INTEGRATIVE INKBLOT PERCEPTION AS A FUNCTION
OF INTELLIGENCE OF INSTITUTIONALIZED
CHILDREN

APPROVED:

Major Professor

Minor Professor

Dean of the School of Education

Dean of the Graduate School
INTEGRATIVE INKBLOT PERCEPTION AS A FUNCTION
OF INTELLIGENCE OF INSTITUTIONALIZED
CHILDREN

THESIS

Presented to the Graduate Council of the
North Texas State University in Partial
Fulfillment of the Requirements

For the Degree of

MASTER OF ARTS

By

C. Dale Dodd, B.A.
Denton, Texas
January, 1965
# TABLE OF CONTENTS

LIST OF TABLES ................................. iv

Chapter

I. INTRODUCTION .............................. 1

Statement of the Problem
Theoretical Basis for Inferring Intellectual Functioning from Inkblot Perception
Clinical versus Psychometric Interpretation of Inkblot Perception
Intellectual Functioning Assessed by the California Short-Form Test of Mental Maturity
Hypotheses

II. REVIEW OF RELEVANT LITERATURE ........ 17

III. METHODOLOGY ............................ 24

Subjects
Description of the Instruments
Procedure

IV. STATISTICAL ANALYSIS OF DATA ........ 35

V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS 41

BIBLIOGRAPHY ............................... 43
LIST OF TABLES

Table                                                                                           Page

I.  Product-moment coefficients of partial correlation
    of the experimental variables . . . . . . . . . . 36

II. Levels of significance of the product-moment
    coefficients of partial correlation of the experi-
    mental variables. . . . . . . . . . . . . . . . . . 37
CHAPTER I

INTRODUCTION

The assessment of human intelligence has long been an area of interest in the field of psychology. Many workers have defined intelligence and have developed instruments which have purported to measure the constructs which they have delineated. With the introduction of factor analysis has come a clarification of some of these disparate and frequently redundant constructs. Today many psychologists are able to concur in what constructs are implied by the rubric "intelligence."

Traditionally employed instruments for intellectual assessment are largely structured. By "structured" it is meant that the responses to the test stimuli are restricted to a discrete set predetermined by the test format. Tests such as the Stanford-Binet, the Weschsler scales, the Raven Progressive Matrices, and the California Test of Mental Maturity represent structured measures of intelligence.

Perhaps the most representative of the unstructured approaches to intellectual evaluation is the Rorschach technique. Responses to ambiguous stimuli are given few restrictions. Typically, the examiner explicitly encourages freedom of expression. Only in the inquiry
phase does the technique assume any real structure. The Rorschach and similarly unstructured instruments are properly classified as projective techniques. The term "projective" is used to imply that the perceptual idiosyncracies of the testee are reflected by his free responses to ambiguous stimuli. The concept rests largely upon the assumption that factors other than the testee do not influence the response. The less structured the instrument, the more the individual projects of himself.

Projective techniques are generally focused upon personality assessment and not upon what is thought of as "intellectual" measurement. The Rorschach is chiefly used to derive structural personality configurations and is usually limited to qualitative evaluation of intelligence. Recently, however, several attempts have been made to develop psychometric indices of intelligence from inkblot perception tasks. This effort was initiated largely by the work of Beck with the Rorschach.

The present study seeks to establish the validities of the several measures of intelligence that have been developed from inkblot perception theory. Basically, each of these indices is correlated with intelligence criteria, intelligence quotients from the California Short-Form Test of Mental Maturity. Selected inkblots from the Holtzman Inkblot Technique comprise the stimuli for responses scored for the various factors under study. Criteria for scoring the inkblot responses are
derived from the theoretical formulations of Beck (1), Phillips (6) and Holtzman (4).

Current clinical practice in psychology frequently makes use of the Rorschach as an instrument for personality evaluation. Its place in a typical diagnostic battery is firmly rooted in many clinical settings. With some testees it may be desirable to limit the extensity of such a battery. Particularly with children the maintenance of adequate rapport becomes a problem when testing is prolonged. When shortening of the battery is indicated the decision to eliminate a particular test is made primarily upon a consideration of its usefulness in providing information relative to the diagnosis. A test which can perform several diagnostic functions is, thus, preferable to one measuring only a single function. The ability to achieve a valid index of intelligence from an instrument rich in personality information would represent a considerable savings in time and expense.

A significant advantage of a projective technique, such as the Rorschach, over the traditional intelligence test is the minimal transparency of the former. Many testees impair their performance on an intellectual scale because they experience emotional reactions to their perception of the purpose of the scale. This reaction may be specific to the testing situation, thus distorting the picture of the person's intellectual functioning in his usual environmental context. Such emotional arousals are more apt to occur with group testing than with an individual
administration where the examiner can better meet the special needs of the testee.

For the foregoing reason and others, an inkblot perception technique is highly desirable for group testing. The stimuli are interesting and motivating to most subjects. While more structure is necessarily introduced into the response format, the group administration remains essentially projective.

Finally, inkblots represent largely "culture free" stimuli. Only norms for the evaluation of responses require cultural specificity. Inkblots are likewise quite stable stimuli over long periods of time, necessitating only infrequent revision of norms. On the other hand, many structured assessment techniques are quite culture dependent and require revision of the stimuli with time.

Theoretical Basis for Inferring Intellectual Functioning from Inkblot Perception

Herman Rorschach briefly recognized the role of an integrative process in inkblot perception as related to cognitive process. Thus, he states that "the number of W is, before all, index to the energy at one's disposal for the organization drive . . . . An optimum of these abilities is a further component of intelligence" (7, p. 63). Rorschach apparently considered the movement determinant a factor in the organization of the percept. With reference to plate III of the Rorschach, he writes, "the legs of the figures are separated off from the rump. It
requires, most likely, a primary movement experience to enable one to transcend this dividing point" (7, p. 26). In his interpretation of the testee's mode of approach, Rorschach emphasized more qualitative features than quantified assessment of intellectual level. Rorschach considered W and M to be the principal indicators of intelligence in his test, while F+ per cent and A per cent were considered lesser signs.

Beck (1) has given a more comprehensive theoretical formulation of intelligence as inferred from the Rorschach. While largely in agreement with the notions of Rorschach, Beck has greatly elaborated the use of perceptual determinants to index intellectual functioning. His Organization Activity, Z, represents a composit of several perceptual integration determinants into an intended index of intellectual function. Beck states, "the core criterion for Z is that S is building two or more percepts having no necessary relation to each other into a new unit percept, the meaning of which as a unit confers upon the organized details the meanings which the S sees in them" (1, p. 46).

That Beck believes Z to be an index of intelligence is clearly indicated in his writings. Referring to Z he states:

These totals vary directly as the intelligence of S. The Z factor has certain virtues not inherent in W. For one thing, it takes account of much Z activity that W misses. Second, since it is not scored in discrete units, as is necessary in the case of W, it makes it possible to take account of intermediate values and continuous distributions, and is thus a more flexible measure. Third, it is an index of the intellectual energy as such, irrespective of the kind of intelligence that S uses, something that does influence W.
Thus, $Z$ is a more accurate representative of the intelligence functioning per se. (2, p. 12).

Thus, it is apparent that Beck would expect a high positive correlation between $Z$ and intelligence criteria. He would not, however, anticipate such a relationship between $W$ and intelligence, looking upon $W$ as more an indicator than an index of intelligence.

Beck has outlined a rather explicit guide for scoring $Z$. His criteria are:

1. All $W$ is $Z$.
2. Any two or more component elements of a figure may be organized into relationship. The unit may then consist of two or more $D$, $D$ with $Dd$, $Ds$, or $Dds$, or any combination of these.
3. The meaning reported by $S$ must belong to the larger organized material.
4. All $Z$ must be in responses determined in part, at least, by form. Responses determined entirely by color, $C$, or by light values, $Y$, therefore, cannot be $Z$.
5. The portions organized need not necessarily be external to each other, since subjects will sometimes analyze and re-synthesize a figure or detail.
6. Mere presence of contours between two details is not ipso facto evidence of $Z$. Certain portions of the figures are broken up by contours but are frequently selected as units without any $Z$ activity. Examples will be found among the responses listed as not $Z$.
7. When two or more kinds of $Z$ occur in the same response, the one of higher value is credited.
8. In those precision alternatives that need to be scored, $Z$ is credited only once.

In those descriptive-art responses that are sufficiently more than description to be scorable, $Z$ is not scored. In all responses the burden of proof is on the response before it can be scored $Z$ (1, pp. 47-48).

Ainsworth's (5, pp. 352-360; 412-413) interpretation of the Rorschach includes specific reference to the assessment of intelligence. She points
out that obtained low correlations between Rorschach indices and intelligence scales can be accounted for by two factors. First, she believes that the test formats, unstructured versus structured, are contexts of expression that interact differentially with the personality dynamics of the testee. Thus, some individuals may demonstrate greater intellectual performance when given the limits of a structured test of intelligence. The same individual might perform poorly where fewer limits upon his test expression are imposed, as in the Rorschach. Secondly, Ainsworth contends that it is the amalgam of various signs that produces a really valid Rorschach index of intelligence. She cites illustrative studies wherein correlations ranged from 0.35 to 0.78, utilizing single factors and a combination of factors, respectively.

Ainsworth lists six factors to be evaluated in the assessment of intellectual level for the Rorschach. In general, she follows Rorschach's original suggestions but emphasizes the importance of form level in utilizing W and M as indices. She also includes Original (O) responses and the percentage of responses other than Human (H), Human Detail (Hd), Animal (A), and Animal Detail (Ad). Ainsworth's contention is that these factors must be considered in terms of their interactions with personality idiosyncrasies before intellectual level may be inferred. Thus, she does not offer a concise index such as Beck's Z.

Phillips (6) and his associates have elaborated the concept of inkblot perceptual organization as developed by Beck. They recognize
four discrete constructs as related to this integrative process. In each case scoring is contingent upon three preliminary criteria: Form Definiteness (FD), Form Appropriateness (FA), and Pathognomic Verbalization (V). By FD is meant the form specificity of the percept, aside from any consideration of the stimulus. Thus, a "knight in armor" is a more form definite percept than "milk spilled on the floor." Form Appropriateness is the authors' term for F+. Pathognomic Verbalization is a category subsuming several concepts such as confabulation, incoherence, autistic logic and contamination. Tabular criteria are available for scoring FD, FA and V. Both FD and FA must achieve a minimal score, and V must not exceed a maximal value for a percept to be evaluated for the various integration categories.

Functional Integration is scored if the percept contains two or more discrete and conceptually independent sub-percepts in movement in relation to one another. The category thus makes use of M.

Collective Integration implies a clustering or grouping implicit within the percept. The collection must, however, be of a conceptual, categorizing nature as opposed to simple enumeration.

Positional Integration involves a spatial relationship between two or more units of the percept. The relationship may be static or animate, but must be dependent upon a spatial factor. Very simple spatially related percepts such as "a man in a coat" are considered only as verbalistic elaborations and are not scored as Positional Integration.
Structural Integration is credited where a color-boundary functionally mediates two adjacent and discrete percepts. This integrative process usually involves the perception of two or more elements that are contained in different color areas of the blot respectively. The color-boundary concept is extended to color-white space connections, but apparently not to changes in shading intensity. To receive credit for Structural Integration C must be a determinant of each element of the integrated percept. The authors are unclear as to how a white space percept can be color determined.

Holtzman (4, pp. 64-66; 177) has adopted Phillips' four integration criteria as the components of his Integration Factor (I) as scored in the Holtzman Inkblot Technique (HIT). The factor is credited if any of the four criteria are met. Holtzman does not elaborate upon the rationale for an integration factor. He apparently accepts the theoretical assumptions of Phillips, who, in turn, embraces much of Beck. As with the Rorschach, tables of criteria exist for scoring FD, FA and V with the HIT. Holtzman reports significant correlations of I with various intelligence measures. The magnitude of these correlations has generally been about 0.30.

Clinical Versus Psychometric Interpretation of Inkblot Perception

Many authors have written in support of the "clinical" validity of the Rorschach. Generally, what is meant is that the Rorschach is of
practical value in facilitating the diagnosis of and therapeutic planning for clients. The instrument thus is not considered separate from its context in the diagnostic battery. Too, such clinical validity does not separate the examiner from the validation of the instrument. Other writers have argued for a strict empirical validation of the Rorschach as a psychometric instrument. Under the atomistic procedures of the latter approach, the Rorschach has generally failed to receive support. It seems apparent that these two positions represent extremes which are each inappropriate to any meaningful validation of the technique. Ainsworth summarizes the problem in her review of Rorschach validation techniques:

The fact that interpretative hypotheses are modified by the context of the configuration in which they appear presents a difficult dilemma in planning validation research. On the one hand it may be argued that if the discrete hypotheses cannot be shown to have some valid basis, a judgment based on the integration of these hypotheses can scarcely be valid. On the other hand, it seems equally justifiable to insist that validation research is irrelevant unless it tests out the hypotheses as they are actually used in practice. There is probably no simple or single solution to this problem. (5, p. 413).

While clinical validation need not be uncontrolled, impressionistic observation, it is rather difficult to adapt to the limitations of scientific methodology. Perhaps the best compromise lies in testing specific hypotheses derived from the theory purportedly utilized by the clinician. Of course, the clinician may possess better diagnostic validity with the Rorschach than his theory might indicate, but such is only his ineptness in formulating his actual position. Conversely, he may be
using a valid theory ineffectively. However, research must make some assumptions, and the assumption that the clinician's theory is the basis for his diagnostic efficacy represents a lesser limitation than does the fragmentation of the instrument. The present study tests both the validity of hypotheses derived from inkblot perception theory and of specific atomized indices. Thus, there is a basis for roughly comparing the two validation approaches in addition to the intended theoretical validation.

A further obstacle to Rorschach validation research is the psychometric inadequacies of the instrument. Particularly limiting is the variable number of responses, R, obtained from conventional Rorschach administration. Holtzman has expressed the problem in his monograph:

Providing a subject with only ten inkblots and permitting him to give as many or as few responses to each card as he wishes characteristically results in a set of unreliable scores with sharply skewed distributions, the majority of which fail to possess the properties of even rank-order measurements. (4, p. 8).

Fiske and Baughman (3) report that most Rorschach scores are complex, curvilinear functions of R. Linear regression methods and the use of percentage ratios are inadequate techniques for eliminating the confounding of R variability. Various attempts have been made to modify the administrations or scoring techniques to avoid this problem. Generally, these changes involve restriction of the number of responses or scoring only the first response to a card. Holtzman's technique restricts responses to one per blot when the full complement
of forty-five is used, but he recommends extension to two or perhaps three responses per blot when fewer cards are used.

Holtzman (4, pp. 11-28) indicates that many of his objectives have been accomplished with the development of the HIT. By restricting the number of responses, conducting an inquiry immediately following the response and, above all, using specially developed inkblots, he has overcome the principal psychometric limitations of the Rorschach. In general, variables scored on the HIT are highly reliable and less skewed than is typical with the Rorschach.

Intellectual Functioning Assessed by the California Short-Form Test of Mental Maturity

The California Short-Form Test of Mental Maturity (CTMM) (8) provides the intelligence criteria for the present study. This instrument yields Language Factor (LF), Non-Language Factor (NLF) and Total Mental Factors (TMF) intelligence quotients. The CTMM is a group administered, structured test of intelligence which enjoys a wide range of current application. It is, therefore, a meaningful criterion in terms of facilitating generalization of its correlates to a general population. The validity of this instrument is established by its high correlations with both the individually administered Stanford-Binet (S-B) and Wechsler Intelligence Scale for Children (WISC).

The Short Form CTMM is broken into four factors measuring "psychologically different processes." The manual reports "a
statistically strong communality of intelligence among them."

Of theoretical interest to the present study is the verbal, non-verbal dichotomy in the format of the CTMM.

The verbal CTMM factor consists of the test items mediated by language. Such items are in a sense more heavily structured than are the non-verbal items which rely less on verbal communication. Thus, the non-verbal problems of the CTMM might be expected to more closely resemble the task of inkblot perception than would the verbal CTMM items. A further reinforcement of this expectancy lies in the form perception dependency of many of the CTMM non-verbal items. As inkblot perception integration theories generally make use of a form perception quality, $F+$, the two tasks assume greater similarity. The CTMM manual reports a greater independence of CTMM LF and NLF intelligence quotients than exists with WISC Verbal and Performance intelligence quotients. The CTMM might well maximize the expected verbal, non-verbal correlation difference.

Hypotheses

Consistent with the theoretical formulations presented above, the following hypotheses were developed:

1. Beck's W significantly positively correlates with CTMM LF IQ.
2. Beck's W significantly positively correlates with CTMM NLF IQ.
3. Beck's W significantly positively correlates with CTMM TMF IQ.
4. Beck's M significantly positively correlates with CTMM LF IQ.
5. Beck's $M$ significantly positively correlates with CTMM NLF IQ.
6. Beck's $M$ significantly positively correlates with CTMM TMF IQ.
7. Beck's $Z$ significantly positively correlates with CTMM LF IQ.
8. Beck's $Z$ significantly positively correlates with CTMM NLF IQ.
9. Beck's $Z$ significantly positively correlates with CTMM TMF IQ.
10. Holtzman's FD significantly positively correlates with CTMM LF IQ.
11. Holtzman's FD significantly positively correlates with CTMM NLF IQ.
12. Holtzman's FD significantly positively correlates with CTMM TMF IQ.
13. Holtzman's FA significantly positively correlates with CTMM LF IQ.
14. Holtzman's FA significantly positively correlates with CTMM NLF IQ.
15. Holtzman's FA significantly positively correlates with CTMM TMF IQ.
16. Phillips' $P_1$ significantly positively correlates with CTMM LF IQ.
17. Phillips' $P_1$ significantly positively correlates with CTMM NLF IQ.
18. Phillips' $P_1$ significantly positively correlates with CTMM TMF IQ.
19. Phillips' $P_2$ significantly positively correlates with CTMM LF IQ.
20. Phillips' $P_2$ significantly positively correlates with CTMM NLF IQ.
21. Phillips' $P_2$ significantly positively correlates with CTMM TMF IQ.
22. Phillips' $P_3$ significantly positively correlates with CTMM LF IQ.
23. Phillips' $P_3$ significantly positively correlates with CTMM NLF IQ.
24. Phillips' $P_3$ significantly positively correlates with CTMM TMF IQ.
25. Phillips' $P_4$ significantly positively correlates with CTMM LF IQ.
26. Phillips' $P_4$ significantly positively correlates with CTMM NLF IQ.
27. Phillips' $P_4$ significantly positively correlates with CTMM TMF IQ.
28. Holtzman's $I$ significantly positively correlates with CTMM LF IQ.
29. Holtzman's $I$ significantly positively correlates with CTMM NLF IQ.
30. Holtzman's $I$ significantly positively correlates with CTMM TMF IQ.
31. $\sum P_I$ significantly positively correlates with CTMM LF IQ.
32. $\sum P_I$ significantly positively correlates with CTMM NLF IQ.
33. $\sum P_I$ significantly positively correlates with CTMM TMF IQ.
CHAPTER BIBLIOGRAPHY


CHAPTER II

REVIEW OF RELEVANT LITERATURE

The first chapter has summarized the basis for inferring intelligence from inkblot perception. It further touched upon the psychometric inadequacies of the Rorschach and Holzman's attempt to circumvent these difficulties. While the present chapter is by no means an exhaustive survey of the vast literature relating to this thesis, it is intended to further document the contentions made in Chapter I.

Zubin (7) has critically reviewed much of the Rorschach literature and has summarized his investigation, particularly as it relates to the validity of the Rorschach. He states that four "facts" are apparent:

1. Global evaluations of the Rorschach seem to work when the Rorschach worker and the clinician work closely together.
2. Atomistic evaluation, as well as global, of the content of the Rorschach protocols (as distinct from the perceptual scoring) seem to work.
3. Atomistic analysis of the perceptual factors is a failure.
4. Factor analysis of atomistic scores of both the perceptual, as well as the content variety, seem to work. (7, p. 315).

In conclusion, Zubin finds that the Rorschach is best considered an interview technique and is, therefore, dependent upon a content evaluation for its validity. He suggests the development of scales for content analysis of the Rorschach.
Fiske and Baughman (2) report a study involving 633 outpatients at a mental hygiene clinic. An analysis of the median frequencies in each Rorschach scoring category revealed three highly significant findings:

1. Relationships between R and each scoring category often appear to be complex and non-linear.
2. The form of the relationship with R seems to vary for the various categories although some have similar patterns.
3. The forms of the relationships with R are fairly similar for the normal and outpatient groups. (2, p. 32).

As indicated in Chapter I, Fiske and Baughman conclude that scores based on response frequency in scoring categories are not satisfactory measures and that taking such scores as percentages is only a partially adequate solution.

Cronbach (1) provides a rather exhaustive analysis of Rorschach research methodology. In discussing methodological problems which have appeared in the literature, he notes several areas in which errors are typically made. He states that:

... perhaps 90% of the conclusions so far published as a result of statistical Rorschach studies are unsubstantiated; not necessarily false, but based on unsound analysis. Present statistical tools are imperfect. And no procedure is equally advisable for all studies. (1, p. 429).

In offering suggestions for methodological refinement with Rorschach studies, Cronbach lists several points:

(i) Matching procedures in which a clinical synthesis of each Rorschach record is compared with criterion are especially appropriate.
(ii) If ratings are to be treated statistically, it is often advisable to dichotomize the rating and apply chi-square or bi-serial r.
(iii) Common errors which must be avoided in significance tests are:

(a) use of critical ratio and uncorrected chi-square on unsuitably small samples;
(b) use of sample values in the formula for differences between proportions;
(c) use of formulas for independent samples when matched samples are compared;
(d) interpretation of P-values without regard for the inflation of probabilities when 100's of significance tests are made or implicitly discarded;
(e) acceptance of conclusions when a significant difference is found with a hypotheses based on fluctuation in a pattern sample.

(iv) Counting procedures are not generally preferable to additive methods for Rorschach data. The most widely useful procedures are chi-square and analysis of differences in mean rank. These yield results which are invariant when scores are transformed.

(v) Normalizing scores is frequently desirable when making significant tests involving variance tests.

(vi) Where there are group differences in total number of responses, this factor must be held constant before other differences can be soundly interpreted. Three devices for doing this are:

- Rescoring a fixed number of responses on all papers;
- Constructing the group equated on the number of responses;
- And analysing profiles of normalized scores (pattern tabulation).

(vii) Ratio and difference scores should rarely be used as a basis for statistical analysis. Instead, patterns should be defined and statistical comparisons made of the frequency of a certain pattern in each group. Use of chi-square with frequencies of Rorschach "signs" is recommended.

(viii) Multiple regression and linear discriminate functions are unlikely to reveal the relationships of Rorschach scores with other variables, since the assumption of linear compensation is contrary to the test theory.

(ix) Rank correlation, curvi-linear correlation, or correlation of normalized scores are often more suitable than product moment correlation.

(x) No entirely suitable method for estimating Rorschach variables now exists. Studies in this area are much needed. (1, pp. 393-429).
Holtzman (5) developed the **Holtzman Inkblot Technique** with the goal of eliminating the psychometric inadequacies that plague the Rorschach. He states four major advantages of the Holtzman Inkblot Technique over the Rorschach:

1. the number of responses per individual would be relatively constant;
2. each response would be given to an independent stimulus, avoiding the weaknesses inherent in the Rorschach where all responses are lumped together regardless of whether they are given to the same or different inkblots;
3. a richer variety of stimuli capable of eliciting much more information than the original 10 Rorschach plates would be obtained by obtaining a fresh start in the production of stimulus materials, especially in view of recent experimental studies of color, movement, shading, and other factors in inkblot perception;
4. a parallel form of the inkblots could be constructed easily from item analysis data in the experimental phase of development, and adequate estimates of reliability could be obtained independently for each major variable.

Holtzman admits to the loss of R and sequential approach as variables with his technique, but feels that the gains in other areas justify these losses. "The loss of R as a variable, however, is minor compared to the expected gain in stability of other intrinsically more interesting variables such as location, movement, color, shading, and form level" (5, p. 12).

Swartz (6) has developed a technique for group administration of the **Holtzman Inkblot Technique**. As his study utilized college students and the full complement of **Holtzman Inkblots**, his procedure was not directly applicable to the present research. Directions, printed on the
cover of a special group booklet were read aloud while the subjects read them silently:

You will be shown a series of inkblots, each of which will be projected on the screen before you for one minute. Using your imagination, write down in the space provided a description of the first thing the blot looks like or reminds you of. Include in your description the particular characteristics or qualities of the inkblot which are important in determining your responses - i.e., what about the blot made it look that way? Give as complete an answer as you can in the time available. None of these inkblots has been deliberately drawn to look like anything in particular. No two people see exactly the same things in a series of inkblots like these. There are no right or wrong answers. (6, p. 437).

Trial inkblots X and Y were then projected on the screen individually and typical responses were indicated. The role of form, color, shading and blend determinants was illustrated by reference to these trial blots. Initial instructions were repeated and the examiner asked for any questions. Eight inkblots were pre-selected for verbal reinforcement throughout the series. This reinforcement consisted of paraphrasing parts of the original instructions. The first three inkblots were each exposed for 120 seconds; the fourth, fifth and sixth for 100 seconds each; the seventh, eighth and ninth for 90 seconds each; and the remainder for 75 seconds each. Split-half reliability coefficients ranged from 0.70 to 0.86 for FD, FA, M, V, and L.

Holtzman (4) has compared Swartz's group administration technique with the standard individually administered version. Using 418 college students, divided into four groups, tested twice with one week between sessions, it was possible to represent all possible combinations of the
two methods of administration; the two parallel forms, A and B; and the two orders of presentation. Six examiners obtained the individual protocols, and four other examiners obtained the group data. Mean correlations for L, FD, FA, M, I and V ranged from 0.61 to 0.94.

Herron (3) adapted Swartz's group procedure for use with the first thirty of the forty-five Holtzman inkblots. Using college students he found correlations between this short form and the standard group form ranging from 0.52 to 0.78 for L, FD, FA, M, V, and L.
CHAPTER BIBLIOGRAPHY


CHAPTER III

METHODOLOGY

Subjects

Subjects used in this study consisted of 34 children living in two orphanages in Dallas, Texas: Sunshine Home and Juliette Fowler Home. Twenty females and 14 males ranged in age from 10 years and 6 months to 14 years and 9 months, with a mean age of 12 years and 6 months. Both homes derive their wards from the Dallas County Commissioner's Court. Subjects represent the entirety of the populations of the two homes within the age limits specified. The age limits were imposed to provide subjects appropriate to the instruments involved. The number of subjects used was necessarily limited by those available in the orphanages but was considered adequate to achieve significance with the levels of correlation expected.

Description of the Instruments

Two instruments were used in this study: the California Short-Form Test of Mental Maturity and an adaptation of the Holtzman Inkblot Technique.
The California Short-Form Test of Mental Maturity

Level 2 of the California Short-Form Test of Mental Maturity (CTMM), 1963 Revision, was administered to each subject. Separate administrations were conducted with Sunshine Home and Fowler Home subjects. Subjects recorded their answers directly in the test booklets.

The CTMM consists of seven subtests classified under four factor headings. Factor I comprises the first three subtests: "Opposites," "Similarities," and "Analogies." Factor II includes the next two subtests: "Numerical Values" and "Numerical Comprehension." The final subtest, "Delayed Recall," is the measure constituting Factor IV. The four factors are labeled "Logical Reasoning," "Numerical Reasoning," "Verbal Concepts," and "Memory," respectively. Three intelligence quotients are obtained with the CTMM, a "Language Factor Intelligence Quotient" (LF), a "Non-Language Factor Intelligence Quotient" (NLF), and a "Total Mental Factors Intelligence Quotient" (TMF). These indices are deviation intelligence quotients with a mean of 100 and a standard deviation of 16 points for all age levels. The Stanford-Binet Intelligence Scale, Form L-M, was used in scaling the 1963 CTMM revision. The three intelligence quotients from the CTMM were used as intelligence criteria in this study.

Holtzman Inkblot Technique Adaptation

Ten cards were selected from the forty-five comprising the Holtzman Inkblot Technique (HIT), Form A. These cards were selected
on the basis of a published item analysis to maximize the probability of
scorable Holtzman Integration Factor (I) responses to the blots (3, pp.
397 - 399). The ten inkblots were arranged in a series extending in order
of presentation from most to least probability of an I response. The se-
quence was thus one of increasing perceptual integration difficulty. Two
other HIT inkblots, X and Y, were presented simultaneously as prelimi-
nary demonstrations. The entire series incorporated the order of
Holtzman Inkblots represented as follows: X, Y; 12A; 25A; 19A; 4A;
34A; 41A; 21A; 45A; 17A; 27A.

Written permission was obtained from The Psychological Corpora-
tion to photographically reproduce the inkblots from the HIT for purposes
of this study. Each of the cards used was photographed on 35-millimeter
Kodachrome II daylight film, ASA 25, with a Minolta SR-7 camera
equipped with a shaded, 58-millimeter effective focal length, f/1.4
Rokkor lens. Each exposure was made at f2.8 with a shutter speed of
1/500 second. Exposures were illuminated by bright, early afternoon
sunlight, striking the cards at approximately a 90-degree angle of
incidence.

The demonstration slide was made with a format consisting of
card X in the upper right quadrant, a schematic outline of the X inkblot
in the upper left quadrant, and card Y in the lower right quadrant with
its schematic appearing in the lower left quadrant. The schematics
were blank line drawings on white paper. The remaining ten cards were
individually photographed against a dead black background. Resolution and color fidelity of the photographic reproductions were considered adequate replications of the original inkblots to warrant their use in this study.

Booklets were prepared to facilitate the recording of responses by the subjects. Each booklet consisted of four pages of white letter-size bond, stapled together in the upper left corner. The format consisted of black line drawing schematics of the inkblots appearing to the left of numbered questions concerning the inkblot percept. Three such schematics and accompanying questions were longitudinally arrayed on each of the first three pages, while the fourth page contained only the final array. The schematic drawings were adapted from those published in the Holtzman manual and record form. The questions accompanying each schematic were as follows:

#1 What does this look like?  
  Why?  What makes it look like that?

#2 What else does this look like?  
  Why?  What makes it look that way?

Spaces were provided directly beneath each question for the subject's response. The booklets were printed by an offset process from master copies prepared in IBM "Executive" type.

Responses to the inkblots were scored for eleven factors:

1. W, Beck's whole response, was scored in accordance with criteria suggested by Beck for use with the Rorschach (1, pp. 12-23).
Specifically, all portions of the blot figure must have been utilized in the percept. A cut-off whole was not included in this formulation of criteria. The quality of the W was likewise ignored by the criteria.

2. M, Beck's movement response, was likewise scored in accordance with Beck's criteria for use with the Rorschach (1, pp. 72-97). Because of the limitations of the group administration technique, the productions of the subjects were often inadequate to clearly define the scoring of M. It was, therefore, necessary to score M more grossly than is usual with individually obtained protocols. In general, M was restricted to human percepts implying activity roughly appropriate to the bodily focus of the response and to animal percepts implying human movement.

3. Z, Beck's organization activity, was scored with reference to the criteria listed in Chapter I.

4. FD, form definiteness, was scored with the aid of the published form definiteness table appearing in the scoring guide for the HIT (2, pp. 15-16). The responses listed in the various categories served as anchor points for the judgmental scoring of FD on a five-point scale. In general, FD is an index of the form specificity and elaboration of details of the percept.

5. FA, form appropriateness, was scored using the reference responses listed in the scoring guide for the HIT as anchor points in the judgmental scoring of the factor on a three-point scale (2, pp.
62-106). FA is intended as an index of the agreement of the percept with the form of the inkblot stimulus. The criteria reference responses were scored by a panel of clinical judges, rating the responses individually.

6. \( P_1 \), Functional Integration, was scored according to the criteria suggested by Phillips and his associates. Reference to these criteria was made in Chapter I.

7. \( P_2 \), Collective Integration, criteria were likewise stated in Chapter I.

8. \( P_3 \), Positional Integration, criteria were stated in Chapter I.

9. \( P_4 \), Structural Integration, criteria were stated in Chapter I.

10. \( I \), Holtzman's integration factor, was scored in accordance with criteria stated in Chapter I.

11. \( \sum P_i \) was derived as the unweighted summation of each of the four Phillips factors: Functional, Collective, Positional, and Structural Integration.

In addition to the factors which were derived to test the hypotheses formulated in Chapter I, several factors were necessarily scored as they comprised criteria for the scoring of the eleven factors listed above. These computational factors are listed below:

1. Holtzman's movement, derived from Zubin, Sells and Wilson, was scored on a five-point scale ranging from "no movement or static potential for movement" to "violent movement, such as whirling, exploding" (2, p. 25). This factor differs from Beck's M principally in its lack of restriction to human activity.
2. \( V \), pathognomic verbalization, embraces nine criterion areas of content description, including fabulation, fabulized combination, queer response, incoherence, autistic logic, contamination, self-reference, deterioration color, and absurd response. The separate categories are assigned different published weights, which, when summed, give the index, \( V \) (2, pp. 26-38).

Holtzman's movement must be scored at least on the first scale value above zero for a response to be credited as functionally integrative. Thus, the factor is a prerequisite for the scoring of functional integration. With regard to pathognomic verbalization, Holtzman states: "... and \( V \) must not be scored higher than 1 before the response is judged sufficiently adequate to allow anything but a score of 0 on Integration" (2, p. 39).

Procedure

Subjects were divided into two groups for administrative expediency: one group comprised the subjects from Sunshine Home and another group comprised the subjects from Fowler Home. Administration procedure was essentially identical with each group.

Subjects were seated at writing tables in front of the projection screen. Each subject commanded an unobstructed view of the screen. Seating of subjects was prearranged to restrict the equivalent card to subject distance to the limits of eight to twenty inches. Response booklets were distributed, face down, along with pencils. Preliminary
remarks instructed subjects not to open the booklets until told to do so. Lights were dimmed to provide adequate projection image contrast while maintaining sufficient light for the subjects to write their responses.

Instructions were first read to the subjects, with their answer booklets unopened.

You will be shown pictures of inkblots. These inkblots were made by spilling ink on a piece of paper and folding it. Each picture will be shown on the screen for three minutes. Use your imagination and write down in the space provided the first thing the blot looks like or reminds you of. None of these inkblots has been made to look like anything in particular. No two people see exactly the same things. There are no right or wrong answers. I am interested in knowing how each of you sees these inkblots. Please do not tell anyone what you see while the pictures are being shown. You may talk about them if you wish after we are finished. Be sure to write your answers as carefully as you can. This is not a spelling test, but try to spell as best you can. Write as much as you wish in the time available.

The demonstration slide was shown and the following commentary was read:

Some people see this inkblot [pointing to inkblot X] as a moth or winged creature. Here you can see what looks like the moth’s head, its wings, body and tail. [The various parts of the blot were pointed out as they were mentioned.] You would probably say that this inkblot looks like a moth because it is shaped like a real moth is shaped. Now look at the drawing to the left of the inkblot. This drawing is intended as a guide in helping you show where you saw whatever you might have seen. In the case of the moth you would circle the entire drawing because you saw the moth in the whole inkblot. But, suppose you had not seen the whole moth. Let’s say you only thought the inkblot looked like a moth’s head. [The “head” area of the moth percept was pointed out on inkblot X.] You would then only draw around this part of the drawing [indicating the appropriate region of the schematic to the left of inkblot X]. To help you remember what to write
and to keep track of the time you have to work in, the booklet in front of you has questions written out which I will read out loud as we go along. I want you to think of two things the inkblot looks like or reminds you of. When you draw around the place where you saw the two things, be sure to number your drawings to go with the numbers of the questions. Now look at this inkblot again [pointing to inkblot X]. You might have seen this as a pool of oil. Now this doesn't really look like anything in particular, but the blackness might have reminded you of oil. So you could say that the color, the black, made you think of a pool of oil. In this case the shape probably wasn't too important in making the inkblot look like oil. Now look at the other inkblot [indicating inkblot Y]. Many people see this as a human figure or a skeleton. The reason you might see it as a human figure or skeleton could be that you think it is shaped like it. If you saw the skeleton you might have thought that the shape made it look like a human, but the shading made it look more like bones, so together the shape and shading reminded you of a skeleton. Another common thing that is seen in this inkblot is blood [indicating the colored areas of inkblot Y]. Probably the reason you would think of this as blood would be the reddish color of it. Your answers to the questions might be that you see blood and you see it because the inkblot is the color of blood. Be sure to draw around the part of the drawing on the left that looks like blood in the picture. Now, remember, you will see each inkblot for three minutes. During this time I will read out loud the questions printed in the booklet. Write the answers to each question after I have read it. Use your imagination and write what you see, and why you think it looks that way. Be sure to draw around the part of the drawing to the left of the questions so that I can know exactly where you saw what you did. Number your drawings. Write down any two things each inkblot reminds you of. I am the only one who will read your answers. Please do not talk after we have started. Now turn your answer booklet over to the first page. Notice there are little drawings to the left of each set of questions. I will read these questions as we go along. Write your answers underneath each question. Here is the first inkblot.

Questions appearing in the booklet were then read in accordance with the verbal instructions and according to a prearranged time schedule. The first question was read immediately upon presentation of the
slide. After approximately half a minute the second question was read. After another half minute the subjects were reminded to draw around the area on the schematic that had been utilized in forming their percepts. After another half minute the sequence was repeated at the same interval schedule for the second percept. Procedural questions were answered individually but other questions were answered non-directively. At the end of the inkblot presentation the subjects were asked to check back through their booklets to make sure that each set of drawings had been properly numbered. Before passing in their booklets the subjects were asked to write their names on the back of the test booklet.

The California Short-Form Test of Mental Maturity was administered to the two groups separately. The CTMM administration followed the HIT administration by about a week. CTMM data that were unobtainable because of absence of some subjects at the time of administration were obtained from school records. The CTMM data from this latter source were derived about three months prior to the test administrations for this study. Standard, published procedures were followed in the administration of the CTMM (4, pp. 13-22).
CHAPTER BIBLIOGRAPHY


CHAPTER IV

STATISTICAL ANALYSIS OF DATA

In Chapter I thirty-three hypotheses were presented to be tested in this study. Based upon a knowledge of related studies, a positive correlational relationship was hypothesized in each case. Other research indicated that several of the variables under study were significantly related to an age variable. The data from the present research confirm this expectancy. As age of subjects was uncontrolled in the selection of subjects, a statistical control was necessary to eliminate a possible confounding by age as a variable. The coefficient of partial correlation was adopted for use with product-moment correlation coefficients.

\[
\hat{r}_{ab.c} = \sqrt{1 - r_{ac}^2} \sqrt{1 - r_{bc}^2}
\]

(1, p. 166)

Assuming normality, \( t \) was adopted as a test of significance for the correlation coefficients.

\[
t = \sqrt{\frac{r_{ab.c}}{1 - \frac{2}{N - 3}}}
\]

(1, p. 167)

A one-tailed \( t \) test was used, as the correlations were, in each case, in the predicted positive direction.
Table I indicates that W is only slightly correlated with any of the CTMM IQ's. The correlational level is insufficient to be significant with the sample size used in this study. M is slightly and more significantly correlated with the CTMM IQ's. The magnitude of these correlations seems, however, insufficient for predicting intelligence on the basis of M. Likewise, Beck's Z only slightly correlates with intelligence as operationally defined by the CTMM IQ's; correlations approach significance at the 5% level. FD is moderately and significantly correlated with CTMM IQ's. Correlation between FD and CTMM NLF is greater than between FD and CTMM. FA poorly, and insignificantly, correlates with the CTMM IQ's. Holtsman's I factor correlates moderately and significantly with the CTMM factors and seems to share much "non-intellective" variance with Z, as I and Z are rather strongly correlated at a highly significant level. $\sum P_1$, the summation of the Phillips' factor scores, appears to improve the prediction of the intelligence criteria only slightly over I. I and $\sum P_1$ are very strongly correlated. $P_1$, Phillips' Functional Integration, is somewhat less related to the CTMM IQ's than is I or $\sum P_1$, but comprises a moderately efficient predictor of the criteria. $P_1$ correlates more strongly with I than Z. $P_2$, Phillips' Collective Integration, is only slightly correlated with CTMM IQ's at a marginal significance level. $P_2$ correlates more strongly with I than Z. $P_3$, Phillips' Positional Integration, is the best integration factor prediction of CTMM IQ's in this study. $P_3$ correlates moderately with the
<table>
<thead>
<tr>
<th></th>
<th>NLF</th>
<th>TMF</th>
<th>W</th>
<th>M</th>
<th>Z</th>
<th>FD</th>
<th>FA</th>
<th>I</th>
<th>( \Sigma P_1 )</th>
<th>( P_1 )</th>
<th>( P_2 )</th>
<th>( P_3 )</th>
<th>( P_4 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF</td>
<td>0.86</td>
<td>0.97</td>
<td>0.03</td>
<td>0.24</td>
<td>0.28</td>
<td>0.39</td>
<td>0.13</td>
<td>0.50</td>
<td>0.49</td>
<td>0.40</td>
<td>0.24</td>
<td>0.52</td>
<td>0.32</td>
</tr>
<tr>
<td>NLF</td>
<td>-</td>
<td>-</td>
<td>0.04</td>
<td>0.26</td>
<td>0.26</td>
<td>0.45</td>
<td>0.11</td>
<td>0.36</td>
<td>0.48</td>
<td>0.38</td>
<td>0.20</td>
<td>0.57</td>
<td>0.22</td>
</tr>
<tr>
<td>TMF</td>
<td>-</td>
<td>-</td>
<td>0.03</td>
<td>0.24</td>
<td>0.27</td>
<td>0.44</td>
<td>0.14</td>
<td>0.49</td>
<td>0.49</td>
<td>0.40</td>
<td>0.22</td>
<td>0.56</td>
<td>0.27</td>
</tr>
<tr>
<td>Z</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.73</td>
<td>0.76</td>
<td>0.53</td>
<td>0.24</td>
<td>0.67</td>
</tr>
<tr>
<td>I</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.97</td>
<td>0.88</td>
<td>0.61</td>
<td>0.66</td>
</tr>
<tr>
<td>( \Sigma P_1 )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.91</td>
<td>0.53</td>
<td>0.74</td>
<td>0.70</td>
</tr>
<tr>
<td>( P_1 )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.59</td>
<td>0.51</td>
<td>0.50</td>
<td>-</td>
</tr>
<tr>
<td>( P_2 )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.20</td>
<td>0.08</td>
<td>-</td>
</tr>
<tr>
<td>( P_3 )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>0.34</td>
<td>-</td>
</tr>
</tbody>
</table>

**TABLE I**

PRODUCT-MOMENT COEFFICIENTS OF PARTIAL CORRELATION
OF THE EXPERIMENTAL VARIABLES
### TABLE II

**Levels of Significance of the Product-Moment Coefficients of Partial Correlation of the Experimental Variables**

<table>
<thead>
<tr>
<th></th>
<th>NLF</th>
<th>TMF</th>
<th>W</th>
<th>M</th>
<th>Z</th>
<th>FD</th>
<th>FA</th>
<th>I</th>
<th>∑P₁</th>
<th>P₁</th>
<th>P₂</th>
<th>P₃</th>
<th>P₄</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF</td>
<td>9.70</td>
<td>23.32</td>
<td>0.17</td>
<td>1.43</td>
<td>1.68</td>
<td>2.26</td>
<td>0.76</td>
<td>3.32</td>
<td>3.26</td>
<td>2.51</td>
<td>1.43</td>
<td>3.54</td>
<td>1.95</td>
</tr>
<tr>
<td>NLF</td>
<td>-</td>
<td>-</td>
<td>0.23</td>
<td>1.56</td>
<td>1.56</td>
<td>2.92</td>
<td>0.63</td>
<td>2.24</td>
<td>3.15</td>
<td>2.19</td>
<td>1.20</td>
<td>4.01</td>
<td>1.30</td>
</tr>
<tr>
<td>TMF</td>
<td>-</td>
<td>-</td>
<td>0.17</td>
<td>1.43</td>
<td>1.62</td>
<td>2.82</td>
<td>0.81</td>
<td>3.26</td>
<td>3.26</td>
<td>2.51</td>
<td>1.29</td>
<td>3.90</td>
<td>1.62</td>
</tr>
<tr>
<td>Z</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>6.76</td>
<td>3.61</td>
<td>1.43</td>
<td>5.24</td>
<td>6.02</td>
</tr>
<tr>
<td>I</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>23.32</td>
<td>10.59</td>
<td>4.47</td>
<td>5.08</td>
<td>4.80</td>
</tr>
<tr>
<td>∑P₁</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12.82</td>
<td>3.61</td>
<td>6.38</td>
<td>5.69</td>
<td></td>
</tr>
<tr>
<td>P₁</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4.20</td>
<td>3.43</td>
<td>3.32</td>
<td></td>
</tr>
<tr>
<td>P₂</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1.20</td>
<td>0.46</td>
<td></td>
</tr>
<tr>
<td>P₃</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2.09</td>
<td></td>
</tr>
</tbody>
</table>

*Table entries are t-values. Single underlining of an entry indicates P less than 5%; double underlining of an entry indicates P less than 1%. Entries not underlined indicate P greater than 5%.*
CTMM criteria at a high level of significance and significantly correlates about equally with Z and I. $P_4$, Phillips' Structural Integration, is only slightly related to CTMM IQ's.

Of the thirty-three hypotheses stated in Chapter I, seventeen were accepted at the 5% level of confidence or better. $I$, $P_1$, $P_1$ and $P_3$ were all found to be at least moderately accurate estimators of the CTMM IQ's. No factor seemed to predict more efficiently one or the other of the CTMM TMF IQ component IQ's, LF and NLF.
CHAPTER BIBLIOGRAPHY

CHAPTER V

SUMMARY AND CONCLUSION

Thirty-four children living in two Dallas orphanages, Sunshine Home and Juliette Fowler Home, were administered the California Short-Form Test of Mental Maturity (CTMM) and a group administration adaptation of the Holtzman Inkblot Technique (HIT). Ages of subjects ranged from 10 years and 6 months to 14 years and 9 months, with a mean age of 12 years and 6 months. Analysis of the data obtained from these administrations suggests the following conclusions:

1. Holtzman's Form Definiteness (FD), as scored with the HIT, is a moderately efficient estimator of CTMM Short-Form IQ's, but is less effective than Holtzman's Integration Factor (I) in estimating the Total Mental Factors (TMF) IQ.

2. Holtzman's I, as scored with the HIT, is a moderately efficient estimator of intelligence as operationally defined by CTMM Short-Form IQ's.

3. A simple summation of scores on each of Phillips' four integration factors (\( \Sigma P_j \)) is only slightly superior in estimating CTMM Short-Form IQ's than is Holtzman's I.

4. Phillips' Functional Integration Factor (\( P_1 \)), as scored with the HIT, is moderately efficient in estimating CTMM Short-Form IQ's, but is less effective than Holtzman's I.
5. Phillips' Positional Integration Factor ($P_3$), as scored with the HIT, is moderately efficient in estimating CTMM Short-Form IQ's and is more superior as a predictor than either Holtzman's I or $\sum P_1$.

6. W, M, Z, FA, $P_2$ and $P_4$ failed to achieve significant levels of correlation with any of the CTMM Short-Form IQ's.

7. Certain visual perception integration factors, as scored with the HIT, are valid indices of intelligence as operationally defined in this study, even when treated "atomistically."

The following recommendations are proferred for future studies related to this thesis.

1. Subjects should be greater in number and more typical of general population children since the criterion instrument was standardized on a largely "general" population.

2. Tape recorded instructions should be used with both HIT and CTMM administrations to reduce potential examiner variability.

3. Scoring should be accomplished by at least two persons initially working independently and later collaboratively.

4. Different age levels should be studied.

5. The group administration of this adapted HIT should be compared with both individual and group administrations of the full HIT.
BIBLIOGRAPHY

Books


Rorschach, H., Psychodiagnostik, Bern, Hans Huber, 1932.

Articles


Tests
