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**MOSAIC AGGLUTINATION IN PARANOID SCHIZOPHRENICS
AND UNDIFFERENTIATED PSYCHOTICS**

by **Roy B. Henderson**

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Psychology and Education of the
University of Ottawa as partial
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CURRICULUM VITAE

Ray E. Henderson was born February 6, 1927, in Burden, Kansas. He received the Bachelor of Arts degree in Psychology and Education from Northwestern College, Winfield, Kansas, in 1951. He received the Master of Science degree in Clinical Psychology from the New Mexico Highlands University, Las Vegas, New Mexico, in 1958. The title of his thesis was A Study on the Relationship of Suicide Methods to Psychosexual Development.

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INTRODUCTION

The clinical psychologist is often called upon to do nothing more than offer a diagnosis. Although he may not be exactly pleased with this situation, it is a function that he must fulfill. In an effort to be as objective as possible in carrying out this task, he is often forced into using psychological tools that will aid him in understanding the patient. However, even with the available psychological tools, clinicians often find themselves confronted with contradictory and confusing bits of information about their patients. This study was undertaken with the hope that it might offer some additional clues in understanding a patient. Placing a diagnostic label on a patient is certainly not the most important role for the clinician, but the ability to correctly diagnose the patient could have considerable effect on the future life of the patient. Therefore, it seems plausible to assume that anything which might strengthen the clinician's ability to diagnose properly would be worth investigating.

This study grew out of the belief that the Mosaic test did measure something, and that experimental research might reveal something of what it was measuring. Not most of all, it grew out of the experimenter's conviction that if any tool reveals any promise of better understanding a human being, it should be studied and experimented with.

From the theoretical viewpoint, this report will probably not be of great importance. The theories postulated in this study are not new. They have been put forth time and again by various authors. They are new, however, when one considers them in the light of Mosaic production.

The first portion of this thesis is concerned with a review of the literature taking into consideration all, or practically all, of the experiments that have been done with the Mosaic test. The purpose in reviewing all of the literature was to bring into focus to the reader the vast amount of confusion and contradictory findings with the Mosaic. This review reveals that few studies have been concerned with a single diagnostic pattern; while most have attempted to group the various diagnostic signs together and investigate them all at once.

This is followed by the assumptions leading up to the hypothesis and the formulation of the hypothesis.

The second section deals with the experimental design of the project. A detailed description of the tool, the characteristics of the sample, and the method of statistical analysis are presented.

The results obtained in this experiment are then presented and discussed. This discussion evaluates the different patterns constructed, the reliability of the test,

and the agreement between raters. The frequency of occurrence of patterns are statistically computed and the results presented.

Some of the shortcomings of the study are presented along with indications for subsequent research in the summary. The report concludes by presenting some sample patterns in the appendix.

CHAPTER I

REVIEW OF THE LITERATURE

The Mosaic test was designed in 1929 by Margaret Lowenfeld. It was originally devised "as a means of exploring a possible relationship between national cultures and folk design",¹ but has been employed mainly as a diagnostic tool since then. Lowenfeld's test material consisted of 456 pieces. There were five shapes and 6 different colors for each shape. In attempting to account for the shapes selected, Lowenfeld stated:

It seemed that, in general, patterns of European origin could be reduced to combinations of five fundamental shapes: the two most common four-sided figures, the square and the diamond; and the three principal triangles, the right angle, the equilateral, and the scalene (or half-equilateral).²

The selection of colors was also based on folk patterns and consisted of red, black, yellow, blue, white, and green. The complete set consisted of 48 squares, 96 half-squares, 96 diamonds, 144 scalene triangles, and 72 equilateral triangles. The subject was requested to make anything he

¹ Margaret Lowenfeld, "The Lowenfeld Mosaic Test", Journal of Projective Techniques, Vol. 16, No. 2, 1952, p. 200.

² Margaret Lowenfeld, "The Mosaic Test", American Journal of Orthopsychiatry, Vol. 19, No. 3, 1949, p. 539.

wanted to with the Mosaic pieces on a tray measuring 12-3/8" x 10-1/4". Lowenfeld requested that the finished product be pleasing to the subject.

In the United States, the use of the Mosaic as a diagnostic tool was pioneered by Wertham and Golden.³ After testing over one thousand patients of various diagnostic categories, they set forth certain signs they felt to be indicative of particular clinical categories. Their original publication led to considerable research and a new-found interest in the Mosaic.

This interest in the Mosaic probably reached its peak in 1948, when at the International Conference the Mosaic "was discussed and for the first time, patterns from different countries were compared".⁴ Interest in the Mosaic continued to run high, and in 1950 the Catholic University of America at Washington, D. C. held a workshop on the Mosaic. Although this resulted in considerable research, much of it was in the form of unpublished doctoral dissertations.

³ Frederic Wertham and Lill Golden, "A Differential Diagnostic Method of Interpreting Mosaics and Colored Block Designs", Journal of Psychiatry, Vol. 58, No. 1, 1941, p. 124-131.

⁴ Margaret Lowenfeld, "The Lowenfeld Mosaic Test", p. 201.

1. Test Material.

The original Mosaic test designed by Lowenfeld has already been discussed. Other investigators have varied the material somewhat. Wertham,⁵ for example, added one new piece to the original set which he referred to as an oblong. Feeling that Lowenfeld's set, which was constructed of plastic, was not durable; he constructed his set of aluminum. Pieces were made somewhat thicker, measuring $1/8$ of an inch. Each of the six different shapes was painted with baked-on enamel. His color scheme was the same as Lowenfeld's, employing six colors in all. Each color appeared on eight diamond-shaped pieces, six equilateral triangles, twelve oblongs, eight triangles measuring $1-5/8$ " at the base and $1-1/8$ " on each of the other two sides, and twelve triangles measuring $2/3$ " on one side, $1-1/2$ " on the second side and $1-3/8$ " on the other side. Including the four squares, measuring $1-1/8$ " on each side, the entire set consisted of three hundred pieces. Wertham also utilized a larger tray, measuring 16 inches by $10-1/2$ inches and having a $1/2$ inch raised margin.

Diamond and Schmale⁶ employed pieces even thicker, measuring $3/16$ " in thickness. They replaced the scalene

⁵ Frederic Wertham, "The Mosaic Test", in Projective Psychology, Edited by Abt & Bellak, New York, Grove Press, 1950, p. 232.

⁶ Bernard L. Diamond and Herbert T. Schmale, "The Mosaic Test: An Evaluation of its Clinical Application", American Journal of Orthopsychiatry, Vol. 14, No. 2, 1944, p. 237-250.

triangles, used by Lowenfeld, with rectangles measuring 1-1/2" by 1/2". Their set consisted of 300 pieces in all, with ten pieces of each color for each particular shape.

2. Instructions and Recording.

Lowenfeld requested that the subject build a design that pleased the individual doing the construction. Wertham varied his instructions somewhat, since he showed the subject a sample of each shape and of each color and explained that each shape came in all six colors. He then informed the subject to make anything that he wanted to on the tray. After completion, the subject was asked what the design represented. Wertham⁷ also requested that the subject not destroy a design when it was nearly complete.

Recording of the completed design has been done in different manners. Lowenfeld⁸ suggested the use of gummed pieces, each of the same color and shape used in the design. As each piece was removed, a gummed piece was placed on the paper underneath it. Wertham⁹ recorded his material by removing the pieces from the tray singularly and tracing them with a pencil at the same location they were at in the tray.

7 Frederic Wertham, "The Rorschach Test", p. 233.

8 Margaret Lowenfeld, Op. Cit., p. 201.

9 Frederic Wertham, Op. Cit., p. 231-234.

The color used was written in and later colored in with a crayon. Diamond and Schmale¹⁰ employed color photography in reproducing their designs, while McCulloch and Girdner¹¹ utilized rubber stamps. A piece of paper was placed over the original design and a rubber stamp of the same shape and of the same color was used to correctly record the design.

3. Scoring, Reliability and Validity.

Efforts to establish a good scoring system with the Mosaic have been discouraging. Lowenfeld¹² contended that no exact scoring method, considering factors such as number of pieces, shapes and colors used, could serve much real value in interpretation. Wertham and Golden,¹³ while offering no scoring method as such, listed twenty descriptive characteristics that they felt could be classified. These consisted of such things as symmetry, choice of color, designs constructed, etc.

¹⁰ Bernard L. Diamond and Herbert T. Schmale, "The Mosaic Test: An Evaluation of its Clinical Application", p. 238.

¹¹ Thomas L. McCulloch and John E. Girdner, "Use of the Lowenfeld Mosaic Test with Mental Defectives", American Journal of Mental Deficiency, Vol. 53, No. 3, 1949, p. 486-496.

¹² Margaret Lowenfeld, Op. Cit., p. 200-202.

¹³ Frederic Wertham and Lill Golden, "A Differential Diagnostic Method of Interpreting Mosaics and Colored Block Designs", p. 124-131.

Wideman,¹⁴ in an attempt to validate an objective scoring method, listed forty-six different scoring categories. His scoring system included categories such as percentage of different colors used, percentage of different shapes, number of shapes, etc.

Kerr,¹⁵ in one of the first validity studies with the Mosaic, requested judges to match Mosaic patterns with character sketches. In one experiment, consisting of normals and psychotics, sixteen correct matchings out of twenty were made. Diamond and Schmale¹⁶ found that when the subject was retested under varied conditions, the basic elements of the Mosaic pattern remained. This finding, according to them, indicated that the test possessed a reliability adequate for clinical usage.

In a more recent experiment, Eysenck and Himmelweit¹⁷ obtained positive correlations of .646 and .590 when they did a test-retest with male neurotics. These correlations were based on the number of pieces used and the number of colors used respectively. They also noted a tendency for the same

¹⁴ Harley R. Wideman, "Development and Initial Validation of an Objective Scoring Method for the Lowenfeld Mosaic Test", Journal of Projective Techniques, Vol. 19, No. 2, 1955, p. 177-191.

¹⁵ Madeline Kerr, "The Validity of the Mosaic Test", American Journal of Orthopsychiatry, Vol. 9, 1939, p. 232-236.

¹⁶ Bernard L. Diamond and Schmale, Op. Cit., p. 237-250.

¹⁷ Herbert Dorken, "The Mosaic Test: Review", Journal of Projective Techniques, Vol. 16, No. 3, 1952, p. 285.

pattern to be present in the second testing. Using male neurotics, Himmelweit and Eysenck¹⁸ wrote character sketches from the Mosaic patterns. The patterns were then given to a psychiatrist who was familiar with each patient and he was requested to match the character sketch with the patient. Their results were better than chance expectancy. Other studies have failed to obtain positive results, however.

Levin,¹⁹ using a double set of Mosaics, hypothesized that incoherent designs would appear significantly more often in an institutionalized group than in a non-institutionalized group. Using normals, defectives, maladjusted, neurotics, paretics, and schizophrenics, he also hypothesized that unsuccessful designs would occur more frequently among the pathological groups. A scoring system was devised, by combining various signs, and three judges were in agreement 90% of the time. He concluded, however, that the Mosaic could not be used as a tool for differential diagnosis.

The results of the study were sweepingly negative and it was concluded that there is no justification for continuing to use the Lowenfeld Mosaic test in its present form.²⁰

18 H. T. Himmelweit and H. J. Eysenck, "An Experimental Analysis of the Mosaic Projection Test", in British Journal of Medical Psychology, Vol. 20, 1945, p. 283-294, quoted by John E. Bell, Projective Techniques, New York, Longmans, Green, & Co., 1948, p. 410-420.

19 Monroe L. Levin, "Validation of the Lowenfeld Mosaic Test", Journal of Consulting Psychology, Vol. 20, No. 4, 1956, p. 239-248.

20 Monroe L. Levin, p. Cit., p. 248.

Even though experimenters such as Levin concluded the Mosaic had no place among the diagnostic tools, others continued to feel the Mosaic had promise. For example, Bell stated: "This test satisfies so many of the criteria of a good projective technique that it would seem to merit much further development."²¹ Pascal also pointed out the possibilities of the Mosaic by stating:

At this stage of its development the Mosaic test seems to be a qualitative instrument which in qualified hands renders valuable aid in the diagnosis of psychological disorders.²²

4. Basic Assumptions.

Although disagreement exists concerning the various signs, it is generally agreed that they have some meaning, and that a Mosaic production does offer some insight about the person constructing the design. Johnson felt the Mosaic "provides a means of demonstrating the functioning of the cognitive and emotional processes in a real concrete situation".²³ He explains that Lowenfeld felt it measured not only what the person could really do, but also his ability

²¹ John E. Bell, Projective Techniques, p. 420.

²² G. R. Pascal, Progress in Clinical Psychology, Vol. 1, edited by Daniel Brewer & Lawrence E. Aft, New York, Grune & Stratton, 1958, p. 188.

²³ Thomas F. Johnson, "The Function of the Mosaic Test in Clinical Practice", Journal of General Psychology, Vol. 56, First half, 1957, p. 52.

to organize movable elements in the visual-motor perceptual field of experience in terms of pattern or gestalten.

According to Wertham, the "Mosaic test is operative primarily in the sphere of pathological processes and of Kraepelinian categories".²⁴ It did not offer much understanding of the dynamics of the personality, he contended. Zucker, maintaining the same viewpoint as Wertham, stated:

If the Rorschach penetrates into deeper layers of the personality, revealing concealed dynamics, masked psychological motivations and gratifications, the Mosaic limits itself to the single area of formal, differential diagnosis. In this sphere there is ample proof of the validity and preciseness of the method.²⁵

Diamond and Schmale²⁶ assumed that defects in the subject's basic personality structure would be reflected in the achieved recognizable gestalt produced from the Mosaic. Bloch,²⁷ however, was in disagreement with this assumption, since she felt the particular type of disorganization did not always show itself on the Mosaic test.

²⁴ Frederick Wertham, Op. Cit., p. 205.

²⁵ Louise Zucker, "The Clinical Significance of the Mosaic and Rorschach Methods", American Journal of Psychotherapy, Vol. 4, No. 3, 1950, p. 456.

²⁶ Bernard L. Diamond and Herbert T. Schmale, Op. Cit., p. 287-296.

²⁷ Margaret J. Bloch, "The Mosaic Test as a Diagnostic Instrument and as a Technique for Illustrating Intellectual Disorganization", Journal of Projective Techniques, Vol. 18 No. 1, 1954, p. 80-94.

5. Factors of Age, Intelligence, Culture, and Sex.

Several investigators have concerned themselves with intelligence and its effect on Mosaic production, but very few have given much attention to the factors of cultural and sexual differences. Stewart and Leland,²⁸ in attempting to discover whether predictions concerning adjustment in normal children could be made with the Mosaic, concluded that intelligence played little part in the type of designs made by normal children. Using one hundred boys and girls, ranging in age from five years and eight months to seven years and three months, they reported that about one-half of them used the edge of the tray, indicating dependency.

Wolf and Gerson,²⁹ using children from age five to nine, attempted to rank the Mosaics according to an estimate of intellectual capacity as determined by the Binet. Results showed a positive trend. On a second study, employing analysis of variance, the same authors concluded that the Mosaic measured something correlated with intelligence, but that it did not coincide with the type of intelligence assessed by the Binet. A third study by the same authors

²⁸ Ursula Stewart and Lorraine Leland, "Lowenfeld Mosaics Made by First Grade Children", Journal of Projective Techniques, Vol. 19, No. 1, 1955, p. 62-66.

²⁹ Henriette Wolf & Elaine Gerson, "Some Approaches to the Problem of Evaluation of Mental Ability with the Mosaic Test", American Journal of Orthopsychiatry, Vol. 25, No. 4, 1955, p. 752-759.

resulted in a correlation of .79 when they attempted to approximate the mental age from the Mosaic patterns without knowing the chronological age. Their sample consisted of forty-five cases, ranging in age from four to thirteen years.

In an effort to learn more about the developmental trend and at the same time to study the adolescent pattern, Stewart and Leland³⁰ examined the Mosaics of seventy-one boys and fifty-four girls and compared their results with one hundred 6 year-olds. They concluded that the older subjects showed a greater tendency towards making abstract designs, but felt that intelligence played no role in the production of the pattern. Boys, they found, made more airplane and house designs, while girls constructed more designs of humans and flowers.

Robertson,³¹ attempting to settle the problem as to whether the Mosaic really measured intelligence, tested ninety elementary school children with the Mosaic and the Binet. Using the Binet score, he classified his subjects as either average, below average, or above average. The subject's Mosaic patterns were then rated into these

³⁰ Ursula Stewart, Lorraine Leland, & Leith Strieter, "Mosaic Patterns of Eighth Grade Children", Journal of Projective Techniques, Vol. 21, No. 1, 1957, p. 73-79.

³¹ Malcolm H. Robertson, "Scoring Intelligence on the Lowenfeld Mosaic Test", Journal of Consulting Psychology, Vol. 21, No. 1, 1957, p. 418.

classifications by four psychologists. Although interjudge agreement was high, intercorrelation was not. He concluded that the Mosaic was testing a different level of intelligence than the Sinet or other intelligence tests.

Other investigators reached the conclusion that intelligence did not play an important role in the Mosaic test. For example, McCulloch and Girdner³² felt that an IQ of sixty or more was sufficient for a satisfactory Mosaic pattern and that a higher level of intelligence had little effect on success or failure.

Feeling that cultural factors might play a role in the production of designs, Stewart and Leland³³ studied designs of English children as opposed to American children. They found that American children made fewer abstract designs and a higher percentage of representational designs, and were less coherent in their designs.

Only one study appeared in the literature that concerned itself with masculinity and femininity. Lalonde³⁴

³² Thomas L. McCulloch and John B. Girdner, "Use of the Lowenfeld Mosaic Test with Mental Defectives", p.486-496.

³³ Ursula Stewart & Lorraine A. Leland, "American versus English Mosaics", Journal of Projective Techniques, Vol. 16, No. 2, 1952, p. 246-248.

³⁴ Gisèle Lalonde, The Use of Twenty Characteristics of Masculinity and Femininity with the Mosaic Test, unpublished Master's thesis, University of Ottawa, Ottawa, Ontario, 1954, 69 p.

attempted to list certain characteristics, related to masculinity-femininity, which might appear on the Mosaic test. She concluded that men often use more pieces and that their designs were more compact; while females often make several small designs and their designs tend to be more loose.

6. Clinical Conditions.

The majority of studies with the Mosaic have been concerned with clinical diagnosis. Many of the studies appearing in the literature have been brought about, in part, due to the original findings of Wertham and Golden.³⁵ Attempts also have been made not only to classify various characteristics of Mosaic production in order to differentiate between the neuroses and the psychoses, but also between normals and mental defectives.

Wertham³⁶ stated that mental defectives make small, simple, compact designs that are usually complete. "As a rule, they show not a disorganization but a good organization at a low organizational level."³⁷ Zucker³⁸ followed this same

35 Frederic Wertham & Lill Golden, Op.Cit., p.124-131.

36 Frederic Wertham & Lill Golden, Op.Cit., p.124-131.

37 Frederic Wertham, "The Mosaic Test", p. 249-250.

38 Louise Zucker, "The Clinical Significance of the Mosaic and Rorschach Methods", p. 473-487.

line of thinking. In studying the designs of two hundred defectives however, McCulloch and Girdner³⁹ found more variability than Wertham and Golden had reported. They concluded that the signs advocated by Wertham as indicative of mental deficiency, were to be found only at the very low levels. Reiman,⁴⁰ after testing 175 patients, concluded that the mental defective's design is often non-representational and is characterized by a lack of success.

After attempting to differentiate between train-injured defectives and undifferentiated defectives, Shottell and Lawrence⁴¹ stated that the train-injured defectives used more pieces, while the non-injured group delayed starting the task longer. Groups were matched for CA, MA, and IQ. They found that neither group varied much in the colors used or in the shapes used. Himmelweit and Eysenck⁴² found that the mental defective made relatively few shapes and employed a small number of pieces in constructing the designs.

³⁹ Thomas L. McCulloch and John B. Girdner, Op. Cit., p. 486-496.

⁴⁰ Gertrude M. Reiman, "The Mosaic Test: Its Applicability and Validity", Journal of Orthopsychiatry, Vol. 20, No. 3, 1950, p. 600-615.

⁴¹ Anna M. Shottell and Ernest S. Lawrence, "Mosaic Patterns of Institutionalized Mental Defectives", American Journal of Mental Deficiency, Vol. 50, No. 1, 1951, p. 161-168.

⁴² H. T. Himmelweit and H. J. Eysenck, "An Experimental Analysis of the Mosaic Projection Test", p. 283-294, quoted by Herbert Dorken, "The Mosaic Test: Review", Journal of Projective Techniques, Vol. 10, No. 3, 1952, p. 287-296.

Wertham and Golden,⁴³ in discussing organicity, spoke of two distinct patterns found on the Mosaic. The sub-cortical pattern was characterized by a stone-bound design in which the subject became dependent upon the outer stimuli. The second pattern, the cortical pattern, was characterized by an inability to achieve a good configuration. The patient used a small number of pieces and attempted to make some elementary concrete form, often of a geometric shape.

Zucker⁴⁴ pointed out that the designs of organic patients often reflected their confusion; whereas Diamond and Schmale⁴⁵ concluded that the organic produced a design very similar to the schizophrenic, often showing disregard for color. They also felt that the stone-bound design appeared in productions from schizophrenics more than in productions from organic subjects.

In an attempt to test the validity of the organic signs of cerebro-arteriosclerosis with the Mosaic, Mahler and Martin⁴⁶ postulated five separate criteria designed to be representative of the cortical and sub-cortical groups. They

43 Frederic Wertham & Lill Golden, Op. Cit., p. 124-131.

44 Louise Zucker, Op. Cit., p. 473-487.

45 Bernard L. Diamond & Herbert T. Schmale, Op. Cit., p. 237-250.

46 Brendan A. Mahler & Anthony W. Martin, "Mosaic Productions in Cerebro-arteriosclerosis", Journal of Consulting Psychology, Vol. 18, No. 1, 1954, p. 40-42.

obtained positive results with both the cortical and sub-cortical group. One of their most important conclusions was that a self-report was necessary in order to fully understand planning ability.

Endeavoring to discover whether the organics produced more concrete designs, Bloch⁴⁷ classified patterns from a hundred patients into abstract, concrete, and symbolic categories. She found that none of the organics in her group constructed a concrete design and that the organics could produce well-organized and complex Mosaic patterns. She concluded from this that it was of no particular diagnostic significance whether a patient constructed a concrete, abstract, or symbolic design. She also concluded that the finished pattern alone was an inadequate instrument for measuring disorganization and that the clinician must take into consideration visual-motor behavior during the testing.

Other investigators have contended that the Mosaic does have value in understanding abstract thinking as compared to concrete thinking. Coim,⁴⁸ in working with children, concluded that the Mosaic was helpful in discovering to what

⁴⁷ Margaret J. Bloch, "The Mosaic Test as a Diagnostic Instrument and as a Technique for Illustrating Intellectual Disorganization", p. 89-95.

⁴⁸ Hanna Coim, "The Value of Projective Methods in the Psychological Examination of Children: The Mosaic Test in Conjunction with the Rorschach and Binet Tests", Rorschach Research Exchange, Vol. 12, No. 4, 1948, p. 216-237.

extent abstract thinking was impaired. Additive placement of pieces side by side and the lining up of pieces was common in the brain-injured child, according to Crim. She also reported these subjects often piled up similar tiles on the tray, and that all of their designs showed an inability to shift with repetitiveness and toodge t the stimuli. In studying children with brain tumors, she claimed that the Mosaic was sometimes more sensitive than the Borschach. She found that the child with a brain tumor could often build a normal and well-planned design, but that he repeated the same gestalt time and again when asked to construct another design. Removal of the tumor resulted in the child's ability to create a new design.

Videman⁴⁹ found that the organic often constructed a design much like the schizophrenic, but the schizophrenic used less chromatic color, more pieces, and more oblong shapes. The organic often attempted a symmetrical design but was unable to accomplish this successfully.

Very little appears in the literature concerning epilepsy and Mosaic production. According to Wertham,⁵⁰ small simple patterns, somewhat like those of the mental defective, are often constructed by the epileptic.

⁴⁹ Harley R. Videman, "Development and Initial Validation of an Objective Scoring Method for the Losenfeld Mosaic Test", p. 177-191.

⁵⁰ Frederic Wertham, op. Cit., p. 252.

Considerable disagreement appears in the literature concerning the affective disorders and signs or the Mosaic. Wertham and Golden⁵¹ postulated that the manic-depressive produced simple designs with fewer pieces than the normal. There was an emphasis upon color rather than form, and jutting red pieces were a common characteristic. Patients in a depressed state used blues and blacks often, which indicated their depressed mood. Other investigators have disagreed with these signs however, especially concerning the use of blues and blacks.

Diamond and Schmale⁵² felt that the depressive's production showed retardation and a feebleness of production, but concluded that color was not a significant criterion. Wideman⁵³ also found that the use of blues and blacks was of no particular significance. Depressed patients sometimes started their designs off-center and in red, according to McLeod.⁵⁴ He felt that with improvement, red and white combinations began to appear as a pattern.

Many signs have been postulated concerning Mosaic production and the schizophrenic. Some investigators are in

⁵¹ Frederic Wertham & Lill Golden, Op. Cit., p. 124-131.

⁵² Bernard L. Diamond & Herbert T. Schmale, Op. Cit., p. 237-250.

⁵³ Harley R. Wideman, Op. Cit., p. 177-191.

⁵⁴ Herbert Dorken, Op. Cit., p. 287-294.

agreement, while others are in complete disagreement. Wertham and Golden⁵⁵ classified the characteristics of paranoid schizophrenia and schizophrenia separately. The schizophrenic, according to them, placed an over-emphasis on the formal principles of organization such as symmetry and repetition. Abstract designs are common in the schizophrenic and attempts at concrete designs resulted in unrealistic productions. Form was given more attention than color, and color was used unrealistically. Often only one color was used, according to Wertham,⁵⁶ which might be yellow, white, or green, but seldom red or black. Designs were often hollow and supersymmetry was present.

The paraphrenic group, or paranoid schizophrenic, produced a simple compact agglutination. Although Wertham's definition of agglutination seemed inadequate since he merely stated that it consisted of a few pieces placed closely together with no discernible form of organization, he stated:

A simple agglutination indicates a severe functional psychosis of paraphrenic stamp. (...) Simple agglutinations are as pathognomic for severe chronic functional psychoses as the Wasserman test is for syphilis.⁵⁷

⁵⁵ Frederic Wertham & Lill Golden, Op. Cit., p. 124-131.

⁵⁶ Frederic Wertham, Op. Cit., p. 246.

⁵⁷ Ibid., Op. Cit., p. 247-248.

Diamond and Schmale⁵⁸ also reported that the schizophrenic placed little emphasis upon color, and showed a preference for black and white, or blue. They felt that the construction of multiple unrelated patterns appeared early in the disease. In the more advanced stages, they reported finding defects in form configuration. The placing of pieces on edges and attempts to achieve a third-dimensional laterality, as well as all-over patterns or completely filling the tray was also reported by them as being indicative of schizophrenia. Vidéou⁵⁹ found that the schizophrenic often started a design by defining the border, and he concluded this was an attempt to define reality.

Wideman,⁶⁰ in a very systematic study, also found there was a neglect of chromatic colors and that the schizophrenic often refused to use green and yellow. White was used often and designs were often of one color. Mosaic-like designs were frequent. His group of schizophrenics used few pieces, with no regard for pattern, form, or color. He also found that several small abstract patterns were characteristic of the schizophrenic.

58 Frederic Wertham & Lill Loiden, Op. Cit., p. 124-131.

59 Herbert Jorlen, Op. Cit., p. 204-205.

60 Harley H. Wideman, Op. Cit., p. 17-19.

The diagnostic signs related to the psychoneurotic group are varied and somewhat contradictory in the literature. Wertham and Golden⁶¹ found that neurotics often employed the edges of the tray to build along. According to them, a frame design with another design inside of it was indicative of some anxiety or inner weakness. Lowenfeld⁶² found that the neurotic often misinterprets the instructions. Corner patterns, and the using of the edge of the tray was also indicative of anxiety according to her. Wideman⁶³ reported few precise indicators, but felt that the neurotic often used more red and less blue and green. He also concluded that the neurotic often constructed more than one design. Zucker⁶⁴ felt there were no clear signs that distinguished between neurotics and psychopaths, nor were there definite signs to differentiate between the various types of neuroses. Diamond and Schmale⁶⁵ found the neurotic often made stalling remarks, and a solid colored pattern was common in their designs. Two patterns, one very abstract and one very concrete, were

61 Frederic Wertham & Lill Golden, Op. Cit., p. 124-131.

62 Margaret Lowenfeld, The Lowenfeld Mosaic Test, p. 208.

63 Harley R. Wideman, Op. Cit., p. 177-191.

64 Louise Zucker, Op. Cit., p. 473-487.

65 Bernard L. Diamond & Herbert T. Schmale, Op. Cit., p. 237-250.

sometimes constructed by their neurotics. They concluded that designs constructed by neurotics were quite similar to designs of normals.

Most investigators are in agreement that some differences between neurotic designs and normal designs can be detected, however. Wertham and Golden⁶⁶ contended that normals used more pieces and employed more shapes and colors than neurotics did. The normal was able to achieve a more recognizable gestalt. Diamond and Schmale⁶⁷ also reported normals using more colors and felt they were better able to achieve their intended end. Aldeman⁶⁸ found that most normals used four or more colors, and that they used white less than the pathological groups. He also concluded that the normal used green more often than the abnormal, and that he was able to construct a more compact design.

Only one study appears in the literature concerning the Mosaic as a prognostic tool. Bowen,⁶⁹ after requesting a free design from the patient, instructed him to make specific designs offering him patterns as guides. A final

66 Frederic Wertham & Lill Golden, Op. Cit., p. 124-131.

67 Bernard L. Diamond & Herbert T. Schmale, Op. Cit., p. 237-250.

68 Harley R. Aldeman, Op. Cit., p. 177-191.

69 Barbara Bowen, "An Extension of the Mosaic Test Designed to Increase its Prognostic Value", Journal of Projective Techniques, Vol. 18, No. 1, 1954, p. 5-10.

free design was then requested. She concluded the prognosis was poor if the patients couldn't change their set enough to produce the series pattern. Those who returned to their original free design on the second trial were also considered as poor prognoses. Patients who were able to utilize the forced designs as support for trying out new creations were considered as having a good prognosis.

7. Summary and Basic Hypothesis.

Conclusions about the Mosaic have been varied and often contradictory. In the studies that have been reported, most investigators reached their conclusions by attempting to study several signs at the same time. Few studies appeared in the literature in which the investigators approached the problem by setting forth the idea that a particular type of disorder, because of the underlying pathology, would produce a specific type of design.

This study was based on the idea that because of characteristics common to each specific type of pathology, a specific type of pattern would be present. Since it was well established that one of the most precise indicators of the paranoid schizophrenic was suspiciousness, it was assumed that this same characteristic would appear in the paranoid's Mosaic production. Since the paranoid was guarded and suspicious, his design would reflect these same

characteristics. If the paranoid schizophrenic could be induced to construct a design, he would guard against giving any meaning to the design. In other words, it was hypothesized that the paranoid schizophrenic would go through the motions of following the instructions; but he would be reluctant to build any actual thing that differed from the essential parts, or to reveal what he had actually constructed. In this manner, he would not only express some of his hostility by behaving in a negative way; but he would reveal his suspicious nature by refusing to give meaning to his design. His design would be characterized by simply sticking the pieces against one another, or by agglutination.

Wertham, as indicated earlier, also spoke of agglutination as being characteristic of the paranoid schizophrenic; but he failed to give the process of agglutination the broad and explicit definition needed. For the purpose of this study, agglutination was placed into two categories:

1. When the subject placed the pieces closely together in a compact mass, either symmetrical or non-symmetrical, but reported it as being nothing.
2. When the subject placed one particular type of mosaic piece together to form the same shape. For example, when diamonds were used to form a diamond, or when squares were used to form a square.

Since agglutination actually includes the putting together of parts without really changing the meaning of the

constituent parts, this definition of agglutination took on a broader meaning than it had been given before.

It was assumed that the paranoid schizophrenic would construct a pattern showing agglutination more than the other types of psychoses because in this manner he would feel he was out-smarting the examiner. Employing this assumption, the null hypothesis was stated in the following form: There would be no difference in the frequency of occurrence of agglutination in paranoid schizophrenics and in undifferentiated psychoses.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter outlines the procedures involved in testing the hypothesis proposed in the preceding chapter. A description of the tool involved will be presented first, followed by details of the method used in testing. The third section will be a description of the sample population. The chapter will conclude by presenting a brief summary of how the material was organized and the method of statistical analysis.

1. The Tool of the Experiment.

Since the majority of experiments with the Mosaic, conducted on the North American continent, have been done with Mosaic sets that are not available for purchase, the experimenter was left with the task of constructing a Mosaic test. Although the size of the pieces and the number of pieces used corresponded to the test used by Wertham, the material was of a different nature.

The Mosaic set used in this experiment consisted of three hundred pieces, constructed from 1/8" macanite. The pieces were hand lacquered five times in the colors of red, black, green, blue, white, and yellow. Each of the six different shapes was produced in these colors.

Table I.—
Description of the Mossig test used.

Shape	Dimensions	Number of pieces per color
Diamonds	1-1/8" on each side	8
Squares	1-1/8" on each side	4
Triangles (equilateral)	1-1/2" on each side	6
Triangles (isosceles)	1-3/8" base, with 1-1/8" on each of the other two sides	8
Triangles (right)	2/3" on one side, 1-1/2" on the 2nd side, and 1-3/8" on the remaining side	12
Oblongs	1-1/2" by 1/4"	12

The pieces were contained in a metal box measuring 4-1/2" by 10", and 1-1/4" in depth. The tray which the subject built his design on was constructed from 1/4" fir plywood, and measured 16" by 10-1/2". A raised margin of 1/2" was constructed around the tray which allowed the subject to build to the margin, if he so desired, and also served to keep the pieces from falling off.

A sheet of clean white paper was placed on the bottom of the tray each time, so that the subject was always constructing his design on a white background.

2. The Method of the Experiment.

Patients were selected after going through the alphabetical card file and then the individual case file. Lists were then prepared and three patients were called from the ward each time. The three patients were met by another psychologist, who brought each patient into the testing room singularly.

The assisting psychologist introduced each patient to the examiner after they entered the testing room. No effort was made to establish rapport, but the examiner attempted to be as warm and as permissive as possible in explaining to the patient what was expected from him. The box containing the Mosaic test was kept closed until the actual instructions were started. The tray, however, was

placed directly in front of where the patient was sitting.

Each patient was given the following instructions:

In this box are a number of different shapes (at this point the examiner opened the box). These shapes come in diamonds, squares, different types of triangles, and in oblong pieces. (The patient was shown each piece). As you can see, they also come in the various colors - red, yellow, white, green, blue, and black. (Again, the colors were pointed out). You are being asked to build something with these - anything that you like - there is no right or wrong to this. Just build something on the tray using these pieces.

The subject was timed from the time he first touched a Mosaic piece until he designated that he was finished building. Once the patient had indicated that he was finished, he was asked what he had constructed. He was also asked whether he liked what he had built or not. The patient was then taken from the testing room and his design was recorded.

Recording of the design was done by using rubber stamps of the same size and same shape as the piece used. Each Mosaic piece was removed individually from the tray and stamped with the appropriate rubber stamp in the same location. The color of the piece was then initialed in with pencil and an arrow, pointing up, was placed in the upper left hand corner to indicate the correct position of the design. The patient's assigned number was also placed in the upper left hand corner.

The information concerning the content of the design, the amount of time required, and positive or negative feelings about the design were entered on an index card. This same index card also contained information about age, sex, admittance date, education, marital status, and the ward number. Later the colors used, as well as the types of pieces used, were entered on this card also.

Whenever a patient asked questions about constructing a design, he was answered in non-committal answers. Again he was informed that he could build whatever he wanted to, and that there was no right or wrong to the test. The examiner made an attempt to keep all conversation at a minimum during the testing, however. Patients who showed a great deal of reluctance about constructing a design were reassured that they could build whatever they wanted to; but they were also informed that if they didn't care to construct anything, they didn't have to.

Following the testing, the patient was sent back to the ward and the assisting psychologist attempted to make certain that he did not remain and talk to patients that were still to be tested.

After all the patients were tested, a check was made to select some of those who had shown agglutination in their patterns. These, along with an equal group that definitely did not agglutinate, were then retested for reliability of

the test. In all, twenty of the patients were retested and their designs reproduced again. Standardized instructions were given again to each patient. The fact that the second testing didn't necessarily call for memory was emphasized to the patient. Instructions were as follows:

You have been selected to build something again. This is not a test of memory - nor is there any right or wrong to it. You don't have to build anything like you did last time - just build whatever you want. The same pieces are here: diamonds, squares, different types of triangles, and oblong pieces. As you already know, they come in red, yellow, white, green, blue, and black. Just build anything that you want to.

3. The Sample.

All of the subjects used in the sample were male patients from the St. Lawrence State Hospital at Edgersberg, New York. The study was originally planned with the idea of using females only. However, after testing fifteen female patients, the examiner found that the accessibility of the desired female population was limited, so the study was changed to include only males. None of the results include the original fifteen females.

The first selection of patients was made from an alphabetical card index and only two requirements were necessary: the diagnosis had to indicate that the patient was psychotic, and the date of birth could be no later than 1910.

Following this selection, the patient's file was then carefully checked and a final selection made. Since none of the files contained any intelligence test results, the grade level reached or the evaluation of intellectual functioning, as ascertained by the examining psychiatrist, was used as a criterion for intelligence. Any patient who had not passed grade six, or who was evaluated as borderline intelligence or below was discarded from the sample. The patient's file was also searched for such factors as conflicting diagnosis and evidence of lobotomy. If these appeared, they were also dropped from the sample. Since most of the patients were on medication, no attempt was made to control for this factor. Only a very limited number of files contained psychological testing and the diagnosis was based entirely on the psychiatric interview.

A careful search of the files revealed that only eighty-four patients were available for the purposes of this study. Out of these eighty-four patients selected, twelve refused to construct a design. Those most often refusing to take part in the experiment were either paranoid schizophrenics or catatonic schizophrenics (see Table II).

The sample, therefore, consisted of seventy-two male patients which were divided into two groups, the paranoid schizophrenics and the undifferentiated psychotic group. Although the two groups were not matched for age

Table II.-
Number, Age, and Diagnosis of Patients Refusing
to Construct a Design.

Diagnosis	Mean Age	Number
Paranoid schizophrenia	43.03	6
Catatonic schizophrenia	42.08	4
Hebephrenic schizophrenia	24.00	1
Epilepsy	24.07	1

or other factors, an attempt was made to keep certain factors as constant as possible. All of the patients were American born and white. Only twenty patients in the sample had been married and, at the time of testing, only thirteen were still married. Out of the entire sample, fifty-four of the patients were still single.

The two groups were quite uneven since only twenty-eight paranoid schizophrenics could be obtained that met the requirements previously outlined. The undifferentiated psychotic group was somewhat larger, numbering forty-four patients in all. Originally, it had been hoped that this group could be handled by the various sub-groups; however, the number of patients in each sub-group was too small. The undifferentiated psychotic group consisted of four different diagnostic categories of patients who ranged in length of hospitalization time from one month to twenty-eight years. These are presented in Table III. The average length of hospitalization time for the undifferentiated psychotic group was 8.31 years. The average length of hospitalization time for the paranoid schizophrenic group was 7.15 years, and ranged from one month to twenty-four years.

The ages for the entire sample ranged from sixteen years to fifty-two years and four months. There was very little difference in the age range between the two groups, since the paranoid schizophrenic group ranged in age from

Table III.-

Diagnostic Classifications and Age Ranges of Patients
in the Undifferentiated Psychotic Group.

Diagnosis	N	Age Range
Catatonic Schizophrenia	13	17.00 to 49.06
Hebephrenic Schizophrenia	16	16.06 to 52.04
Simple Schizophrenia	8	16.06 to 52.00
Epilepsy (psychotic)	7	23.08 to 48.02

nineteen years and four months to fifty-one years and one month; while the undifferentiated psychotic group ranged in age from sixteen years and six months to fifty-two years and four months. The mean age for the paranoid schizophrenic group was 39.25 years; while it was 36.67 years for the undifferentiated psychotic group. Refer to Table IV.

4. Organization and Statistical Analysis of the Data.

After the testing was completed, each design was scored by the examiner for the presence or absence of agglutination. This was done by studying both the design and the index card, since the latter indicated what the patient had actually constructed. It was possible for agglutination to occur in two separate and distinct patterns, each calling for a self-report from the patient. A pattern was scored for agglutination if either of the following occurred:

1. The pieces were placed together in a mass (either symmetrical or non-symmetrical) and the patient reported that it represented nothing, and that it reminded him of nothing.

2. The patient used the pieces to construct something (a whole) without actually changing the meaning of the pieces (the parts) used. In other words, the patient used squares to construct a square, or diamonds to construct a diamond, or pieces of red to construct red.

The pieces used to construct the design had to touch one another in both categories before the design could be considered as agglutinated. In other words, if the patient

Table IV.-
Age Distributions of the Two Groups.

Group	Mean	S.D.
Paranoid schizophrenics	39.25	8.04
Undifferentiated psychotics	36.67	10.95

constructed a loose design with scattered pieces on the tray and reported it as nothing, it was not scored as an agglutinated design. After the examiner had scored all of the designs, an independent rater was requested to score them.

The independent rater, another psychologist, had no previous experience with the Mosaic. He went through the same procedure with each design as the examiner had. This served as a reliability check on rating the designs. Since the criteria for rating a design as an agglutinated pattern were fairly explicit, there was perfect agreement between the examiner and the independent rater.

The same procedure was used in judging the twenty patients who did a retest pattern. Both the examiner and the independent rater judged each design, and perfect agreement was again present. The twenty patients who were retested served as a test-retest reliability check for agglutination. The scoring involved no numerical scores and was scored positive if the design remained the same on the second testing. If the patient constructed an agglutinated design on the first test and a non-agglutinated design on the second testing, it was scored negative. In other words, any change was scored negative; while a repeat pattern was scored positive. The statistical analysis of the test-retest reliability was done with the Phi

Coefficient, and the following formula was used:

$$\phi = \frac{a\delta - \beta\gamma}{\sqrt{pq p'q'}}$$

The null hypothesis stated there would be no significant difference in the frequency of occurrence of agglutination in paranoid schizophrenics and in a group of undifferentiated psychotics. Since the presence or absence of agglutination could be placed into frequencies of occurrence, the statistical analysis of the results was done by using the Chi Square formula. The following formula was used to compute the Chi Square:

$$\chi^2 = \frac{N (ad - bc)^2}{(a+b) (a+c) (b+d) (c+d)}$$

CHAPTER III

PRESENTATION AND DISCUSSION OF RESULTS

This chapter is concerned with the compilation and analysis of the results of the experiment in the light of the null hypothesis. The first section considers the reliability of the Mosaic test in measuring agglutination. The second section deals with the frequencies of agglutination and its relationship to the null hypothesis. The differences between agglutinated patterns and the non-agglutinated patterns will be discussed in the third section. A final section is devoted to a summary of the findings.

1. Reliability of the Mosaic.

The amount of similarity between the first and second design of the patients that were retested was quite surprising. In fact, many of the repeat patterns produced by the patients were so similar that it would have been possible to correctly match them. Even though the content often varied, certain formal qualities were present in the second testing which were very apparent. Actually, the reliability of the test was somewhat impaired due to three consecutive house designs. Since this was the only time during the entire testing that the same pattern reoccurred in succession, it seems quite probable that some type of

communication took place between the patients doing the constructing. Although the three house designs had a negative effect, the reliability score still revealed a substantial relationship. A phi coefficient of .61 was obtained, indicating that at least a moderate correlation existed.

2. Frequency of Agglutination.

From the entire sample of seventy-two patients that were tested, sixteen patterns were judged as agglutinated patterns. The paranoid schizophrenic group constructed eleven agglutinated patterns; while the undifferentiated psychotic group constructed only five patterns that were judged as agglutination (refer to Table V). With the exception of one catatonic schizophrenic, all of the patterns showing agglutination in the undifferentiated psychotic group were constructed by hebephrenic schizophrenics.

Approximately 78% of the patients constructed designs which could not be scored as agglutination. The paranoid schizophrenic group constructed seventeen non-agglutinated designs; while the undifferentiated psychotic group constructed thirty-nine designs that revealed no agglutination.

A two by two contingency table for chi square, employing the formula presented in the previous chapter,

Table V.-

Frequency of Occurrence of Agglutinated Patterns
and Non-agglutinated Patterns in the Sample.

Group	Agglutinated Patterns	Non-agglutinated Patterns
Paranoid Schizophrenic	11	17
Undifferentiated psychotics	5	39
Total	16	56

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was used to compute the results. The formula was used without employing any correction formula, since every cell contained at least five patients and the lowest expected frequency was six. For the results to be significant at the .01 level, a chi square of 5.025 or greater was necessary. A chi square of 7.71 was obtained in the present study. Therefore, the results were significant and not due to chance alone. The null hypothesis that there was no significant difference between the frequency of agglutination in paranoid schizophrenics and in undifferentiated psychotics in Mosaic production was rejected.

Agglutination occurred most often in this study from the patient refusing to give meaning to his design, and describing it as nothing. Out of the sixteen agglutinated patterns, nine were scored for agglutination because the patient refused to give any meaning to a compact mass of pieces he had placed on the tray. All but one of these patterns were constructed by patients diagnosed as paranoid schizophrenics. Refer to Table VI.

This category of agglutination, considered separately, was also computed by means of chi square to determine if the results were significant. In other words, constructing a compact mass and refusing to give meaning to it was tested for significance. Since one of the cells contained only one patient, the following formula was used,

Table VI.-

Frequency of Occurrence of Agglutination in the Sample
Due to Constructing a Compact Mass and
Refusing to Give Meaning to It.

Group	Agglutinated Patterns	Non-agglutinated Patterns
Paranoid Schizophrenic	8	20
Undifferentiated Psychotic	1	43
Total	9	63

Incorporating Yates correction formula:

$$\chi^2 = \frac{N \left([ad - bc] - \frac{N}{2} \right)^2}{(a+b)(a+c)(b+d)(c+d)}$$

A chi square of no greater than 8.54 was obtained. Anything beyond 6.635 was significant at the .01 level of significance. The obtained results, therefore, indicated that constructing a compact mass or design and refusing to give meaning to it was of some significance in the present study. Reluctance to give meaning to a design was indicative of paranoid schizophrenia in the present study.

The remaining seven patterns that were scored for agglutination were scored in that manner because the patients used the pieces (the parts) to construct a design (the whole) without actually changing the meaning of the pieces (the parts). Only three of these patterns were constructed by the paranoid schizophrenic group; while three were constructed by hebephrenic schizophrenics and one by a catatonic schizophrenic. Since the undifferentiated psychotic group constructed four designs of this nature and the paranoid schizophrenic group constructed only three, the results were not significant.

3. Differences Between the Two Patterns.

Although the chief difference between an agglutinated pattern and a non-agglutinated pattern appeared to be

the failure to give meaning to the agglutinated pattern, such factors as the number of pieces and the number of colors were also explored.

The use of color seemed to have very little effect on whether or not a design was agglutinated. The mean number of colors used was four for both the agglutinated patterns and the non-agglutinated patterns. The range of colors, for both patterns, ranged from using one color to using all six colors. In the agglutinated designs, there appeared to be no particular preference for any certain color; while red was used slightly more in the designs that were not agglutinated. Blue seemed to be rejected most often in the designs revealing no agglutination; while in the agglutinated designs, all the colors were used in about equal proportions.

There was a slight difference in the mean number of pieces used in the agglutinated designs as compared to designs which were not agglutinated. The mean number of pieces used in constructing an agglutinated pattern was twelve; while in the non-agglutinated pattern it was sixteen (refer to Table VII). Employing the "t" test to determine if these results were significant, a "t" of 1.12 was obtained. This was not significant even at the .05 level of significance. Therefore, the number of pieces used did not appear to be significantly different between an agglutinated design and a non-agglutinated one.

Table VII.-

Means, Standard Deviations, and Standard Errors of the Means of the Pieces Used in the Agglutinated Patterns and Non-agglutinated Patterns.

Pattern	N	M	σ	σ_M
Agglutinated	16	12	11.005	2.84
Non-agglutinated	56	16	15.89	2.14

The content between the two types of patterns varied considerably, since an agglutinated design represented either the pieces of the Mosaic, or nothing. The non-agglutinated designs were mostly of concrete objects. House designs were the most common (see Table VIII). A few of the designs were quite bizarre, with comments such as:

That's a man picking up scrap, here's another man picking up scrap. That's a loose man that hasn't been captured yet and this is a man picking up loose ends towards a higher education.

Although not a part of this study, the diagnostic sign that schizophrenics tend to build abstract designs did not seem to hold up in the present study.

4. Summary.

The aim of this research project was to determine whether agglutination occurred more frequently in the designs of paranoid schizophrenics than it did in a group of undifferentiated psychotics. Considering both categories of agglutination, sixteen patients constructed designs that were agglutinated; while fifty-six did not agglutinate. A chi square of 7.71 was obtained and the null hypothesis was rejected. There appeared to be some relationship, in the present study, between agglutination on the Mosaic and paranoid schizophrenia.

The refusal to give meaning to a design was considered as an individual category representative of agglutination.

Table VIII.-

Content and Frequency of its Occurrence
in the Non-agglutinated Designs.

Content	Frequency of Occurrence
Numbers	1
Doorway	1
House	10
Buildings	2
Emblems	3
Egg	1
Design	7
Barn	1
Chimney	1
Tree	1
Ladder	1
Bizarre content	6
Dinner bell	1
Airplane	1
Flower	1
Sidewalk	1
School house	1
Fence	1
Bridges	1
Snake	2
Garage	1
Silo	1
Locomotive	1
Arrow	1
Checker-board	1
Floor tile	3
Bow	1
Initials	1

The paranoid schizophrenic group constructed eight of the nine patterns that fell into this category. Using Yates correction formula, a chi square of 8.54 was obtained. This was significant at the .01 level of significance, indicating that refusal to give meaning to a compact design was associated with paranoid schizophrenia in the present study.

No significant differences were found between the non-agglutinated designs and the agglutinated designs regarding color and the number of pieces used in constructing a design.

SUMMARY AND CONCLUSIONS

In the analysis of Mosaic patterns from a group of paranoid schizophrenics and a group of undifferentiated psychotics, it was found that the hypothesis of no significant differences in the frequency of agglutination did not hold up. The results, considering both categories of agglutination, were significant enough to warrant additional investigation into this problem.

The refusal to give meaning to a compact design was only one category of agglutination, but proved to be significant beyond chance expectancy alone. This should be investigated further, since some possibility exists that it could be a good diagnostic sign in determining paranoid schizophrenia on the Mosaic test.

Although the results obtained in the present study revealed a positive trend, it should be pointed out that a study of this nature should have a closer control on the diagnostic labeling than the present study. The investigator found several patients coming into the testing room that behaved in a very suspicious and paranoid manner, but were labeled under other diagnostic categories. It is suggested that further study, controlling for this factor, might reveal even more significant results than the present findings.

An attempt should be made to determine the predictive value of agglutination. If the assumptions proposed in the present study are correct, then the Mosaic test should be capable of determining paranoid schizophrenia from a group of mixed diagnostic categories and normal individuals. Selecting patients as they are admitted to a hospital, rather than testing them after they have been hospitalized for some time, would also afford a better study. In the present study, there was too much range in length of hospitalization. Testing the patients as they entered the hospital would also eliminate the effect of drugs which may be an important variable that was not controlled for in the present study.

The results, however, do indicate that the Mosaic test is worthy of further investigation as a diagnostic tool. It is non-threatening to most patients, easy to administer, and the results from the present study indicate that it does seem to hold promise worthy of further research.

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Bertham, Frederic, "The Mosaic Test", in Projective Psychology, edited by Lawrence E. Abt and Leopold Bellak, New York, Grove Press Inc., 1950, p. 230-256.

An excellent description of the diagnostic signs on the Mosaic. Similar to his original article, but with more detail and clarification. His conclusions about the paranoid schizophrenic's production served as an important consideration in the present study.

Aldeman, Harley L., "Development and Initial Validation of an Objective Scoring Method for the Lowenfeld Mosaic Test", in the Journal of Projective Techniques, Vol. 19, No. 2, issue of June 1955, p. 177-191.

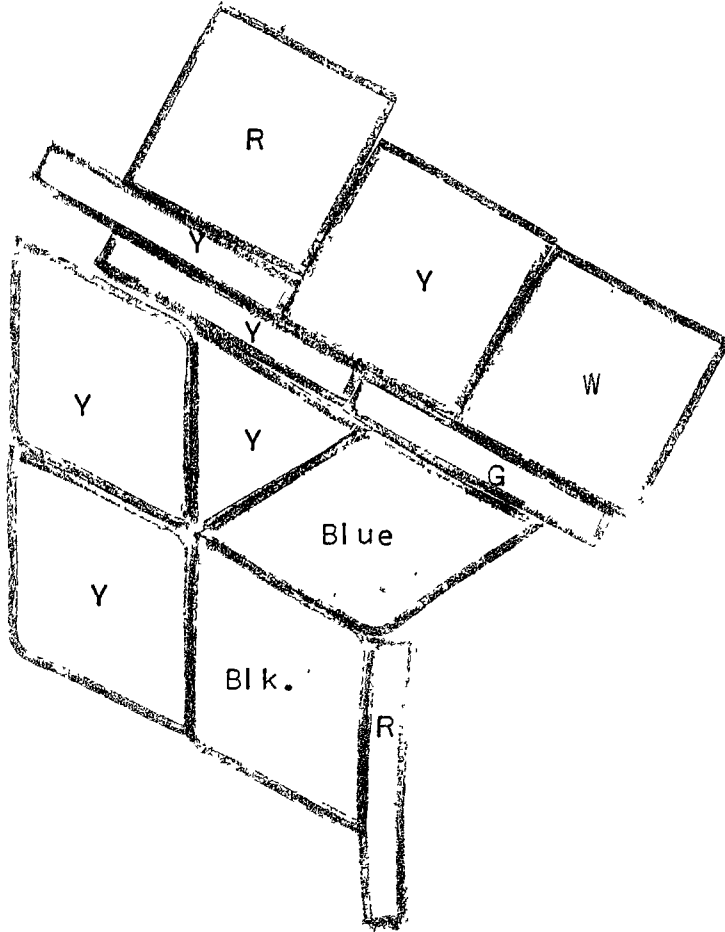
A good study, presenting the best objective scoring system yet devised. A good validity study on some of the diagnostic signs. Definitely recommended reading.

Zucker, Louise, "The Clinical Significance of the Mosaic and Rorschach Methods", in the American Journal of Psychotherapy, Vol. 4, No. 3, issue of July 1950, p. 473-487.

Presents some of the diagnostic signs including those advocated by Bertham. Served as an additional impetus to the present study.

APPENDIX I

A SAMPLING OF THE DIFFERENT PATTERNS

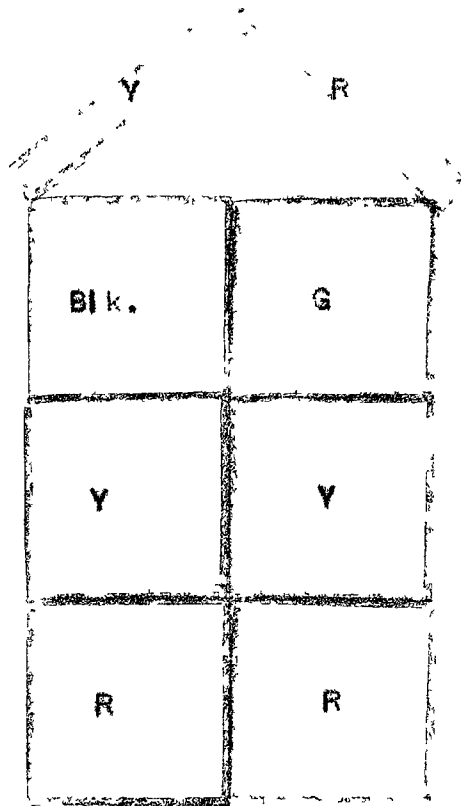


Agglutinated Pattern

Y	Blue	Blk.	W
Blk.	Y	Blue	R
Y	R	Y Y	G

Agglutinated Pattern

APPENDIX I



Non-agglutinated Pattern

Described as a House

APPENDIX 2

ABSTRACT OF
MOSAIC AGGLUTINATION IN PARANOID SCHIZOPHRENICS
AND UNDIFFERENTIATED PSYCHOTICS

AFFENDIX 2

ABSTRACT OF

Mosaic Agglutination in Paranoid Schizophrenics
and Undifferentiated Psychotics

Several studies have been done with the Mosaic test attempting to verify some of the diagnostic signs. Most of these have been concerned with several signs in the same study. Few have concerned themselves with only one sign or with what might be expected from one particular diagnostic category due to the underlying pathology. In this study, the focus of attention was on one single sign appearing on the Mosaic.

It was postulated that because of the suspicious nature of the paranoid schizophrenic, he would construct a design on the Mosaic which revealed his suspiciousness. This type of design would be in the form of an agglutinated pattern, which consisted of two different categories. The patient would either construct a compact mass and refuse to give any meaning to it, or he would use the pieces to build something without actually changing the meaning of pieces used.

I Roy B. Henderson, doctoral thesis presented to the School of Psychology and Education of the University of Ottawa, Ontario, August 1962, viii-61 p.

A total population of eighty-four patients was selected, but twelve of these refused to take part in the experiment. The remaining sample consisted of twenty-eight paranoid schizophrenics and forty-four undifferentiated psychotics. Each patient was administered the Mosaic and the pattern was scored for the presence or absence of agglutination. As a reliability check on the Mosaic, twenty of the patients were retested. The designs were scored by the examiner and by an independent rater for agglutination and there was perfect agreement between the ratings.

The results did not uphold the hypothesis of no significant differences in the frequency of agglutination between the two groups. Refusal to give meaning to the design, considered as a separate category of agglutination, was also found to be significant. Therefore, agglutination appeared to have some relationship to paranoid schizophrenia in the present study.

It was suggested that additional investigation be done on Mosaic agglutination, and that attention be focused on the predictive power of this pattern in ascertaining paranoid schizophrenia.