AN ABSTRACT OF THE THESIS OF

Bill Duane Persinger, Jr. for the Master of Science

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Title: THE RELATIONSHIP BETWEEN SELECTED PERSONALITY VARIABLES AND PERFORMANCE ON THE MEMORY-FOR-DESIGNS TEST IN A UNIVERSITY SAMPLE

Abstract approved: Joseph B. Holmes

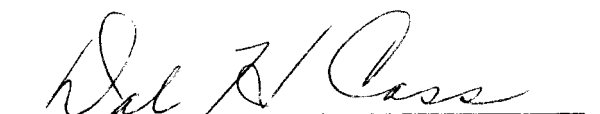
Basically, efforts were directed at establishing a relationship between personality traits and expressive behavior on the Memory-For-Designs Test. It was hypothesized (null) that there was no such relationship. Data analysis proved this true to a large extent.

Two-hundred and forty-one Memory-For-Designs Test protocols were examined for closure difficulty, figure expansion, and figure constriction. Chi squares were then employed to compare those data with the personality type of the subjects. The Sixteen Personality Factor Questionnaire provided that information. The major conclusion drawn from the data analysis was that regardless of his personality, a subject will perform like most other subjects in relation to Memory-For-Designs Test behavior. Differentiation between groups, on a gross level, was not obtained. Qualitatively, individual differences were glaring, but there was no quantifying procedure to summarize that data.

The subjects were university students between the ages of eighteen and twenty-three, male or female, who were U.S. Citizens

attending Emporia State University. Initially, they were given the personality test in groups. Subjects who met sample qualifications were asked to return for a follow-up test with the Memory-For-Designs Test. This phase was carried out individually. Data were compiled in terms of frequency of occurrence of subjects in a given cell and evaluated in two-way and one-way chi squares.

A basis for the study was founded in research done on the Bender-Gestalt Test in light of the dearth of projective work on the Memory-For-Designs Test. This procedure allowed a sort of construct validity between the two tests. Principles used in defining the variables and devising the testing procedures were based on this presumed similarity. This also provided a framework for the development of logical hypotheses. Moreover, equating the Memory-For-Designs Test with the Bender-Gestalt Test established a wider theoretical formulation.



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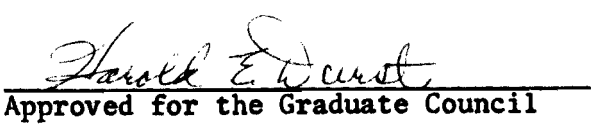

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THE RELATIONSHIP BETWEEN SELECTED PERSONALITY VARIABLES AND PERFORMANCE ON THE MEMORY-FOR-DESIGNS TEST IN A UNIVERSITY SAMPLE

A Thesis

Presented to

the Department of Psychology

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of the Requirements for the Degree

Master of Science

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by

Bill D. Persinger, Jr.

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Chapter 1

INTRODUCTION

Any given individual will commonly express his personality in various ways. Individuals may even reveal aspects of their personality or characteristic behavior patterns through the manner in which they reproduce geometric designs from memory. To begin analyzing investigation of the preceding, the reader is provided with relevant information concerning the problem by means of a theoretical formulation, an introduction, a formal statement of the problem, statements of the hypotheses, the purpose of the study, and its limitations. Definitions of terms, significance of the study, and a chapter summary are supplied.

THEORETICAL FORMULATION

Research on the nature of personality has taken diverse forms over the years. A number of tests and techniques have been developed which purport to measure those aspects of human functioning. These assessment devices are being used in research and applied settings with general acceptance. Among the instruments developed are tools designated as projective devices. Definitions of these subjective tests may be wide and varied.

According to Chaplin, a projective device utilizes vague or unstructured stimulus objects to assess an individual's usual manner

of perceiving his world and behaving in it.[1] With such methods, a subject may be required to verbally elaborate upon pictorial scenes as in the Thematic Apperception Test[2] or he may be required to "tell what he sees" in an inkblot as in the Rorschach Technique.[3] Still another mode of eliciting clues to personality has been to evaluate reproductions of gestalten drawn from memory by a subject. Such is the nature of the Bender-Gestalt Test (B-G Test).[4]

In the last case, it is assumed that the motor expression (drawing) exhibited by the testee will provide clues to his behavior patterns or emotional development. These clues are derived, in part, from the style in which the gestalten are reproduced. For example, were the figures neatly arranged? Were the reproductions left open in places which should have been closed? Or, were the designs smaller or larger than the stimulus figure? Advocates of the projective use of the Bender-Gestalt Test claim that those characteristics and numerous others can be applied as indicators of personality.

Not all researchers are as convinced of the power of the Bender-Gestalt as a test of personality as are some of its adherents. Tolor has provided guidelines for the projective use of the Bender-Gestalt

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[1]J. P. Chaplin, Dictionary of Psychology (New York: Dell Publishing Co., Inc., 1968), p. 411.

[2]M. I. Stein, The Thematic Apperception Test (Cambridge: Addison-Wesley Pub. Co., Inc., 1955), pp. 31-38.

[3]B. Klopfer and H. Davidson, The Rorschach Technique (New York: Harcourt, Brace, and World, Inc., 1962), pp. 26-47.

[4]L. Bender, A Visual Motor Gestalt Test and Its Clinical Use (New York: American Orthopsychiatric Association Monograph, 1938,3), pp. 98-111, 157-165.

Test which he believes should be followed. Furthermore, he cautioned against the use of the test as an instrument for differential diagnosis. While admitting that the test has projective qualities, Tolor maintained a conservative position regarding predictions for individual cases based on Bender-Gestalt Test protocols.[5]

Researchers and clinicians have also explored the other utilitarian feature of the Bender-Gestalt Test since its introduction by Bender in 1938. It is possible to obtain a measure of an individual's cerebral functioning through the quality of his Bender performance. Severe distortions and disorganizations of the gestalten have been found to be present in the records of subjects with organic cerebral impairment.

Using a similar approach in regard to the assessment of brain damage, Graham and Kendall developed the Memory-For-Designs Test. Raw scores on this instrument are derived from the severity with which the gestalten or geometric figures have been distorted. Severe destruction or disorganization yields a fairly reliable raw score which, when corrected, usually points to cerebral damage.[6]

Barring surface differences, the Bender-Gestalt Test and the Memory-For-Designs Test (MFD) approach the assessment of brain damage in the same basic way. With this in mind, these two instruments may be considered as "sister tests".

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[5]A. Tolor, "The Graphomotor Techniques," Journal of Personality Assessment, 1968, 32(3), 222-228.

[6]F. K. Graham and B. S. Kendall, 'Memory-For-Designs Test: Revised General Manual," Perceptual and Motor Skills, 1960, 11, 147-188.

THE PROBLEM

Many psychological test batteries administered to individuals will contain either the Bender-Gestalt Test or the Memory-For-Designs Test or both as diagnostic aids. From performance on the Bender-Gestalt Test, clinicians are able to derive indices of two types of functioning that the subject is likely to exhibit. They can obtain a measure of cerebral damage, or the lack of it, and can evaluate characteristic approaches the subject relies on in dealing with the environment. With the Memory-For-Designs Test, only an adjunctive assessment of cerebral impairment, or the absence of it, can be validly derived from the corrected raw score of the subject. It may be that there is another practical use to which the Memory-For-Designs Test may lend itself; that is, that of a projective technique.

Statement of the Problem

Is there a significant relationship between personality characteristics and expressive motor performance by randomly selected male and female college undergraduates on the Graham-Kendall Memory-For-Designs Test?

Statement of the Hypotheses
(Null Form)

The following hypotheses have been written in order to test the problem stated above. For the sake of clarity and organization, they have been numbered. This procedure was indicated because of ease of reading and statistical analysis in Chapter 4.

Hypothesis 1. There are no significant differences in the degree of closure difficulty on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, G, or H. Symbolically, H_0: $\mu_1 = \mu_2 = \mu_3$. (Alternative Form, Appendix A).

Hypothesis 2. There are no significant differences in the degree of figure size expansion on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, E, or H. Symbolically, H_0: $\mu_1 = \mu_2 = \mu_3$. (Alternative Form, Appendix A).

Hypothesis 3. There are no significant differences in the degree of figure size constriction on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, E, or H. Symbolically, H_0: $\mu_1 = \mu_2 = \mu_3$. (Alternative Form, Appendix A).

Purpose of the Study

The aim of this investigation was to explore the potential utility of the Graham-Kendall Memory-For-Designs Test as a projective device, suitable for crude assessment in clinical work. Crude assessment implies that the Memory-For-Designs Test would be employed as a screening device. Furthermore, the Memory-For-Designs Test would be used only as a member of a battery of diagnostic psychological tests.

Significance of the Study

The major significance that might be derived from this study would be a stimulation of further research on the problem. In 1938, when Bender introduced her technique, she laid the groundwork for a multitude of research studies. The efforts of Hutt are a prime example of the type of inquiry stimulated by Bender's monograph. Hutt's adaptation of the Bender-Gestalt Test is abundant with interpretive hypotheses based on deviations from the stimulus patterns which appear on a given record.[7] Other research, like that of Pascal and Suttell,[8] is also a direct descendant of Bender's original work. The present investigation, on a more limited scale than Bender's, has been prepared with the anticipation of more extensive work to follow. Furthermore, it would seem highly desirable that the clinician will eventually be able to derive two indications from a single administration of the test. Being able to measure organic cerebral functioning and personality variables in one short sitting would be a time-saver for the clinician.

DEFINITION OF TERMS

Clarity and unambiguous meaning assigned to certain terms is a necessity for accurate communication between researchers. In order to satisfy this basic requirement, the following crucial terms have

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[7]M. L. Hutt, The Hutt Adaptation of the Bender-Gestalt Test (New York: Grune and Stratton, 1969), pp. 68-106.

[8]G. R. Pascal and B. J. Suttell, The Bender-Gestalt Test: Quantification and Validity for Adults (New York: Grune and Stratton, 1951), pp. 3-9.

been specifically defined and documented where necessary.

Bender-Gestalt Test

Developed by Bender in 1938, this test has been used as an index for detecting brain damage in suspect patients, and as a screening device for that purpose. The test has been investigated for its projective value by Bender[9] and others. The test itself consists of nine gestalt patterns which are composed of lines, dots, and curved sections. Depending upon the method employed, the subject may be required to copy, recall, or elaborate on the figures. In addition, the subject may be asked to "tell what the figures remind him of." In this way, the test evaluator can derive additional information about the subject concerning conflicts, tensions, and certain other problem areas.

Memory-For-Designs Test

The Memory-For-Designs Test involves the presentation of simple geometric figures and reproduction of those designs from immediate recall. The test was originally developed as an indicator of organic brain impairment. The test materials consist of fifteen five inch square cards on each of which is printed a geometric figure, devoid of any meaningful associations. The figures are drawn using only straight lines.[10] Scoring of the test does not depend upon the artistic quality of the figures drawn. Also, intellectual factors do not affect Memory-For-Designs Test performance to any great degree.

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[9]Bender, loc. cit.

[10]Graham, loc. cit.

Personality

Wolff provides this pertinent definition of personality:

> . . . in view of the intimate relationship between personality, body features, physiological processes, and, indeed the whole chemistry of the organism, it seems that personality penetrates the whole organism; it is in fact the collective name for the total manifestation of man.[11]

Wolff qualified this statement somewhat by stating that with such a wide usage of the term personality, the entity that is to be studied, loses its meaning. He proposed that specific aspects of manifestation of personality be studied scientifically.[12] This investigation, by focusing on expressive motor behavior in relation to personality, purported to measure that particular manifestation of the larger unit, personality.

Sixteen Personality Factor Questionnaire Form A

The Sixteen Personality Factor Questionnaire is a paper and pencil test of human character developed by Cattell. The test consists of 187 questions which are responded to in a multiple-choice fashion. In replying to any given item, the subject may indicate agreement, neutrality (no commitment), or disagreement with regard to himself. Only one choice per question is allowed.[13]

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[11] W. Wolff, The Expression of Personality (New York: Harper and Bros., 1943), p. 6.

[12] Ibid.

[13] R. B. Cattell, H. W. Eber, and M. M. Tatsuoka, Handbook for the Sixteen Personality Factor Questionnaire (Champaign: Institute for Personality and Ability Testing, 1970), p. 80.

Sten Score

Stens are standard scores on the Sixteen Personality Factor Questionnaire (see Appendix D) which utilize a raw score mean of 5.5 for the sample being tested. Any raw score which falls at Stens five or six is therefore considered to be an average response or that the person is neither high nor low on a particular trait. Scores at or below Sten four are interpreted as being departed from an average or mean response. Also, scores at or above Sten seven are beginning to depart from the average. Standard tens (Stens) will fall along the bell-shaped curve encompassing extreme ends of that theoretical curve.[14]

LIMITATIONS OF THE STUDY

Three areas of concern to this study qualified as limitations. The three areas are (1) the use of a questionnaire type personality test, (2) the exploratory nature of the inquisition into the Memory-For-Designs Test, and the limited number of drawing styles to be assessed, and (3) the sample which was studied.

None of the points placed a limit on the theoretical substrata on which the study was based. Empirical research and common knowledge point to the fact that what people do, what they say, their posture, and even their handwriting bear the stamp of their individuality. The present study was limited somewhat by its parameters, not by the assumptions which underlie it.

First, one might justifiably ask how an objectified, quantified,

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[14]Ibid., pp. 62-65.

and verbally oriented instrument could tap sources of human personality. How can an instrument be sensitive to individual cases when scores are evaluated in light of the performance of others?

Because of a need to establish groups with commonalities on certain facets of personality, the Sixteen Personality Factor Questionnaire was chosen, with its limitations, as the device to accomplish the task. In spite of its susceptibility to faking, its verbal nature, and its condensing of a gamut of adjectives describing human behavior into sixteen factors, the test yields reliable enough scores to allow a researcher to formulate statistical hypotheses based on its sten scores. Groups of people can be identified by their common standing and can be easily tested when distinctions between disparate groups must be evaluated. The limitation, then, is that the results apply to groups, not to individuals.

Secondly, this investigation explored some new possible uses for the Memory-For-Designs Test. The lack of background research on the test as a personality index posed a limitation. Because of the dearth of direct support, studies from the Bender-Gestalt Test had to be consulted for applicable information to use as a starting point. As far as the two tests are similar, there is no limitation. When those similarities cease, there will be limitations in the transfer of Bender-Gestalt findings to be applied to the Memory-For-Designs Test. For example, the Memory-For-Designs Test stimulus figures are composed entirely of straight lines. Many of the projective hypotheses associated with the Bender-Gestalt Test pertain to its curved lines as well as its straight and parallel lines. Other interpretations from Bender-Gestalt Test protocols stem from the elaboration phase employed

in some variations. The present study made no attempt to assess elaborations since its purpose was to establish whether or not the Memory-For-Designs Test performance in normal subjects is even related to personality.

Related to the exploratory nature of the study is the fact that very few drawing styles from the Memory-For-Designs Test were examined as a part of the research design. From similar research on the Bender-Gestalt Test, a conservative observation places the number of possible deviations at a minimum of sixty. Out of the many choices available, the drawing methods chosen were selected because of their relative objectivity in measurement and their expected occurrence in a normal group.

Finally, using a college population is certainly justified as some research on this topic has utilized such a sample as a control group. Generalization of the results should not proceed beyond that of the type of group evaluated. To say that this study may apply to other college students in the midwest would be a safe generalization. But, to carry the assumptions to in-patients at a state hospital would be risky. In that case, further study would be indicated. These cautions are forwarded because the subjects were from a restricted sample. The restrictions included the age of the subjects and the fact that they were undergraduates in psychology courses during the Fall semester of 1977. These alone restrict broad generalizations.

SUMMARY

In this chapter, an introduction to the problem identified the general nature of the study and the theoretical formulation was furnished to place the problem in proper perspective. An outline of the problem and a formal statement of the problem explained the need that the research was based on. Statements of the hypotheses delineated, exactly, what the experimental procedures would be testing. Null forms of the hypotheses were given in the main text while alternatives for each were relegated to Appendix A. The purpose of the study was presented and its potential significance was discussed. Statements of the limitations in three areas within the research were given.

Chapter 2

REVIEW OF RELATED LITERATURE

The material covered in this chapter is a review of the pertinent literature surrounding the present research topic. Three major areas have been identified as having some bearing on this proposal. To begin the review, research on the relationship of perception and motor expressive behavior to personality is presented. The next section of this chapter deals with work utilizing the Bender-Gestalt Test as a projective device which has implications for the Memory-For-Designs Test. The third major subdivision of the chapter examines studies which have investigated various aspects of the Memory-For-Designs Test. A chapter summary is provided.

PERCEPTION AND EXPRESSIVE BEHAVIOR

Basic to most conscious behaviors are three processes which can be termed reception (perception), integration, and expression. Researchers have shown that need states of the organism can influence these processes to one degree or another. Supposedly, not only do normal need states determine perception and subsequent behavior but psychopathology and cerebral abnormality have a definite disruptive role in this process.

In 1939, Mira wrote of the work he had done on a technique he developed called, Myokinetic Psychodiagnosis. The procedure is very complex but can be explained superficially by stating that a measure of

personality was available through the manner in which an individual produced a series of lines and patterns. In Myokinetic Psychodiagnosis the assumptions are:

> . . . based on the involuntary expressions of the predominant attitude of reaction evaluated as a function of the shiftings observed during blind execution of linear movements in the fundamental directions of space.[1]

Through qualitative and quantitative analysis of the lines, Mira was able to make statements concerning characteristics of subjects (as a group) who drew the lines. He detected differences in the drawings (movements) between groups of obsessed patients, depressed and anxious patients, schizophrenics, depressed cases with retardation, elated subjects, psychopathic patients, and organic cases.[2]

Though not relying entirely on drawing techniques as an evaluation method, Wolff also studied the dynamics of expressive behavior and its relationship to personality. His work focused upon the experimental study of forms of self-expression. Wolff included unconscious and conscious material that lent itself to evaluation. A few of the variables under inspection were voice quality, gait, handwriting, posture, facial expression, the hands and profiles of his subjects, and so on.[3] Following his definition of personality (see Chapter 1) his purpose in experimentally analyzing these and other forms of expression is clear.

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[1]E. Mira, "Myokinetic Psychodiagnosis: A New Technique for Exploring the Conative Trends of Personality," Proceedings of the Royal Society of Medicine, 1940, 33, 173-194.

[2]Ibid.

[3]W. Wolff, The Expression of Personality (New York: Harper and Bros, 1943), pp. 3-58.

Another undertaking which falls into this category is Witkin's classic experimentation with tasks required of subjects and their relationship to personality. Witkin concluded that there are two major determinants in perceptual behavior, requirements of the task (field situation) and the psychological orientation of the person. He noted that visual field dependence was related to passivity in his subjects and that visual field independence or analytical perceptual performance was related to activity (an opposite of passivity). Moreover, the passive person is one who cannot function independently of environmental support, has problems (intrapersonal) with authority figures, and exhibits an absence of initiating activity. Activity in a subject denotes the opposite or independent functioning with little need for reliance on environmental support.

Field dependence and independence have implications for other types of behavior. Aside from being passive, field dependent subjects exhibited a lack of awareness of inner life, difficulty in regulating anxiety, and a low self-esteem. Field independence, and its concomitant, activity, came to be associated with an awareness of inner life, less anxiety (fear), and a higher self-esteem. Witkin concluded that a reciprocal relationship exists between perception and the adjustment patterns worked out by the person.[4]

As much as needs, values, motives, and attitudes are a part of the personality, they tend to influence perception. That perception, then, is an input which is followed by integration of the perceptual

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[4]H. A. Witkin, H. B. Lewis, M. Hertzman, K. Mackover, P. Meissner, and S. Wagner, Personality Through Perception (New York: Harper and Row, 1954), pp. 464-489.

stimuli which is proximated by some action or expression. To illustrate a portion of this relationship, Bruner and Goodman experimented with two groups of ten year old children. The first group of children came from poor families, and the second group was the product of rich families. The subjects were required to estimate the relative sizes of coins from one to fifty cents. The results clearly indicated that poor children overrated the true sizes of the coins significantly more often than rich children, pointing to the possibility that the importance of money caused the misestimation.[5]

The significance of the preceding studies lies in their demonstrations of the fact that a person does what he does on the basis of his personality, which implicates a whole range of behaviors and processes, both physical and mental. Gestalten, too, represent a segment of an organism's experience.

Interactions with gestalten, as on the Bender-Gestalt Test or Memory-For-Designs Test, are assumed to involve some aspects of the person's personality. Hutt stated that, ". . . the gestalt experience is always a product of the interaction of the individual's needs, attitudes, and complexes with the objective stimulus or stimulus situation."[6] In the same breath, Hutt became even more specific by advancing the notion that:

> An outstanding hypothesis derived from work in this field is that gestalt patterns are perceived (and incompletely perceived)

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[5]J. S. Bruner and C. C. Goodman, "Value and Need as Organizing Factors in Perception," Journal of Abnormal and Social Psychology, 1947, 42, 33-44.

[6]A. Weider, Contributions Toward A Medical Psychology, ed. Max L. Hutt (New York: Ronald Press, 1953), p. 666.

gestalt patterns are completed) according to the fundamental needs of a subject. Studies of expressive behavior have emphasized the fact that the needs of a subject are expressed in his conscious as well as his unconscious motor behavior.[7]

PROJECTIVE USE OF THE BENDER-GESTALT TEST

Gestalt patterns are the materials which comprise the Memory-For-Designs and Bender-Gestalt Tests. Perception of these patterns requires that the subject take some action. Three choices are available; he can refuse to engage in reproduction of the designs, he can cooperate and draw the figures as he sees them (possibly distorting the original stimulus) or he can purposely distort the figures.

In choosing to reproduce the designs (on either test) the person has created another transaction between himself and the objective world. According to assumptions made in this paper, the individual will not only interact with the stimuli, he will place something of himself into the situation. Pascal and Suttell agree. They noted that, "The test situation for the individual, once he is subjected to it, becomes a bit of reality with which he has to cope."[8] Coping with that reality involves, again, the complex chain of events which can be separated into three phases. The subject attends to (perceives) the gestalten, his mind (physiologically) processes the information, and his muscles allow him to express what the test calls for.

Investigators have explored these functions in normal, abnormal,

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[7]Ibid., pp. 666-667.

[8]G. R. Pascal and B. J. Suttell, The Bender Gestalt Test: Quantification and Validity for Adults (New York: Grune and Stratton, 1951), p. 8.

young, and old subjects. The review of literature on the Bender-Gestalt Test will begin with a summary of Byrd's work with children.

In 1956, Byrd tested 200 children judged in need of psychotherapy and 200 children who were "normal". He hypothesized that signs on the Bender-Gestalt would differentiate individuals between groups. The age range in the groups was from eight to fifteen years. For purposes of finer discrimination, Byrd broke the ages into four groups; ages eight to nine, ten to eleven, twelve to thirteen, and fourteen to fifteen, each containing normal and disturbed children.

Of the fifteen signs Byrd evaluated, four were found to differentiate children needing therapy from well-adjusted children across all age levels. These factors were orderly sequence, change in curvature, closure difficulty, and rotations. When each age bracket was considered alone, additional differentiating signs were discovered.

In the eight to nine year range, (1) placement of the first figure in the upper middle portion of the page, (2) orderly sequence, (3) chaotic sequence, (4) change in curvature, (5) closure difficulty, and (6) rotation and overlapping difficulty discriminated at the .05 level or beyond. Discriminators in the ten to eleven year range were (1) placement of the first figure in the upper middle portion of the page, (2) orderly sequence, (3) chaotic sequence, (4) overall change in size, (5) change in angulation, (6) change in curvature, (7) crossing difficulty, (8) rotation, and (9) overlapping difficulty. Signs which differentiated the two groups in the twelve to thirteen year range included (1) orderly sequence, (2) overall change in size, (3) change in angulation, (4) change in curvature, (5) closure difficulty, and

(6) rotation. Indices at the fourteen to fifteen year level were (1) orderly sequence, (2) chaotic sequence, (3) overall change in size, (4) change in angulation, (5) closure difficulty, (6) rotation, and (7) collision.

Generally, those signs which carry some negative connotation occurred more frequently in disturbed children. Specifically, chaotic sequence, change in curvature and angulation, closure difficulty, rotation, change in size, overlapping difficulty, and collision were these signs.[9]

Several years later, Clawson carried out work much the same as that just reviewed. She sought to define those relevant test factors whoch could be used as indices of emotional disturbance in children. Forty males and forty females were tested who were in the age range of seven to twelve years. None of the children were psychotic or organically impaired. The control group consisted of eighty children within the specified age group who attended the Wichita, Kansas public schools and who were judged well-adjusted.

The following factors were discovered to have discriminating power at the .05 level of confidence and beyond: orderly arrangement, first figure in the middle of the page, compressed arrangements (bottom, edge, and top tendencies), changes and unevenness of size, rotation, changes in angulation and curvature, separation, workover, multiple pages, and turning the spike inward on figure five.

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[9]E. Byrd, "The Clinical Validity of the Bender-Gestalt Test with Children: A Developmental Comparison of Children in Need of Psychotherapy and Children Judged Well-adjusted," Journal of Projective Techniques and Personality Assessment, 1956, 20, 127-136.

While Clawson did not utilize a developmental breakdown according to age, she did include some interesting and pertinent comparisons of behavioral styles with the Bender-Gestalt Test factors. Acting out was associated with expansive organization, horizontal page usage, circular organization, and uneven size. Withdrawn behaviors tended to be associated with compressed organization and small or decreased figure size.

Going a step further, Clawson noted that certain Rorschach responses occurred with some Bender-Gestalt Test signs. She found that (1) a constricted Rorschach and constricted figure size of the Bender-Gestalt Test occurred together with significant frequency, (2) interpersonal aggression on the Rorschach and joining trouble on the Bender-Gestalt Test were significantly related, and (3) aggressive Rorschach responses were accompanied by uneven figure size on the Bender-Gestalt Test.[10]

In 1962, three years after her report concerning the work cited above, Clawson authored a manual for the Bender Visual Motor Gestalt Test for children. Her work resembles that of Hutt's,[11] the major difference being the age of the subjects who were tested.

From her experience, Clawson saw the need for some type of procedure which would guide workers in the use of the Bender-Gestalt Test with children. In her method she employed four steps which

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[10]A. Clawson, "The Bender Visual Motor Gestalt Test as an Index of Emotional Disturbance in Children," Journal of Projective Techniques and Personality Assessment, 1959, 23, 198-206.

[11]M. L. Hutt, The Hutt Adaptation of the Bender-Gestalt Test (New York: Grune and Stratton, 1969), pp. 69-105.

constituted the administration of the test. The copy phase, an immediate recall, an elaboration, and an association phase comprise those four steps. Hutt's technique is similar.

Once Clawson's protocols had been secured, they were scored with respect to the occurrence or non-occurrence of the factors outlined by Clawson. She delineated deviations of (1) sequence--order or arrangement of the drawings, (2) page cohesion--edge tendency, top tendency, and bottom tendency, (3) use of white space--expansion, rotation, and multiple pages, (4) modification of figure size--increases, decreases, and unevenness, (5) modification of gestalt--closure difficulty, simplification, changes in angulation and curvature, and rotation, and (6) work methods--erasure, workover, line quality, and several others. Hypotheses about the relationships between behavioral styles and drawing methods were presented which follow the patterns and content in her 1959 work.[12]

Aiming at standardization, Koppitz has written a manual for the use of the Bender-Gestalt Test with young children. She defined eleven emotional indicators which when evaluated, yield information concerning emotional development and interpersonal attitudes.

The emotional indicators were (1) confused order, which implies a lack of planning ability, (2) wavy lines on figures 1 and 2, which is related to a lack of stability, (3) dashes for circles, indicating impulsivity and lack of interest or attention, (4) progressive increase in size (figures 1, 2, and 3), being associated with low frustration

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[12]A. Clawson, The Bender Visual Motor Gestalt Test for Children: A Manual (Los Angeles: Western Psychological Services, 1962), pp. 7-105.

tolerance and explosiveness, (5) large size of drawings, denoting acting out behavior, (6) small size of drawings, which is associated with anxiety, timidity, and withdrawal behavior, (7) fine line, which again, indicates timidity and withdrawal behavior, (8) overwork--reinforced lines, suggestive of overt aggressiveness and impulsiveness, (9) second attempt, which reveals some anxiety or impulsivity, (10) expansion requiring two or more sheets of paper, which is related to acting out behavior and impulsiveness, and (11) constriction, where using less than one-half of one sheet for all figures represents withdrawal, shyness, and depression. This last test indicator has since been eliminated from the original eleven.

The author stated that the emotional indicators are a function of the emotional status of the child. Koppitz added that while a child may have poor perceptual-motor ability, his Bender-Gestalt Test record will not show the emotional indicators given good adjustment. On the other hand, a child who is perceptually and motorically normal will show the indicators, to one degree or another, depending on the severity of his lack of emotional development. Assuming, then, that perceptual-motor status is not related to the emotional indicators, but that the emotional characteristics of the child determine the occurrence or non-occurrence of those indicators, it was possible to proceed to an objective scoring method.[13]

Evaluating the Bender-Gestalt Test records of adults has consumed most of the efforts of researchers in this area. Gobetz is

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[13]E. M. Koppitz, The Bender-Gestalt Test for Young Children (New York: Grune and Stratton, 1963), pp. 126-131.

an avid and meticulous worker who has defined a number of "signs" on the Bender-Gestalt Test that need not be covered individually in this paper. However, his method of approaching these signs is interesting and deserves mention.

Gobetz identified two chief avenues for analyzing Bender-Gestalt Test protocols. Graphic signs are those signs which can be discovered by inspecting or measuring the drawings. One might measure the height, symmetry, or contiguity of a design or series of designs. Methods signs are those indices which are scorable by direct observation of the subject's test behavior. For example, these include counting, paper rotation, drawing direction. Gobetz advocated clinical use of the Bender-Gestalt Test as a projective technique because of its ease of administration during a battery of examinations and its differentiating power on some signs with certain groups.[14]

The method above is another approach where objectifying and quantifying an instrument has taken place to systematically study aspects of reproductions and the clues to personality in them. Two other researchers, Pascal and Suttell, have developed a nearly objective scoring method which has gained acceptance in evaluating Bender-Gestalt Test performances of adults in regard to personality. When using their approach, the standard administration procedures are used where the subject is asked to copy the figures.

Scoring of the protocols is simple but requires training.

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[14]W. A. Gobetz, A Quantification, Standardization, and Validation of the Bender-Gestalt Test on Normal and Neurotic Adults (Washington: American Psychological Association, Inc., 1953), 67 (6), (no. 356), pp. 1-28.

Not all the projective hypotheses seem so far removed from their source. In a very astute observation, Lerner noted that:

> . . . others draw boxes sometimes in such a manner as to condemn themselves to fit into the box whatever figure is presented, regardless of size or shape. This implies not only rigidity but a respect for rules and order so strong as to be self-defeating - an emphasis on controlling or constricting, on form rather than on content.[17]

An instrumental figure in the development of the Bender-Gestalt Test as a projective method was Hutt. His work is abundant with interpretive hypotheses about the behavior and/or personality of those who produce certain deviations on that test. Hutt defined five major test factors which encompass a variety of drawing styles. Each of the drawing styles he observed denote some behavioral or personality trait.[18] A rather lengthy outline of Hutt's work will be given in Appendix D because much in the way of support for the present investigation comes from his efforts.

Two scales are provided in Hutt's work which yield objective data concerning test behavior and its implications in regard to personality. The Psychopathology Scale consists of seventeen factors which are scored for degree of pathology. Factors comprising the scale include a good portion of the outline in Appendix D. The Adience-Abience Scale attempts to assess perceptual approach and avoidance behavior. This approach-avoidance does not necessarily reveal itself

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[17] Ibid., p. 9.

[18] Hutt, loc. cit. Hutt's outline was slightly modified for presentation in this thesis. The original work went into much detail about the interpretive significance of these factors, spanning a great number of pages in the process. The concise highlight of his work was presented in Appendix D to illustrate the theoretical and empirical basis of the present study.

in behavioral acts outside the perceptual realm.[19]

Research on the Diagnostic Validity of the Bender-Gestalt Test

Naches used the Bender-Gestalt Test as a diagnostic aid in determining acting out behavior in children. In this instance, no projective hypotheses were offered to explain the behavior under scrutiny. A behavior was defined, measured, and analyzed. As a result of analysis, it was determined that the test is a valid instrument for differentiating children with problems of acting out from children with no such problems. The five indices used were (1) confused arrangement, where no more than three figures were drawn in direct sequence, (2) ascending order, where figures drawn first were at the bottom of the page, (3) expansive, scattered arrangement of figures, (4) horizontal paper rotation, and (5) progressive increase in figure size or one very large figure, were able to make distinctions between groups at the .01 level of confidence.[20] It might be noted that the preceding results partially confirm those reported by Clawson.[21]

More support of the Bender-Gestalt Test as a tool for personality study came from Stewart and Cunningham. They employed the Pascal-Suttell scoring system in evaluating recall reproductions of female psychotics, non-psychotics (personality disorders and neurotics), and student nurses. The results demonstrated that the groups differed

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[19]Ibid., pp. 123-138.

[20]A. M. Naches, "The Bender-Gestalt Test and Acting Out Behavior in Children," Dissertation Abstracts, 1967, 28(5-B), 2146.

[21]Clawson, loc. cit.

significantly in all but one instance. Differentiation of psychotics and non-psychotics, upon standard presentation (copy), fell just short of the .05 level. However, when the recall phase of the Pascal-Suttell method was used, significant differences in the visual motor performances of the three groups were evident.[22]

Another researcher, Robinson, found that when the Pascal-Suttell system was employed, a significant difference could be obtained in the performances of schizophrenics and paretics. She acknowledged that there may have been some minor cerebral dysfunction in her schizophrenic group, but assured that there were notable differences between the schizophrenic and paretic group in regard to gross brain pathology; the gross impairment being a function of the paretic group.[23]

As an investigator in this area, Bell has defined general characteristic drawing styles of individuals who are representative of various pathological groups found in Bender's writings. He found, in the alcoholic encephalopathies, members of this group who incompletely perceived gestalten and revealed perseveration of strokes. Those persons who were afflicted with Korsakoff's psychosis also showed perseveration of motor impulses or rhythmic movements when reproducing the gestalt figures. In chronic alcoholic hallucinatory states, the gestalten seemed to be perceived, but outlines of the drawings appeared

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[22]H. Stewart and S. Cunningham, "A Note on Scoring Recalled Figures of the Bender-Gestalt Test Using Psychotics, Non-psychotics, and Controls," Journal of Clinical Psychology, 1968, 14, 207-208.

[23]N. M. Robinson, "Bender-Gestalt Performances of Schizophrenics and Paretics," Journal of Clinical Psychology, 1953, 9, 291-293.

hazy (not well-defined). Alcoholic confusional states revealed disturbances of integration of the parts into the whole and of orientation of the figure on the background.

Schizophrenics generally showed evidence of dissociations in the gestalten manifested in (1) change in the rate or direction of movement in part or all of the figures, and (2) in orientation or spatial separation of a part of the figure by movement in the radial direction on a horizontal plane, rotary, or vertical movement to an angle of forty-five degrees.

Depressives were noted to draw with "compulsive precision" and were dissatisfied with their results. Manics tended to draw with elaborations (motor and verbal) which did not destroy the gestalt.[24]

Related to a portion of the aforementioned definitions outlined by Bell is a statement by Bender which illuminates the disruptive effects of psychopathology on perceptual-motor performance. She stated:

> In the visual motor function in schizophrenia, therefore, we find the fundamental disturbance of splitting expressing itself by a dissociation in the gestalt figures which often distorts them fundamentally so that the gestalt principles are split.[25]

Correlated with the notion that reproduction of gestalten are dependent upon personality is the assumption that somewhere between interpretation and motor expression of the gestalten a subject will

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[24]J. E. Bell, Projective Techniques (New York: Longmans Green, 1948), pp. 341-345.

[25]L. Bender, A Visual Motor Gestalt Test and Its Clinica Use (New York: American Orthopsychiatric Association Monograph, 1938, 3), p. 106.

interject his need system which reveals itself in the product. Simpson sought to test that assumption in a doctoral dissertation using two groups of children (boys) and three hypotheses about their performance. He hypothesized that (1) normal and disturbed boys differ significantly in their ability to copy designs other than those found on the Bender-Gestalt Test, (2) that they differ significantly in their ability to discriminate approximations of the Bender-Gestalt Test designs from the true designs, and (3) that the two groups differ significantly in their reproductions of the figures.

Prior to being given the Bender-Gestalt Test, the subjects were required to copy four geometric designs not present on the Bender-Gestalt Test. This procedure was designed to test for differences by asking the two groups of children to discriminate real Bender-Gestalt Test designs from approximations of those designs. Upon evaluation of the first two hypotheses, it became apparent that there were no significant differences between the groups on copy ability and perceptual ability.

Evaluation of the third hypothesis revealed that there were significant differences in the manner in which each group drew the Bender-Gestalt Test designs. Apparently, normal and disturbed boys interpreted (processed) the designs differently, and hence, the differences in expression.[26]

Attempting a finer discrimination, Leonard tested two groups

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[26]W. H. Simpson, "A Study of Some Factors in the Bender-Gestalt Reproductions of Normal and Disturbed Children," Dissertation Abstracts, 1959, 19, 1120.

based on Bender-Gestalt Test performance. His groups were a suicidal and non-suicidal sample. Each group contained forty-six psychiatric patients. He used three steps in analyzing the reproductions; (1) trained clinical raters rated for presence of organicity or impulse control problems, (2) the tests were examined for signs of depression and suicide according to previous research, and (3) nine measurements for deviation in size and spatial constancy. When evaluated, neither of the first two methods was reliable enough to differentiate the two groups based on performance; however, two of the template measurements did discriminate ($p < .01$) between the suicidal and non-suicidal groups. Specifically, suicidal patients produced more constricted designs and had more difficulty reproducing an even ground slant on design 2.[27]

In spite of conflicting results and discrepancies in the literature, researchers like Kramer and Fenwick explored the discriminating power of the Bender-Gestalt Test. They examined the ability of the test to make distinctions between organics, functionals, and normals using two common scoring systems, the Pascal-Suttell method and the Hain system. Basically, the Pascal-Suttell system was able to differentiate among all three groups. The Hain System did very well in differentiating between the functional and organic groups. In addition to the scoring systems used in analyzing the protocols, a clinical judge, operating within some limits, was able to do slightly better in

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[27]C. V. Leonard, "Bender-Gestalt as an Indicator of Suicidal Potential," Psychological Reports, 1973, 32, 665-666.

his grouping according to broad diagnostic classification.[28]

Utilizing the tachistoscopic method, Lindsay was able to obtain differences between subgroups of neurotics, and between neurotic and normal subjects by the Pascal-Suttell scoring system. Using an analysis of variance, Lindsay discovered that there were significant differences in the performances of anxiety and hysterical neurotics, normals and anxiety neurotics, and normals and hysterical neurotics at .05 and beyond.[29]

The foregoing represents a case where the neurotic disturbance invaded the perceptual-motor sphere. It might be justifiable, then, to assume that facets of a normal personality may reveal themselves in the drawing style of an individual. In fact, this is entirely likely when one refers to Wolff's statement[30] which was presented in Chapter 1 of this paper.

Though intriguing, normal personalities have not been the objects of the greater amount of research along these lines, Sarkar is no exception to the almost exclusive study of abnormal subjects. He has attempted to establish group differences based on perceptual-motor performance as evaluated by the Bender-Gestalt Test. Sarkar hypothesized that (1) schizophrenics versus organics, (2) normals versus

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[28]E. Kramer and J. Fenwick, "Differential Diagnosis with the Bender-Gestalt Test," Journal of Personality Assessment, 1966, 30(1), 59-61.

[29]J. Lindsay, "The Bender-Gestalt Test and Psychoneurotics," British Journal of Psychiatry, 1954, 100, 980-982.

[30]W. Wolff, The Expression of Personality (New York: Harper and Bros., 1943), p. 6.

organics, (3) schizophrenics versus normals, and (4) organics versus non-organic mental patients and normals combined would differ significantly in their Bender-Gestalt Test reproductions. In an evaluation of the copied designs, Sarkar statistically supported his hypotheses. A summary statement from his work claimed:

> Hence it is proved that there lie marked differences in the nature of perception and the corresponding visual-motor functions of the schizophrenic, organic (brain-damaged) mental patients and normal individuals when the performance of each of these groups is considered individually as well as when the visual-motor functions of the combined group of the schizophrenics and normals are compared with those of the organic mental patients.[31]

It seems that when it comes to a question of fine discrimination, i.e., between psychotics-neurotics, or psychotics-personality disorders, disagreements over the differentiating capacities of the Bender-Gestalt Test flare up. Most researchers admit that the state of knowledge concerning the personality assessment value of the Bender-Gestalt Test is in flux. Exemplifying that disagreement is a study by Tamkin which opposes the results of most of the aforementioned research items. Standard scores were computed from the protocols of twenty-seven functional psychotics and twenty-seven neurotics, and personality disordered cases. These subjects had been matched for age. No significant differences were discovered for the performances between the groups. Tamkin concluded that the Pascal-Suttell system for scoring the Bender-Gestalt Test has little value in differentiating between

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[31]S. N. Sarkar, "A Study of the Visual Motor Functions of Schizophrenic and Brain Damaged Mental Patients," Indian Journal of Psychology, 1972, 47(2), 165-172.

the functional psychiatric groups studied.[32]

A great deal of the research has established the ability of the Bender-Gestalt Test as a diagnostic aid. As a member of a diagnostic battery, the Bender-Gestalt Test has been shown to have utility in differentiating among groups of mentally ill patients, and between mentally ill subjects and normal subjects. The Bender-Gestalt Test has also been shown to have usefulness in differentiating patients with cerebral disorders from those patients who are functionally impaired, but who appear to have some type of organic damage because of their overt behavior and symptoms.

Two French investigators, Bertrand and Matchabely, found that various psychiatric groups did display some features which were characteristic enough to make some distinctions. For example, schizophrenics commonly changed dots to loops, had tendencies toward vertically drawing horizontal figures, and disorganizing parts of figures. Paranoid patients exhibited a tendency toward perfection, guiding lines, markings, and many corrections in their performances. As a final illustration, hysterical patients reproduced the figures using the wrong number of elements, hatched curved lines, and exhibited a tendency for dots to become dashes.[33]

By studying normal cases exclusively, Weiss introduced a different approach to personality research with the Bender-Gestalt

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[32]A. S. Tamkin, "The Effectiveness of the Bender-Gestalt in Differential Diagnosis," Journal of Consulting Psychology, 1957, 21(4), 355-357.

[33]K. Matchabely et R. Bertrand, "Quelques Considerations Pratiques Sur L'Application du Test du Moteur de Structuration Visuelle de Bender en Clinique Psychiatrique," Revue de Psychologie Appliquee, 1953, 3, 326-332.

Test. He analyzed the occurrence of deviations in reproduction of gestalten in a non-clinic group. Severe distortions and modifications of the figures were rare on both copy and recall phases of Bender-Gestalt testing. Mild destructions, disorganization, rotations, simplification, and contaminations occurred with slightly greater frequencies in his non-clinic group. However, both severe and mild destruction were uncommon.[34]

STUDIES UTILIZING THE MEMORY-FOR-DESIGNS TEST

The Memory-For-Designs Test is the subject matter of the present study. Inclusion of a review of studies employing the test is a necessary and logical section. However a problem arises when one realizes that very little of the work on the Memory-For-Designs Test has concerned itself with topics other than organic impairment in subjects. The following reviews are deemed useful by virture of the fact that they crystallize the need for a study of the perceptual-motor behavior of normal subjects. Furthermore, inclusion of the reviews place the study in a larger prospective.

Research has borne out the idea that there are similarities between the Memory-For-Designs Test and the Bender-Gestalt Test when both are used as indices of brain damage. Quattlebaum found that scores on the Memory-For-Designs Test are highly correlated (r = .851) with scores on the Bender-Gestalt Test. This correlation was

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[34]A. A. Weiss, "Frequency of Distortions, Rotations, Perseverations, Simplifications, and Contaminations etc. on the Bender Visual Motor Gestalt Test in a Non-Clinical Population," Israel Annals of Psychiatry and Related Disciplines, 1970, 8(1), 75-80.

significant of the .01 level of confidence for the fifty-two neuropsychiatric patients included in the study. In fact, he recommended using both tests together as a check since they tend to yield few false positives and many false negatives.[35]

Validity, too, has been a question delved into by researchers interested in these devices. Anglin et al. showed that validity coefficients determined for the Bender-Gestalt Test and the Memory-For-Designs Test did not differ significantly, .55 and .67, respectively. In addition to similarities based on coefficients of validity and measurement of the same events, Anglin was able to demonstrate that the Memory-For-Designs Test allowed significantly higher interscorer agreement than that obtained for the Bender-Gestalt Test records. They suggested that the greater specificity in scoring the Memory-For-Designs Test accounted for that occurrence.[36]

In 1969, Turland and Steinhard asserted that the Memory-For-Designs Test may not be as efficient as its authors claimed. Turland reported that the test produced fewer correct classifications, more misclassifications, and more unclassified cases than the standardization data indicated as noted by Graham and Kendall. As a result of their findings, Turland and Steinhard directed two criticisms at the present method of evaluating those scores. First, they claimed that intelligence is related to performance on the Memory-For-Designs Test;

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[35]L. F. Quattlebaum, "A Brief Note on the Relationship Between Two Psychomotor Tests," Journal of Clinical Psychology, 1968, 24(2), 198-199.

[36]R. Anglin, M. Pullen, and P. Games, "Comparison of Two Tests of Brain Damage," Perceptual and Motor Skills, 1965, 20, 977-980.

that is, intelligence as measured by the Mill Hill, the Wechsler Full Scale I.Q., and the Progressive Matrices. Secondly, the authors made a case for the inclusion of base rates in the prediction of whether or not a score on the Memory-For-Designs Test is indicative of brain damage. In its present usage, no such procedures are employed. These researchers claimed that knowledge of base rates would affect the interpretation given to the score.[37]

Coming closer to the subject matter of this thesis, a study conducted by Kendall presented information which indicated that the test score means of psychotics and psychoneurotics on the Memory-For-Designs Test were significantly different at the .02 level. The test score means of psychotics did not differ significantly ($p > .05$) from a group of miscellaneous controls. In her study, she reported a tendency for individual functionally psychotic patients to make poor scores. The focus of the study was on differentiating the control group (mainly a functionally psychotic group) from the experimental group (organic cases). A significant difference in the test scores was obtained between groups.[38]

Using a control group of schizophrenics and an experimental group of organic cases, Armstrong set out to determine the consistency of longitudinal performance of both groups on the Memory-For-Designs Test. Results indicated that the organic group had mean scores twice

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[37]D. N. Turland and M. Steinhard, "The Efficiency of the Memory-For-Designs Test," British Journal of Social and Clinical Psychology, 1969, 8, 44-49.

[38]B. S. Kendall, "Memory-For-Designs Performance in the Seventh and Eighth Decades of Life," Perceptual and Motor Skills, 1962, 14, 399-405.

as high as the schizophrenic group, 14.87 and 7.33, respectively. The important findings were that (1) there was low interest variability for the organic group and (2) that the schizophrenic group showed greater interest variability for consecutive testing. The author attributed those findings to the possibilities that organic cases displayed less erratic behavior than schizophrenics, that organics were more motivated to improve than the schizophrenics, and that there was a learning effect involved.[39]

Further support for the assumption that visual motor performance may be related to the type of disorder presented is found in the work of Kempel. He tested forty-five organic, psychotic, and non-psychotic subjects for performance on the Memory-For-Designs Test on the second, sixth, and tenth days of initial hospitalization. Significant differences were uncovered for the three testing groups. Specifically, the organic group was significantly different from the two non-organic groups. Although unable to discover any differences in the performances of psychotic and non-psychotic subjects, Kempel noted that his psychotic subjects exhibited greater test-retest variability when compared to the organic and non-psychotic cases.[40] Consider Kempel's findings in relation to those of Armstrong's[41] and a fairly obvious similarity reveals itself: the variability of

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[39]R. G. Armstrong, "The Consistency of Longitudinal Performance on the Graham-Kendall Memory-For-Designs Test," Journal of Clinical Psychology, 1952, 8, 411-412.

[40]L. T. Kempel, "Orientation Errors During Successive Administration of the Memory-For-Designs Test," Journal of Consulting and Clinical Psychology, 1973, 41(2), 314.

[41]Armstrong, loc. cit.

performance by schizophrenic and other functionally psychotic groups stands out.

Three researchers from the United Kingdom have found the Memory-For-Designs Test to be a tool useful in arriving at a diagnosis of cerebral disorder if it is a member of a diagnostic battery. May, et al. compared the performances of three groups; a group of organic cases, non-organic cases (functionally mentally ill cases), and alcoholics. They demonstrated that the organic groups made significantly more errors on the Memory-For-Designs Test than patients in the other groups. Furthermore, the alcoholic cases showed no more impairment than the functional cases, indicating that the alcoholics in their sample had no demonstrable cerebral dysfunction. It was concluded that use of the Memory-For-Designs Test is justifiable in light of its returns.[42]

It is encouraging to see that no absolute agreements exist concerning the utility of the Memory-For-Designs Test. Therefore, much research is being stimulated. Watson uncovered evidence to refute the findings of the aforementioned study. In a comparative study, Watson explored the ability of the Memory-For-Designs Test, the Bender-Gestalt Test, and the Benton Visual Retention Test to discriminate between brain damaged patients and schizophrenics. His results indicate that neither the Bender-Gestalt Test nor the Memory-For-Designs Test could provide significant differences. Benton Visual Retention scores did distinguish between the two groups, but it was

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[42]A. E. May, A. Urquhart, and R. E. Watts, "Memory-For-Designs Test: A Follow-up Study," Perceptual and Motor Skills, 1970, 30, 753-754.

recommended by the author that caution should be applied when generalizing results to other populations.[43]

Research results by Ascough, Strouf, Cohn, and Smith suggested that the Memory-For-Designs Test may have some utility in differentiating brain damaged cases from schizophrenics. These investigators found that 77 percent of the organic cases were correctly identified. Their recommendations were that:

> While the required proportion of schizophrenics to brain damaged may not obtain over a total hospitalized population in many settings, the test may be employed profitably over the subpopulation of patients in which discrimination between brain damage and schizophrenia is very difficult.[44]

Studies from the literature indicate that the Memory-For-Designs Test is a reliable and valid instrument for the detection of brain damage. However, the results obtained often depended on the method of data analysis and the population being sampled.

Using artificial base rates (.50 with cerebral damage and .50 without cerebral damage) and a cutting score between five and six, Korman and Blumberg, stated that the Memory-For-Designs Test was the "most effective single test" in predicting the presence or absence of brain damage when compared to similar tests, including the Bender-Gestalt Test. They cautioned against generalization of the results to clinical settings because of the artificiality of the base rate used. They also noted that if the Graham-Kendall breakdown system (normal,

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[43]C. G. Watson, "The Separation of Neuropsychiatric Hospital Organics From Schizophrenics with Three Visual Motor Screening Tests," Journal of Clinical Psychology, 1968, 24(4), 412-414.

[44]J. C. Ascough, M. Strouf, C. Cohn, and R. Smith, "Differential Diagnosis of Brain Damage and Schizophrenia by the Memory-For-Designs Test," Journal of Clinical Psychology, 1971, 27(4), 471-472.

borderline, and critical) is used to predict brain damage, only 32.5 percent of their cerebral disordered group would have been correctly rated.[45] Thus, the method of analysis does influence interpretation of the results. This is essentially what Turland and Steinhard were speaking of in their investigation, cited earlier.[46]

In all but the fewest of cases, did any of the research publications concerned with the Memory-For-Designs Test focus on a topic other than the expressed use of the test. The possible exception which has any real bearing on the present study, is the work performed by two researchers, Craddick and Stern. In that inquiry, they found that a stress factor caused a significant reduction in the height of Memory-For-Designs Test reproductions. The subjects, forty Air Force personnel, were given a battery of tests, including the Memory-For-Designs Test, in the initial stage of the experiment. About a month later, four experimental groups were, again, given the Memory-For-Designs Test, this time prior to experiencing biodynamic stress. A control group also took the test, but experienced no biodynamic stress (abrupt deceleration).

The results of a pretest (before stress) revealed that the heights of the drawings for the four experimental groups, taken together, were significantly lower than the height of the drawings of

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[45]M. Korman and S. Blumberg, "Comparative Efficiency of Some Tests of Cerebral Damage," Journal of Consulting Psychology, 1963, 27(4), 303-309.

[46]Turland, loc. cit.

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[46]Turland, loc. cit.

the control group.[47]

Related to the theoretical undercurrent of the research studies presented in this chapter, Rapaport has emphasized that:

> ". . . at present, however, all perception is to be recognized as 'pure sensory experience'--which is an abstraction never available to conscious experience--in terms of needs, drives, interests, attitudes, and the experiences of past and present related to them."[48]

SUMMARY

Chapter 2 was a product of an effort to relay research findings about the topic of this thesis. Wherever possible, opposing viewpoints were given to maintain objectivity. An introductory paragraph provided a map of the course that the review would take.

The first major subdivision discussed several studies which dealt with the perceptual and expressive motor aspects of personality. These reports served to allow the reader to place the topic in a greater scheme and establish connection with a host of relevant research areas.

A review of pertinent material on the Bender-Gestalt Test provided a link between expressive motor behavior and personality upon which the investigation was founded. To date, practically no projects have been located on the projective possibilities in a

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[47]R. A. Craddick and M. R. Stern, "Effect of Pre- and Post-Stress Upon Height of Drawings in a Perceptual-Motor Task," Perceptual and Motor Skills, 1963, 17, 283-285.

[48]R. R. Holt, Diagnostic Psychological Testing, ed. D. Rapaport, M. M. Gill, and R. Schafer (New York: International Universities Press, Inc., 1978), p. 272.

Memory-For-Designs Test. By establishing similarity between the Bender-Gestalt Test and the Memory-For-Designs Test, a worthwhile case was made for an investigation such as this.

Finally, two points were achieved by presenting a representation of research studies performed on the Memory-For-Designs Test. First, the lack of investigation into projective qualities of the Memory-For-Designs Test was illustrated and, more importantly, light was shed on the tests' general acceptance as an indicator of brain damage.

From the review, it may be indicated that studies of normal or non-clinic populations with the Memory-For-Designs Test would be beneficial undertakings. Expanding on the knowledge of personality characteristics of normals through their reproductions of gestalten would certainly add weight to related research on abnormal populations.

Chapter 3

METHODS AND PROCEDURES

The following chapter describes the experimental procedures used in this study. Discussion leans heavily upon defining the sample, the population or universe from which the sample was taken, the materials, the type of design, and statistical analyses applied to the data. A chapter summary is provided.

POPULATION AND SAMPLING

Detailed description of the universe or population being sampled is a crucial aspect in the research procedure. Preceding that section of this chapter is an equally involved definition of the sample which was employed. Along these lines, Borg and Gall asserted that an adequate description of the sample will allow other investigators an opportunity to evaluate the research for its possible future application.[1]

The Subjects

The subjects tested in the research were not selected on a true random sampling basis. Specifically, incidental nonprobability sampling was the method of subject selection. In this manner, subjects were included in the study not as a result of true random selection,

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[1]W. R. Borg and M. D. Gall, Educational Research (New York: David McKay Co., Inc., 1971), p. 452.

but because they were identified as belonging to a particular group of ready availability. No attempt was made to utilize a true random sample of the entire universe of normal human beings. The selection method can be applied legitimately if generalizations from the resultant data are advanced with caution.

The subjects were undergraduates at Emporia State University enrolled in the 1977-78 academic year. The age range was from eighteen to twenty-three years. Intelligence levels most likely extended from the lower limit of the normal I.Q. range to the superior or gifted level. Most subjects were likely 'midwesterners', but no control was employed for this variable. However, all subjects were citizens of the United States. The majority of subjects were enrolled in undergraduate psychology courses at the freshman and sophomore levels.

Assuming that Emporia State University undergraduates represent undergraduates in other midwest universities, the results may be applied with some degree of confidence. To say that the results of this study will be applicable to all non-clinic groups would be a violation of the limits of the research set by the universe or population.

The Population

The nonprobability incidental sample defined above is representative of eighteen to twenty-three year old black or white, male or female undergraduates of average or better I.Q. who attend small, rural universities in the central portion of the United States, and who are American Citizens. These are the outermost boundaries of the total population which may be expected to possess the characteristics found

in the sample described above.

MATERIALS AND INSTRUMENTATION

Ordinarily, a detailed description of either the Graham-Kendall Memory-For-Designs Test or the Sixteen Personality Factor Questionnaire may be regarded as superfluous since each is generally well-known. Inclusion of the tests in this section seemed a necessary step because neither test was applied in the manner prescribed by its authors. The Memory-For-Designs Test was not used as an index of cerebral damage. Only one form (A) of the Sixteen Personality Factor Questionnaire was administered. Cattell has recommended using a combination of forms for research purposes as a means of increasing the validity of the personality measure.[2]

The Memory-For-Designs Test

The Memory-For-Designs Test consists of fifteen geometric figures which are composed of straight lines shown to the testee on five inch square cards. Testing is done individually and takes approximately five to ten minutes to administer and score. The original purpose of the instrument was to screen clinic cases with organic brain damage from those cases with no such impairment. The deleterious effects of organicity on the brain are expected to manifest themselves in distorted and disorganized reproductions of the gestalten or geometric figures. Graham and Kendall proposed a scoring system using

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[2]R. B. Cattell, H. W. Eber, and M. M. Tatsuoka, Handbook for the Sixteen Personality Factor Questionnaire (Champaign: Institute for Personality and Ability Testing, 1970), p. 40-41.

cut-off scores and corrections for age and vocabulary level on both adult and child protocols.[3]

The present investigation departed from original uses of the test on two major counts, (1) the Memory-For-Designs figures were evaluated in terms of lack of closure, figure size expansion, and figure size constriction for purposes of discovering any connection of these drawing methods with the personality traits of the subject, and (2) since detection of cerebral dysfunction was not the goal of the research, the Graham and Kendall scoring procedures were not used. These two deviations represent the exploratory nature of the study.

In connection with the first mentioned departure in the preceding paragraph, Hunt has stated that the research does not clearly indicate the role of emotional and motivational factors in Memory-For-Designs performance.[4] The problem that researchers have undertaken, illustrated by Hunt, has been to study the effects of abnormal motivation and emotional behavior (psychopathology) upon Memory-For-Designs Test performance. Scanty is the research on the visibilities of normal or non-clinic personalities in reproduced (drawn) gestalten.

Reliability of the test. In discussing the reliability of the Memory-For-Designs Test, two major points need to be considered. First, the reliability of the Memory-For-Designs Test as it is applied to the assessment of brain damage must be evaluated. Secondly, there is the

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[3]F. K. Graham and B. S. Kendall, "Memory-For-Designs Test: Revised General Manual," Perceptual and Motor Skills, 1960, 11, 147-188.

[4]A. B. Baker, Clinical Neurology, I, ed. H. F. Hunt (New York: Hoeber and Harper, 1955), p. 324.

problem of no reliability data for use of the test as in this thesis; i.e., as a test of personality.

Speaking to the former, Graham and Kendall reported interrater reliability for their scoring system at .99. This coefficient was obtained from the raw scores of 140 validation subjects used by the authors. An index of reliability (square root of the reliability coefficient) on the same 140 subjects revealed a coefficient of .92.[5]

The second problem of reliability presented a very distinct challenge for the present research study. How can reliability data be given when no previous research has established a precedent? The answer had to come from remotely related studies (see Chapter 2) which may have provided only a rudimentary indication of Memory-For-Designs Test reliability for personality assessment. Furthermore, until results of this study are refuted or borne out by future research, no direct basis will exist which can yield data on reliability.

Validity of the test. Graham and Kendall reported the validity of the Memory-For-Designs Test in terms of its ability to differentiate groups of brain disordered (organic) cases from cases where a functional or no disorder existed. Using a cut-off score of twelve, only four percent of a control group (non-organics) fell into the critical area, which indicates brain damage. In a cross-validation group only two percent of control subjects scored in the critical area. In contrast, fifty percent of the organic group scored in the critical area, and forty-two percent of the cross-validation group of organic subjects

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[5]Graham and Kendall, loc. cit.

scored in that area.

The authors claimed that there is a borderline area between the raw scores of five and eleven. By adding the percentages of subjects in the borderline area with those in the critical area, twenty-one percent of controls and seventy-nine percent of organic cases scored at or above five, indicating suspicion of organic impairment. In the cross-validation group, twenty-two percent of controls scored in the borderline area and above, and seventy-eight percent of organic cases were identified as borderline or critical. Stating their results in another way, seventy-eight percent of organic subjects in the cross-validation group were correctly identified whereas twenty-one percent of the brain damaged subjects in that sample were misclassified. Results from the original sample of organic and control subjects are similar.[6]

The present investigation cannot claim any validity data because of the deviation in original use of the Memory-For-Designs Test. However, reliance on studies which have employed the Bender-Gestalt Test as a test of personality offers an indirect source of construct validity based on similarities between the two tests. The fact that many researchers agree that the Bender-Gestalt Test has some projective value, and that personality is being assessed, hints at validity. From that, it may be cautiously assumed that, if the Memory-For-Designs Test has qualities similar to the Bender-Gestalt Test, it may also have some degree of construct validity and/or concurrent validity.

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[6]Ibid.

The Sixteen Personality Factor Questionnaire Form A

Developed by Cattell some twenty-nine years ago, this paper and pencil type personality test has been the focus of a multitude of research. Through the technique of factor analysis of traits, the author identified sixteen major factors which yielded reliable data about a given subject or group of subjects. Cattell has provided multiple forms and standardization data for each.[7]

Reliability of the test. In the 1970 edition of the handbook for the Sixteen Personality Factor Questionnaire, Cattell chose to report reliability in the forms of dependability and stability coefficients. Dependability coefficients are those which indicate "the correlation between two administrations of the same test when the lapse of time is insufficient for people themselves to change with respect to what is being measured."[8] Stability coefficients are correlations between test and retest with a period of two months or longer intervening. Both measures reveal fairly high correlation when the group nature of the test is taken into account.[9]

Validity of the test. Again, referring to the 1970 edition, the author chose to underscore the treatment of validity of the test

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[7]R. B. Cattell, D. R. Saunders, and G. Stice, Handbook for the Sixteen Personality Factor Questionnaire (Champaign: Institute for Personality and Ability Testing, 1957), p. 1-19.

[8]R. B. Cattell, H. W. Eber, and M. M. Tatsuoka, Handbook for the Sixteen Personality Factor Questionnaire (Champaign: Institute for Personality and Ability Testing, 1970), p. 30.

[9]Ibid., pp. 30-31.

with a discussion of construct, indirect, and concrete validities. Construct validities are those coefficients of correlation which give an indication of the degree of relationship between what the test is supposed to measure and the scale itself. These coefficients appear to be reasonably high for a variety of combinations of forms of the test. The direct validity (construct) coefficients range from .77 to .96 for the complete Sixteen Personality Factor Questionnaire (Forms A+B+C+D). Indirect validity approaches the problem of construct validity by investigating factors surrounding the 'construct.' Coefficients in this case appear to be satisfactorily high, and even somewhat higher than those given for direct construct validity. Concrete validity data are reported in terms of how the Sixteen Personality Factor Questionnaire correlates to similar measures. Cattell asserted that the test has some qualities which are synonmous with the factors that are assessed by the MMPI. Comparison between the Guilford-Zimmerman Temperament Survey and Sixteen Personality Factor Questionnaire is also provided by Cattell.[10]

DESIGN OF THE STUDY

The scheme of the study resembled most closely those designs which are factorial in nature. Robinson outlined three major points of factorial designs which are satisfied by criteria involved in this investigation. First, two independent variables are analyzed simultaneously. Secondly, factorial combination of the independent variables provides needed information on the possibility of interaction effects. Finally, a secondary variable (personality) is controlled for

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[10]Ibid., pp. 34-47.

by making it a second independent variable.[11] The design is best characterized as a between-subjects comparison. Differences in frequencies were measured using two independent variables with more than two levels of either variable.

The Independent and Dependent Variables

Beginning with hypothesis number one, or the closure hypothesis, the two independent variables were closure difficulty on the Memory-For-Designs Test (IV_1), and the three factors on the Sixteen Personality Factor Questionnaire, A, G, and H (IV_2). The dependent variable was the number of subjects who scored in such a way as to place them in one of the factorial cells of the chi square analysis. The first independent variable (IV_1) was divided into three levels. They were: eight to fifteen figures with closure problems, one to seven figures with closure problems, and zero figures with closure problems. The second independent variable (IV_2) was divided into two levels for the two-way chi squares and into one level for the one-way chi squares. The two levels (for factors A, G, and H) consisted of scores at or below Sten three and scores at or above Sten eight for the two-way chi squares. For the one-way comparisons, Stens five and six were combined to represent the Sixteen Personality Factor Questionnaire.

The first independent variable (IV_1) for the second hypothesis, or the expansion hypothesis, was figure size expansion on the Memory-For-Designs Test. The three levels used here were divided in the same

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[11] P. W. Robinson, Fundamentals of Experimental Psychology: A Comparative Approach (Englewood Cliffs: Prentice-Hall, Inc., 1976), pp. 235-258.

manner as with the closure hypothesis. They were: eight to fifteen figures expanded, one to seven figures expanded, and zero figures expanded. The second independent variable (IV_2) had two levels for the two-way chi square comparisons and one level for the one-way comparisons. For the two-way comparisons, the levels were divided at scores at or below Sten three and scores at or above Sten eight on the Sixteen Personality Factor Questionnaire for factors A, E, and H. For the one-way comparisons, Stens five and six comprised the group under scrutiny. Memory-For-Designs Test levels were the same as above. In this case, the dependent variable was the number of subjects who scored in such a way as to place themselves in one of the cells in any factorial combination or chi square cell.

For the third hypothesis, or the constriction hypothesis, the first independent variable (IV_1) was the constriction of figure size on the Memory-For-Designs Test. There were three levels. Level one was eight to fifteen figures constricted, level two was one to seven figures constricted, and level three was zero figures constricted. The second independent variable (IV_2) had two levels for the two-way comparisons, and one level for the one-way chi squares. For the two-way chi squares, level one was scores at or below Sten three and level two was scores at or above Sten eight on the Sixteen Personality Factor Questionnaire for Factors A, E, and H. As regards the one-way chi squares, the Memory-For-Designs Test variable and its levels were the same, but subjects in Stens five and six from the Sixteen Personality Factor Questionnaire comprised the group studied. The dependent variable was the number of subjects who scored in such a way as to place themselves in one of the cells in any factorial combination or chi square cell.

Definitions of the independent variables. The independent variables from the Memory-For-Designs Test are to be considered first. The variable, lack of closure or closure difficulty, can be defined as difficulty in joining subparts of a figure at any point of junction on the design. Each figure, no matter how many non-closed joints, was counted as only one instance of closure difficulty. Therefore, the maximum number of closure difficulties per protocol was fifteen. Hutt made three subclassifications he used with the Bender-Gestalt Test which lend themselves to the present study. They are (a) gaps at the point of joining, (b) erasures or corrections at the point of junction, and (c) overlapping or overshooting a point of junction.[12] Any of the three alone or in combination served to count as difficulty with closure. Lack of junction and overshooting were scored as such for deviations exceeding one millimeter.

Figure size expansion refers to the increase in the reproduction by one-quarter the size of both the vertical and horizontal axes of the corresponding stimulus card figure on the Memory-For-Designs Test. Figure size constriction refers to the decrease in the reproduction by one-quarter the size of both the vertical and horizontal axes of the corresponding stimulus card figure on the Memory-For-Designs Test. Both definitions were proposed by Clawson[13] and

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[12]M. L. Hutt, The Hutt Adaptation of the Bender-Gestalt Test (New York: Grune and Stratton, 1969), pp. 85-87.

[13]A. Clawson, "The Bender Visual Motor Gestalt Test as an Index of Emotional Disturbance in Children," Journal of Projective Techniques and Personality Assessment, 1959, 23, 198-206.

Hutt[14] for use with the Bender-Gestalt Test in its projective role. Measurements for the vertical and horizontal axes of the Memory-For-Designs Test figures can be found in Appendix C.

Personality traits from the Sixteen Personality Factor Questionnaire served the function of second independent variables in the research. Factor A represents two bipolar traits which have been labeled sizothymia and affectothymia. Sizothymia (a low score on the test for this factor) designates such characteristics as aloofness, stiffness, and reservedness. Affectothymia is the proper term for a person who scores high on the test for this factor and who exhibits traits labeled as warmth, sociability, easy-going, good-natured, and so on.[15]

Factor E from the Sixteen Personality Factor Questionnaire represents two bipolar traits which have been termed submission and dominance. Submission (a low score on the test for this factor) denotes dependence and docility. Dominance (a high score on the test for this factor) indicates that the subject is aggressive, competitive, and assertive.[16]

Factor G is another element of the Sixteen Personality Factor Questionnaire. This factor represents two bipolar traits which have been labeled lack of internal standards and character. Lack of internal standards indicates casual, fickle, and undependable types of behavior in individuals who score in this area (a low score on the test for this

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[14]Hutt, op. cit., pp. 82-83.

[15]Cattell, op. cit., p. 80.

[16]Ibid., p. 86.

factor). Character, or superego strength, is descriptive of conscientious, persevering, and responsible types of behavior.[17]

Factor H of the test denotes two bipolar traits which have been designated as threctia and parmia. Threctia (a low score on the Sixteen Personality Factor Questionnaire for this factor) describes a person who is shy, timid and withdrawn. Parmia (a high score on the test for this factor) defines a person who is adventurous, thick-skinned, and genial.[18]

The Procedure

In order to achieve maximal results and to enhance the validity of the design, the procedure occurred as presented below. Initially, some 350 students who were available in groups were asked to complete Form A of the Sixteen Personality Factor Questionnaire. After the records were turned in, each was hand scored using the key provided in the test kit. Then, according to the hypotheses, subjects whose scores were at or below Sten three and at or above Sten eight for the selected test variables, and who met sample qualifications were asked to return for another testing period. Also, subjects scoring in Stens five and six were included as a comparison group, and were likewise called in for further testing. Of those 350 tested, 323 met the qualifications of the sample. These 323 subjects were the people called in for the 'follow-up' testing. Anonymity of these individuals was closely guarded.

The second testing session involved administration of the

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[17]Ibid., p. 88.

[18]Ibid., p. 91.

Memory-For-Designs Test. That phase was carried out individually. A coded record was utilized for comparison of the results from both tests. When subjects asked why they were being tested, they were told that it was for a 'follow-up test' of a different sort, which involved drawing some designs. They were also told that they were selected because of the way in which their scores on the personality test distributed themselves.

Of the 323 subjects who qualified, 241 availed themselves for the follow-up test at their appointed times. Each subject was contacted no less than twice, if necessary. However, eighty-two individuals simply did not show for the second test at their reappointed times. Every effort, short of coercion, was used. Still, those eighty-two did not show. This could represent a selective factor or bias. When a subject did come in for the second test, he was told that he would be taking a simple, five-minute test which required him to draw some geometric figures from memory. After five seconds had passed, they were instructed to draw the design as they had seen it. Anxious subjects were informed that artistic ability had very little to do with correct test performance. After completing the designs on the Memory-For-Designs Test, subjects were thanked for their participation and excused.

Statistical Treatment of the Data

Before a researcher chooses a particular statistical tool, he must have pinpointed the type of data which he is intending to collect. Is the data nominal, ordinal, interval, or ratio?

In the hypotheses (Chapter 1) it was stated that the data were

to be collected in terms of how many, or the number of subjects who score in a particular treatment cell. That is, for example, how many subjects exhibited some degree of figure size constriction on the Memory-For-Designs Test and scored at or below Sten three on the Sixteen Personality Factor Questionnaire. Operating from the information given above, a logical answer to the question, "What type of data is it?", clearly is, frequency or nominal data. Linton and Gallo asserted, in a discussion of frequency data, that "For tests of significance, however, the frequency of occurrence of subjects in each category always provides the data."[19]

It follows that if a researcher is dealing with frequency data for nonparametric statistics he must rely on the tool, chi square. Downie and Heath contended that the chi square is the proper tool for use with tests of significance for data that are expressed in frequencies.[20] Results were evaluated at the alpha level .05, and tested the null hypothesis. Alternative hypotheses are detailed in Appendix A.

The statistic mentioned above was used to test each of the three hypotheses. Hypothesis number one, or the closure hypothesis, was evaluated in terms of three 2 X 3 chi squares, one for each Sixteen Personality Factor Questionnaire variable as it related to closure on the Memory-For-Designs Test. The 2 X 3 chi squares sufficed to compare subjects scoring at or below Sten three and subjects scoring at or above

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[19]M. Linton and P. S. Gallo, The Practical Statistician: Simplified Handbook of Statistics (Monterey: Brooks/Cole Publishing Co., 1975), pp. 11-12.

[20]N. M. Downie and R. W. Heath, Basic Statistical Methods (New York: Harper and Row, 1974), p. 188.

Sten eight for each of the three factors. In addition, one-way chi squares were used to analyze the performance of a group of Stens five and six subjects in relation to the closure variable for each of the Sixteen Personality Questionnaire traits (A, G, and H).

The second hypothesis, or the expansion hypothesis, was necessarily evaluated in terms of one-way chi squares. The expected frequencies totaled less than two for each Sixteen Personality Factor Questionnaire variable when combined with the Memory-For-Designs Test factor of expansion. Therefore, there were nine one-way chi squares for the expansion hypothesis. Six of those were used to analyze and compare subjects scoring at or below Sten three, and those scoring at or above Sten eight on the Sixteen Personality Factor Questionnaire. The remaining three were employed to measure differences among a group of subjects scoring at Stens five and six for each Sixteen Personality Factor Questionnaire variable as it related to expansion on the Memory-For-Designs Test.

The third hypothesis, or the constriction hypothesis, was evaluated in terms of two-way chi squares and one-way chi squares. For each Sixteen Personality Factor Questionnaire variable, a two-way chi square was made possible by combining each with the constriction factor from the Memory-For-Designs Test. Thus, there were three two-way chi squares. These involved factors A, E, and H from the Sixteen Personality Factor Questionnaire as did the second hypothesis. The 2 X 3 chi squares sufficed to compare subjects who scored at or below Sten three and those who scored at or above Sten eight for the three factors mentioned. Furthermore, one-way chi squares were used to analyze the performance of a group of Stens five and six subjects in relation to the constriction

variable for each of the Sixteen Personality Factor Questionnaire variables. In each of the above hypotheses, the Stens five and six group served as control subjects.

Control Procedures

In order to take into account the error variance associated with sample selection, a precise population was defined. The effects of age, I.Q., and education were assumed to be equally distributed in the groups. Since subjects were not randomly selected within the sample it is impossible to generalize the results of this experimentation beyond the limits defined as the population in this chapter.

By adding the Stens five and six groups into the data analysis, a control group was established for comparison purposes. In other words, the deviant groups (Sten three and below, and Sten eight and above) could be evaluated in light of their departure from the manner in which an average subject (Stens five and six) would draw the figures. This was the strongest control procedure used within the research. There were no assumptions here as above.

SUMMARY

Chapter 3 has given details concerning the population and sampling, materials and instrumentation used, and the research procedure and design. Discussion of the population provided explicit requirements that each subject had to exhibit prior to being fully included in the study. Briefly, subjects must have been between eighteen and twenty-three, be a U.S. Citizen, attend Emporia State University as an undergraduate, and be either male or female, black or white and possess at least average intelligence. The larger universe from which the

sample was drawn was also defined.

The topics, Materials and Instrumentation, covered the Graham-Kendall Memory-For-Designs Test and the Sixteen Personality Factor Questionnaire. Reliability and validity data on each measure were given.

The study was defined as a factorial design using a between-subjects comparison. Independent and dependent variables were described in detail. In addition, data collection procedures and analysis methods were discussed. Data collected in the prescribed manner were subjected to chi squares for determination of the significance of results. Finally, some assumptions of control and control procedures were mentioned.

Chapter 4

ANALYSIS OF DATA

The general plan of this chapter is to describe the research results in statistical terms. This is the crucial evaluation since any significant material to be derived from the study must be based in empirical fact. Briefly, a response analysis highlights potentially useful information about the types of responses given, regardless of their statistical significance. A statistical analysis provides a summarization of the mass of data in terms of its significance in relation to a priori hypotheses. To conclude, a chapter summary is furnished. Recommendations are interlaced throughout the chapter in brief. Separate tables summarizing the statistical results of each test are provided.

RESPONSE ANALYSIS

The discussion of response characteristics will focus on two particular areas. Initially, responses which characterized the Sixteen Personality Factor Questionnaire for the present sample will be discussed. Subsequent to that presentation, is an analysis of Memory-For-Designs Test responses which should provide some potentially useful information for future research.

Characteristics of the Sample for Sixteen Personality Factor Questionnaire Responses

This discussion reveals useful information about each of the four Sixteen Personality Factor Questionnaire variables employed in relation to responses by the present sample. A factor by factor breakdown should enhance this analysis.

Factor A. Factor A has been associated with two bipolar traits, reservedness and outgoingness. In this university sample, consistently more subjects scored in the extremely sizothymic range. This would seem to indicate that many more college students (both male and female) are reserved and detached than outgoing and warm-hearted. Of 180 Factor A subjects, 141 scored in Sten six or below. This is a likely finding since these traits (reservedness, and so on) are most often associated with individuals who are precise and rigid in their functioning, both personally and occupationally.

Factor E. Factor E has most often been complementary to two bipolar traits designated humility and assertiveness. Unlike Factor A, subjects in this sample tended to distribute themselves evenly on the normal curve over the three ranges assessed (Stens three, eight, and five and six). That is, most subjects tended to fall in the middle range (Stens five and six) with nearly equal numbers at the extremes. Specifically, seventy-five subjects fell into Stens five and six, forty-five fell into Stens three and below, and forty-six fell into Stens eight and above. Since Factor E is normally distributed, it may be an excellent personality type to assess.

Factor G. Most of the subjects tended to score in the average range for this factor (N = 96). The bulk of individuals appear to be neither extremely expedient nor extremely conscientious. They tended to balance out somewhere in the average range with forty-three subjects scoring at Sten three and below, and thirty subjects scoring at Sten eight and above. This points to the fact that with a sample similar to the present one, Factor G (or the trait it denotes) is a stable feature suitable for future research.

Factor H. Factor H is characteristically descriptive of the bipolar traits of shyness versus boldness. Again, the majority of university students scored in the average range suggesting neither extreme shyness nor boldness. Ninety-seven subjects scored in the average range. Fifty-six subjects were found to be shy and restrained while thirty-eight were found to be bold and venturesome. Thus, most subjects in this sample were somewhat shy and restrained in character.

Characteristics of the Memory-For-Designs Test Responses for the Present Sample

Memory-For-Designs Test responses are evaluated in a similar format as seen above. This review is especially enlightening and potentially useful as no prior data have been found in any source on the frequency of occurrence of the following variables in a normal sample.

Factors in closure difficulty. A qualitative description of closure difficulty could be as follows: zero figures unclosed--no closure difficulty, one to seven figures unclosed--moderate closure difficulty, and eight to fifteen figures unclosed--severe closure difficulty. On this basis, it was readily apparent that a vast

majority of college students were ranked as having moderate closure difficulty (N = 180). Obviously, a future researcher would want to alter the present definition of closure difficulty so as to exclude the glaring bias inherent in a university sample. Only forty-one subjects exhibited no closure difficulty, and a mere twenty subjects exhibited extreme closure difficulty.

Factors in figure size expansion. It was not a surprising finding that the vast majority of students did not expand their Memory-For-Designs figures (N = 222). It was quite rare when even one to seven of the designs were expanded by a subject in this group (N = 17). This suggests that figure size expansion may be a significant find. That is, by its near absence in a university sample (normal group), it could be a psychopathological sign. The specific nature of the psychopathology, or its existence for that matter, is questionable and should not be taken as empirical fact. Further research would do well to explore its presence among manic or agitated patients to determine usefulness of the sign as a diagnostic aid. The only sound conclusion which can be made at this time is that figure size expansion represents a clear departure from the manner in which most college undergraduates draw the Memory-For-Designs Test figures. This may or may not reflect deviant personality or behavior.

Factors in figure size constriction. Most outstanding with respect to this behavior is that nearly all subjects constricted their Memory-For-Designs figures to some extent (N = 219). In this instance, it appears that not constricting the figures is deviant behavior (N = 22). This is not necessarily deviance in the psychopathological

sense, but it does represent a departure from the usual mode of responding, at least in a college group. There is no direct evidence which suggests psychopathology or personality correlates to figure size constriction.

STATISTICAL ANALYSIS

The statistical procedures used in determing the significance of the raw data were various chi square maneuvers. Some modification of original plans was necessitated by the depressed expected frequencies for one of the three two-way chi squares. This problem was dealt with by simply performing a one-way chi square on the marginal totals for those independent variables in the expansion hypothesis. The statistical analysis serves to integrate the response variables examined in the preceding section.

Results of Chi Squares for the Closure Hypothesis

The Memory-For-Designs Test figures were examined for lack of closure as defined in Chapter 3. These results were compared to three personality traits from the Sixteen Personality Factor Questionnaire.

Factor A and closure. The 2 X 3 chi square (Table 1, page 67) suggests that there are no signficant differences ($p > .05$) between sizothymic (reserved) subjects and affectothymic (outgoing) subjects with respect to closure problems. In terms of the statistical hypotheses, there are no significant differences between subjects who exhibit closure difficulty on the Memory-For-Designs Test and who score at or below Sten three on the Sixteen Personality Factor Questionnaire, and those subjects who exhibited closure problems and who scored at or above

Sten eight. This is a statement of the null hypothesis.

Furthermore, it was discovered that individuals who scored in Stens five and six (Table 2, page 67) on the Sixteen Personality Factor Questionnaire and who failed to close between one and seven figures, outnumbered ($p < .05$) those who closed all the figures and those who failed to close between eight and fifteen designs. In other words, most people who are average on the trait measured by Factor A, can be expected to fail to close between one and seven figures on the Memory-For-Designs Test. In examining similar responses in Stens three and eight subjects, it became apparent that they exhibited the same pattern as the Sten five and six group. Therefore, no reliable or valid differentiation can be made between groups.

Factor G and closure. As with Factor A, the 2 X 3 chi square analysis (Table 3, page 68) showed that there was no significant difference ($p > .05$) between expedient types and conscientious types with respect to closure difficulty. In terms of the statistical hypotheses referred to above, there are no significant differences between subjects who exhibit closure difficulty on the Memory-For-Designs Test and who score at or below Sten three on the Sixteen Personality Factor Questionnaire, and those subjects who exhibited closure problems and who scored at or above Sten eight. Most subjects failed to close between one and seven figures.

Likewise, failing to close between one and seven figures was noted for a group of Stens five and six subjects (Table 4, page 68). Significantly more people ($p < .05$) in that group failed to close between eight and fifteen figures, and those who closed all their figures. Most subjects, regardless of their personality type, failed

Table 1

Results of the Two-way Chi Square for
Factor A and Closure

		(IV_1) Lack of Closure			
		A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
(IV_2) Factor A	Sizothymia B_1	10	47	11	(68)
	Affectothymia B_2	1	27	5	(33)
		(11)	(74)	(16)	101 = N
		df = 2 alpha = .05	X^2Obtained 3.512	X^2Tabled 5.99	Accept Null (p > .05)

Table 2

Results of the One-way Chi Square for Stens Five and Six
of Factor A and Closure

	Lack of Closure			
	A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
Obtained Frequencies (Factor A)	3	57	12	72 = N
Expected Frequency = 24	df = 2 alpha = .05	X^2Obtained 70.125	X^2Tabled 5.99	Reject Null (p < .05)

Table 3

Results of the Two-way Chi Square for Factor G and Closure

	(IV_1) Lack of Closure			
	A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
Lack of internal standards B_1	3	31	6	(40)
(IV_2) Factor G Character B_2	4	22	3	(29)
	(7)	(53)	(9)	69 = N
	df = 2 alpha = .05	X^2Obtained .941	X^2Tabled 5.99	Accept Null (p > .05)

Table 4

Results of the One-way Chi Square for Stens Five and Six of Factor G and Closure

	Lack of Closure			
	A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
Obtained Frequencies (Factor G)	7	67	19	93 = N
Expected Frequency = 31	df = 2 alpha = .05	X^2Obtained 83.6	X^2Tabled 5.99	Reject Null (p < .05)

to close between one and seven figures on the Memory-For-Designs Test. This fact precludes any differentiating value for closure difficulty in a university group.

Factor H and closure. In this instance, the same results obtain as above. There was no significant difference ($p > .05$) in the 2 X 3 chi square analysis (Table 5, page 70) between very timid subjects and very adventurous subjects with respect to closure difficulty. These were the Stens three and below, and Stens eight and above subjects. Again, most individuals failed to close between one and seven designs, including the Stens five and six group (Table 6, page 70). As before, this means that no valid differentiation is possible among the three groups.

Results of Chi Squares With Expansion Hypotheses

Figure size expansion was considered in light of three Sixteen Personality Factor Questionnaire variables. In each case, a factorial chi square was planned, but was not possible. Due to depressed expected frequencies (fes < 2), the 2 X 3 chi square arrangement could not be employed. To correct the problem, one-way chi squares were performed on each of the marginal totals. In addition, a separate one-way chi square was run on a group of Stens five and six subjects who expanded their figures, and who scored in Factors A, E, and H.

Factor A and expansion. The one-way chi squares performed on the marginal totals for the Memory-For-Designs factor and the Sixteen Personality Factor Questionnaire variable, indicate some significant differences. First, there were significantly more sizothymic subjects

Table 5

Results of the Two-way Chi Square for Factor H and Closure

		(IV_1) Lack of Closure			
		A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
(IV_2) Factor H	Threctia B_1	7	40	8	(55)
	Parmia B_2	2	21	7	(30)
		(9)	(61)	(15)	85 = N
		df = 2 alpha = .05	X^2Obtained 1.542	X^2Tabled 5.99	Accept Null (p > .05)

Table 6

Results of the One-way Chi Square for Stens Five and Six of Factor H and Closure

	Lack of Closure			
	A_1 8-15 figures not closed	A_2 1-7 figures not closed	A_3 All figures closed	
Obtained Frequencies (Factor H)	7	70	13	90 = N
Expected Frequency = 30	df = 2 alpha = .05	X^2Obtained 80.599	X^2Tabled 5.99	Reject Null (p < .05)

($p < .05$) in this sample (Table 7, page 72). Second, most subjects in the extreme groups ($p < .05$) tended not to expand any figures (Table 8, page 72). This may be a significant finding, except for the fact that the group of Stens five and six subjects (Table 9, page 73) performed identically to the two most extreme groups (Stens three and below, and eight and above). Of course, in light of this qualifier, no valid differentiating value can be assigned to the expansion factor in regard to Factor A type variables of personality. Furthermore, although expansion does seem to be related to scores in Stens five and six on the Sixteen Personality Factor Questionnaire (Table 9), this is the exact relationship found with the other personality measures. Thus, no differentiating qualities are present for Factor A, or any of the following factors.

Factor E and expansion. The one-way chi square for Factor E (Table 10, page 73) reveals a nearly equal number of humble versus assertive subjects in this sample ($p > .05$). This is quite unlike any of the other comparisons. The equality of occurrence of these disparate personality types in a college group makes this factor quite suitable for study. Once again, nearly all subjects ($p < .05$) failed to expand their designs (Table 11, page 74). Since there are no differences across the three groups (3, 8, and 5-6), the expansion sign can be given no interpretive significance. Projectively, this may be taken as a sign of impulse control. However, this would be a tenuous and unverified assumption. As evidenced in Table 12 (page 74) the one-way chi square reveals that a significant number of subjects failed to expand figures on the Memory-For-Designs Test. Thus, scoring in Stens five

Table 7

Results of the One-way Chi Square on Marginal Totals for Factor A of the Sixteen Personality Factor Questionnaire

	Factor A			
	A_1 Sizothymia	A_2 Affectothymia		
Obtained Frequencies	64	35		99 = N
Expected Frequency = 33	df = 1 alpha = .05	X^2Obtained 7.919	X^2Tabled 3.84	Reject Null ($p < .05$)

Table 8

Results of the One-way Chi Square on Marginal Totals for Expansion on the Memory-For-Designs Test by Factor A Subjects in Stens 3 and Below and 8 and Above

	Figure Size Expansion			
	8-15 figures expanded	1-7 figures expanded	No figures expanded	
Obtained Frequencies (Factor A)	1	9	89	99 = N
Expected Frequency = 33	df = 2 alpha = .05	X^2Obtained 143.514	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 9

Results of the One-way Chi Square for Stens Five and Six and Expansion by Factor A Subjects

	Figure Size Expansion			
	A_1 8-15 figures expanded	A_2 1-7 figures expanded	A_3 No figures expanded	
Obtained Frequencies (Factor A)	0	5	66	71 = N
Expected Frequency = 23.66	df = 2 alpha = .05	X^2Obtained 113.951	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 10

Results of the One-way Chi Square on Marginal Totals for Factor E of the Sixteen Personality Factor Questionnaire

	Factor E			
	Lack of Internal Standards	Character		
Obtained Frequencies	44	45		89 = N
Expected Frequency = 44.5	df = 1 alpha = .05	X^2Obtained 0	X^2Tabled 3.84	Accept Null ($p > .05$)

Table 11

Results of the One-way Chi Square on Marginal Totals for Expansion on the Memory-For-Designs Test by Factor E Subjects in Stens 3 and Below and 8 and Above

	Figure Size Expansion			
	8-15 figures expanded	1-7 figures expanded	No figures expanded	
Obtained Frequencies (Factor E)	1	5	83	89 = N
Expected Frequency = 44.5	df = 2 alpha = .05	X^2Obtained 144.06	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 12

Results of the One-way Chi Square for Stens Five and Six and Expansion by Factor E Subjects

	Figure Size Expansion			
	A_1 8-15 figures expanded	A_2 1-7 figures expanded	A_3 No figures expanded	
Obtained Frequencies (Factor E)	0	9	63	72 = N
Expected Frequency = 24	df = 2 alpha = .05	X^2Obtained 96.75	X^2Tabled 5.99	Reject Null ($p < .05$)

and six on Factor E of the Sixteen Personality Factor Questionnaire appears to be related to a lack of figure size expansion. This is not interpretively significant simply because expansion was also related to the other personality measures, and not just Factor E.

Factor H and expansion. As with Factor E, the expected frequencies for these variables did not obtain (fes < 2). Since the full requirements for a 2 X 3 analysis were not met, one-way chi squares were performed on each of the marginal totals. The first analysis (Table 13, page 76) revealed that there were significantly more ($p < .05$) restrained subjects in this combination. This may reflect a biasing factor common to college samples. The one-way chi square on the Memory-For-Designs Test marginal totals (Table 14, page 76) indicated the same pattern as in the aforementioned paragraph. Significantly more ($p < .05$) subjects did not expand their designs than those who did for the Stens five and six groups (Table 15, page 77). There were no data to support the original hypothesis of expansion for any of the Sixteen Personality Factor Questionnaire variables studied.

Results of the Chi Squares with Constriction Hypotheses

The Memory-For-Designs Test figures were examined for constriction as defined in Chapter 3. These results were compared to three Sixteen Personality Factor Questionnaire variables by means of chi square analyses. Each factor and Memory-For-Designs variable is discussed below.

Factor A and constriction. When sizothymic subjects were conpared to affectothymic subjects by means of a 2 X 3 chi square (Table 16,

Table 13

Results of the One-way Chi Square on Marginal Totals for Factor H of the Sixteen Personality Factor Questionnaire

	Factor H			
	Threctia	Parmia		
Obtained Frequencies	55	30		85 = N
Expected Frequency = 42.5	df = 1 alpha = .05	X^2Obtained 6.78	X^2Tabled 3.84	Reject Null ($p < .05$)

Table 14

Results of the One-way Chi Square on Marginal Totals for Expansion on the Memory-For-Designs Test by Factor H Subjects in Stens 3 and Below and 8 and Above

	Figure Size Expansion			
	8-15 figures expanded	1-7 figures expanded	No figures expanded	
Obtained Frequencies (Factor H)	1	6	78	85 = N
Expected Frequency = 42.5	df = 2 alpha = .05	X^2Obtained 131.19	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 15

Results of the One-way Chi Square for Stens Five and Six and Expansion by Factor H Subjects

	Figure Size Expansion			
	A_1 8-15 figures expanded	A_2 1-7 figures expanded	A_3 No figures expanded	
Obtained Frequencies (Factor H)	0	9	81	90 = N
Expected Frequency = 30	df = 2 alpha = .05	X^2Obtained 131.4	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 16

Results of the Two-way Chi Square for Factor A and Constriction

	(IV_1) Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Sizothymia B_1	29	29	7	(65)
(IV_2) Factor A				
Affectothymia B_2	21	8	8	(37)
	(50)	(37)	(15)	102 = N
	df = 2 alpha = .05	X^2Obtained 6.031	X^2Tabled 5.99	Reject Null ($p < .05$)

page 77) for constriction and Factor A, a significant difference ($p < .05$) was noted between groups. Without further scrutiny, this finding supports a portion of the constriction hypothesis advanced in Chapter 1 for Factor A. However, when data from the group which was average on Factor A (neither sizothymic nor affectothymic) were analyzed (Table 17, page 79), it was discovered that they exhibited the same pattern as the sizothymic and affectothymic groups. That is, nearly all subjects, regardless of their personality type, tended to constrict their figures to some degree. Thus, one cannot assume figure size constriction to be a differentiating factor between shy and outgoing persons.

Factor E and constriction. The two-way chi square (Table 18, page 79) revealed that there were no significant differences between submissive subjects and dominant subjects on the Memory-For-Designs Test variable, constriction. Furthermore, nearly all subjects constricted their designs to some extent. This was even true for the cases that were average (Stens five and six) on Factor E (Table 19, page 80). Any future investigation would be well-advised to consider the pervasiveness of the phenomenon.

Factor H and constriction. The two-way chi square (Table 20, page 80) indicated that there was no significant difference between extremely shy subjects and very adventurous subjects in relation to constriction of Memory-For-Designs Test figures. A one-way chi square (Table 21, page 81) on a group average on Factor H (Stens five and six) showed that the great majority ($p < .05$) of the subjects tended to constrict their designs to one degree or another. This means, just as

Table 17

Results of the One-way Chi Square for Stens Five and Six and Constriction by Factor A Subjects

	Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Obtained Frequencies (Factor A)	45	24	2	71 = N
Expected Frequency = 23.66	df = 2 alpha = .05	X^2Obtained 39.066	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 18

Results of the Two-way Chi Square for Factor E and Constriction

	(IV_1) Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Submission B_1	21	17	6	(44)
(IV_2) Factor E Dominance B_2	26	13	3	(42)
	(47)	(30)	(9)	86 = N
Expected Frequency = 25	df = 2 alpha = .05	X^2Obtained 26.96	X^2Tabled 5.99	Accept Null ($p < .05$)

Table 19

Results of the One-way Chi Square for Stens Five and Six and Constriction by Factor E Subjects

	Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Obtained Frequencies (Factor E)	38	33	4	75 = N
Expected Frequency = 25	df = 2 alpha = .05	X^2Obtained 26.96	X^2Tabled 5.99	Reject Null ($p < .05$)

Table 20

Results of the Two-way Chi Square for Factor H and Constriction

	(IV_1) Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Threctia B_1	24	28	3	(55)
(IV_2) Factor H				
Parmia B_2	18	9	3	(30)
	df = 2 alpha = .05	X^2Obtained 3.568	X^2Tabled 5.99	Accept Null ($p > .05$)

Table 21

Results of the One-way Chi Square for Stens Five and Six and Constriction by Factor H Subjects

	Figure Size Constriction			
	A_1 8-15 figures constricted	A_2 1-7 figures constricted	A_3 No figures constricted	
Obtained Frequencies (Factor H)	46	34	10	90 = N
Expected Frequency = 30	df = 2 alpha = .05	X^2Obtained 22.396	X^2Tabled 5.99	Reject Null ($p < .05$)

it did above, that most university undergraduates will constrict their designs to some degree, regardless of their personality traits.

SUMMARY

At the outset of the chapter, each Sixteen Personality Factor Questionnaire variable employed in the research was examined independdently. This procedure allowed significant data to be illuminated which concerned responses characteristic of college students.

Briefly, for Factor A, most subjects were reserved and detached (low score on Factor A). Subjects in this sample, for Factor E, were fairly evenly distributed among the levels of that variable. Factor E is a measure of humility versus assertiveness. As regards Factor G, the bulk of subjects scored in the average range although each pole was well represented. The bipolar traits assessed by that factor are expediency and conscientiousness. A pattern similar to Factor G was evidenced in Factor H. Factor H is a measure of shyness versus boldness.

In reviewing Memory-For-Designs Test responses, it was noted that most college undergraduates tended to exhibit some degree of closure difficulty (N = 221). In addition to that, nearly all college students in this sample failed to expand their designs (N = 222). In contrast, a vast majority of those same subjects constricted their Memory-For-Designs Test figures to some extent (N = 219).

The statistical analysis revealed no significant interpretive material. Nearly all subjects exhibited similar types of Memory-For-Designs Test performance, regardless of their personality types. That is, clusters of scores show that there were similar patterns among all groups in any one analysis. More specifically, there was no meaningful

relationship between closure difficulty and detachedness, outgoingness, expediency, conscientiousness, shyness, and venturesomeness. Figure size expansion was not associated significantly with detachedness, outgoingness, humility, assertiveness, shyness, and venturesomeness. Furthermore, figure size constriction was not associated with any of the preceding traits.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

This chapter has been written in an attempt to summarize and highlight the previously amassed raw data and statistical findings. The format of a chapter by chapter review was adopted for the sake of clarity and organization.

SUMMARY

Chapter 1 provided the basis for introducing and formulating the research assumptions. After the theoretical foundation was explained, a statement of the problem was provided. It inquired, "Is there a significant relationship between personality characteristics and expressive motor performance by randomly selected male and female college undergraduates on the Graham-Kendall Memory-For-Designs Test?" Three hypotheses were then advanced to test the statement. The null hypotheses were given in the main text. The basic null hypothesis is that, there are no significant differences between subjects of various personality types on the basis of their reproductions of Memory-For-Designs Test figures.

Four personality traits were utilized as measured by the Sixteen Personality Factor Questionnaire. They included Factors A, E, G, and H. Factors A, G, and H were hypothesized to be unrelated to the Memory-For-Designs Test response of closure difficulty. Factors A, E,

and H were hypothesized to be unrelated to Memory-For-Designs Test responses of figure size expansion and figure size constriction. Three major limitations were cited as (1) the use of a verbally-oriented instrument to measure non-verbal expression of personality, (2) the exploratory nature of the research, and (3) the limitations in sampling due mainly to the restricted population and age ranges.

Chapter 2 was a review of related literature. Three major lines of past and present research came to bear on the topic at hand. They were presented as (1) research related to perception and expressive behavior, (2) projective use of the Bender-Gestalt Test, and (3) studies utilizing the Memory-For-Designs Test. The literature demonstrated that an individual's needs and cathexes manifest themselves in perceptual phenomena, or indeed determine those events. Furthermore, the Bender-Gestalt Test was shown to possess the ability to detect certain personality traits and pattern disturbances. Research has demonstrated that for detecting brain damage, the Memory-For-Designs Test is as useful as the Bender Test. On this assumption, an argument for the projective value of the former was based on its structural and theoretical similarities to the Bender-Gestalt Test.

Chapter 3 described the methods and procedures employed. Population and sample characteristics were defined in detail. Specifically, subjects were defined as undergraduates of either sex enrolled in courses during the Fall Semester of the 1977 school year at Emporia State University. Subjects had to be between eighteen and twenty-three years of age and be registered as American Citizens. The larger population was outlined as males or females between eighteen and twenty-three who were American Citizens attending small midwestern

universities. Most subjects were Caucasian.

The study was carried out on a factorial basis utilizing chi squares to analyze the resultant frequency data. Two independent variables were utilized in the research. One variable dealt with Memory-For-Designs responses, and the other concerned itself with personality traits taken from the Sixteen Personality Factor Questionnaire. Where possible, a 2 X 3 chi square was set up in factorial fashion. If this was impossible (because of fes < 2), a one-way chi square was relied upon based on marginal totals. One-way chi squares were used in examining the responses of the average group (controls) for each of the Sixteen Personality Factor Questionnaire traits employed.

The data collection procedure consisted of administering the Sixteen Personality Factor Questionnaire to groups of subjects, and then recalling them for testing with the Memory-For-Designs Test. In all, some 350 Sixteen Personaity Factor Questionnaires were given. Of these, 241 subjects availed themselves for further testing with the Memory-For-Designs Test. Finally, some not too strict control procedures were identified, and equality of the group on intelligence, education, and age were assumed to exist.

Chapter 4 contained the data analysis results. In that section of the text, each response variable for both instruments was analyzed in order to delineate rough guides for future research, and to note sample trends. The statistical data indicated that no personality factor measured was related to any particular drawing style. Several significant differences did occur, but when compared to the average, or control groups the significance of the findings

disappeared. Other significant differences did not pertain to the hypotheses.

CONCLUSIONS

The mass of data collected show that personality traits, as measured by a verbally oriented scale, do not manifest themselves in the Graham-Kendall Memory-For-Designs Test. That test is, therefore, still unsuitable for use as a valid projective instrument. There are three plausible reasons why the interpretive significance of the designs did not obtain.

First, one might argue that verbal material concerning personality is vastly different (qualitatively) than motor or expressive displays of an individual's character. Theoretically, a subject's verbal report of himself is at the mercy of a selective process, namely thinking. A subject's words are the end product of much abstract cortical activity which is capable of covering up true character. A subject merely reports himself to be whatever he chooses because he has control over his answers. His responses eventually show up as standard scores, which are more a reflection of social desirability or selective revelation than real personality. Closely related, is the position that motor expressions (drawings, posture, flushing, GSR) are related to internal states (personality or character) and are pure manifestations of these. In this case there is no mechanism which could distort the responses (verbal behavior) since the subject is, presumably, naive about the meaning of his motor performance. A messy, unreliable, and disorganized subject should show some indication of those traits on the Memory-For-Designs Test

without realizing it. He cannot selectively cut out his basic disorganization because he is not aware of (in control of) his expressions on a verbal level. He merely draws the figures and tries to hide nothing because he is unaware of revealing anything.

Now, why did this phenomenon not obtain in this study? It is entirely possible that the measures of closure, expansion, and constriction were not sensitive enough to the expression of personality. The relative preciseness of the definitions, yet crudity of the measures, may not have been refined enough to show differences among subjects; just as the human ear fails to detect very real sound waves at some levels. Perhaps the Memory-For-Designs Test factors should be redefined and studied more inclusively. As stated in Chapter 1, there are more than sixty variables to choose from based on work from the Bender-Gestalt Test. This study assessed only three of those.

Finally, it may be that there is actually no projective value to the Memory-For-Designs Test. It is likely that personality traits do not, or cannot, express themselves in drawings. However, there are massive amounts of data to refute this notion. But, the Memory-For-Designs Test could be an exception. It could be totally separated from character or individual personality.

RECOMMENDATIONS

Recommendations are four in number. Briefly, (1) utilize deviant or abnormal (clinic) samples, (2) redefine the three Memory-For-Designs variables used, (3) compare Memory-For-Designs Test responses with some similar expressive technique, and (4) study more than three factors.

First, for exploratory work, the Memory-For-Designs Test should be tested on abnormal groups to determine its usefulness with highly disparate types of personality traits (manic versus depressive) rather than highly similar groups (college students, and so on). If it can discriminate highly disparate groups, then measures for refining the technique can be developed. If it cannot separate two totally separate groups, it should not be used for diagnosis of personality traits at any level.

Next, it is possible that more stringent definitions of closure, expansion, and constriction are in need. Perhaps the overlap or gaps for closure ought to be widened. At the same time, it might be advantageous to utilize a reduction or expansion of one-half the original stimulus size rather than one-quarter. This is more restrictive, and could serve to increase the test's sensitivity.

In the third place, since verbal personality tests are so susceptible to social desirability effects, or faking, an expressive technique such as the Bender-Gestalt or Draw-A-Person tests should be used as comparison data for Memory-For-Designs responses. This would be an effort at establishing concurrent validity, and thus, some projective value of Memory-For-Designs Test.

Finally, any future research should consider more drawing styles. This procedure would increase the chances of discovering some element or elements of gestalt reproduction which may be related to personality. The options seem inexhaustible.

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APPENDIXES

APPENDIX A

ALTERNATIVE HYPOTHESES

ALTERNATIVE HYPOTHESES

The alternative hypotheses to the null hypotheses stated in Chapter 1 were placed here to avoid cumbersomeness in the main text. Evaluation of these hypotheses should enable the reader to evaluate the null hypotheses in terms of the opposite statistical expectation. That is, that there are significant differences in drawing styles that can be related to differences in personality structure. As in the main text, the alternative hypotheses have been numbered for ease of reading and analysis of the data in Chapter 4. The alpha level of .05 was set as the lower limit of statistical significance for both types of hypothesis prior to data collection.

Statement of the Hypotheses
(Alternative Form)

Hypothesis 1. There are significant differences in the degree of closure difficulty on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, G, or H. Symbolically, H_1: $\mu_1 \neq \mu_2 \neq \mu_3$.

Hypothesis 2. There are significant differences in the degree of figure size expansion on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, E, or H. Symbolically, H_1: $\mu_1 \neq \mu_2 \neq \mu_3$.

Hypothesis 3. There are significant differences in the degree of figure size constriction on the Memory-For-Designs Test between three groups of subjects; those with Sten scores from one to three, five to six, and eight to ten on any of the Sixteen Personality Factor Questionnaire variables A, E, or H. Symbolically, H_1: $\mu_1 \neq \mu_2 \neq \mu_3$.

APPENDIX B

HORIZONTAL AND VERTICAL AXES OF THE MEMORY-FOR-DESIGNS FIGURES

HORIZONTAL AND VERTICAL AXES OF THE
MEMORY-FOR-DESIGNS FIGURES

Horizontal Axes*

Figure 1 - 38 mm

Figure 2 - 35mm

Figure 3 - 20mm

Figure 4 - 39mm

Figure 5 - 14mm

Figure 6 - 38mm

Figure 7 - 26mm

Figure 8 - 40mm

Figure 9 - 58mm

Figure 10 - 35mm

Figure 11 - 31mm

Figure 12 - 25mm

Figure 13 - 38mm

Figure 14 - 19mm

Figure 15 - 64mm

Vertical Axes*

Figure 1 - 33mm

Figure 2 - 35mm

Figure 3 - 33mm

Figure 4 - 38mm

Figure 5 - 50mm

Figure 6 - 38mm

Figure 7 - 41mm

Figure 8 - 33mm

Figure 9 - 13mm

Figure 10 - 38mm

Figure 11 - 32mm

Figure 12 - 53mm

Figure 13 - 20mm

Figure 14 - 38mm

Figure 15 - 20mm

*To obtain reductions, multiply by .75. To obtain expansions, multiply by 1.25.

APPENDIX C

STEN SCORE RANGE

FOR THE 16PF

STEN SCORE RANGE
FOR THE 16PF

Sten Value	1	2	3	4	5	6	7	8	9	10
% of Pop.	2.3	4.4	9.2	15.0	19.1	19.1	15.0	9.2	4.4	2.3

APPENDIX D

HUTT'S INTERPRETIVE FACTORS FROM THE BENDER-GESTALT TEST

HUTT'S INTERPRETIVE FACTORS FROM THE BENDER-GESTALT TEST

A. Organization
   1. Sequence--overly methodical arrangement indicates compulsivity and irregular or confused placement has been observed in highly anxious neurotics and agitated schizophrenics.

   2. Use of space--can be abnormal or normal. Perceptual maturity and emotional adjustment affect size of spacings. Excessive use of space between figures is indicative of acting out or assertiveness. Constricted space between figures is related to passivity, withdrawn behavior, and schizoid tendencies.

   3. Use of space II--expansion of size is related to assertiveness and constriction is related to withdrawal.

   4. Collision--reveals a marked disturbance in ego function.

   5. Use of margin--indicative of covert anxiety and an attempt at maintaining control through external support.

   6. Shift in paper position--this is indicative of cantankerousness.

   7. Shifting position of stimulus card--this is another index of cantankerousness.

B. Factors Relating to Size
   1. Overall increase or decrease in figure size--increase in size denotes compensatory, outgoing, assertive modes of performance. Decrease in size indicates withdrawal, passivity, and inhibited performance.

   2. Progressive increase or decrease in size of drawings--progressive increase is related to irritability, tendencies toward loss of control, and acting out impulsively. Progressive decrease is associated with withdrawal, inhibition, and depressive reactions.

   3. Isolated increase or decrease in size--has symbolic meaning. A perceptual-motor slip-of-the-tongue.

C. Factors Relating to Changes in the Gestalt
   1. Closure difficulty--represents difficulty in maintaining adequate interpersonal relationships, fearfulness.

2. Crossing difficulty--denotes some psychological blocking. Correlated with indecisiveness, compulsive doubting, and phobias.

3. Change in angulation--increased angulation is related to decreased affectivity whereas decreased angulation is indicative of increased affectivity.

4. Curvature difficulty--increased curvature is associated with increased emotionality and decreased curvature is related to decreased emotionality.

D. Factors Related to Distortion of the Gestalt

1. Perceptual rotation--could be associated with a profound disturbance in ego functioning with severe rotation.

2. Retrogression--this primitiveness in the reproductions is found in some schizophrenics. It is usually associated with developmental immaturity in the perceptual-motor sphere.

3. Simplification--represents a decrease in cathexes to external objects or tasks. It is an attempt to reduce energy expenditure.

4. Fragmentation--this is related to a severe disturbance in perceptual-motor functioning, and is associated with a decrement in the capacities for abstracting and synthesizing.

5. Overlapping difficulty--is associated with brain damage.

6. Doodling--found in the records of agitated patients, it represents problems in impulse control and anxiety.

7. Perseveration--indicates a markedly decreased degree of spontaneous and adaptive ego control.

8. Redrawing of total figure--this second attempt represents inadequate planning or a self-critical attitude.

E. Movement and Drawing

1. Deviation in direction of movement--a counterclockwise movement tendency is indicative of normal personality adaptations, while clockwise movements indicate passivity and egocentricity in the person.

   Centrifugal drawing indicates assertion and independence, whereas centripetal movements are associated with egocentricity and oppositional trends.

   Vertical plane difficulty suggests some problems with interpersonal relations and with authority. Horizontal plane difficulty may be associated with problems in peer relations.

2. Inconsistency in direction of movement--refers to some type of psychic blocking. It is related to tension during the test and in behavior.

3. Line quality--generally, variations in line quality are associated with cases of brain damage, in variegated subjects with intense anxiety, and in subjects with high amounts of feelings of personal inadequacy.