A STUDY OF THE RELATIONSHIP BETWEEN THE RESPONSES
GIVEN BY PARETICS AND MIXED SCHIZOPHRENICS ON
THE BENDER-GESTALT VISUAL MOTOR TEST

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CHAPTER I

INTRODUCTION

Traditional Gestalt Psychology has been hesitant to consider the emotional components inherent in perceptual processes. From psychoanalysis it is apparent that life is a continuous struggle between constructive drives and destructive, or negative, impulses. These entities do not inhabit some specific phases of affective qualities but are part of one's total personality, which includes processes of and reactions to perceptual experiences. The constructive forces in perceptual organizations are referred to by Bender as "the factor of becoming,"\(^1\) meaning the tendency to sift, to select, to organize, and to react to a stimulus as a whole. Working with and against this tendency of becoming are the destructive forces whereby all gestalten are simplified or destroyed.

Even in mental deviates there is always present the drive to experience complete gestalten, though it may be of a more primitive form, and emerge still whole in itself, and still greater than the sum of all its parts. It is this

\(^1\)Lauretta Bender, Research Monograph No. 2, p. 6.
deviation from good perceptual organization that has given rise to knowledge and understanding of psychopathological states and has helped to refine some of the clinicians' diagnostic techniques.²

The Problem

The purpose of this study is to present quantitative findings of the Bender-Gestalt Visual Motor Test which will indicate the effectiveness of this media as an instrument of differential diagnosis when applied to General Paresis and Mixed Schizophrenia.

Need for Study

Previous work with this test has indicated that the psychomotor functions involved are, within limits, a function of age, intelligence, and psychological deficit. Since it is based on fundamental "gestalten," varying somewhat in level and complexity, and requiring the integration of visual perception with kinaesthetic control, this procedure offers at the purely non-verbal level, data which are germane to another layer of personality assayal.³

²Lawrence E. Abt and Leopold Bellak, Projective Psychology, p. 326.

There has been, however, little effort to establish the significance of the difference in test results of these two psychotic maladies. It is felt that the results of such a study could help greatly in expediting case psychometrics in institutional situations where clinicians are pressed for time. Also, if the psychometricians are to continue to grow in number and prestige, and to maintain their positions as members of the institutional "psychiatric team," then every effort should be made to make their diagnosis and analyzations the correct ones.

Although the writer has felt that there has been a definite need for this study for many reasons, the most important one is that visual motor tests serve most effectively in the diagnosis of organic conditions, and seem to have a prevalent and direct bearing upon the diagnosis of these two conditions chosen for the study.

Sources of Data

This test consists of nine cards each of which contains a relatively simple geometrical form or gestalt. The subjects were required to make a free hand copy of the figure of each card while the card was in front of them.

The subjects for this study were seventy-seven hospitalized patients, thirty diagnosed mixed schizophrenia and forty-seven diagnosed with general paresis. The two groups were

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not equally divided; the schizophrenics consisted of fourteen males and sixteen females and the paretics consisted of thirty-one males and sixteen females. For clarity the clinical groups are referred to according to their beginning letter, as Group P for paretics and Group S for the schizophrenics. The sexes of these groups are designated by a number 1 for males and a number 2 for females. Thus the paretic males become Group $P_1$; paretic females Group $P_2$; schizophrenic males Group $S_1$; and schizophrenic females Group $S_2$. In order to obtain data most typical of that given by entering patients, because this is when the diagnosis is made, the study group was restricted, and includes only subjects who arrived at the Rusk State Hospital from January 1, 1949, to August 31, 1950. This study includes all the patients interned during this period of time who were diagnosed as general paretics or as mixed schizophrenics and who could be tested.

The mean age of Group S was 31.66 years, with a range of fifteen to sixty-six years and a standard deviation of 3.5; of Group P the mean age was 44.41 years and a standard deviation of 4.12. Only those patients were included who were of colored race, and whose background gave no indication of possible language handicap, and whose physical and mental condition, as so judged by the medical record and the statement of ward physicians, permitted co-operation in the test.
Patients whose case histories suggested the presence of primary mental deficiency were eliminated.

While there is the chance in some cases of schizophrenia in which the evidence of constitutional defects is not entirely lacking, a concerted effort has been made to eliminate from this group cases where conflicting diagnoses was indicated in their records, and certainly, no subject has been used who at any time was classified as "psychosis with mental deficiency." No subjects in Group 3 had taken insulin-shock therapy at the time of testing, but all subjects in both groups had had some electro-shock therapy. For this reason, at least four days interim was allowed between therapy and testing, and in many cases, as much as a month had lapsed before testing.

Through these methods of elimination, forty-one paralytics and thirty-two schizophrenics were removed from the study, rendering the final number as originally stated above.

The test was administered to the subjects individually, and in most cases, in private rooms on the various wards. Each patient was given several sheets of white unruled paper, size 8 1/2" by 11", which was placed on a table before the patient. A well-sharpened #2 lead pencil with an eraser was also supplied. Each was notified in advance that there were
nine figures to copy, and each subject was requested to copy on the blank page in front of him, that which he saw on the cards that were placed in a stack parallel to the upper end of the paper. The stimulus cards were then presented one at a time in sequence from Figure A to G. After the patient was satisfied with his copy of a card, it was then turned over out of sight, revealing the next card. At no time was a patient allowed to observe more than one card at a time for fear of confusion. The patients were allowed to pick up the card and to look at it closely if they desired; but the card was placed back at the end of the paper before continuing with the drawing process. This was done to discourage the using of the sides as a straight edge or as a guide to the drawing. If a patient insisted upon turning the card before drawing it, adequate notation was made on the test results to lessen the possibility of mistaken interpretation in scoring.

Only in three cases did subjects want to use more than one piece of paper and the writer dissuaded them as the arrangement of the figures of the test form a gestalt within itself and as such, bore reflection on the areas under consideration for scoring. Throughout the test, as well as at the beginning, effort was made by the writer to establish and maintain rapport, which is recognizably important in obtaining valid test results.
Treatment of Data

These records were then studied with regard to deviations from the stimulus material. Six of the more easily observable differences were chosen as a scoring criteria. These were: rotating or turning the drawn figure, regressing to an earlier or more primitive level of activity, modifying the curvature of the curved lines, perseverating the same drawing or continuing the same pattern of action, difficulty in making closures, and drawings which resulted in fragments. The frequency of each of these deviations was then tabulated for each test card taken by each subject. This provided a method whereby the data could be statistically treated and thus allow for a comparison within and between the groups.

Due to the lack of a larger group of subjects, and in order to compensate for this, Fisher's $t$ score of significance was chosen as a means of comparison in the six aforementioned deviate areas. In order to justify the comparison of one group with the other, the level of significance was computed between the sexes within each group, and then between the same sex of the different groups. This entailed comparisons in the following manner: Group $P_1$ to Group $S_1$, Group $P_2$ to Group $S_2$, Group $P_1$ to Group $P_2$, Group $S_1$ to Group $S_2$. Only after this had been done was Group $P$ compared to Group $S$.

Definition of Terms

The definitions of terms that are to follow are those which will be used throughout this paper. They are, in as far
as the writer can ascertain, without exception in accordance with those wherever the Bender-Gestalt Test is used, but in the manner of statement the method is purely colloquial to the Rusk State Hospital Psychologists.

Closure is the term signifying difficulty in closing figures. It represents an abulia or inability to complete a task and is found in some organic brain damage cases.

Fragmentation is the breaking of the stimulus figure into component parts and only reproducing some of them. It is a pathognomonic indicator and occurs when the dissociative process has proceeded fairly far, and the integrative capacity is for all practical purposes lost. Fragmentation occurs when the patient is in a deteriorated psychotic state or has suffered brain damage.

Mixed Schizophrenia is that psychosis embodying all of the symptoms of Schizophrenia, but has definite characteristics of two or more of the four kinds of the malady. It is sometimes called Schizophrenia-Unclassified.

Modification of Curvature is increasing or decreasing curvature of a figure by means of flattening or exaggerating the curves. Flattening the curvature occurs in cases with reduced affect and emotional blunting; the reverse is true when exaggeration of curvature occurs. Instability and rigidity are reflected in irregularity of amplitude.
Paresis is a general paralysis, dementia paralytica, a chronic disease of the brain characterized by progressive loss of the mental and physical powers. It results from antecedent syphilitic infection. It also means slight or complete paralysis.

Perseveration is the persistence in continuing a response once begun, with disregard to new stimulus that might be presented. It indicates rigidity in emotional organization and is most characteristic of psychotic records.

Regression is the conversion of mature concepts into primitive forms. It is recognizable as the transformation of dots into loops, loops into scribbles, diamonds into squares or circles into dashes, and less frequently, dots and loops into dashes. In a clinical sense it is usually irreversible. It is most often found in adult psychotics and organic brain damage.

Rotation is defined as any change of or in the position of the axis of the figure, whether fully or partly rotated. It is synonymous with disorientation and indicates a dissociative process; while being most often found in organic brain damage, it connotes bizarre perception.

Schizophrenia is a psychosis which appears as a garbled reaction on the part of an individual who lacks the deep instinctual capacities and feelings in meeting the acute problems of reality. There is either a total lack of normal affect or a perversion of the emotions and with this a
tendency to withdraw into a world of one's own subjective construction.
CHAPTER II

RELATED STUDIES

The Bender-Gestalt Test has not amassed an impressive bibliography but there are some studies on record in which it has assumed prominence as a valid clinical tool, and in other instances it has shown interesting results. Before the studies that have particular bearing upon this problem are presented, some general results of various studies will be submitted.

In this regard, Kitay¹ conducted a study in an attempt to establish an objective scoring scheme and to follow through with the extraction of meaningful factors from the final results. Sixty college undergraduate volunteers were given the Bender-Gestalt figures and immediately upon finishing, were given the Rorschach Ink Blot Psychodiagnostic. His scoring method consisted of choosing a unit of measurement and measuring the size deviations from the stimulus figures, according to a group of some twenty-five indices or possible areas of measurement of the nine figures. Then standard scores were computed for the deviations and the standard deviation and the algebraic total were calculated on the basis of these for each of the subjects.

Intercorrelations were made of both the standard deviations and the algebraic total with selected Rorschach scores. Two of the ten Rorschach scores, when correlated with the standard deviation of the Bender-Gestalt Test, yielded a significance at the 1 per cent level, and three were found to be at the 5 per cent level. No significance was found in the correlations involving the algebraic totals. A reliability coefficient of .85 was obtained through the split half technique within the Rorschach indices, and with the Spearman-Brown formula, .92. The correlation between the standard deviations and the algebraic totals of the Bender-Gestalt was .58. While not representing for or against the validity of the Bender test, it does reveal the presence of meaningful material. "Expansion appears to accompany uncontrolled affect and contraction, thus showing a relationship between figure size and emotionality."\(^2\)

Pascal\(^3\) also attempted to establish a valid and reliable scoring procedure for the Bender-Gestalt Test. His scoring key consisted of 102 observable differences between records and stimulus cards. Subjects for the study were 252 persons, 137 of whom were normals. However, after eliminating all over fifty years of age, he had only 137, of which 126 were

\(^2\)Tbid., p. 173.

normals. The abnormals consisted of twenty-one psychotic and fifty psychoneurotic individuals.

Using his scoring criteria, a biserial correlation coefficient between patient-nonpatient yielded a coefficient of .77. Then three unskilled scorers scored the same records and the biserial r was .83. A reliability coefficient of .94 was found between the scorings of a research assistant and those of an office secretary on seventy-six of the cases. It would appear from these findings, since there are indications of being able to quantify this test, that it is possible to obtain reliability and validity from its use.

In his discussion of projective methods employed in army medical installations, Hutt\textsuperscript{4} calls the Bender-Gestalt Test a partially structured personality test because of the requirement of an interaction between the subject and the stimulus material. He more specifically defines it as a projective personality test because "it elicits responses dependent in part upon the projection by the subject of his personal interpretation or interaction into the stimulus."\textsuperscript{5} He points out that it is advantageous to use the Bender test since it shows obvious distortion of the perceptual reality and the elaboration so characteristic of the schizophrenic as well as the confusion and retrogression of the organic brain-injured.

\textsuperscript{4}Hutt, op. cit., pp. 134-140. \textsuperscript{5}Hutt, op. cit., p. 136.
The Bender-Gestalt has been used by Harriman and Harriman in the measure of school readiness. The test was administered to two groups of thirty each; one group had made satisfactory progress in reading; the other group was composed of pre-readers. The results were classified as to the frequency (expressed in percent) that certain deviations from the stimulus material appeared in the two groups. In comparison, all the younger group and many of the older ones modified the curvature. Perseverative effects were more noticeable in the reproductions of the pre-readers, and there was a noticeable difference in the introduction of Gestalt closures. Although the findings indicate that both nursery-school children and second-grade children have imperfect muscular co-ordinations, there are statistically valid differentiations revealed by the Bender. The variances may be accounted for in part by the fact that the older children had had more training in task-oriented work, with standards imposed by adults, as the sensory-perceptual-motor responses of these children tended to resemble those of adults. But it is conjectured by these authors that the differences seem more to be the result of important differences in maturational levels.

Fabian\textsuperscript{7} used the Bender Visual Motor Gestalt Test in his study of vertical rotations in visual-motor performance and its relationship to reading reversals. Tests were given to 588 so-called normal school children and 108 boys from the Childrens Observation Ward of the Psychiatric Division of Bellevue Hospital. Fabian found that:

The tendency to rotate horizontally directed configuration to the vertical position is found in the normal child of pre-school and beginning school age. It is a developmental phenomenon which is gradually corrected as a child matures, but does not disappear until he is seven or eight years of age. When configurational horizontality is accentuated, verticalization becomes more compelling for the child.\textsuperscript{8}

The persistence of the verticalization (or rotation to the point of some ninety degrees), according to Fabian, should be checked through the use of Visual-Motor tests because such persistency may indicate either mental deficiency or some organic brain disease where it is a regressive feature. He further states:

In the general school population, however, the abnormal conditions are relatively infrequent and, if present, they can be readily ascertained. Much more common are infantile patterns of behavior due to emotional difficulties or environmental handicaps which inhibit the learning process and which betray themselves by primitive visual-motor tendencies such as verticalization.\textsuperscript{9}

\textsuperscript{7}A.A. Fabian, "Vertical Rotation in Visual-Motor Performance--Its Real Relationship to Reading Reversals," \textit{The Journal of Educational Psychology}, XXXVI (1945), 129-154.

\textsuperscript{8}Ibid., pp. 151-152.

\textsuperscript{9}Ibid., p. 152.
A novel departure from the application of visually perceived gestalten is Barkley's\textsuperscript{10} introduction of the Hapto-Kinesthetic Gestalt Test for the investigation of brain injuries. He uses plastic cards which contain exact reproductions of Bender's Gestalt figures which are raised in relief one-sixteenth of an inch in height. A subject has to feel the designs and to draw what he feels. After completion of the Hapto-Kinesthetic Test, the regular Bender Gestalt is administered under standard conditions. Barkley writes:

Only a minor pilot study has been run to date, but there appears to be marked and significant difference between the performance of the brain damaged and that of normal subjects. It has been found that many subjects suffering from organic pathology who give a good reproduction of the visual stimuli exhibit marked distortion on the reproductions of the Hapto-Kinesthetic perceptions.\textsuperscript{11}

This particular treatment of the Gestalt concepts seems to show promise as a means of differential diagnosis in the realm of organic brain disorders.

Yacorzynski and Neymann\textsuperscript{12} attempted to make a quantitative approach to the study of responses of psychotics in the completion of figures which involved visual-motor components.


\textsuperscript{11}Ibid., p. 180.

They had forty controls, thirty manic-depressive, and thirty schizophrenic subjects in the study, to whom they gave some original practical drawings and told them to complete them in certain specified ways. They then compared the groups as to consistancy of typical patterns and as to their differences. The quantitative analysis of responses was admittedly highly impractical but it did show that schizophrenics indicated a decrease in motor activity as compared to the manic-depressives, and they also seemed to have a great deal of consistancy in atypical patterns.

Eighteen paretics and twenty-five schizophrenics were given a set of arithmetical progressions and told a story containing absurdities by Hunt, in an attempt to discover the psychological loss of these two groups. They were to continue the various arithmetical progressions and reconstruct the story to remove the absurdities. A clear difference in performance became obvious. The schizophrenics excelled in the arithmetic but failed to see the illogicalness of the story, and when asked to correct it, attacked the sentence structure and punctuation. After the absurdities were pointed out, they claimed to have seen this but did not know they were supposed to say anything about them. The paretics were not as good as the schizophrenics at recalling the story, but they saw the

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absurdities even while having much difficulty in pronouncing the words. Thus their psychological loss differed in character; being too consistent to be accidental and too pronounced to be superficial, the effects of this study point to some fundamental difference in the psychological operation. "The conditions of this experiment suggest that inducing and governing factors are important in determining the functional difference discovered."\(^{14}\)

Immediately following Hunt's study and report, Squires\(^{15}\) wrote a criticism of the work, in an attempt to clarify the paradox that Hunt was obviously in when he drew his conclusion. Squires claims that the test itself was the cause of the problem of interpreting the results, and not the subjects. The paretic suffers from a greater degree of intellectual deterioration than does the schizophrenic, but is not so far removed from objectivity. While his powers of abstraction are diminished to a point that numbers may cease to have meaning to him, what little mentality left is not so completely out of contact with the social as is the case with the schizophrenic. "Contemporary knowledge concerning paresis justifies the view that it may be regarded primarily as a quantitative change, as a reduction of general capacity," but this "quantitative alteration

\(^{14}\)Ibid., p. 462.

carries along with it inevitably a pathological transformation in respect to quality." He then concludes with this remark:

Dereistic thinking and the number series are quite compatible since they are divorced from things and events in the social realm. Since the schizophrenics have no real solidity of experience . . . and no feeling for continuity . . . they do not get along with the tangible Gestalten, as the recognition of absurdities in the material sphere is alien to his emotionally disjoined make-up.  

In her first research monograph dealing with the Bender-Gestalt Test, Bender reports investigations of feeble-minded persons, primitive and civilized children, and mental patients. From this extended study it was ascertained, in addition to the previous conception of Gestalten as being determined by stimulus configurations, that there is a motility of the visual field which also operates in determining spatial relationships, that these patterns change with time in an adult individual, that the patterns tend to become more intricately integrated as maturation progresses, and that the motor pattern of the individual shows its effect in the perceptions.

In disintegrating cerebral lesions such as dementia paralytica or general paresis, it was noticed that the drawings showed a stilted, formalistic, perseverative, and impersonal approach, with reversions to primitive levels, and as the brain recovered they tended to follow the laws of developmental maturation in returning to higher integrative responses.

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16 Ibid., p. 170.  
17 Ibid., p. 171.  
18 Bender, op. cit., pp. 4-6.  
19 Ibid., pp. 80-85.
In schizophrenia a dissociation in the Gestalt figures apparent which often distorts them fundamentally. These dissociations were shown by the change of direction of movement and the spatial separation of a part of a figure through rotation, perseveration, accentuation and fragmentation.²⁰

A continuation of this study was carried on by Bender²¹ with one hundred cases of childhood schizophrenia at the Child Ward of the Psychiatric Division of Bellevue Hospital. She points out that schizophrenia adds nothing to childhood experiences or behavior which an otherwise normal child might not also be capable of under some other condition, but it does modify the social entity by the introduction of mixed tendencies to expansions and contractions, accelerations, and regressions which follow configurational tendencies specific for adult schizophrenia. Thus the main difference between the child and adult schizophrenic is the developmental problem.

²⁰Ibid., pp. 98-106.

CHAPTER III

ANALYSIS OF TESTING RESULTS

This chapter is devoted to the statistical analysis of the data with particular emphasis on the specific objectives of this investigation as outlined in Chapter I.

One of the most important applications of the statistical tools so far developed, is testing for significance of the difference between two means. Statisticians have shown that when Fisher's $t$ is based on the chance difference that occurs between the means of many pairs of samples selected at random from the same population of scores, $t$ itself tends to be distributed in a pattern which follows the normal probability curve, and thus it is possible to evaluate any obtained $t$ in terms of probability. ¹

The following tables express the difference between the means, and the difference between the standard deviations which are treated to give a $t$ score. These $t$ scores are applied to "Fisher's Table of the $t"² and the resulting level of confidence

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is recorded. Those $t$ scores which yielded a percentage larger than .05 were not considered significant and thus are not included in these tables.

The six deviate areas of rotation, regression, modification of curvature, perseveration, closures, and fragmentations are expressed in each table. Table 1 shows the comparison between Groups $P_1$ and $P_2$.

**TABLE 1**

**SIGNIFICANCE OF THE DIFFERENCE OF THE MEANS OF MALE AND FEMALE PARAGIDS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Rotation</th>
<th>Regression</th>
<th>Modification of Curvature</th>
<th>Perseveration</th>
<th>Closures</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Mean</td>
<td>.44</td>
<td>1.79</td>
<td>.18</td>
<td>1.15</td>
<td>1.0</td>
<td>.35</td>
</tr>
<tr>
<td>Difference of S. D.</td>
<td>.76</td>
<td>.85</td>
<td>.68</td>
<td>.56</td>
<td>.64</td>
<td>.62</td>
</tr>
<tr>
<td>$t$ Score</td>
<td>.56</td>
<td>2.1</td>
<td>.29</td>
<td>2.05</td>
<td>1.56</td>
<td>.56</td>
</tr>
<tr>
<td>Level of Confidence</td>
<td>...</td>
<td>.04</td>
<td>...</td>
<td>.05</td>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>

It is evident that the sex difference that occurs in the realm of regression and perseveration is significant at the .04 and .05 level of probability.

Table 2 deals with the same sort of comparison between Groups $S_1$ and $S_2$. 
TABLE 2
SIGNIFICANCE OF THE DIFFERENCE OF THE MEANS OF MALE AND FEMALE SCHIZOPHRENICS

<table>
<thead>
<tr>
<th>Item</th>
<th>Rotation</th>
<th>Regression</th>
<th>Modification of Curvature</th>
<th>Perseveration</th>
<th>Closures</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Mean</td>
<td>.80</td>
<td>1.73</td>
<td>.41</td>
<td>.18</td>
<td>.96</td>
<td>.16</td>
</tr>
<tr>
<td>Difference of S. D.</td>
<td>.73</td>
<td>.61</td>
<td>.24</td>
<td>.51</td>
<td>.46</td>
<td>.64</td>
</tr>
<tr>
<td>t Score</td>
<td>1.09</td>
<td>2.8</td>
<td>1.7</td>
<td>.35</td>
<td>2.1</td>
<td>2.5</td>
</tr>
<tr>
<td>Level of Confidence</td>
<td>...</td>
<td>.01</td>
<td>...</td>
<td>...</td>
<td>.036</td>
<td>.02</td>
</tr>
</tbody>
</table>

Again regression appears significant, except this time at the .01 level of probability, and in addition, closure difficulties and fragmentation come to the fore with significant showings of .036 and .02. Table 3 indicates the significant areas where the males of the groups are compared.

TABLE 3
SIGNIFICANCE OF THE DIFFERENCE OF THE MEANS OF PARETIC AND SCHIZOPHRENIC MALES

<table>
<thead>
<tr>
<th>Item</th>
<th>Rotation</th>
<th>Regression</th>
<th>Modification of Curvature</th>
<th>Perseveration</th>
<th>Closures</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Mean</td>
<td>2.77</td>
<td>.20</td>
<td>.32</td>
<td>1.47</td>
<td>.27</td>
<td>.59</td>
</tr>
<tr>
<td>Difference of S. D.</td>
<td>.61</td>
<td>.73</td>
<td>.25</td>
<td>.55</td>
<td>.67</td>
<td>.66</td>
</tr>
<tr>
<td>t Score</td>
<td>4.6</td>
<td>.26</td>
<td>1.31</td>
<td>2.7</td>
<td>.40</td>
<td>.39</td>
</tr>
<tr>
<td>Level of Confidence</td>
<td>.01</td>
<td>...</td>
<td>...</td>
<td>...</td>
<td>.01</td>
<td>...</td>
</tr>
</tbody>
</table>
Perseveration makes another .01 showing, and rotation for the first time is significant, also with a .01 level of probability. Table 4 makes this comparison of the women of each group.

**TABLE 4**

SIGNIFICANCE OF THE DIFFERENCES OF THE MEANS OF PARETIC AND SCHIZOPHRENIC FEMALES

<table>
<thead>
<tr>
<th>Item</th>
<th>Rotation</th>
<th>Regression</th>
<th>Modification of Curvature</th>
<th>Perseveration</th>
<th>Closures</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Mean</td>
<td>3.13</td>
<td>3.32</td>
<td>2.5</td>
<td>.82</td>
<td>1.69</td>
<td>1.36</td>
</tr>
<tr>
<td>Difference of S. D.</td>
<td>.87</td>
<td>.89</td>
<td>.53</td>
<td>.28</td>
<td>.40</td>
<td>.62</td>
</tr>
<tr>
<td>t Score</td>
<td>3.8</td>
<td>4.79</td>
<td>4.71</td>
<td>2.92</td>
<td>4.23</td>
<td>2.23</td>
</tr>
<tr>
<td>Level of Confidence</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>.36</td>
</tr>
</tbody>
</table>

In all areas but fragmentation, the t values were significant at the .01 level of confidence and even in this deviate area there was a .036 level of confidence. This shows that the greatest and most consistent difference between paretics and schizophrenics seems to stem from the difference between the females of each group. Unlike the results of the comparison of the men in Table 3, with its significance only in rotation and perseveration, the P2-32 groups add regression, modification of curvature, closure difficulties, and fragmentation. Since
regression was also significant in the comparison of Group $S_1$ and $S_2$, as well as Group $P_1$ and $P_2$, but was not significant in the comparison of Groups $P_1$ and $S_1$, it would appear to be primarily a female characteristic. And since it was only .04 in Table 1, it would appear also that it is more of a paretic than a schizophrenic characteristic. Since the difference between Groups $S_1$ and $S_2$ was caused by the male influence, then regression could also be considered, even if to a lesser degree, a male schizophrenic trait.

Perseveration appears to be equally strong at the .01 level between Groups $P_1$ and $S_1$, and $P_2$ and $S_2$, and is at the .05 level of confidence within Group $P$. Its absence from those of significance in the $S_1$-$S_2$ Group would make it appear to be a paretic trait. Rotation has only appeared significant (and at that, at the .01 level) in Tables 3 and 4, which shows a difference between the two maladies, but there is no evidence of a sex difference within the group.

Closure difficulties stand at .036 between $S_1$ and $S_2$, (which is weighted on the male side) and at the .01 level in Table 4, dealing with Groups $P_2$ and $S_2$, but this is caused by the predominance of the paretic females. The absence of any significance in other comparisons would make this appear to be another female characteristic, and possibly more characteristic of the female paretic, but it is also found in the male schizophrenic.
Fragmentation is weighted in almost the same way and can possibly be seen as a basic female paretic tendency because of its absence from the significant listings in Tables 1 and 3, in which paretics and men were involved; but in the case of Table 2, the significance is due to the male schizophrenic's influence.

Modification of curvature is at an acceptable level of confidence in the comparison between Groups P2 and S2, and would thus appear to be solely a female characteristic. Table 5 presents the results of the comparison between Group P and Group S, or the major groups tested. This shows a .01 level of probability in rotation, modification of curvature, perseveration and closure, with a .05 level of significance in regression, while fragmentation is not significant at all. However, upon closer examination this is not a clear-cut picture between the two groups. Within the schizophrenic group there was a significant sex difference in regression, closure, and fragmentation. Also within the paretic group there was a significant sex difference in regression and perseveration. Since these are found within the groups, it is possible that they would have a direct bearing upon the \( t \) score when the main groups are compared. The \( t \) scores from male to male and female to female combinations would not have the same nullifying effect upon the comparison of one whole group to the other, because they merely refine and help to explain the main results of such a comparison.
TABLE 5

SIGNIFICANCE OF THE DIFFERENCE OF THE MEANS OF THE PARETIC AND SCHIZOPHRENIC GROUPS

<table>
<thead>
<tr>
<th>Item</th>
<th>Rotation</th>
<th>Regression</th>
<th>Modification of Curvature</th>
<th>Perseveration</th>
<th>Closures</th>
<th>Fragmentation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference of Mean</td>
<td>3.28</td>
<td>2.77</td>
<td>.57</td>
<td>2.25</td>
<td>1.31</td>
<td>.40</td>
</tr>
<tr>
<td>Difference of S. D.</td>
<td>.42</td>
<td>1.45</td>
<td>.20</td>
<td>.47</td>
<td>.32</td>
<td>.52</td>
</tr>
<tr>
<td>T Score</td>
<td>7.74</td>
<td>1.91</td>
<td>2.65</td>
<td>4.79</td>
<td>4.15</td>
<td>.77</td>
</tr>
<tr>
<td>Level of Confidence</td>
<td>.01</td>
<td>.05</td>
<td>.01</td>
<td>.01</td>
<td>.01</td>
<td>...</td>
</tr>
</tbody>
</table>

Using these data in the two group comparison when there has been a significant difference within a major group, amounts to a T score of T scores.

This leaves rotation and modification of curvature, both of which exhibit a .01 level of confidence, as the only areas that can honestly be considered. This indicates that the differences that occurred were not by chance in most cases, and that they have a direct bearing as to specific and particular characteristics of these two groups.

This varies somewhat from the only other study in this area. Bender\(^3\), in reporting her dementia paralytica studies, stressed the substitution of various letters or numbers for dots, and the reduction of circles to loops, dots to dashes.

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\(^3\) Lauretta Bender, *Research Monograph No. 2*, pp. 77-85.
or dots to loops. In this present study the writer only found one paretic out of eighty-eight persons tested who gave numbers for dots, and only one who gave letters for dots. Certainly there was notable regression in the form of dots into loops and dots into dashes, but also worthy of note was the 52.6 per cent of partial or complete rotation (especially on Figure A), as compared with 18.2 per cent of the same by the group of schizophrenics.

Bender⁴ also pointed out the schizophrenic characteristics of excessive elaboration and distortion of the figures, and she noted that the paretics gave a flattening of effect and a formalistic impersonal approach to the task. In the present study some additional light is thrown on schizophrenic doodling and elaboration, since there was not an instance in sixty-two cases tested that exhibited excessive elaboration (although the writer has seen such examples, they seem to be the exception in so far as fairly well-contained mixed schizophrenics are concerned).

The paretics did show a considerable flattening of effect and many of them were extremely formalistic, which caused them to modify the curvature more than did the schizophrenics. This appears to be the reason for the .01 level of confidence in this area.

⁴Ibid., pp. 92-106.
The fact that it takes some length of time for syphilis to do damage to the central nervous system is possibly the reason for the mean age of the paretics being some twelve years greater than that of the comparison group. While there is no way of telling how long an individual has actually been afflicted with one of these diseases, it is reasonable to assume that schizophrenic entities could start very early in one's life, while it is not likely that syphilis would be contracted until the middle teens or later. Of course, the development of general paresis is customarily considered to take from five to fifteen years.

The paretic may be trying still to confront reality, even when his meninges have already begun rapid deterioration. In the cases of the schizophrenics, there are probably many breaks with reality and relapses into rational activities before they become so asocial that they are, or have to be, hospitalized. Thus it is next to impossible to ascertain how long deterioration has actually been taking place, or how long the breaks with reality have been covered up or forgotten. In either case, so long as the subject can take this test, valid results seem possible as the test does indicate the maturation level, and from this one can tell whether or not there is progress or regression.

Certainly the level of the original intellectual integration as well as the situation and the personality as a whole is significant. However this information cannot be obtained
very easily, and in most of the cases this information cannot be obtained at all.

As to the reason why regression, closure, and fragmentation seem to be the basic attributes of the female paretic and as to why they appear with somewhat less significance as characteristics of the male schizophrenic, only a conjecture will suffice. Since regression points to the seriousness of decadence, it would appear that these two groups wait longer for hospitalization. Whether this is because of social, economic, or personal reasons, it is difficult to ascertain; the evidence points to the fact that these groups are further regressed when they are hospitalized.

This would also apply to the amount of fragmentation, as this too is characteristic of the regressed, or disoriented. It can also be the result of an inability to focus attention or carry through with a task once begun. This would of necessity overlap into the field of closure difficulties, as it too could be the direct result of late admittance to therapy, resulting in undue deterioration.

Perseveration appears to be as characteristic of one sex as it is of another, so long as each is paretic. This is probably due to the destruction of the primary abilities to integrate and coordinate a task from a given stimulus, which results in the distortion of the gestalt without the mental facilities to correct errors. Modification of curvature, which
showed no particular sex significance, but made a good showing as a differential criteria between groups, takes on a new meaning when it is noticed that it is not only weighted on the paretic side, but also on the female side, thereby making it a primary characteristic of the female paretic. Here again it would appear that they had contracted the disease earlier and had waited longer to be hospitalized than had the men in their group. It would seem possible that in many instances the social mores tend to work under the assumption that women and motherhood are above such diseases, and for this reason, many excuses could have been "justly" given for the irrational activities of many patients before they were at last hospitalized.

It could be that the reason that most of these areas have been determined by the female, which gives evidence of their more serious psychotic and dissociative nature, lies in the sociological mores of our age. As Victorian Puritanism looses the ascendancy in the face of useful and purposeful materialism, cultural lag tends to forgive the woman much and to consider it her prerogative to be somewhat neurotic because she is a woman. This in turn could reflect society's tolerance, which has to be practically bent double before a patient is given proper therapy.
These subjects are predominantly from the lower socio-economic level, and in many cases the families will attempt to care for their own diseased members (if they know that they need care), since the families quite often do not have the money to hospitalize them and have little or no knowledge of state hospitals. The families keep the patients until they become a menace to themselves or to others. All the time they could be possibly deteriorating, until finally a law enforcer comes and picks up the "menace to society" and places him in jail until a trial by jury for lunacy can be held. Then the patient is placed in a state hospital if room can be found for him. Another reason for the great delay in hospitalization is that there is great social stigma attached to all sorts of mental illness, especially when it is treated in a state, county, or private hospital.
CHAPTER IV

SUMMARY AND CONCLUSIONS

Summary

The material in this exploratory study is concerned with paretics and schizophrenic results on the Bender-Gestalt Visual Motor Test. It is hoped that the findings will have some value in relation to the differential diagnosis of these two groups. The data were obtained from seventy-seven patients at the Rusk State Hospital, Rusk, Texas. Thirty of the patients were diagnosed as mixed schizophrenia and forty-seven were diagnosed as general paresis. There were sixteen females in each group. The Bender-Gestalt Visual Motor Test was administered to each subject on his respective ward under standard conditions.

The six deviate areas of rotation, regression, modification of curvature, perseveration, closure difficulties, and fragmentation were chosen as the basis of comparison of the records, and the frequency of occurrence of each of these deviations was tabulated for each of the nine figures for each subject. The statistical technique employed was Fisher's t score of significance, and comparisons were made between the sexes within each group, between males and males, and between females and females. Then a comparison was made between the two major groups. Through the use of this technique, eighteen of the thirty computed t
scores were found to reach or to exceed the 5 per cent level of confidence, and consequently were considered to be significant.

However, there were "in-group" differences in the areas of regression, perseveration, closures, and fragmentation, which ruled out their use in the main group comparison. The two remaining, rotation and modification of curvature, had a t score of 7.74 and 2.85 respectively and both were significant at the .01 level of probability.

Regression, closures, and fragmentation were found to be primary characteristics of female paretics and secondary characteristics of male schizophrenics. Perseveration appears to be primarily a paretic trait. Since this is a test of maturational development and measures regression, it is apparent from this study that paretic women and schizophrenic men have regressed more than their disease group counterpart, the female schizophrenic and the male paretic. It would appear that this could be caused by a delay in providing therapy. This entails social, economic, and psychological problems that have a noticeable bearing upon the mores of the East Texas Negro.

Some discrepancies were noted between previously made studies and the present one in the specific characteristics of paretic and schizophrenics on this test. It is felt that this difference could be either because of a difference in groups,
or because of the larger number of subjects in this present study, which deals with a group of patients from a specific geographical location and who appear to be quite homogeneous.

Conclusions

From this study the following conclusions seem to be warranted:

1. It may be stated generally that regression, closure and fragmentation are primary female characteristics and secondary male schizophrenic characteristics.

2. On the basis of the $t$ score values for the number frequencies, perseveration is primarily a paretic characteristic, with the males and females being about equal.

3. The same data showed that generally there was no sex difference in rotation, but that modification of curvature was somewhat weighted on the female side.

4. There is evidence to support the use of rotation and modification of curvature, both of which were basically paretic by emphasis, as a media of differential diagnosis between general paresis and mixed schizophrenia.
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