that fifteen Rorschachs from the actual data would be scored by both Dr. Gerstein and the Experimenter in order to ascertain that the level of reliability was being maintained. This would also serve as a check on the E since all protocols were being scored by one person.

Three sets of five protocols each were chosen by the E. The first set from the first fifty Rorschachs had

an overall percentage agreement of 88.8 with individual agreement percentages of 82, 100, 100, 79, and 83. The second set from the middle fifty Rorschachs had an overall percentage agreement of 85.4 with individual agreement percentages of 85, 85, 82, 75, and 100. The third set from the last fifty had an overall agreement percentage of 85 with individual agreement percentages of 99, 74, 99, 77, and 76. The total reliability established during the scoring was 83.7 percent when calculated on the total number of responses in agreement divided by the total number of responses. When the percentages of agreement for all fifteen protocols were averaged, the reliability was 86.4 percent. Towards the end of the scoring, a particularly difficult and complex protocol was set aside to be scored by both people in order to see what the minimal level of agreement would be. The percentage of agreement on this Rorschach was 67. When this protocol was averaged in with the other fifteen, the overall agreement was 82.4 percent by the first method and 85.2 percent by the second. In all cases the agreement between scorers was significantly greater than chance and on a comparable level with those discussed by other investigators.

Data Analysis

The analysis of the data is discussed in detail

in the Results chapter so this section will be used to explain the composite score (referred to as the DL score). This score is a mean number assigned to each protocol. It was determined by using Wilensky's (1959) modification of Becker's (1956) weighting system. In this procedure, each score is assigned a weight (see Appendix A) and an average is obtained for each card. These averages are in turn averaged giving a single DL score for each subject. In the process of doing this, a problem was located in assigning weights to the No Location/Unclear category. Ninety-four protocols contained one or more responses which were illegible or difficult to locate and had been assigned to this category.

After due consideration, it was decided to treat these responses as if they had not been given. Where no other response was given to a card, it was assumed that the subject had responded to only nine cards and the DL score was averaged on that basis. It was further decided that any subject with fewer than eight cards would be dropped from the study. The protocols of seven subjects from seven of the thirty-two categories were rescored in an attempt to prevent further attrition. This was possible because of a working rule for assuming location which had been developed during the reliability checks.

The Analysis of Variance approach was used whenever possible because it is a more powerful statistical

test than comparable non-parametric methods and because it ensures testing of interaction effects.

CHAPTER IV

RESULTS

Strategy of the Analysis

The analysis of the data is complicated by the number of dependent and independent variables. There are a total of twenty-five variables which are used to measure the effects of diagnosis, ethnicity, sex, and age. These variables include DL, the composite developmental level score, all the scoring categories (see Appendix A) with the exception of DW, DdD, and D++ where over 95 percent of the responses were 0, and the following combination scores:

Total W--all Whole responses
GW (Good W)--all W++ and W+ responses
Total D--all Usual Detail responses
GD (Good D)--all D++ and D+ responses
Dd--all Rare Detail responses
FC--all Fabulized Combinations and Contaminated Responses (Note: this is, of course, not the usual meaning of FC)

An Analysis of Variance (ANOVA) was to be computed for all continuous variables; however, due to the presence of two cells with 0 subjects (as discussed in the Methods chapter) a single Diagnosis X Race X Sex X Age ANOVA was impossible. The decision was made to run four 3-way ANOVAs (Diagnosis X Race X Sex; Diagnosis X Sex X Age;

Diagnosis X Race X Age; Race X Sex X Age) in order to obtain all 3-way interaction effects. This meant that all main effects and 2-way interaction effects would appear in more than one analysis. Some effects are significant in only one or two of the analyses in which they appear and are otherwise insignificant. Therefore the level of significance is listed for each ANOVA in which an effect appears.

Whenever a significant 2-way interaction occurred, tests were computed to determine which means were significantly different. In the case of all 3-way interactions, a 2-way ANOVA was computed for each significant interaction. In those situations where Age was a variable, the Newman Keuls (Winer, 1962) test was used as it enabled each mean to be tested against all other means in one procedure.

Description of Significant Differences

The level of significance for this study was established at $p < .05$. All significance levels will be reported for main effects; whenever the results of a test on an interaction effect are reported, the level of significance can be assumed to be .05. While non-significant results may be important and will be included in discussion, for the sake of clarity only significant results will be reported and discussed in this chapter.

Moreover, some question has been raised regarding the relevance of IQ. While this issue is addressed elsewhere (see Appendix C), it should be noted that Analyses of Covariance (COANOVA) were run for all variables and that of twenty-six significant results, twenty occur on the COANOVA as well as the ANOVA. Additionally, only one significant result occurs solely on the COANOVA. This result is for D+ and is a significant main effect with the MBD group producing more D+ than the OTHER group; however, there is also an interaction effect which this main effect masks and that effect is significant on both analyses and will be discussed later in this chapter.

When examining the results, it is important to bear in mind that all differences between groups were small and that even results significant at the p=.001 level may be based on a difference between means of less than 1.0.[1] The results will be presented in terms of the basic research questions:

1. Are there differences between diagnostic groups?

2. Are there differences between ethnic groups?

3. Are there differences between the sexes?

4. Are there differences between the ages?

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[1]Also, while the particular method of analysis being used compensates for the unequal cell n's, these should not be totally ignored.

The Major Research Questions

A. Are there MBD-OTHER differences?

The OTHER subjects had significantly higher overall means for four response categories. On the composite DL score, OTHER Ss had a higher mean developmental level than MBD Ss, p=.010, p=.008, p=.031[1] (Table 1). OTHER subjects also tend to produce more Fabulized Combinations (FabC) than did MBD Ss, p=.051, p=.102, p=.10 (Table 2). Within five year old males, OTHER Ss produced more mediocre Wholes(Wm) than did MBD Ss (Table 3). It can be seen that this result is significant on only one ANOVA. For Black seven year olds, OTHER S produce more Usual Details (Total D) than do MBD Ss (Table 4).[2]

TABLE 1

MEAN DEVELOPMENTAL LEVEL FOR DIAGNOSIS

Diagnosis	Mean	SD	n
MBD	2.8127	.5556	66
OTHER	2.9934	.4981	255

[1]As described on page 31 of this chapter, the level of significance for an effect is listed for each ANOVA in which it appears.

[2]Note the small n's in these tables. While the results are consistent with the other data, caution must be used in considering the significance of these results.

TABLE 2

MEAN FabC FOR DIAGNOSIS

Diagnosis	Mean	SD	n
MBD	.0303	.1727	66
OTHER	.1176	.4184	255

TABLE 3

MEAN Wm DIAGNOSIS X SEX X AGE

Age	Sex	MBD	n	Other	n	t
5	Male	2.2000	15	3.4700	36	2.4736 $p<.05$
5	Female	3.8000	5	2.5000	22	
t				2.1456	$p<.05$	
6	Male	3.2900	14	3.0600	33	ns
6	Female	2.0000	3	3.4600	26	ns
7	Male	3.2200	9	3.6500	37	ns
7	Female	3.6700	3	3.4200	31	ns
8	Male	3.0700	14	3.5100	41	ns
8	Female	3.3300	3	3.3100	29	ns

TABLE 4

MEAN TOTAL D DIAGNOSIS X RACE X AGE

Age	Race	MBD	n	Other	n	t
5	White	10.0000	12	6.5000	38	ns
5	Black	4.1300	8	4.8500	20	ns
6	White	5.9300	15	7.9300	41	ns
6	Black	7.0000	2	7.6100	18	ns
7	White	9.9000	10	7.8400	43	ns
7	Black	.5000	2	10.3200	25	2.5562 p<.05
t		2.3213	p<.05			
8	White	9.7300	11	11.1300	38	
8	Black	8.1700	6	7.9700	32	

The MBD subjects had a higher number of responses in four categories. Within males, MBD Ss produced more Amorphous Whole (Wa) responses than did OTHER Ss (Table 5). For Black seven year olds, MBD Ss produced more minus form level Whole (W-) response than did OTHER Ss (Table 6).[1] White MBD Ss produced more integrated Usual Detail (D+)

[1]Note the small n's in these tables. While the results are consistent with the other data, caution must be used in considering the significance of these results.

TABLE 5

MEAN Wa FOR DIAGNOSIS X SEX

	Male	n	Female	n	t
MBD	.4400	52	.0700	14	ns
Other	.1900	147	.2600	108	ns
t	2.2318	p<.05	ns		

TABLE 6

MEAN W- FOR RACE X DIAGNOSIS X AGE

Age	Race	MBD	n	Other	n	t
5	Black	2.00	8	3.40	20	ns
5	White	2.17	12	2.08	38	ns
6	Black	6.00	2	3.17	18	ns
6	White	2.40	15	2.73	41	ns
7	Black	5.50	2	2.12	25	2.3873 p<.05
7	White	2.50	10	2.12	43	ns
t		2.0105	p<.05			
8	Black	3.33	6	2.66	32	ns
8	White	2.18	11	1.68	38	ns

responses than did White OTHER Ss (Table 7), and for the five year olds, MBD Ss produced more Contaminated Responses (ConR) than did the OTHER group (Figure 1).

Although only the seven year old Blacks significantly differ on W-, the responses for both Blacks and Whites at all but two age levels follow the same pattern of being higher for MBD than for OTHER Ss (see Table 6). As is consistent with the W- response, the OTHER Ss give more Wm responses although there is some question as to whether the direction is the same for females. Black OTHER Ss give more Usual Detail responses than MBD Ss at ages five, six, and seven, although the difference is significant only at age seven. The White Ss do not show any consistent trend with five and seven year old MBD Ss and six and eight year old OTHER Ss giving more D responses.

TABLE 7

MEAN D+ FOR DIAGNOSIS X RACE

	White	n	Black	n	t
MBD	.85	48	.22	18	2.8695 $p<.05$
Other	.56	160	.55	95	ns
t	2.2184	$p<.05$	ns		

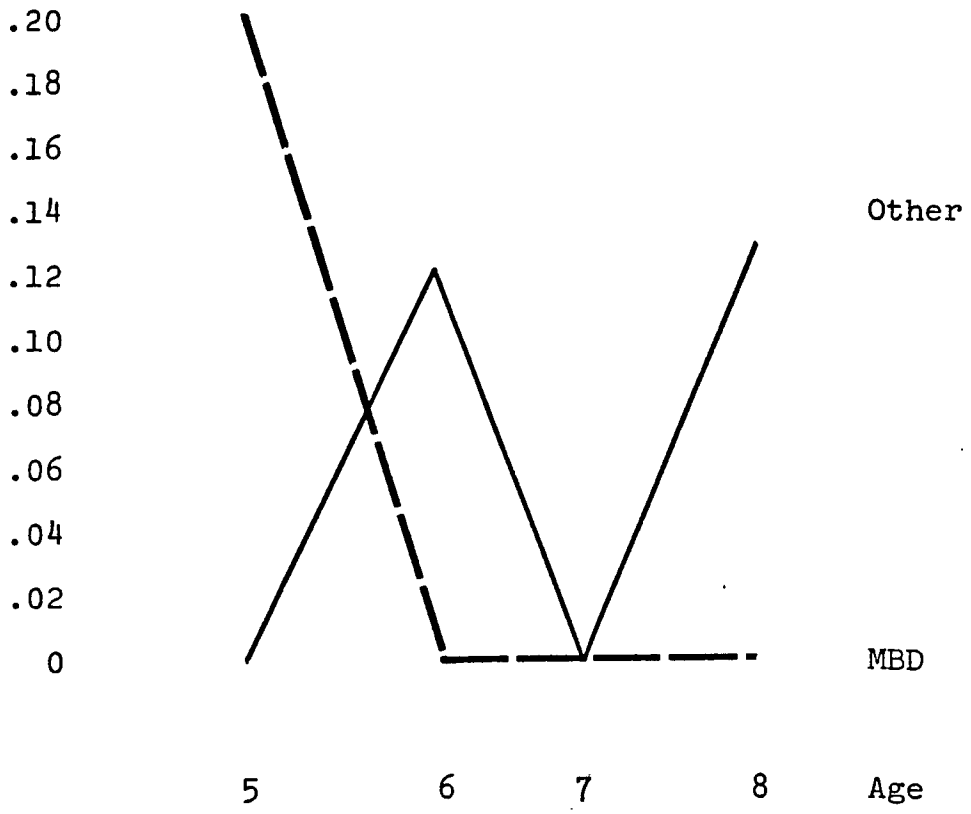

Fig. 1. Mean ConR Diagnosis X Age

Since Fabulized Combinations can be perceived as reflecting "poor judgment" and "inadequate reality testing," this response is more consonant with emotional disturbance than with organicity. The Contaminated Response results appear to be in the opposite direction; however, on further inspection (Figure 1), it becomes clear that only at age five do MBD subjects give any responses in this category. While the differences are not significant at later ages, it is worth noting that the mean response for MBD children at ages six, seven, and eight is 0. Perhaps the difference for the five year olds is attributable to a general immaturity, leaving them less capable of designating two acceptable responses (a man and a Bat) instead of one bizarre one (a Batman).

The most difficult result to explain is the higher number of D+ responses by White MBD subjects. On inspection it is seen that the Black Ss are non-significant in the opposite direction with the OTHER Ss giving more D+ responses as would be expected (Table 7). The possible racial differences will be discussed in the following chapter. The fact that a highly integrated response is being given by a group which is expected to have difficulty with integration is confusing. It is possible that the ability to integrate details may reflect the tendency of the White MBD child to concentrate on individual sections, with a consequent increase in skill

in handling small groups of perceptions while still having problems with Wholes.

It is apparent that differences between the two diagnostic groups can be distinguished but patterns are not as clear as previous literature has indicated. Some differences hold only for one sex, one age, or one ethnic group. The MBD child is considered to be immature in his ability to organize his perceptions. It would be expected that he would have difficulty in giving high level organizational responses and that his attempts at integration would frequently fail. These assumptions are supported by six of the eight significant results. This issue will be reexamined after discussion of the race differences.

B. Are there Black-White differences?

The White subjects have higher mean responses on six variables while the Blacks have higher mean responses on four. The Whites have a DL score that is higher than the Blacks, p=.019, p=.005, p=.020 (Table 8) and they produce more Vague Wholes (Wv), p=.045, p=.013, p=.021 (Table 9). The Black subjects give more Amorphous Usual Details (Da) than do the White subjects, p=.015, p=.032, p=.028 (Table 10). Male Whites produce more Vague Details (Dv) than do male Blacks (Table 11). Within the MBD category, Whites produce more integrated Usual Details (D+) than Blacks (Table 7).

TABLE 8

MEAN DEVELOPMENTAL LEVEL FOR RACE

Race	Mean	SD	n
White	3.0048	.5085	208
Black	2.8667	.5164	113

TABLE 9

MEAN Wv FOR RACE

Race	Mean	SD	n
White	.8221	1.2519	208
Black	.5133	.8464	113

TABLE 10

MEAN Da FOR RACE

Race	Mean	SD	n
White	.1202	.3807	208
Black	.2389	.6017	113

TABLE 11

MEAN Dv FOR RACE X SEX

	Male	n	Female	n	t
White	.58	114	.48	94	ns
Black	.32	85	.64	28	ns
t	2.2538	$p<.05$			

Eight year old Whites produce more Mediocre Details (Dm) than do eight year old Blacks (Figure 2), and seven year old Blacks produce more Rare Details (Dd) than seven year old Whites (Figure 3). Similarly seven year old Blacks produce more minus level Rare Details (Dd-) (Figure 4); however, they also produce more high level Usual Details (GD=D++ + D+) than do seven year old Whites (Figure 5). Within the category of seven year old MBD Ss Whites produce more Usual Details (Table 4) and Blacks give more W- responses (Table 6).

The major conclusion from these results is that there are differences between the two ethnic groups and that perceptual development cannot be assumed to be similar. The developmental level differences will be discussed in detail in the discussion chapter; the other results will be considered here. The frequency with which Whites give Wv responses may be due to a tendency to present generalizations when confronted with confusing affective material and may reflect cultural differences between the two groups. While this vagueness of Wholes continues with the detail responses for males, the females are reversed (insignificantly) with the Black females being more likely to give vague responses (see Table 11).

At age eight, Whites give more Dm responses and at age seven, Blacks give more GD responses. It is unclear

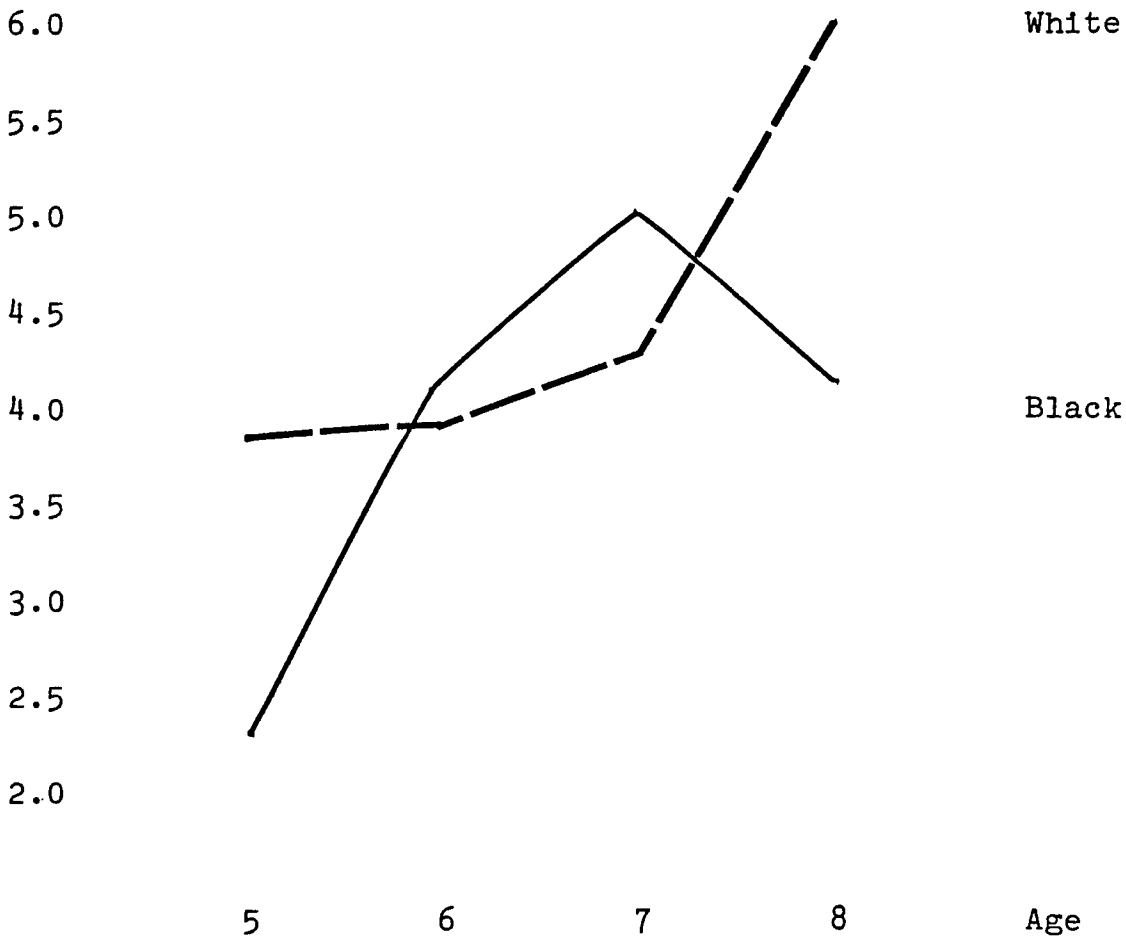

Fig. 2. Mean Dm for Race X Age

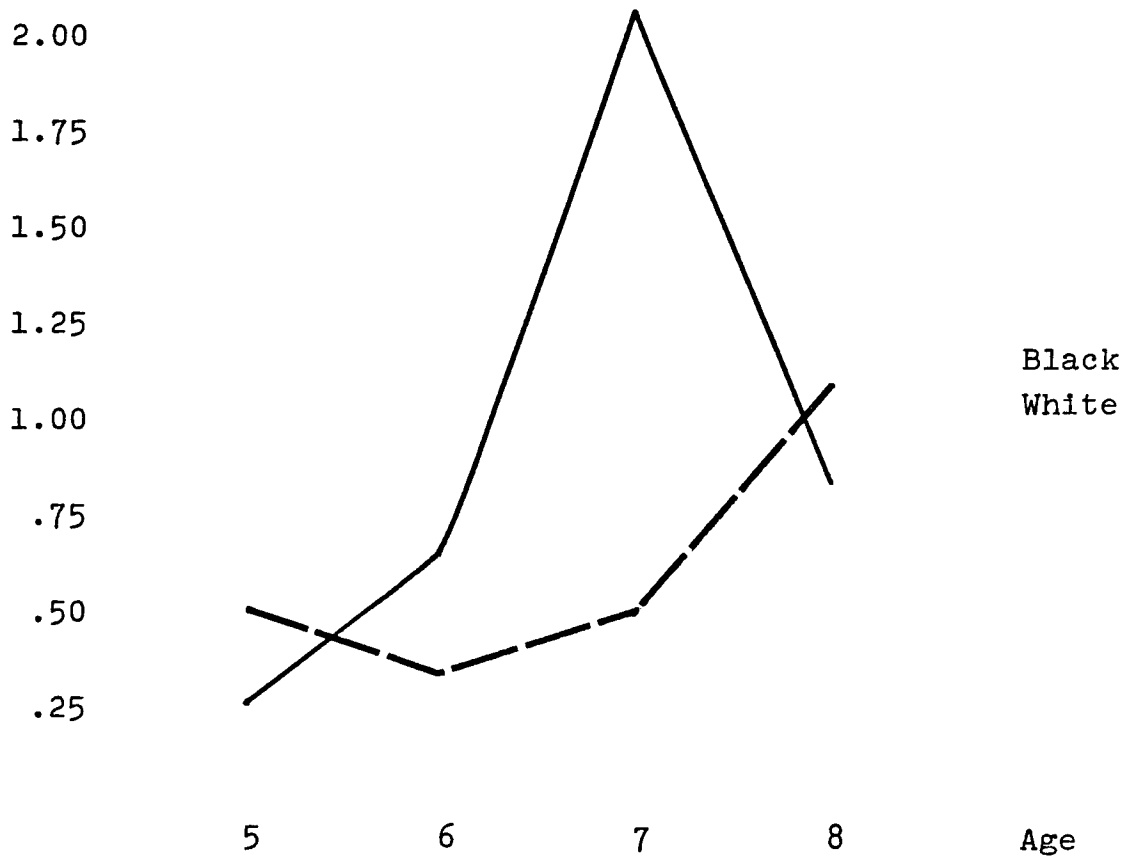

Fig. 3. Mean Dd for Race X Age

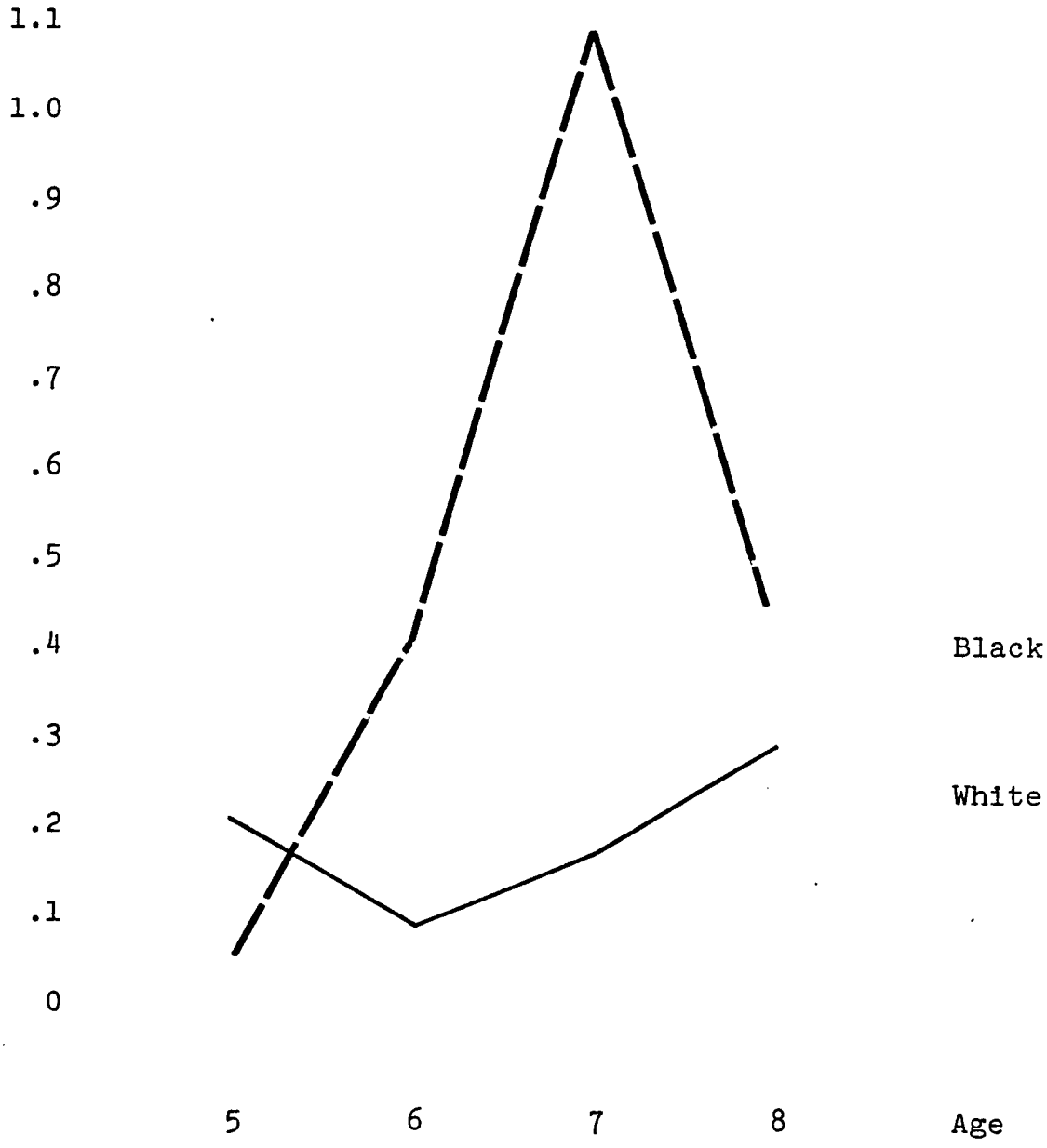

Fig. 4. Mean Dd- for Race X Age

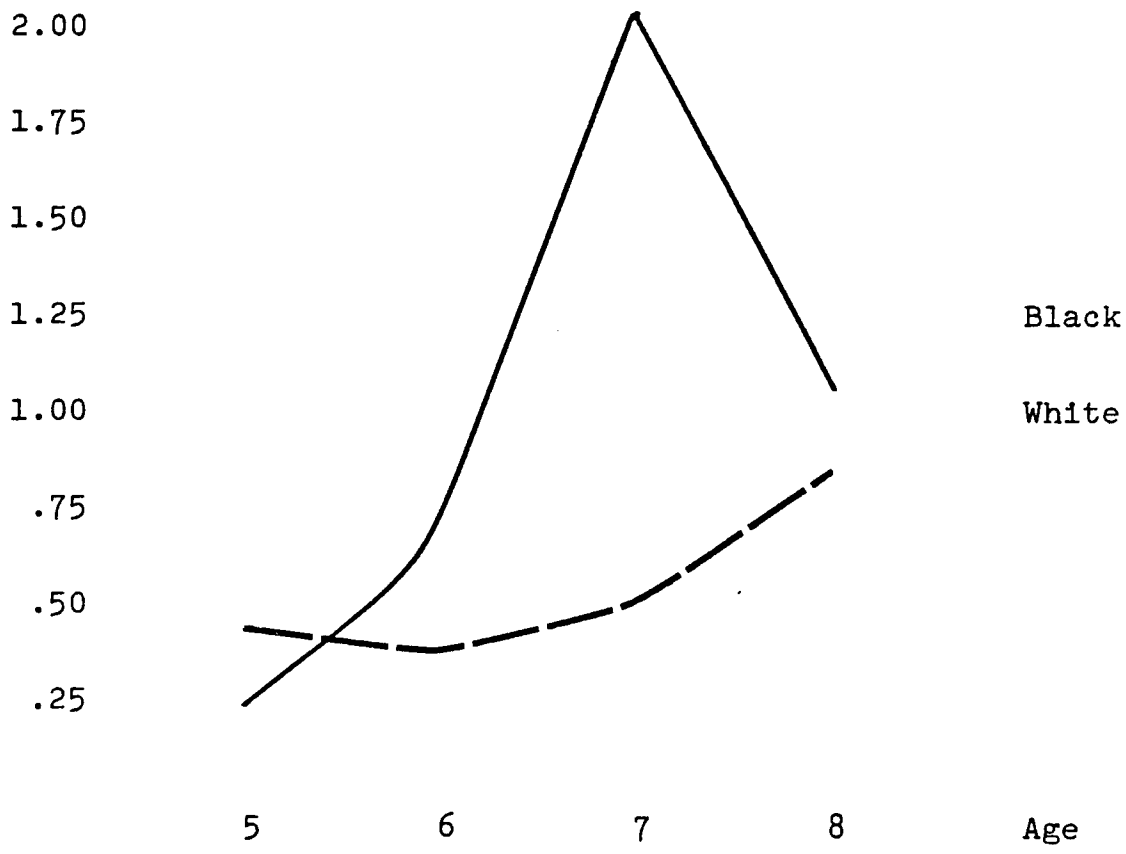

Fig. 5. Mean GD for Race X Age

as to why the Blacks give a higher number of Da responses. Their performance tends to fluctuate between well-integrated responses and those which are totally formless, with few responses in the categories inbetween. At this point, there is no single hypothesis which will cover the results, but further investigation into perceptual functioning seems indicated.

C. Are there Male-Female differences?

There are only two significant sex differences, both of which are interaction effects. For five year old OTHER Ss, males produce more Mediocre Whole (Wm) responses (Table 2), and for five year olds in general, males produce more Vague Detail (Dv) responses (Figure 6). On inspection it is seen that the results for Wm are similar although insignificant at ages seven and eight; at all three ages in the MBD category the females produce insignificantly more Wm responses. The single exception is age six where the pattern is reversed for both diagnostic categories. With Dv, the males have again a higher mean at age seven, but the females are higher for ages six and eight, approaching significance at age eight.

In general, the sex differences appear to be minimal, occurring infrequently and only in interaction with other variables, particularly age. There is some possibility that developmental patterns are slightly

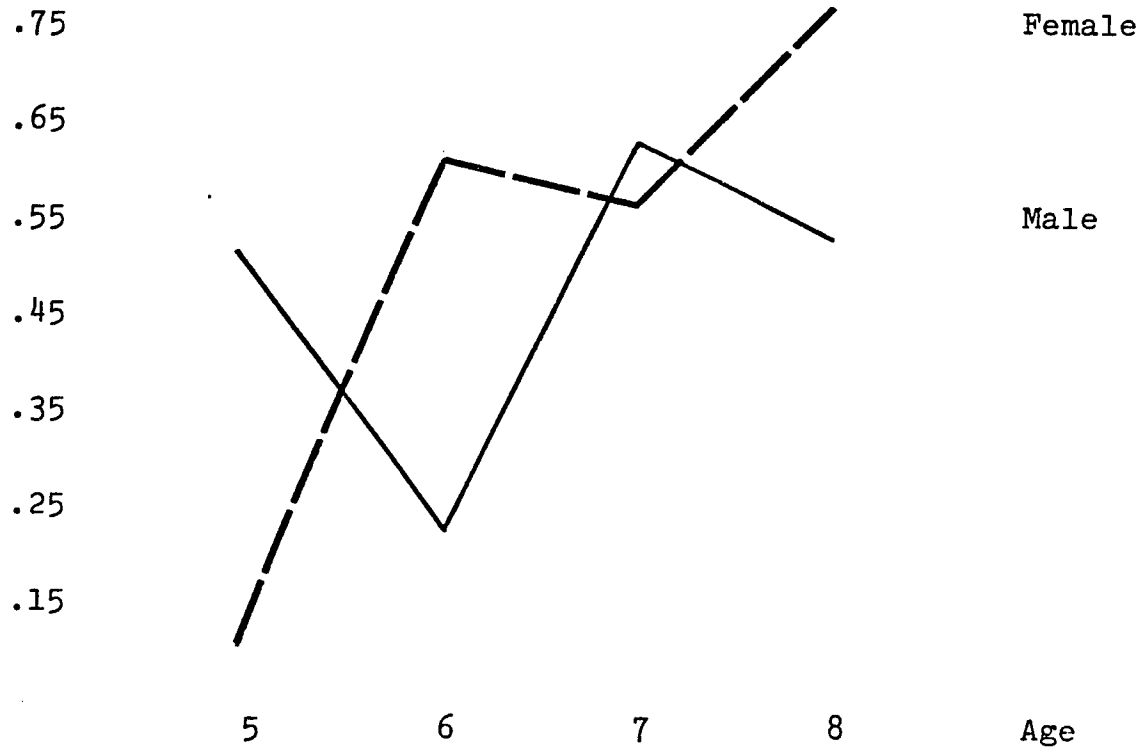

Fig. 6. Mean Dv for Sex X Age

TABLE 12

MEAN D- FOR AGE

Age	Mean	SD	n
5	2.0000	2.0765	78
6	2.5395	2.2771	76
7	2.6375	2.3016	80
8	3.0575	2.7210	87

TABLE 13

MEAN FabC FOR AGE

Age	Mean	SD	n
5	.0128	.1132	78
6	.1842	.5089	76
7	.1375	.4967	80
8	.0690	.2549	87

different for males and females, but these differences do not preclude combination of the two groups.

D. Are there Age differences?

The age differences can be broken down into two groups: those which occur as main effects; and those which occur for only one sex, race, or diagnosis. In general, eight year olds produce more minus level Usual Detail (D-) responses than do five year olds ($p=.033$, $p=.034$, $p=.037$) and the number of D- responses appear to increase linearly with age (Table 12). While six year olds produce more Fabulized Combinations than five year olds ($p=.048$, $p=.037$, $p=.033$), there is no linear increase for this variable (Table 13). The six year olds have the highest number of these responses, which may be attributable to the stresses which occur at this age or to this particular sample.

Within the Blacks, the seven year olds are higher than five year olds in producing Dd, GD (higher than six year olds for these variables), Dm, and Dd- (Figures 2, 3, 4, and 5). There are no age differences for the Whites on GD, Dd or Dd-; White eight year olds are significantly different from all other ages in producing more Dm. On inspection of the means, it is clear that in all cases the Black seven year olds have higher means than Blacks

of any other age with the other ages generally falling so that five year olds are lower than six year olds who are lower than eight year olds. For the White subjects, while the five and six year olds vary in position, their means are consistently lower than the seven year olds which are lower than the eight year olds with the only exception being Dd- where the five year olds are closer to the eight year olds (no significant differences).

Female eight year olds produce more Dv than female five year olds, but there are no differences for males. This may reflect cultural or developmental differences in dealing with emotion at different ages. Within the OTHER category, six and eight year olds produce more Contaminated Responses than do five and seven year olds with all differences being significant ($6 > 5$, $6 > 7$, $8 > 5$, $8 > 7$) (Figure 1). There are no significant differences in the MBD category. It is unclear as to why these differences are obtained and they may reflect the ages at which children with severe emotional problems are brought for treatment.

The age differences reinforce the previous conclusions about the differences in development between the two ethnic groups. While there are some general differences between ages, the greatest difference is between the patterns for the two races. Some conclusions which

can be drawn from these results will be discussed in the following chapter.

CHAPTER V

DISCUSSION

Potential Limitations

An immediate question can be raised about the use of the Rorschach as a research instrument when the issues of reliability and validity are still unresolved. Despite several hundred pieces of research, discussion continues with some investigators insisting that the Rorschach has proved to be unreliable and/or invalid while others contend either that the instrument cannot be measured by present techniques or that its reliability and/or validity has already been proved.

Holzberg (1960) in his discussion of "reliability as it pertains to the Rorschach" states that there are four areas of investigation:

1. the subject's responses in terms of "temporal consistency" (test-retest), "consistency of performance on two forms of the test" (equivalency), and "internal consistency" (split-half).
2. the consistency between different judges in scoring the same protocols.
3. the consistency between judges in their interpretations.

4. the consistency of one judge in his "scorings and/or interpretations of the same Rorschach on two or more occasions.[1]

The structure of the Rorschach raises difficulties in dividing it into two equal parts. This becomes increasingly true when color and form level are considered. Other problems which arise when using the traditional tests of reliability include the factor of memory. Remembrance of previous testing may inflate test-retest reliability. Even the use of similar ink blots for comparison may be affected by the development of a set or previously developed manner of handling the ambiguous task. When retesting occurs after a lengthy period of time, the reliability may be affected by the subject's increased maturity and personality changes.

One suggested method for handling these difficulties is to relate the consistency of perceptual and conceptual functioning on the Rorschach and on other perceptual and conceptual tasks. There is some question as to whether this meets the requirements for a test of reliability. Investigations of the consistency between judges have shown, in general, that judges trained in the same scoring techniques demonstrate a high degree of

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[1]Jules Holzberg, "Reliability Re-examined" in M. A. Rickers-Ovsiankina, ed., Rorschach Psychology (New York: John Wiley, 1960), p. 365.

reliability. Consistency of interpretation has also been demonstrated; however, the nature of the Rorschach is such that there is no one interpretation of a record which is "correct." This aspect of the Rorschach is part of the reason that some users feel that it is more appropriate to study validity than reliability and to let the latter depend on the former.

The issue of validity is also unclear although more success has been achieved in devising measuring techniques. The most notable of these has been the development of construct validity in which the test is used in an hypothesis testing experiment using a construct defined by the test. It is important that a test not be considered validated on the basis of one successful prediction. Research has also focused on the areas of content validity and criterion validity. The former may not be applicable to the Rorschach as it presupposes a test designed to sample certain population characteristics and that assumption cannot be made with regard to the Rorschach. The latter has shown the Rorschach to be valid in several areas. Those investigators who feel that the Rorschach should be looked at globally and subjectively have challenged the investigation of specific elements alone.

These issues, while relevant to the use of the Rorschach, are not entirely relevant to this study. Many

of the issues about reliability and validity have to do with the use of the Rorschach as a diagnostic instrument. In this study the Rorschach is being used to obtain scores. The investigation is not of the whole Rorschach, but of an already established Rorschach procedure, the Friedman Developmental Level Scoring System. The emphasis then shifts to the scoring reliability. This has been discussed in detail in Chapter III where it was shown that the interscorer reliability for this sytem is very high, averaging a mean percent agreement of about .93. In one sense this study attempts to validate these scores against an established diagnosis.

Discussion of the Rorschach forces consideration of another possible limitation--the way in which the data were originally gathered. It has been clearly shown that many factors can affect a test including the examination room, the examiner's attitude, and the race, sex, and age of examiner and subject. In this clinic most of the subjects were tested by White examiners. While the objectivity of the scoring system and its primary focus on the location aspects of the scores should minimize them, the possibility of confounding effects from these unknown factors does exist.

Possible difficulties also arise from the nature of the two diagnostic classes. There may be greater

heterogeneity within the groups than was originally assumed. This is particularly true for the MBD subjects. While the clinic techniques for separating MBD and emotionally disturbed children were rigorous, the study includes children diagnosed over a ten year span. During this time, the definition of MBD has altered. Spezzano's (1976) recent review of the literature was aimed at the question of homogeneity as it applied to hyperactivity. He showed that hyperactivity which is often regarded as a symptom of MBD could be reflective of other factors. One of these which could have bearing on this study is the lack of an appropriate place for releasing energy. Children with high activity levels and moderate time for activity or children with normal activity levels and minimal opportunities for release might appear to be hyperactive. This would be particularly true in school where the child might have difficulty in restraining himself. These children might be referred to child guidance clinics with presenting symptoms which would accentuate the possibility of a diagnosis of MBD. This becomes of particular interest when examining the seven year old Black subjects. Their responses are strikingly different than those of subjects at surrounding ages and they include many high level responses. One might speculate on what behavior occurs that characterizes this group

as a whole and results in referral to a clinic. These children may be more actively exploring their world in such a way that their behavior is difficult for others to tolerate. The fact that there is no significant difference between the MBD and OTHER groups along these dimensions may support this speculation.

One aspect of MBD that is as yet unresolved is its relationship to IQ. While the general definition implies an average or above IQ, there is no reason to assume that minimal brain dysfunction does not occur in children with below average IQ when retardation and brain damage are not present. This aspect may have an effect in that some groups may be diagnosed MBD with lower IQs than would be considered necessary for such a diagnosis in a different group. When investigating Black-White differences, this is further confounded by the fact that clinicians frequently assume that Blacks will test approximately ten points below their actual IQ on intelligence tests and make diagnostic decisions accordingly.

No specific data on the socioeconomic status of the subjects in this study were obtained. The impressions of the Examiner and of professionals in the clinic were that the Black and White populations were similar with reference to SES. This does not eliminate the fact that the Black families may not have been at the higher

SES levels for long with the concomitant backlog of nutritional and educational deprivation. As these possible differences in nutrition and education were translated into IQ differences, they have been shown to be negligible (see Appendix C).

Conclusions from this study are limited by the fact that the sample came essentially from one clinic. While it can be considered a representative clinic, the conclusions should be confirmed for other urban, and suburban, clinics before being widely generalized. The use of one clinic combined with the cross-grouping necessary for analysis leaves some cells with small n's. Where these are particularly small, a cautionary note exists in the text.

Another statistical question may arise with regard to the number of comparisons. The presence of the four major variables leads to a 4-way Analysis of Variance test. Such an analysis was not conducted because the n's in the 4-way cells would have been inordinately small and because the interpretation of the third-order interaction would have been cumbersome. One of the consequences of conducting the four 3-way analyses which then became necessary was the large number of non-independent comparisons which were made. Some question can therefore be raised as to whether the significant findings can be

attributed to chance. As most of these findings appeared consistently where ever it was possible for them to appear, there is good reason to treat them as if they are not attributable to chance.

Summary of Results

This thesis involved scoring the Rorschachs of 321 children between the ages of five and eight using the Friedman Developmental Level Scoring System. In this system all responses to Rorschach cards are scored for their genetic level based on the perceptual organization of the blot. Individual response scores were analyzed separately and in combination in order to determine developmental differences between Minimally Brain Dysfunctioned and emotionally disturbed (OTHER) children, Blacks and Whites, males and females, and ages five, six, seven, and eight. While the emphasis in this study is on the effects of the four main variables and their interactions on the scores, the data generated by the research makes it possible to do some comparing with previous authors and to present some normative data in the form of means tables (appendix D).

The diagnosis and race results are discussed last in this chapter in order to emphasize their importance. Therefore, the order of presentation is changed from that of the Results chapter with sex and age results being

discussed first in this section.

Sex

There were no differences between the sexes after age five and only two differences at that age. Emotionally disturbed five year old males produced more Mediocre Wholes than did the females which may reflect a tendency to begin organizing the world at an earlier age. Ames (1952) found that in general boys produced slightly more W responses than girls (54 percent to 52 percent); however, she does not state whether these differences are significant.

The non-significant trend in the opposite direction for the MBD category may indicate that when there is a retarding factor present, such as organicity, girls function on a higher developmental level in accordance with studies which have shown more rapid maturation for females. This fact may also account for their significantly smaller production of Vague Details; however, there is the possibility that five year old males are more actively exploring the world and the poor D responses may be the beginning of later genetically high D responses.

These relatively minimal sex differences are consistent with the results of Wilson (1954) and Ames (1952). Ames found that the sex differences in Rorschach responses were neither large nor consistent; Wilson found

significant sex differences only at ages fourteen to fifteen and concluded that there were not sufficient differences to preclude combining the groups.

Age

Although the overall developmental score (DL) did not distinguish between the ages, several of the individual scores did. These four ages had been chosen because Hemmendinger (1953) had shown them to be ages during which many developmental changes occurred. Contrary to expectation, there were no differences in the amount of Whole responses. Hemmendinger's data showed a marked decrease in median W percent by age seven. The results of this study correspond more closely to those of Ames (1952) who found that all children gave similar amounts of Whole responses[1] (Table 14).

In general, more Detail responses were given at the older ages which would have been predicted on the basis of Hemmendinger's discussion of the increased

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[1]It should be noted when comparing the results from these three studies that different techniques of data analysis were used. Ames reports her data in terms of mean percentages and mean number of responses without statistical tests of significance. Hemmendinger used the Chi Square test to check for significance and reports in terms of median percentages. This study used a multivariate approach, ANOVA, and reports in terms of mean number of responses. Comparisons with regard to age trends must be made with caution.

interest in details after age six. There was also an increase in immature D responses which would not have been predicted (eight year olds gave more D- responses than did five year olds). While this may reflect an increase in all detail scores, it is more probable that the minus quality is due to the emotional and organic problems of the sample. It is difficult to ascertain whether Ames found similar results since she only reports a similar distribution of D responses for all ages.

Although Hemmendinger and this thesis (Black subjects only) showed an increase in Rare Detail responses with age, this was not reflected in Ames' data where the Dd percent decreased after age six. Some difficulty in comparing the three groups on this variable arises from Ames' definition of Dd. She includes Space responses in this category so that it is impossible to determine what her data mean in terms of Rare Detail responses.

While some age differences occurred for both ethnic groups, differences between them occurred frequently enough to warrant their being discussed separately.

Whites had fewer age differences than Blacks, with eight year olds producing significantly more Mediocre Detail responses than all other ages. There were no significant differences in amount of well-integrated D (D+) or in Rare Detail responses, in contrast with

TABLE 14

COMPARISON OF THE RESULTS OF AMES, GLIXMAN, HEMMENDINGER

	Glixman $\bar{X}$			Ames $\bar{X}$			Ames $\bar{X}$%			Hemmendinger Median %		
	W	D	Dd	W	D	Dd	W	D	Dd	W	D	Dd
5	7.3	6.37	.40	7.5	5.1	.76	58	34	8	44.5	50	2.5
5-1/2				7.7	4.7	1.14	55	33	12			
6	7.7	7.4	.4	7.6	5.7	1.6	51	34	15	30	55	13
7	7.4	8.6	1.0	8.2	7.9	1.6	51	41	8	8.5	61.5	19.5
8	7.5	9.6	.9	7.9	6.6	.6	55	37	7	3.5	69	16

Hemmendinger's results. He found that genetically mature responses increased with age, becoming significant at ages six to eight. This study did not show such an increase for W++, W+, D++, or D+ for the White subjects.

A significant increase in D responses with age occurred for Blacks also; however, significant differences occurred only between seven and five year olds, with the exception of the well-integrated D responses, where the seven year olds produced significantly more D++'s and D+'s than either the six or five year olds. This increase in mature D responses corresponds with Hemmendinger's findings.

When the results were inspected in detail, it was seen that the Whites increased in number of responses in a linear fashion, but the Blacks increased to age seven and then began decreasing. This may reflect a more rapid maturing of Black individuals if the decrease in Detail responses heralds the beginning of well-integrated Wholes. Further developmental research would be necessary to substantiate this. The fact that the Blacks are beginning to show significant increases in well-integrated Details, while the Whites have no significant differences at these ages may support this speculation. There may be a cultural push towards maturity for Black children which is not present in the Whites and which overrides emotional

and organic difficulties.

The Blacks also show an increase in Rare Detail responses from ages five to seven, although most are of "-" form level. The minus form level was determined by Hertz's frequency tables. Hertz states that these tables were standardized on an entirely White population.[1] Because of the cultural differences between ethnic groups, it is possible that some responses which occur frequently for Blacks and would then be included as "+" forms occur infrequently for Whites and are listed as "-" forms. While this does not eliminate the effect of the minus responses for Blacks, it raises another factor which must be considered when evaluating this response. The increase in Rare Detail responses coincides with Hemmendinger's study of normal development in which he showed that

> In terms of the parts of stimuli to which they react (W%, D%, Dd%), children's perception becomes more differentiated with age, first rather grossly (D scores) and then more and more finely and more fragmentary (Dd scores).[2]

Aside from the peaking of age seven the Black subjects in this sample appear to follow the developmental stages as described by Hemmendinger more closely than do the White subjects. This may reflect a difference in diagnosing so that Black subjects with the same diagnosis

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[1]Personal communication from Dr. Hertz to Dr. Gerstein with a copy for this author.

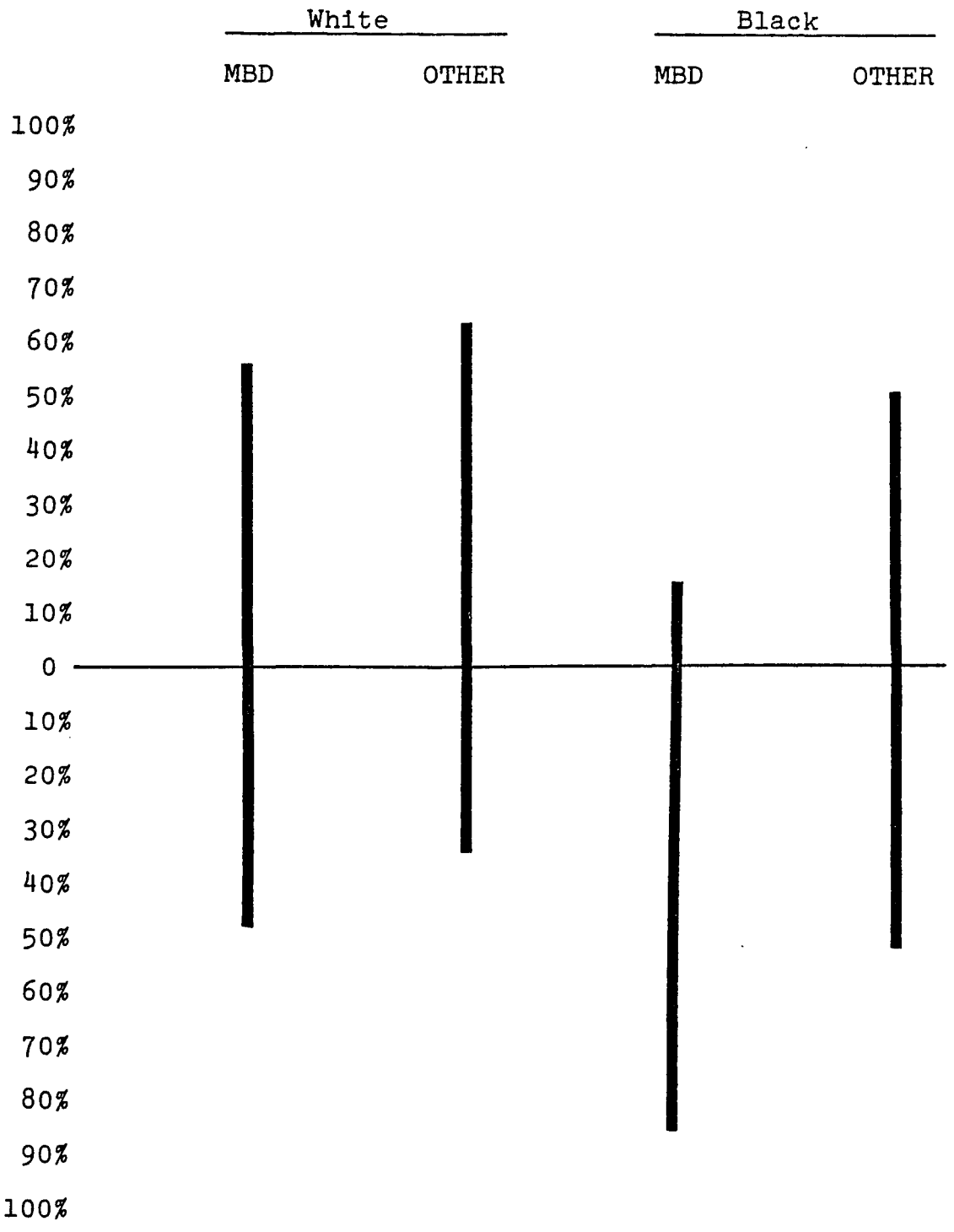
[2]Hemmendinger, p. 164.

as White subjects are in fact less disturbed.

Fabulized Combinations and Contaminated Responses also distinguish between the ages, with an increase in FabC's at age six which is significantly different than age five, and increases in ConR for the OTHER Ss, with ages six and eight significantly different than ages five and seven. The differences in these responses seem to reflect the emotional disturbance of the children coming in, but the total number of responses, thirteen for ConR and twenty-five for FabC, preclude any but the most tentative conclusions.

Diagnosis

The Minimal Brain Dysfunction children appear to perform differently from the emotionally disturbed children, although there is considerable overlap in some areas. While differences vary from subgroup to subgroup, enough exist so that it is clear that there is a separate diagnostic category that can be described objectively in terms of developmental functioning: (1) MBD subjects are lower on overall developmental level although establishing a cut-off score does not significantly distinguish between the diagnostic groups for Whites and there is considerable overlap for the Blacks (Figure 7). (2) MBD subjects have a tendency to produce lower level Whole responses, primarily Amorphous Wholes. Their



(cutting point 2.90)

Fig. 7. % Distribution of DL for Diagnosis by Race

difficulties in organization lead to a higher production of W- responses in Blacks and a lower production of Mediocre Wholes for males. (3) Fabulized Combinations, which are considered reflective of emotional disturbance, occur significantly more frequently for the emotionally disturbed group. Pẽna's (1953) study with cerebrally damaged adults indicated similar results. His experimental group gave "very few Fabulized Combinations and Contaminations in comparison with the schizophrenics."[1] Ames stated that "contamination . . . occurs quite normally from 4-1/2 through 5-1/2 years of age. Similarly, confabulated responses occur in apparently quite normal subjects at all age levels from 4 through 7 years of age with the exception of 6 years."[2] Within this clinic population, however, the scores distinguish between the two diagnostic groups.

Pẽna found that the cerebrally damaged group functioned more immaturely than other adults, but differently from the emotionally disturbed subjects. While this appears to be primarily true for the children with MBD (including the ConR results at age five which indicate

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[1]Pẽna, Journal of Projective Techniques, 1953.

[2]Louise Ames, Janet Learned, Ruth Metraux, and Richard Walker, Child Rorschach Responses: Developmental Trends from 2-10 Years (New York: Paul B. Hoeber, Inc., Medical Book Dept., Harper and Bros., 1952), p. 281.

greater immaturity for the MBD group), one exception does exist. The White MBD subjects gave significantly more D+ responses. This finding is consonant with the concept of MBD children as being more responsive to details within situations, but dissonant with all other evidence regarding their difficulty in organizing percepts.

One can speculate that this result reflects the cultural training within White homes where there may be an emphasis on school and other tasks requiring organization of details. This would be qualitatively different from the process by which the Black seven year olds acquire and produce integrated D's since it occurs for only this small segment of the population. The trend for Blacks is consistent with the concept of MBD Ss as less mature since Black MBD Ss give fewer D+ responses. The results indicate that MBD patients can be distinguished from emotionally disturbed children on the basis of their perceptual functioning, with the emotionally disturbed children giving a developmentally higher set of responses.

Race

The most dramatic and confusing results of this study have to do with the differences between the two ethnic groups. These differences are noticeable in the age interactions and in the comparisons between the ethnic groups. In contrast with the results of Gerstein,

Brodzinsky, and Reiskind (1976). Black Ss were found to perform at a lower developmental level than White Ss. This may be due to the difference in IQ range between the two studies, particularly since that aspect of the DL score which best discriminates between the racial categories is also the aspect most related to IQ (see appendix C).

When the individual scores were investigated, it was found that seven year old Black Ss produced significantly more W-, Dd, and Dd- responses than did White Ss of the same age. Furthermore eight year old Black Ss produced fewer Mediocre D's than did eight year old White Ss. In the other direction, White Ss produced significantly more Vague Wholes and Details. This low level response may reflect less integrative capacity for the White Ss than for the Black Ss, who produce more integrated D's at the seven year old level, or it may indicate the next step up from the minus level response and in that way be consistent with the DL score.

As yet it is unclear as to why these differences exist. They may reflect physiological differences; however, it is more likely that they are due to cultural differences between the two groups. There may be practical reasons why the Black child is more alert to details in the environment. This would be especially true

for the street-wise child. The lower DL score may be due to the fact that many Black children are not exposed to the same developmental tasks that exist for White children. The fact that Gerstein, Brodzinsky, and Reiskind (1976) found a significant difference in the other direction for their low IQ group (Black Ss scored higher than White Ss on DL) would seem to support this speculation. The cultural differences may increasingly handicap Black children with age. At this point, the two groups cannot be considered to be equivalent.

Future Implications

This research involved so many variables and generated so much data that it seems useful to restate the intentions of the thesis before discussing its implications. Prior to this study, there had been no systematic investigation of the effects of sex, race, and diagnosis on the developmental level scores of children. The major purpose of this study was to be an exploratory investigation of the effects of these variables including the usefulness of the scoring system when they were included. As a first step exploration, it provides some implications for future research and for clinical consideration.

Research

One clear implication for future researchers is that they must find a way of dealing with cross-classifications. It is necessary to use a multivariate approach. The importance of the interaction effects has emphasized the need to include more than one sex, age, or ethnic group when investigating this area.

The question of the homogeneity of the diagnostic groups has been raised and left unclarified. Some differences may not have appeared because of an overlap between the categories. Other investigators may wish to ascertain more precisely the degree of homogeneity in their diagnostic groups. One possible way of handling this might be to include a behavior rating scale which could be used descriptively or as a screening technique.

Future investigators may also wish to control more precisely for SES by using some of the existing rating scales. There is the possibility that this factor may affect developmental stages. It might also be of interest to see whether the socioeconomic status of the patients affects the way in which they use the clinic.

The results of this study showing MBD children to be less mature perceptually than emotionally-disturbed children provide a beginning point for further experimentation. This difference could be examined using other

areas of behavior in addition to performance on the Rorschach.

One of the major findings of this thesis was the difference in developmental levels between the Black and White subjects. The next logical step is to check this out with a non-clinic population. It is important to discover whether the differences are a phenomenon of the clinic population or whether they reflect general developmental patterns. It would also be appropriate to confirm the presence of these differences in other clinics to ensure that they are not a consequence of some other variable operating only in this sample.

The use of non-clinic subjects would be a way of providing additional normative data using these variables. The age range could be extended to correspond to that of Hemmendinger. Diagnostic differences could be included in such a study by comparing a "normal" group with a clinically diagnosed group. If this were done, intensive screening would have to be performed in order to obtain the "normal" subjects.

In terms of the scoring system, further research is needed to isolate those scores which best differentiate between categories. The possibility of score patterns should also be investigated. This complex task would be accomplishable because of the advent of computers.

A computer could be programmed to search for patterns which could then be tested in other samples.

Clinical

There are several implications of particular relevance for the clinician. Primarily, clinicians need to be extremely cautious when diagnosing patients, especially children, from different ethnic groups. This study implies that there may be developmental differences which need to be taken into account. If Black and White children mature differently, then behavior which would appear disturbed for a White seven year old might be age-appropriate for a Black seven year old. Until these differences are clearly delineated, clinicians need to be aware of the possibilities and to diagnose with care. In clinics with mixed ethnic groups populations, it might make most sense to have clinicians from each group available for consultation.

While conclusions from the data must of necessity be somewhat tentative, there are signs which the clinician can utilize when diagnosing children of these ages. The presence of FabC or ConR, particularly in the older children, appears to be indicative of emotional disturbance. Their presence would seem to be evidence against a primary diagnosis of MBD, although that might still be a secondary factor. For White children, the presence of

Wa responses, particularly in combination with D+ responses, would seem to indicate that MBD is the primary diagnosis. While some of these conclusions may be applicable to Black children, care should be taken before making assumptions. If the Hertz tables are used, the high W- response may indicate MBD in Black children; however, there is still some question as to whether MBD has the same definition for both ethnic groups and this needs to be carefully determined.

Beyond the data, I have gained certain impressions which interacted with my own clinical impressions and which may have bearing for other clinicians. The first of these is with regard to the scoring system. The overall DL score was not particularly useful for distinguishing the clinical groups. The difference between means, although significant, was small and precluded setting a cut-off limit. Moreover, it is unclear as to what is being measured. Since the score did not distinguish between the four age groups, it is uncertain whether the groups were blurred because of emotional and organic problems or whether the score is not a reflection of overall developmental functioning. It has certainly been of use in several research studies where some social action is predicted with adults; however, it is not efficient when discriminating between groups of children.

The individual scores prove to be of more use in discriminating categories. With further research, it is conceivable that they could be of great help in diagnosing children. They are of more use than a combined score in this type of research because specific aspects of perceptual functioning are quantified.

Research in this area is rewarding but complicated because of the difficulties in establishing precision. The Friedman Developmental Level Scoring system proves to be a useful way for the clinician to analyze the Rorschach. This does not mean that the more subjective aspects should be ignored; this tool provides an objective technique for analyzing the way in which an individual organizes his world, perceptually and otherwise. As research in this area continues, it is especially important that the information which is gathered is fed back to the practicing clinician in a practical form. There is a need for pertinent research to aid the clinician in his tasks. The present study was not sufficient to establish this scoring system as a diagnostic tool for the clinician. It has shown it to be of use, and there are indications that with further research, rules could be established that would permit it to be used effectively as a diagnostic instrument.

APPENDIX A

LIST OF SCORES AND COMBINATIONS OF SCORES

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LIST OF SCORES AND COMBINATIONS OF SCORES

Weights	Scores	
6	W++	"A response in which a unitary blot is perceptually articulated and then reintegrated into a well-differentiated unifying whole, the specific form of which matches the blot."[1]
5	W+	"A response in which all the discrete portions of a broken blot are combined into a unifying whole and in which the specific form implied in the content matches the blot."[1]
4	Wm	"A mediocre response in which the gross outline and articulation of an unbroken blot are taken into account so that the specific form implied in the content matches the blot."[1] For this thesis the same score was applied to a broken blot which fit the criteria.
3	Wv	"A vague response in which there is a diffuse general impression of the blot. Although some form element is present, it is of such an unspecific nature that almost any perceptual form is adequate to encompass the content."[1]
1	Wa	"An amorphous response in which the shape of the blot plays no determinable role. Such responses are based solely on chromatic or achromatic aspects of the blot, and in customary scoring procedure, no form element would be included in the score."[1]

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[1]Friedman, Journal of Projective Techniques, pp. 173-174.

Weights	Scores	
1	W-	"A response in which the content produced requires a definite specific form, which, however, is not provided by the blot. (Goodness of match between blot and content is based upon the plus and minus form tables . . . of . . . Hertz . . .)."[1]
1	DW	"Rorschach's confabulatory response, in which 'a single detail, more or less clearly perceived, is used as the basis for the interpretation of the whole picture, giving very little consideration to the other parts of the figure' (Rorschach, 1942)."[1]
6	D++	"A response to a D location where there is both the articulation and reintegration into a percept of good form level."[2]
5	D+	"A response in which two or more discrete blot areas (two or more D) are combined into one percept, the specific form of which matches the blot."[1]
4	DM	"An F+ response to a single D area, where the content has definite form requirements, but where the blot is not broken down and reintegrated."[2]
2	Dv	"A vague response to a D area, the content of which involves unspecific form demands. Analogous to the Wv response, the Dv response may be attributed to practically any D area."[2]
2	Da	"An amorphous response given to a D location."[2]
2	D-	"A response to a D location which, according to normative tables, is classified as being minus."[2]

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[1]Ibid.

[2]Goldfried, Stricker, and Weiner, Rorschach Handbook of Clinical and Research Applications, pp. 22-26.

Weights	Scores	
2	DdD	"A confabulatory response, where the response to a D area is generalized from what is seen in a Dd area. As is the case with the DW score, it is important to determine that the Dd percept was in fact responsible for the response to the D area."[2]
1	FabC	"A Fabulized Combination in which two or more acceptably interpreted areas are combined, on the basis of spatial relationship, into one absurd percept."[1]
1	ConR	"A Contaminated response, in which two interpretations to the same area are fused into one."[1]
3	Dd+	A response to a Rare Detail location as determined by Beck which is of plus form level.
2	Dd-	A response to a Rare Detail location as determined by Beck which is of minus form level. Form level is determined by the Hertz Frequency Tables.

For the purposes of this study, several combinations of scores were inspected statistically. They are:

Total W	W++ + W+ + Wm + Wv + Wa + W- + DW
Good W	W++ + W+
Total D	D++ + D+ + Dm + Dv + Da + D- + DdD
Good D	D++ + D+
Dd	Dd+ + Dd-
FC	FabC + ConR

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[1]Friedman, Journal of Projective Techniques, pp. 173-174.

[2]Goldfried, Stricker, and Weiner, Rorschach Handbook of Clinical and Research Applications, pp. 22-26.

APPENDIX B

RULES FOR SCORING

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RULES FOR SCORING

1. Use Beck's location scores.
2. Two or more Usual D's = D.
3. Two or more D's in arbitrary combination = Dd.
4. Dd scored "+" or "-" by form level not integration.
5. Use Hertz's tables for form level.
6. When not clear if W or *W* use original scorer's decision. Whenever location not otherwise determinable, use original.
7. *W* determined by less than or 1/8 missing. (This is a cut-off W).
8. When similar percepts occur in different directions (∧V), it should be scored twice; when it is the same percept although the card is turned (V∧), it is scored once. (Ex: on card V bat and butterfly with the head once at the top and once at the bottom = twice; with the head at the bottom and the bat described as right side up and upside down = once.)
9. In cases without adequate inquiry, give benefit of the doubt and score higher.
10. When integration occurs after questions in the inquiry, do not score.
11. Always check to see if additional information is given in inquiry <u>or after questions</u> and rate it accordingly.
12. Use Fab/C only as a perceptual score in general ignoring emotional attributes.
13. When animals are attributed with human qualities, permit it and do not score Fab/C for children. Affective or interactional qualities where human attitudes are added to animals are acceptable.

14. If two people are doing something, score "+" for integration even if they are not stated as being together.

15. Score W++ for a response in which a unitary blot (I, IV, V, VI, IX) is "perceptually articulated and then reintegrated into a well-differentiated, unifying whole, the specific form of which matches the blot."

16. Score W+ when "all the discrete portions of a broken blot are combined into a unifying whole, and in which the specific form implied in the content matches the blot."

17. Score Wm for "A mediocre response in which the gross outline and articulation of an unbroken blot are taken into account so that the specific form implied in the content matches the blot." (Card VII is included with unbroken blots in this category for those responses which imply a "U" shape.)

18. W responses to broken blots which do not include integration are also scored Wm.

19. Score W- for a "response in which the content produced requires a definite specific form, which, however, is not provided by the blot."

20. A "-" score supercedes all other scoring except Fab/C, Con/R, DW, or DdD. Form level must be "+" to score integration, vague, or amorphous.

21. Score Wv for "a vague response in which there is a diffuse general impression of the blot. Although some form element is present, it is of such an unspecific nature that almost any perceptual form is adequate to encompass the content."

22. Score Wa for "an amorphous response in which the shape of the blot plays no determinable role. Such responses are based solely on chromatic or achromatic aspects of the blot, and in customary scoring procedure no form element would be included in the score."

23. "v" and "a" can be differentiated in that if any shape is implied it is scored "v," i.e., blood splotch is "v" while blood is "a."

24. Scores follow the same format and rules for D locations. D++ involves one D; D+ involves two or more D's.

25. DW is a confabulatory response where content is generalized to the whole on the basis of what is seen in a D area. DW must have supporting evidence that entire percept was based on response to D area from either inquiry or free association.

26. DdD follows same rules as above.

27. Fab/C occurs when two or more separately interpreted areas are combined on the basis of their spatial relationship; the resulting response is a percept which does not usually occur in nature.

28. ConR is a score given when two separate responses are fused and attributed to the same area of a blot.

29. Score a response twice if either of these two criteria are met:

    a. there are at least two scorable, non-identical contents which occur in free association
    b. if one of the contents introduced in the inquiry is of "-" form level.

30. Do not score a response twice if either of the two following criteria are met:

    a. a new percept which does not modify the original percept is developed in the inquiry
    b. two or more contents occur in free association but one meets all of these criteria:

        1. occupies approximately less than 1/4 of the figure percept
        2. contains only form as determinant
        3. falls into class of mediocre responses

31. Do not score percepts rejected in free association.

32. Score percepts rejected in inquiry only if location can be determined.

33. Card IV minus lower phallic area (Beck's D) = W.

34. Score all additionals.

35. If the integrated percept is "-" and the included secondary content is "-," score as two "-" responses.

36. In a "-" integration, if one part is a "+," it should be scored.

APPENDIX C

THE CORRELATION OF IQ AND THE DEVELOPMENTAL LEVEL SCORES

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THE CORRELATION OF IQ AND THE DEVELOPMENTAL LEVEL SCORES

The relationship between IQ and the Friedman developmental scores, including DL, has been peripherally discussed in several studies (notably Goldfried, 1962; Friedman and Orgel, 1964; and Kissel, 1965). Because the issue has been mentioned and as a matter of interest, Analyses of Covariance (COANOVA) with IQ as the covariate were also conducted. With the exception of three main effects, these analyses yielded similar results to the Analyses of Variance (ANOVA).

On the analysis of the composite DL score, both significant effects (Diagnosis and Race) were not significant on the COANOVA. The most direct interpretation of this disappearance is that when that part of the DL variance which is linearly independent of IQ (as determined by the WISC and Stanford-Binet) is analyzed, there are no significant effects. This part of the DL score does not differentiate between the groups.

A similar conclusion can be reached for the Wv response where the significant Race effect on the ANOVA disappears on the COANOVA. In this case, there is some indication of a trend in the same direction ($p=.101$; $p=.099$; $p=.999$). The correlation of Wv and IQ is

significant though small, r=.12.

The correlations between IQ and the scores range from .00 to .42. For the interest of the reader, the correlations between IQ and DL are listed here in total and by subject categories.

Total	.27
MBD	.36
OTHER	.20
White	.24
Black	.25
Male	.26
Female	.30
5 yr.	.23
6 yr.	.36
7 yr.	.26
8 yr.	.25

APPENDIX D

TABLES OF MEAN NUMBER OF RESPONSES IN EACH SCORING CATEGORY BY DIAGNOSIS, RACE, SEX, AGE, AND INTERACTIONS

	White Male MBD			
	5	6	7	8
n	9	13	7	8
W	6.89	8.15	7.71	7.0
GW	.78	.77	.86	.37
W++	.22	.08	.29	.13
W+	.55	.69	.57	.25
Wm	2.33	3.31	3.29	2.75
W-	2.44	2.46	2.71	2.5
Wv	.67	.85	.85	1.13
Wa	.67	.77	N	.25
DW	N Ø	N Ø	N Ø	N Ø
D	11.44	5.31	10.57	8.75
GD	1.33	.08	.57	.50
D++	.11	N Ø	N Ø	N Ø
D+	1.11	.46	1.57	.63
Dm	5.33	2.31	4.71	3.63
D-	4.0	2.23	3.14	3.37
Dv	.55	.31	.71	1.0
Da	.22	N Ø	.43	.13
DdD	.11	N Ø	N Ø	N Ø
Dd	1.34	.08	.57	.50
Dd+	.67	N O	.43	.37
Dd-	.67	.08	.14	.13
FC	.44	.08	N Ø	N Ø
Fab/C	N Ø	.08	N Ø	N Ø
Con/R	.44	N Ø	N Ø	N Ø
No.Resp.	20.78	14.15	19.14	16.5
IQ	115.5	95.0	94.14	95.63

N Ø = No response was given.

	White Male Other			
	5	6	7	8
n	20	20	19	18
W	7.75	7.60	7.84	6.67
GW	1.1	.8	1.21	.83
W++	.15	.20	.37	.22
W+	.95	.60	.84	.61
Wm	3.55	2.90	3.74	3.44
W-	2.2	3.05	2.16	1.61
Wv	.75	.75	.42	.67
Wa	.15	.10	.31	.11
DW	N Ø	N Ø	N Ø	N Ø
D	6.7	6.65	8.21	10.83
GD	.40	.35	.84	1.11
D++	N Ø	N Ø	.05	N Ø
D+	.60	.35	.42	.50
Dm	3.40	3.70	4.26	6.11
D-	1.90	2.20	2.63	3.72
Dv	.75	.30	.74	.50
Da	.05	.10	.11	N Ø
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.40	.35	.85	1.11
Dd+	.25	.15	.53	.78
Dd-	.15	.20	.32	.33
FC	.05	.40	.16	.39
Fab/C	.05	.35	.16	.17
Con/R	N Ø	1.0	N Ø	4.0
No.Resp.	15.25	15.2	17.53	19.39
IQ	114.1	112.5	108.0	108.7

N Ø = No response was given.

	White Female MBD			
	5	6	7	8
n	3	2	3	3
W	7.67	5.0	7.33	5.67
GW	.67	1.5	1.33	.33
W++	.33	.50	.33	N Ø
W+	.33	1.0	1.0	.33
Wm	3.67	1.5	3.67	3.33
W-	1.33	2.0	2.0	1.33
Wv	1.67	N Ø	.33	.67
Wa	.33	N Ø	N Ø	N Ø
DW	N Ø	N Ø	N Ø	N Ø
D	5.67	10.0	8.33	12.33
GD	.33	.50	N Ø	.67
D++	N Ø	N Ø	N Ø	N Ø
D+	1.0	.5	1.0	1.0
Dm	3.67	4.5	4.67	8.0
D-	.67	3.5	2.0	2.67
Dv	N Ø	1.0	.67	.33
Da	.33	.5	N Ø	.33
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.33	.50	N	.67
Dd+	N O	.5	N Ø	N Ø
Dd-	.33	N Ø	N Ø	.67
FC	N Ø	.50	N Ø	N Ø
Fab/C	N Ø	.5	N Ø	N Ø
Con/R	N Ø	N Ø	N Ø	N Ø
No.Resp.	14	16	16	19.33
IQ	105	81.5	89.33	95.33

N Ø = No response was given.

	White Female Other			
	5	6	7	8
n	18	21	24	20
W	6.72	7.95	7.42	7.1
GW	.67	.86	.87	.85
W++	.11	.19	.25	.20
W+	.55	.67	.63	.65
Wm	2.44	3.57	3.42	3.2
W-	1.94	2.43	2.08	1.75
Wv	1.5	.76	.87	.85
Wa	.17	.33	.17	.40
DW	N Ø	N Ø	N Ø	.05
D	6.27	9.14	7.54	11.40
GD	.17	.48	.25	.65
D++	N Ø	N Ø	N Ø	.05
D+	.39	.67	.71	.80
Dm	3.5	5.0	4.04	6.55
D-	2.28	2.67	2.17	3.15
Dv	.05	.67	.50	.65
Da	.05	.14	.13	.20
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.17	.48	.25	.65
Dd+	.17	.48	.21	.45
Dd-	N Ø	N Ø	.04	.20
FC	N Ø	.38	.17	.15
Fab/C	N Ø	.14	.17	.10
Con/R	N Ø	.24	N Ø	.05
No.Resp.	4.37	5.44	4.32	7.82
IQ	107.4	106.2	106.9	111.9

N Ø = No response was given.

	Black Male MBD			
	5	6	7	8
n	6	1	2	6
W	5.67	8.0	9.0	8.67
GW	1.17	1.0	N Ø	N Ø
W++	.33	N Ø	N Ø	N Ø
W+	.83	1.0	N Ø	N Ø
Wm	2.0	3.0	3.0	3.5
W-	1.83	3.0	5.5	3.33
Wv	.50	1.0	.5	1.0
Wa	.17	N Ø	N Ø	.67
DW	N Ø	N Ø	N Ø	.17
D	4.33	3.0	.50	8.17
GD	.17	N Ø	N Ø	.50
D++	N Ø	N Ø	N Ø	N Ø
D+	.33	N Ø	N Ø	.33
Dm	1.67	2.0	.5	3.5
D-	1.67	1.0	N Ø	3.67
Dv	.50	N Ø	N Ø	.17
Da	.17	N Ø	N Ø	.50
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.17	N Ø	N Ø	.50
Dd+	.17	N Ø	N Ø	.33
Dd-	N Ø	N Ø	N Ø	.17
FC	N Ø	N Ø	N Ø	N Ø
Fab/C	N Ø	N Ø	N Ø	N Ø
Con/R	N Ø	N Ø	N Ø	N Ø
No.Resp.	11.67	12.0	10.0	18.33
IQ	85.5	72.0	84.5	84.67

N Ø = No response was given.

	Black Male Other			
	5	6	7	8
n	16	13	18	23
W	8.13	7.31	7.33	8.35
GW	.50	.85	.67	1.30
W++	.06	.38	.11	.26
W+	.44	.46	.55	1.04
Wm	3.37	3.31	3.55	3.57
W-	3.31	3.0	2.5	2.52
Wv	.5	.15	.44	.74
Wa	.44	N Ø	.17	.22
DW	N Ø	N Ø	N Ø	N Ø
D	4.75	8.54	10.5	7.69
GD	.19	.46	2.17	.96
D++	N Ø	N Ø	N Ø	N Ø
D+	.37	.61	.72	.43
Dm	2.56	4.54	5.33	4.13
D-	1.37	3.23	3.55	2.57
Dv	.19	.08	.50	.43
Da	.25	.08	.39	.13
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.18	.46	2.16	.96
Dd+	.12	.23	1.11	.39
Dd-	.06	.23	1.05	.57
FC	N Ø	.08	.22	.17
Fab/C	N Ø	.08	.22	.04
Con/R	N Ø	N Ø	N Ø	.13
No.Resp.	13.31	16.54	20.28	17.57
IQ	101.0	97.54	101.6	102.0

N Ø = No response was given.

	Black Female MBD			
	5	6	7	8
n	2	1	0	0
W	8.0	12.0		
GW	.50	N Ø		
W++	N Ø	N Ø		
W+	.5	N Ø		
Wm	4.0	3.0		
W-	2.5	9.0		
Wv	1.0	N Ø		
Wa	N Ø	N Ø		
DW	N Ø	N Ø		
D	3.50	11.0		
GD	1.0	N Ø		
D++	N Ø	N Ø		
D+	N Ø	N Ø		
Dm	2.0	4.0		
D-	1.0	7.0		
Dv	.5	N Ø		
Da	N Ø	N Ø		
DdD	N Ø	N Ø		
Dd	1.0	N		
Dd+	1.0	N Ø		
Dd-	N Ø	N Ø		
FC	N Ø	N Ø		
Fab/C	N Ø	N Ø		
Con/R	N Ø	N Ø		
No.Resp.	14.5	18.0		
IQ	98.0	19.0		

N Ø = No response was given.

	Black Female Other			
	5	6	7	8
n	4	5	7	9
W	7.25	7.40	5.86	8.55
GW	.50	.20	.57	1.22
W++	.25	N Ø	.14	.22
W+	.25	.20	.43	1.0
Wm	2.75	3.0	3.43	3.55
W-	3.75	3.6	1.14	3.0
Wv	.25	N Ø	.29	.78
Wa	N Ø	.60	.43	N Ø
DW	N Ø	N Ø	N Ø	N Ø
D	5.25	5.2	9.86	8.67
GD	.25	1.20	2.14	1.67
D++	.25	N Ø	N Ø	N Ø
D+	.75	N Ø	.71	.78
Dm	2.75	3.6	5.43	4.11
D-	1.25	1.4	2.43	2.22
Dv	.25	.20	.71	1.11
Da	N Ø	N Ø	.57	.44
DdD	N Ø	N Ø	N Ø	N Ø
Dd	.25	1.20	2.14	1.66
Dd+	.25	.20	.71	1.44
Dd-	N Ø	1.0	1.43	.22
FC	N Ø	.40	N Ø	.11
Fab/C	N Ø	.20	N Ø	N Ø
Con/R	N Ø	.20	N Ø	.11
No.Resp.	13.25	14.6	18.0	19.0
IQ	101	90.2	95.43	98.44

N Ø = No response was given.

Category	n	W	GW	W++	W+	Wm	W-	Wv
MBD	66	7.4	.68	.17	.51	2.98	2.57	.80
OTHER	255	7.51	.87	.20	.67	3.34	2.39	.69
Black	113	7.72	.77	.17	.60	3.35	2.85	.51
White	208	7.48	.87	.21	.66	3.23	2.2	.82
Male	199	7.61	.86	.20	.66	3.30	2.55	.64
Female	122	7.31	.79	.18	.61	3.22	2.22	.83
Age 5	78	7.3	.78	.15	.63	2.97	2.42	.86
Age 6	76	7.7	.79	.20	.59	3.2	2.85	.59
Age 7	80	7.4	.88	.24	.64	3.5	2.25	.59
Age 8	87	7.5	.88	.19	.69	3.37	2.22	.80

GW = W++ + W+

GD = D++ + D+

FC = Fab/C + Con/R

N Ø = No response was given.

Category	n	Wa	DW	D	GD	D++	D+	Dm
MBD	66	.36	.01	7.74	.71	.01	.70	3.64
OTHER	255	.22	.00	8.17	.57	.01	.56	4.41
Black	113	.23	.01	7.47	.50	.01	.49	3.87
White	208	.26	.00	8.38	.64	.01	.63	4.46
Male	199	.26	.01	7.87	.56	.01	.55	4.01
Female	122	.24	.01	8.41	.67	.02	.65	4.64
Age 5	78	.27	N Ø	6.37	.58	.03	.55	3.28
Age 6	76	.29	N Ø	7.4	.47	N Ø	.47	3.96
Age 7	80	.20	N Ø	8.6	.72	.01	.71	4.50
Age 8	87	.24	.02	9.6	.61	.01	.60	5.14

GW = W++ + W+

GD = D++ + D+

FC = Fab/C + Con/R

N Ø = No response was given.

Category	n	D-	Dv	Da	DdD	Dd	Dd+	Dd-
MBD	66	2.71	.48	.20	.00	.47	.27	.20
OTHER	255	2.54	.49	.15	.01	.74	.44	.30
Black	113	2.46	.40	.24	.00	1.00	.52	.48
White	208	2.63	.53	.12	.00	.52	.35	.17
Male	199	2.68	.47	.15	.00	.74	.41	.33
Female	122	2.40	.52	.18	.00	.61	.41	.20
Age 5	78	2.0	.37	.13	.01	.40	.26	.14
Age 6	76	2.54	.37	.09	N Ø	.41	.24	.17
Age 7	80	2.64	.59	.24	N Ø	1.00	.54	.46
Age 8	87	3.06	.60	.18	N Ø	.90	.57	.33

GW = W++ + W+

GD = D++ + D+

FC = Fab/C + Con/R

N Ø = No response was given.

Category	n	FC	Fab/C	Con/R	No.Res.	IQ
MBD	66	.09	.03	.06	16.38	94.9
OTHER	255	.18	.12	.06	16.95	105.8
Black	113	.10	.06	.04	16.67	106.9
White	208	.19	.12	.07	16.92	97.3
Male	199	.16	.10	.06	16.77	103.3
Female	122	.16	.09	.07	16.94	103.9
Age 5	78	.06	.01	.05	14.74	106.4
Age 6	76	.27	.18	.09	16.09	101.9
Age 7	80	.14	.14	N Ø	17.65	102.6
Age 8	87	.17	.07	.10	18.60	103.3

GW = W++ + W+

GD + D++ + D+

FC + Fab/C + Con/R

N Ø = No response was given.

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