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## A Rorschach Study of the Effect of Electric Shock Treatment on the Schizophrenic Personality

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A RORSCHACH STUDY OF THE EFFECT OF ELECTRIC SHOCK  
TREATMENT ON THE SCHIZOPHRENIC PERSONALITY

by  
Anthony B. Tabor

A Thesis Submitted to the Faculty of the Graduate School  
of Loyola University in Partial Fulfillment of  
the Requirements for the Degree of  
Master of Arts

June  
1952

## LIFE

Anthony B. Tabor was born in Chicago, Illinois, December 6, 1920.

He was graduated from Foreman High School, Chicago, Illinois, June, 1939, and from Loyola University, Chicago, Illinois, June, 1949, with the degree of Bachelor of Science in the Social Sciences. His first two years of undergraduate work were spent at De Paul University, Chicago, Illinois.

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## CHAPTER I

### INTRODUCTION

Favorable results have been reported in the literature when convulsive shock therapy is administered as the sole treatment in various types of psychoses. The improvement or cure, whether clinical or social in nature, is usually evaluated through clinical interviews with individual cases. Although this is undoubtedly a reliable method when employed by a competent diagnostician, little is known about the nature of the changes which had taken place or about the permanence of the cure.

The present research will attempt to formulate a more objective description of the transition in the structure of the patient's personality as a result of shock treatment by the utilization of a standardized projective approach, the Rorschach Test.

Schizophrenia was chosen as the most suitable clinical entity for this study. In spite of extensive studies on the subject of schizophrenia, there is still considerable mystery regarding many of its phases. Little is known regarding

its nature, etiology, and cure. Convulsive shock therapy has been found efficacious in producing remissions, but its true function as a specific curative measure is surrounded with speculative theorizing.<sup>1</sup> Although this study does not purport to explain the causal relationship between somatic treatment and the remission it produces, an objective description of what constitutes a "cure" may suggest areas for more intensive study and influence theoretical considerations.

Most clinical studies deal with single symptoms permitting greater control and more intensive observation. The method is not practical, however, in the present study since the complexity of the schizophrenic personality can be understood meaningfully only when studied as an interrelated whole. The Rorschach Psychodiagnostics Test, a projective method of personality diagnosis, satisfies this requirement more adequately than other known instruments.

This study is based on the hypothesis that if any consistent changes in the schizophrenic personality are brought about by convulsive shock therapy, a quantitative Rorschach study of the personality before and after a series of treatments should detect these changes. The chief focus of research,

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1 Zygmunt A. Piotrowski, "The Prognostic Possibilities of the Rorschach Method in Insulin Treatment," Psychiatric Quarterly, XII, 1938, 689.

then, will be to arrive at an objective description of a group of patients diagnosed as schizophrenic at the time of admission to a hospital and to compare these data with the test results of the same patients after a series of electric shock treatments. The diagnoses and remissions or improvements will be based on psychiatrists' clinical judgments.

Supplementary data which may profitably be noted are the following: (1) How many of the Rorschach signs found in schizophrenia by Beck, Rickers-Ovsiankina, Rorschach, Kelley and Klopfer<sup>2</sup> appear in the first protocols of the present study? (2) Having ascertained the presence of some of these signs, how many are influenced or eliminated in the course of treatment? (3) Are the changes produced in the patient's personality structure merely shifts within the psychotic patterning or are these changes in the direction of normalcy?

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<sup>2</sup> Bruno Klopfer and Douglas McGlashan Kelley, The Rorschach Technique, New York, (1946), 362.



## CHAPTER II

### REVIEW OF THE LITERATURE

Since Sakel introduced insulin shock as a specific form of therapy in the treatment of schizophrenia in 1928, there has been a considerable amount of speculation and research in an attempt to formulate the psychological effects on the patients. Similar interest was devoted to electro-convulsive therapy when Cerletti and Bini first demonstrated its use in the treatment of schizophrenia in 1938. Both of these modes of therapy have achieved widespread application although very little is known of either the specific therapeutic changes or the psychological effects. Furthermore, no adequate theory has been developed to explain their success. Various attempts have been made, therefore, to arrive at descriptive definitions of the changes in personality that have been noted following convulsive therapy. Most of these studies have utilized the Rorschach Test.

The earliest of these studies was concerned with the effects of insulin coma. In 1939 Piotrowski<sup>1</sup> reported on a

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1 Zygmunt A. Piotrowski, "Rorschach Manifestations of Improvement in Insulin Treated Schizophrenics," Psychosomatic Medicine, I, 1939, 508.

study of sixty schizophrenic patients who were tested before and after series of insulin treatments. A comparison of the pre-treatment records with the post-treatment records of each patient revealed differences which closely paralleled the differences in improvement as observed clinically; patients whom the medical staff declared unimproved did not, as a rule, show significant differences between the pre-treatment and the post-treatment records, while those who improved greatly or recovered showed noticeable differences. A comparison of Rorschach findings and clinical observations was possible with regard to such traits as perseveration, capacity for prolonged voluntary attention, approximate degree of manifest anxiety, agitation, impulsive emotional reactions, emotional lability, nature of dominant attitude, whether it is one of resignation or self-assertion, quality of mental production, conscious control over the thought processes, coherence of reasoning, and so forth.

Some of Piotrowski's specific findings following successful insulin treatment are: (1) significant improvement in the speed and ease of interpretations, less hesitation, more self-assurance, less circumstantial, more to the point, and the average time per response is usually shorter, (2) not only verbal form, but logical content changes for the better and less confusion is experienced between the interpretation and the description of the blot, (3) increase in the number

and quality of M responses, presence of more active inner life, (4) increase in the number and percentage of FC responses; good and effortless emotional contact, (5) increase in F plus per cent, conscious control over thought processes, adequacy of ideas and prolonged voluntary attention, (6) percepts undergo marked change for better regardless of amount of associative elaboration, (7) ability to combine felicitously the various details of the inkblots into more meaningful wholes improves in some patients. This would correspond to an improvement in constructive thinking. Integration is better.

Considerable emphasis is placed upon the quality of the percept. Piotrowski maintains that "reasonable elaborations based on vague percepts are indications of poorer prognosis than far-fetched elaborations based on good percepts. The percept, then, may be regarded as being of primary importance whereas the thoughts expressed in the fantasies and in the elaboration of the percepts are undoubtedly of secondary importance and are much more variable."<sup>2</sup>

Piotrowski has found that at least several of the changes listed above can be found in the post-treatment record of every improved patient. It should be noted, however, that no adequate statistical treatment is found anywhere in the

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2 Ibid., 509.

evaluation of his results. In this respect, Piotrowski's study is considerably more subjective than the present endeavor and his opinions are inconclusive.

Halpern considered the same problem in her research with a smaller group, seventeen males between the ages of eighteen and thirty years of age.<sup>3</sup> Her patients were divided into two groups: Group A consisted of seven patients who remained unimproved following treatment and Group B, also seven patients, who had improved and maintained their place in society for a year or more. Apparently three cases were excluded from the study, although no reason is given.

Halpern wished to determine which personality types benefit most from insulin therapy and, secondly, what changes are found in the personality structure after insulin. The latter consideration is of primary concern in the present investigation. She found that the two groups differed markedly in (1) productivity, (2) Erlebnistyp, and (3) the presence or absence of human responses (H).

Group profiles were compiled for both groups. Before

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<sup>3</sup> Florence Halpern, "Rorschach Interpretation of the Personality Structure of Schizophrenics Who Benefit from Insulin Therapy," Psychiatric Quarterly, XIV, 1940, 826.

commenting on Halpern's procedure it may prove worthwhile to review some of the conclusions she draws from the data. The following is a brief summary of her conclusions: In the post-treatment protocols there is evidence of greater awareness of reality, a more concrete, practical approach. In Group A, all but one case displayed some receptivity to emotional stimuli, even though not always well-controlled. There was some evidence of inner life in four of the seven cases as well as some signs of creativity. These signs were absent in all but one of the pre-treatment protocols. In Group B, pre-treatment records showed a preponderance of impulsive and uncontrolled emotionality. Post-treatment records indicated an adjustment in the direction of the socially acceptable response. Nearly all test factors in the post-treatment records of both groups show trends toward a normal picture.<sup>4</sup>

Although these generalizations made by Halpern are vague and noncommittal, speaking of "trends" in the personality changes is nonetheless unjustified without statistical evidence. Her listing of the sum of responses for each group for purposes of comparison is a procedure thoroughly condemned by Cronbach.<sup>5</sup>

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4 See Table I, page 9.

5 Lee J. Cronbach, "Statistical Methods Applied to Rorschach Scores: A Review," Psychological Bulletin, XLVI, 1949, 399.

TABLE I  
DIFFERENTIAL EFFECTS OF INSULIN  
THERAPY IN SCHIZOPHRENIA<sup>6</sup>

Rorschach Data	Group A (unimproved)		Group B (improved)	
	Before Treatment	After Treatment	Before Treatment	After Treatment
R	102	116	227	146
RF%*	17	16	4	5.5
W%	45	34	60	47
D%	46	53	33	45
F%	73	68	50	56
F+%	84	100	88	98
M%	3.9	13.7	18.9	17.0
Csum	10	10.5	25	11
M:C	2:10	5:10.5	24:25	17:11
H%	4.9	6.9	14.9	13.6
Hd-At%	21	18	7.9	7.5

\* RF% is defined as the percentage of rejections.

<sup>6</sup> Halpern, "Rorschach Interpretation of the Personality Structure of Schizophrenics Who Benefit from Insulin Therapy," Psychiatric Quarterly, XIV, 829.

Most of her study, however, was apparently based on the comparison of averages of various test categories. Halpern describes her results rather noncommittally in terms of the presence or absence of certain traits or in terms of the degree to which certain aspects of the personality are modified. The very fact that the subjective conclusions are the only results of the study which are cited does, by implication, attribute significance to them which is not warranted by the evidence quoted.

One of the first Rorschach studies concerned with electric convulsive therapy was a simple experiment reported by Kelley, Margulies, and Barrera on the effects of one convulsion.<sup>7</sup> The Rorschach Test given before and after a single treatment disclosed no significant changes in the patient's personality.

A similar approach was taken by Löwenback and Stainbrook.<sup>8</sup> The effects of single treatments were noted by the Rorschach technique, but the testing continued throughout the series of treatments to study the cumulative changes brought

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7 D. M. Kelley, H. Margulies, and S. E. Barrera, "The Stability of the Rorschach Method as Demonstrated in Electric Convulsive Therapy Cases," Rorschach Research Exchange, V, 1941, 36.

8 Hans Löwenback and Edward J. Stainbrook, "Observations on Patients after Electro-Shock," American Journal of Psychiatry, XCVIII, 1942, 831.

about by electric shock. Fifteen state hospital cases were studied after each of one hundred separate shocks.

Standard Rorschach technique was used wherever possible, but a modified method was employed for the investigation of the quickly changing post-convulsive personality states. Each patient was asked to respond to three cards only after each convulsion, a protocol being taken continuously from the time he was first able to speak until a steady state was reached in most cases, no longer than one hour after shock. After three or four treatment days, responses to all ten cards were assembled into a composite Rorschach record for every five-minute interval in an individual patient's post-shock recovery.

Usually fifteen to twenty minutes elapsed before a patient could speak intelligibly, although some records were obtained within five minutes. The first records were marked by an abnormally low number of responses, usually not more than fifteen, most of which were simply color naming. Fifty to sixty per cent of the responses frequently occurred on the last three cards.

Usually less than thirty-five per cent of the responses were determined by form alone and the percentage of sharply perceived forms was very low, about twenty per cent, evidence of perceptual laxity. The first adequate form res-



ponses were usually given to card five, a compact, definitely shaped figure. Even at this low level, however, there was evidence of the basic personality attitudes as demonstrated by responses peculiar to the individual being tested in the pre-shock state (such as "horse" to card five), being among the first responses other than color-naming which the patient gave to the blots. In many patients the pre-convulsive attitude of rejection of the test was maintained after shock as well.

Perseveration was usually manifested in the post-shock state as well as previously although the authors suggest the possibility that the response perseverated may change during the process of recovery. At the same time, the manner of interpretative control shifted from an early, almost complete attention to details to a progressively increasing concern with the whole blot. Paradoxically, the observation was made that a patient might pay more attention to details and produce a much greater number of responses than before as well as after termination of treatment, but these responses remained primitive.

Along with the emphasis in intellectual approach (gradual increase in W), there was a growing orderliness in responding to the cards. In the early records there was a great deal of repetition on the same card, but twenty-five to

forty minutes later, the patient might enumerate details particularly on the color cards, in an orderly fashion from top to bottom, and the symmetrical counterparts of details might then be described together in one response (for example, "two bears"), rather than as two separate figures.

In the records taken within fifteen minutes of shock, color-naming sometimes constituted as high as eighty per cent of the total responses and persisted, but with diminishing frequency, throughout the protocol. As recovery progressed, there was, in almost all cases, a gradual formalization of color details with greater emphasis on form. Even patients whose answers were severely limited in the normal state after recovery showed a refinement of color-naming by specifying the proper shade.

Movement responses, commonly associated with personality stability, were always last to reappear. Thus, after each single shock a long recuperative distance had to be covered before stable responses were again presented.

Certain differences were observed between pre-treatment Rorschach findings and those obtained after cessation of treatment. Two groups were distinguished, one showing clinical improvement and disappearance of many of the pathologic Rorschach indicators and the other in which definite signs of abnormality

still remained.<sup>9</sup> Löwenback and Stainbrook suggest this as a possible indicator of those who will remain "cured" as distinguished from those who will relapse.<sup>10</sup>

Rabin reports a study designed to determine the effects of electric shock treatment on the memory, intelligence level, and personality of clinically improved and not improved psychotic patients.<sup>11</sup> He administered the Rorschach Test before and immediately upon the completion of a course of electric shock treatments to ten psychotic state hospital patients (eight of whom were schizophrenics) between the ages of twenty and forty. The average period between examinations was about one month.

The post-treatment Rorschach protocols of Rabin's study showed greater productivity (R), the tendency for F plus per cent to gravitate toward the average range, and an increase in the number of shading responses. There was also a reduction in the number of rejections and a marked improvement in speed

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9 Illustrative cases drawn from these groups are presented in Table II, page 15, H. S. of Group 1 representing a case whose symptoms have subsided and F. W. of Group 2, a case in whom signs of abnormality remain.

10 Löwenback and Stainbrook, "Observations on Patients after Electro-Shock," American Journal of Psychiatry, XCVIII, 832.

11 I. Rabin, "Effects of Electric Shock Treatment upon Some Aspects of Personality and Intellect," American Psychologist, II, 1947, 284. (Abstract)

TABLE II  
 RORSCHACH PSYCHOGRAMS OF TWO PATIENTS BEFORE  
 AND AFTER SUCCESSFUL TREATMENTS<sup>12</sup>

Rorschach Data	H. S. of Group 1		F. W. of Group 2	
	Before Treatment	After Treatment	Before Treatment	After Treatment
R	21	21	14	24
W	4 (3) <sup>a</sup>	6	1	5
D	6 (4)	11	9	10
d	5	3	3	6
Dd			1	2
S		1	1	2
M		3		
FK				
F	10 (1)	7 (2)	9	10 (1)
Fc		1		2
C'				2
FC		4		4
CF		2		1
C				1
C <sub>n</sub>	6		4	
P	4	4	1	5
O			1	2

<sup>a</sup> Additional scores.

<sup>12</sup> Löwenback and Stainbrook, "Observations on Patients after Electro-shock," American Journal of Psychiatry, XCVIII, 832.

of response." No single Rorschach factors were found which might serve as indices or as predictors of improvement, but the total patterns did correspond with improvement.

A relatively smaller number of studies have been made on electro-shock patients as compared with patients being treated with insulin. If this fact has any significance at all, a review of the literature on the subject produces no general agreement as to the reasons for this paucity of research. The fact that insulin shock was used for ten years prior to the introduction of electric shock as a form of therapy may partially account for the greater interest directed toward the former. This is especially true since the effects of electric shock treatment do not differ essentially from those produced by insulin coma.<sup>13</sup> After a study of electric shock therapy in two hundred cases of schizophrenia, Kalinowsky, Lothar, and Worthing concluded that the relative merits of electric shock as compared with insulin shock treatment was a highly disputable question. Current investigation with these two types of treatments as well as a combination of both types still leaves the question of comparable value unanswered.<sup>14</sup>

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<sup>13</sup> C. O. Cheney and H. E. Clow, "Prognostic Factors in Insulin Shock Therapy," American Journal of Psychiatry, XCVII, 1941, 1038.

<sup>14</sup> Lothar B. Kalinowsky and Paul H. Hoch, Shock Treatments and Other Somatic Procedures in Psychiatry, New York, 1946, 199.

Consequently, it is believed that neither electric shock nor insulin coma have a specific curative effect, but that both may bring about changes that accelerate or facilitate improvement in those patients who have the constitutional capacity for such improvement or recovery. Cheney and Clow state that "patients who will benefit by insulin treatment will have the same characteristics as those benefited formerly with other forms of treatment."<sup>15</sup> Piotrowski also shares this view. He claims that "since insulin is not a specific in the treatment of schizophrenia, we do not expect the personality changes following this treatment to be qualitatively different from the spontaneous changes occurring in schizophrenia. The personality changes produced by insulin treatment are more rapid and perhaps more intense but apparently they do not differ in nature from the spontaneous changes."<sup>16</sup>

This lack of distinction between various forms of treatment is noted in a study by Beck.<sup>17</sup> He discusses the effect of shock therapy upon schizophrenia, but fails to mention the specific type of shock treatment employed.

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<sup>15</sup> Cheney and Clow, "Prognostic Factors in Insulin Shock Therapy," American Journal of Psychiatry, XCVII, 1038.

<sup>16</sup> Piotrowski, "The Prognostic Possibilities of the Rorschach Method in Insulin Treatment," Psychiatric Quarterly, XII, 689.

<sup>17</sup> Samuel J. Beck, "Effects of Shock Therapy on Personality, as Shown by the Rorschach Test," Archives of Neurology and Psychiatry, L, 1943, 483.

Beck bases his study on only eight cases of schizophrenia between the ages of fifteen and thirty-four. The interval between pre-treatment and post-treatment Rorschachs ranges from eight days to three years. He found the pattern on the second test, as a whole, similar to the pattern found in the first test. Furthermore, he was under the conviction that changes after shock therapy were no more striking than those of patients who improved without treatment.

Results show that patients tend to improve with respect to Rorschach factors related to intellectual control (as F% or F+%) at the cost of richness in mental life (impoverished content and reduced mental productivity). The changes were insignificant in the area of movement responses, that is, inner life (considered by Beck as the core of personality) was resistant to the impact involved in shock treatment. Improvements which do take place in outer activities (periphery of the personality) are limited.

Beck's results seem to indicate that the patient himself is not really reached by shock treatment. He claims that "so far as one can hazard a conclusion from statistically scanty material, one may state that shock therapy is not as effective in reaching the inner personality as either spontaneous remission or deep-searching intensive psychotherapy."<sup>18</sup>

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<sup>18</sup> Ibid., 484.

In commenting on Beck's report, Joseph Rheingold summarized Beck's findings as indicating little change in the personality except in the intellectual sphere and that the gain, which consists of increased intellectual control, is at the expense of intellectual function.<sup>19</sup> Rheingold noted, however, that the clinical impression which now seems to be crystallizing is that shock treatment essentially damages the mind of the patient and that the clinical improvement is correlated with that damage. He contended that there seemed to be many discrepancies between Beck's results and those of other investigators, particularly Piotrowski. Piotrowski's results were not only at variance with Beck's, but in some respects flatly contradictory. Beck stated that the score for the intellectual factors Z, W, and so on, decreased if improvement occurred. Piotrowski stated that there was an increase. W%, for example, and the average number of responses was twice that of the group which did not improve. Both agreed on the increase in F plus.

Rheingold further pointed out that there was a real difference of opinion on color and movement responses. Beck said that the color factor was unimportant. Piotrowski stated that there was a definite increase; the improved presented a larger number of color responses than the unimproved. With

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19 Ibid.



respect to the movement response, Beck said that the remarkable fact was its stability, but Piotrowski said that the movement factor was the most outstanding variable and that in the group of patients whose condition improved the increase was five times as great as that in the group which showed no improvement.

Piotrowski questions the likelihood of finding any significant differences between the results of electric shock and insulin coma treatments.<sup>20</sup> Assuming this improbability to be a fact for the present, we find that four of the studies reviewed in this chapter are directly comparable in their approach to the present undertaking.

The studies of Piotrowski, Halpern, Rabin, and Beck are similar in that the major concern was directed toward the schizophrenic personality as affected by a series of shock treatments. In each case patients were administered the Rorschach Test before and after the series, test results being used as the criterion of change in the personality structure. Piotrowski and Halpern restricted their studies to sixty and seventeen patients, respectively, treated by insulin alone while Rabin studied only effects of electric shock therapy on eight patients. Beck also used eight subjects, but did not

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20 Letter from Zygmunt A. Piotrowski, New York State Psychiatric Institute, March 12, 1951.

state explicitly the type of shock treatment which was utilized. It is entirely possible, however, that he had included both insulin- and electric-shock-treated cases in his sampling, as is true of the present study.

Although the studies of Kelley, Margulies, and Barrera and that of Löwenback and Stainbrook differ markedly from the present attempt, they illustrate interesting aspects in the development of post-shock personality changes: the former proves the inefficacy of a single treatment and the latter portrays the gradual development of the schizophrenic personality's reorientation toward reality.

In conducting experiments of this nature, the question of control groups frequently arises. For example, in the discussions of specific curative effects of any shock treatment, is the improvement or cure assumed to be attributable to the shock or are there other objective facts to account for the results? Halpern ventures the following reply: "It is not reasonable to assume that all, or even the majority of schizophrenic patients, would tend in the same direction during the one to three-month period represented by the average course of treatment, were there not some common factor exerting pressure in that direction. As far as can be determined, the only thing

these patients had in common was the ward routine and the insulin therapy."<sup>21</sup>

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21 Halpern, "Rorschach Interpretation of the Personality Structure of Schizophrenics Who Benefit from Insulin Therapy," Psychiatric Quarterly, XIV, 832.

## CHAPTER III

### PROCEDURE

Since the purpose of the present research is to study the effects of convulsive therapy on the schizophrenic personality structure, an attempt was made in so far as it was possible to maintain uniformity in procedure so that shock treatment alone might be held accountable for any changes in the patients' reactions.

Ideally, one would attempt to further isolate the independent variable (treatment) by comparing the present group with a control group of schizophrenics who were receiving no treatment at all. This, however, was not feasible for several reasons: (1) the writer obviously had no control over the recommendation or denial of treatment to patients, (2) patients admitted to the hospital were usually admitted for the specific purpose of somatic treatment, (3) denial of treatment in individual cases was done for reasons which likewise precluded the advisability of including them in the present study, for example, suspicion of organic pathology, inadvisability of treating chronic cases which had benefited little or not at all from treatment in the past, and so forth, and (4) one might

seriously question any individual's right to withhold treatment from patients amenable to it and believed likely to benefit from it.

Accordingly, only patients diagnosed by a psychiatrist as schizophrenic and scheduled for shock treatment were considered suitable subjects for the present study. The group included twenty patients, thirteen of whom were treated at a state hospital and seven at a private hospital in the one year's period from June 20, 1950 to June 14, 1951.

The group consisted of thirteen men and seven women; sixteen of the group were native whites and four were foreign born. They were relatively young, with a mean age of 30.2 years ( $\sigma$  8.8 years). The youngest was nineteen and the oldest forty-seven. The educational level of the group approximated an average high school population with a mean of 10.3 years of formal schooling and a  $\sigma$  of 2.4 years.

The duration of illness prior to hospitalization for treatment ranged from two weeks to two years and ten months. The extremely long illnesses were recorded in several cases that had been under psychiatric care on an out-patient basis. Few patients, however, were treated very soon after the onset of illness; the average duration prior to shock treatment was

approximately nine months and three weeks.

The Rorschach Test was administered prior to the first treatment. The Klopfer Method of administration and scoring was followed with one modification: the testing of limits was omitted to preclude any insight into the test which the patient might gain, distorting the validity of the retest following treatment. Any suspicion or reticence on the patient's part was allayed at the outset by suggesting that the test was designed only as an aid in facilitating his cure. Little resistance was encountered after this reassurance.

After the course of treatments was terminated and the psychiatrist pronounced the patient improved or remitted, the Rorschach Test was administered again. An average of two months and seventeen days (sigma of one month and twelve days) had elapsed between the first testing session and the retest. The original plan was to allow about one week following the termination of treatment to permit the post-shock confusional state to clear before administering the second Rorschach. The patients in the private hospital, however, were frequently discharged from the hospital on the same day as the last treatment was administered or one or two days later. Consequently, it was necessary to test some patients shortly after the shock therapy terminated. Patients were not accessible for testing

following their release from the hospital. This condition must be considered as a factor in the subsequent interpretation of the results.

The number of treatments administered to patients was varied in individual cases as warranted in the opinion of the psychiatrist in charge and not all patients were treated by electric shock alone. The thirteen state hospital patients were treated by electric shock only, each receiving twenty treatments. Of the seven patients from the private hospital, one received 22 treatments, two received 16 treatments, one received 14 treatments, and three received only 7 treatments. Four of the seven patients were given supplementary treatment by insulin coma. The total time under coma was, respectively, thirty-one hours and forty-five minutes, sixteen hours and thirty minutes, three hours and forty-five minutes, and three hours and thirty minutes.

Rorschach group profiles were prepared for the twenty patients before and after shock treatment. An inter-group comparison was then made on all quantitative test factors in the locations, determinants, content, etc. by the chi square test for significant differences using a correction for continuity in small samples.<sup>1</sup> A similar procedure was used in appraising

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<sup>1</sup> Henry E. Garrett, Statistics in Psychology and Education, New York, (1948), 246.

the prevalence and disappearance of the twenty Rorschach signs considered symptomatic of schizophrenia by various investigators.<sup>2</sup>

Although all the patients used in this research were considered at least improved following the series of treatments, only nine showed marked improvement on the second Rorschach Test. The group was dichotomized, therefore, into those showing improvement on the Rorschach and those apparently unimproved according to the test. These statistical groups were submitted to similar tests of significant differences.

Since eleven of the twenty cases tested had been diagnosed as paranoid schizophrenia while the remainder were undetermined or simple types, this division into paranoid type and other types was likewise submitted to a statistical test of differences on individual test factors as well as on the twenty Rorschach signs.

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2 Klopfer and Kelley, The Rorschach Technique, 362.



## CHAPTER IV

### INTERPRETATION OF RESULTS

Several major assumptions are implicit in the treatment of the present data. First, the diagnoses of schizophrenia as arrived at by attending psychiatrists, the sole criteria on which selection of patients was based, are considered to be accurate and reliable. Secondly, in spite of the practical difficulty in maintaining a control group, personality changes revealed in the Rorschach Test will nevertheless be assumed to have a causal relation with therapy. A final assumption is statistical in nature, namely, the null hypothesis. In evaluating the data, no differences between pre- and post-shock test records are considered to be significant unless this fact can be substantiated statistically at a high level of probability. Table III lists the probability ratios obtained on various quantitative test factors from the entire experimental group before and after the twenty cases in the present study were treated by shock.<sup>1</sup>

A survey of the table suggests that, with a few exceptions, the group profiles before and after therapy remain

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<sup>1</sup> Page 29.

TABLE III

RELIABILITY OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS USING  
THE CHI SQUARE TEST<sup>2</sup>

Scoring Category	Probability Ratio <sup>3</sup>
Increased W%	.70
D%	1.00
d%	1.00
Increased Dd/S%	.20
M	1.00
Increased FM	.20
Decreased m	.30
Increased F%	<u>.02</u>
Increased Fc	.50
C'	1.00
Increased FC	.50
CF	1.00
Decreased C	<u>.05</u>
Decreased R	.30
Decreased F+%	.50
A%	1.00

241. 2 Garrett, Statistics in Psychology and Education,

3 Ibid., 246. Small sample, corrected for continuity.

TABLE III (continued)

RELIABILITY OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
 RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS USING  
 THE CHI SQUARE TEST

Scoring Category	Probability Ratio
Decreased sum C	.10
Increased Hd+Ad	.10
H-Hd-A-Ad	1.00
Less confused succession	<u>.01</u>

basically unchanged. One of the most common characteristics of schizophrenia, the overemphasis on whole responses, was found quite consistently before as well as after treatment. Eighty per cent of the group maintained an equally divided emphasis on W-D-Dd and W-Dd-D types of approach. The mean W percentages before and after therapy were forty-eight and fifty-two, respectively. Although the emphasis on vague whole responses does not change markedly, the schizophrenic does seem to have an improved orientation toward the test which is reflected in more logical sequence of responses. The generally confused succession of responses tends toward a simply loose succession. Seventeen of the twenty cases manifested a confused succession of responses before shock while only eight of the entire group

remained confused after treatment. Although this difference is significant at the one per cent level of confidence, relatively little weight can be attributed to this factor since too few responses were present in most cases to justify an adequate rating of succession.

The clearing of some of the patient's former confusion with a continuation of an emphasis on vague whole responses lends a stability to the latter which suggests that it may be a component of the patient's pre-psychotic personality not readily amenable to change. The inability to organize the perceptual field finds its counterpart in the sterility of the patient's inner resources, especially when considered in relation to a mature type of creativity. This is evident in the low number of human responses in this study, a condition which remains unaffected by treatment. Only forty per cent of the patients had one or more M responses before treatment and this percentage remained the same for the post-shock group. Although an abnormally small number of M is generally to be expected in schizophrenia, Rorschach and Klopfer and Kelley emphasize one exception and that is in the case of paranoids. They had found that, contrary to the writer's findings, paranoid schizophrenics usually have a high number of human movement responses in their records. Piotrowski, on the other hand, claims that in all types of schizophrenia subjected to a study

of this nature movement responses are the most outstanding variable. This claim finds no confirmation in the present case.

The paucity of inner resources is further reflected in the infantile nature of the schizophrenics' reactions. A greater number of patients projected animal movement in their responses, although fewer such responses were recorded in each individual case. Eleven patients used FM responses after shock as compared to only seven prior to any treatment. This slight increase in the use of animal movement, although not significantly large, might be suggestive of greater spontaneity in reactions following shock treatment. This is contraindicated, however, by the significant increase in the severity and prevalence of constriction after shock. Prior to treatment, nine of the twenty cases studied manifested signs of rigidity, exceeding fifty F per cent. After treatment, sixteen exceeded fifty per cent. The difference is significant at the two per cent level of confidence.

The increase in rigidity does not affect form quality significantly. The mean F plus per cent before shock therapy was seventy-nine and increased to eighty-one after treatment. Obviously no real change is indicated here. This level of form quality may seem relatively high, however, considering the nature of the population studied. It is probably due to the

fact that many responses were extremely vague, but their being basically correct precluded, according to the Klopfer Method, attributing a negative form quality to them, thus inflating this statistic.

It is interesting to note that the only area of the test besides F per cent which assumes any significance is in the area of color. This is especially noteworthy in that it conforms to Bleuler's claim that " 'emotional deterioration' stands in the forefront of the clinical picture."<sup>4</sup> An apparent decrease in the magnitude of sum C is not substantiated significantly since the chi square test produces a significant difference only at the ten per cent level. This area of affectivity is dominated, however, by the heavily weighted pure C responses in which the greatest changes have been noted. The extent to which pure C responses have been eliminated after therapy has been found to be significant at the five per cent level. Nine patients produced one or more pure C responses prior to treatment (one of whom had nine) while only three patients retained this type of reaction following a course of treatments. It is interesting to note that while color naming appeared in four records prior to treatment, it appeared only once after treatment. The group tends to become more

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<sup>4</sup> Eugen Bleuler, Dementia Praecox of the Group of the Group of Schizophrenias, New York, (1950), 40.

homogeneous in that none of its members exceeds a sum C of four. This is due largely to the aforementioned decrease in pure C responses. After treatment the patient is still incapable of exercising any but the most crude type of emotional control, therefore the FC and CF responses which do appear rarely and in poor form, remain basically unchanged. Use of finer differentiation in the form of shading is comparatively rare and remains unchanged after treatment.

Inspection of the distribution of content categories used by the group indicates a marked redistribution tending toward an emphasis on more popular content and an elimination of unusual concepts. Human responses are rare in view of the excessive emphasis on animal responses. A per cent remains relatively high after treatment averaging about forty-six per cent before and forty-eight after treatment. A per cent, as such, is not considered of great significance in schizophrenia. Rickers-Ovsiankina considers the relation of A and O responses important, but the scarcity of O responses in the present study does not warrant any statement in substantiation or disproof of this contention. At best, we can say that the tendency toward high A per cent in schizophrenia suggests an immature outlook which persists in spite of treatment. The percentage of the group which exceeds fifty A per cent remains at forty-five per

cent before as well as after treatment.

No significant change in responsivity is indicated. The mean R remains constant at 13.3 before and after treatment, but there does appear to be a shift in the distribution tending toward a concentration (median) in the ten-to-twelve-responses category. Prior to treatment, three cases responded to the test with only three responses. After shock, six responses was the lowest R recorded. The three cases, however, responded with ten, twelve, and seventeen responses, respectively.

The entire group under consideration was judged clinically improved by the psychiatrists who treated them. A study of the summary of quantitative factors, however, indicated that several cases displayed no tangible test improvement at all. A supplementary analysis was therefore attempted to determine whether any marked differences distinguished the group who showed improvement on the retest from those who showed none or even produced less favorable records. Two advanced graduate students collaborated with the writer in the discrimination of improved and unimproved cases. The judgments were based on quantitative changes in the three main scoring areas of the test, location, determinants, and content. The improved group thus selected was distinguished by its increased use of small detail, improved form quality, decrease in sum C, and less



confused succession. The unimproved decrease markedly in the production of pure C responses.<sup>5</sup>

A similar analysis was made of paranoid schizophrenics as compared with other types.<sup>6</sup> The eleven paranoids in the group were distinguished chiefly by the greater constriction and fewer C responses from the nine mixed and undetermined types which comprised the second group.

Another tabular approach to this type of data, although not as rigidly quantified, is that of using certain Rorschach "signs" among schizophrenic subjects with specific reference to the twenty signs listed by Klopfer and Kelley. The clinical findings of Beck, Rickers-Ovsiankina, Rorschach, and Klopfer and Kelley are compared. Since the table is evidently based on clinical impressions and observations alone, statistical treatment in this area is obviously impractical. The writer attempted, however, to analyze the degree to which the pre-shock findings of the present research agreed with those of other investigators since any significant change in the occurrence of these signs after treatment might modify the purely quantitative data previously discussed.

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5 See Table IV, page 37.

6 See Table V, page 38.

TABLE IV

CHI SQUARE TESTS OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS, OF WHOM  
NINE WERE IMPROVED AND ELEVEN UNIMPROVED<sup>7</sup>

Scoring Category	Probability Ratio <sup>8</sup>	
	Improved Gp.	Unimproved Gp.
Increased W%	.20	.50
Increased D%	.20	1.00
Increased d%	.10	.10
Increased Dd/S%	<u>.05</u>	.30
Increased M	.30	.30
Increased FM	.10	.30
m	1.00	1.00
Increased F%	.10	.30
Fc	1.00	1.00
C'	1.00	1.00
Increased FC	.30	1.00
Increased CF	.30	.50
Decreased C	.50	<u>.02</u>
Increased R	.40	.10

241. 7 Garrett, Statistics in Psychology and Education,

8 Ibid., 246. Small sample, corrected for continuity.

TABLE IV (continued)

CHI SQUARE TESTS OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS, OF WHOM  
NINE WERE IMPROVED AND ELEVEN UNIMPROVED

Scoring Category	Probability Ratio	
	Improved Gp.	Unimproved Gp.
Increased F+%	<u>.05</u>	.50
Increased A%	.50	.50
Increased Hd+Ad	<u>.02</u>	1.00
Increased Sum C	<u>.05</u>	.10
Less confused succession	<u>.01</u>	.20

TABLE V

CHI SQUARE TESTS OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS, OF WHOM  
ELEVEN WERE PARANOID AND NINE, OTHER TYPES<sup>9</sup>

Scoring Category	Probability Ratio <sup>10</sup>	
	Paranoid	Other Types
W%	1.00	1.00
D%	1.00	1.00

9 Garrett, Statistics in Psychology and Education, 241.

10 Ibid., 246. Small sample, corrected for continuity.

TABLE V (continued)

CHI SQUARE TESTS OF DIFFERENCES BETWEEN PRE- AND POST-SHOCK  
 RORSCHACH RECORDS OF TWENTY SCHIZOPHRENICS, OF WHOM  
 ELEVEN WERE PARANOID AND NINE, OTHER TYPES

Scoring Category	Probability Ratio	
	Paranoid	Other Types
d%	1.00	1.00
Increased Dd/S%	1.00	.20
Increased M	.50	.50
Increased FM	.20	.50
Decreased m	.20	1.00
Increased F%	<u>.05</u>	.10
Increased Fc	.30	1.00
Increased C'	.30	.30
Increased FC	.10	.20
Increased CF	.50	.50
Decreased C	<u>.05</u>	.30
Increased R	.50	.30
Increased F+%	.30	1.00
A%	1.00	1.00
Increased Hd+Ad	.30	.10
Decreased Sum C	1.00	.50
Less confused succession	<u>.05</u>	<u>.05</u>

Position (Po) responses, extreme variation in form quality, and contaminated responses are three of the twenty signs which are considered pathognomic in schizophrenia by Ewald Bohm<sup>11</sup> and are frequently quoted as such by other Rorschach investigators. The present study confirmed only the extreme variability in form quality. About one-half of the group manifested this variability and it was especially prominent in the records of those patients whose post-treatment test results generally showed little or no improvement. No contamination of responses was found and the incidence of Po responses was negligible. Klopfer points out, however, that the absence of these signs does not preclude a diagnosis of schizophrenia, but that the diagnosis is usually more easily made when they are present.

It is generally agreed that the schizophrenic's approach is typically confused with an emphasis on whole responses. This was also found in the present study, but the general consensus of opinion concurs with the writer's findings that the DW response is not the most typical, as Beck maintains. DW responses are present, but occur rarely. Dd responses are generally overemphasized.

A further review of the twenty Rorschach signs finds most investigators agreed on the dominance of color in the Erlebnistyp. There was no dominant tendency in the present

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<sup>11</sup> Klopfer and Kelley, The Rorschach Technique, 352.

study when individual ratios were considered, although there was greater production of color responses in general. While only forty-five per cent of the group produced one or more M responses, seventy-five per cent produced color responses. Color responses were usually poorly controlled, occasionally assuming the form of color naming.

The present study is in general agreement with most of the other Rorschach signs considered in relation to schizophrenia. Any more exact comparisons than the foregoing are impossible since there is no way of interpreting what frequency of occurrence is considered when stating that a certain sign is "present" in schizophrenia. Certain investigators may mean by this that a sign frequently is present while others may simply mean that the sign may appear in a schizophrenic record.

Rating these somewhat indefinite criteria before and after shock treatment reveals marked changes in only two areas. There is a significant decrease in rejections and abstract and personal references disappear after treatment. An average of approximately seven Rorschach signs appears in each record and this number is not affected significantly by treatment. Generalizations about shifts in the personality structures are unwarranted.

A similar tabulation of the eleven paranoid schizophrenics as distinguished from the other types of schizophrenia does not reveal any significant differences between the two groups or their degree of improvement.

Since none of the studies published on this subject to date have been treated statistically in a manner similar to the present study it is difficult to compare them validly with this study. Piotrowski's study gives no statistical validation of his conclusions. The present study produces no evidence of increased production of M responses nor of generally higher F plus per cent. An increase in well-controlled color responses (FC) is only suggested in this study since pure C responses decrease significantly while sum C remains unchanged. The decrease in heavily-weighted C responses suggests a shift toward better controlled responses after treatment to maintain the relatively constant sum C before and after treatment. These speculations, however, are unsubstantiated by statistical proof.

Halpern's suggested areas of significant differences are unconfirmed in the present study. Neither responsivity, Erlebnistyp, nor production of human responses underwent any marked changes.

Responsivity was also claimed to increase by Rabin.

As in the present study, he found that rejections decreased substantially. None of his other results find confirmation in the present study.

The question of stability of the personality as based on movement responses was considered substantiated by Beck in his study. The present study does not confirm his contention. Although the number of responses show no significant change for the group as a whole, individual cases do not retain the ability to produce movement responses in a sufficient proportion of the cases to justify the conclusion that they indicate stability. Beck also minimized the importance of color responses. This area was found to be most significantly changed in the present study. Beck cited no statistical evidence for his conclusions.



## CHAPTER V

### SUMMARY AND CONCLUSIONS

This study was designed to obtain an objective formulation of the changes which are observed in the personality of schizophrenics after a series of electric shock treatments. Although little is known about the causes of schizophrenia, even less is known of the cures produced by various forms of treatment. The latter area, with which this study is concerned, has been the subject of considerable research. Only a few of these studies, however, are directly comparable to the present one and even these have been most subjective in nature, with little or no statistical validation. In order to minimize any subjective bias which might distort the data of the present study, the major emphasis was confined to the purely quantitative aspects of the Rorschach Test.

The subjects of this study were twenty patients diagnosed as schizophrenic by a psychiatrist, treated by electric shock, and declared improved after the termination of treatment. Thirteen of the cases were treated at a state hospital and seven at a private hospital in the one year's period from June 20, 1950 to June 14, 1951. The group consisted of

thirteen men and seven women whose mean age was 30.2 years with 10.3 mean years of formal education.

The Rorschach Test was administered and scored according to the Klopfer Method. The period between the original testing upon admission to the hospital and the retest after termination of treatment averaged two months and seventeen days.

The thirteen state hospital patients received a standard series of twenty treatments. The amount of treatment varied, however, at the private hospital. Of the seven patients treated there, one received 22 treatments, two received 16 treatments, one received 14 treatments, and three received only 7 treatments. In four of these seven cases supplementary treatment by insulin coma was administered.

The review of literature produced only four Rorschach studies of a similar nature. Only one of these, however, is identical with the present study. This is the study by Rabin who noted the effects of electric shock treatment on eight schizophrenic patients and found greater productivity (R), the tendency for F+ per cent to gravitate toward an average range, an increase in shading responses and in speed of responding, and a reduction in the number of rejections.

Studies by Piotrowski and Halpern differ only in that

insulin shock was used. Piotrowski, however, minimizes the probability of finding differences in the effects of insulin and electric shock. He lists several qualitative changes and places considerable emphasis on the importance of the quality of the percept as compared with the elaborations of the percept. His study involved sixty schizophrenic patients, the largest group of any study reviewed in this paper.

In a study of seventeen schizophrenics, Halpern found the greatest differences in productivity, Erlebnistyp, and the presence or absence of human responses.

Beck studied the effects of shock on eight schizophrenic patients, but fails to mention the type of shock employed. He found shock treatment ineffective in reaching the "inner personality" of the patient.

Allied research by Kelley, Margulies, and Barrera and by Löwenback and Stainbrook is not comparable to the present study, but illustrates interesting aspects in the development of post-shock personality changes: the former proves the inefficacy of a single treatment and the latter traces the gradual development of the schizophrenic personality's reorientation toward reality.

Little or no statistical evidence was produced to substantiate the conclusions arrived at in the studies reviewed.

The emphasis was primarily on qualitative aspects of the Rorschach Test and interpretations of results tended to be quite subjective in nature.

The results of the pre- and post-shock Rorschach tests of the present study were tabulated and summarized in the appendix. The interpretation of results proceeded on the null hypothesis, that is, no changes were assumed to be significant unless their significance was demonstrable at a high level of confidence. Table III lists the probability ratios of the quantitative changes which occurred in various areas of the test as measured by the chi square test, corrected for small samples.

Considered as a group, the schizophrenic personality pattern is with but few exceptions basically unchanged. In the location categories the emphasis remains concentrated on vague whole responses with consequent de-emphasis of more concrete responses to parts of the blot. No consistency is found in the use of determinants, although a marked increase in constriction is significant at the .02 level. Prior to treatment nine of the twenty cases manifested rigidity while after treatment the number of cases increased to sixteen.

In the area of affectivity pure C responses decrease significantly at the .05 level. The number of patients producing one or more pure C responses decreased from nine to

three after therapy.

These are the only personality changes which assume any significance in the entire study. Less confusion in succession is indicated, but this factor is limited in significance by the short records on which judgments of succession were based. No change occurs in responsivity.

Although all of the patients included in the study were considered improved at the termination of treatment, a large proportion showed no improvement on the Rorschach Test. The group was therefore divided into nine improved and eleven apparently unimproved cases and submitted to similar chi square analysis. These findings are summarized in Table IV. The patient who manifests improvement is differentiated from the unimproved by a significantly improved form quality (at the .05 level) and a greater emphasis on small details. The latter is especially concentrated in the human and animal details, being significant at the .02 level. Sum C tends to increase.

Table V lists the findings of a third statistical analysis which was made of the eleven paranoid schizophrenics in the study considered as one group and compared with the remaining nine cases of mixed and simple types of schizophrenia comprising the second group.

The paranoid cases are differentiated from other types in the same characteristics which discriminate the entire pre-shock group from the post-shock group. A marked increase in rigidity and a decrease in the production of pure C responses are both significant at the .05 level.

These three analyses comprised the purely quantitative aspects of the present study. The twenty Rorschach signs in schizophrenia (many of which are qualitative) were then tabulated and submitted to a similar series of analyses, 1) for the entire group, 2) for improved and unimproved, and 3) for paranoid and other types.

This aspect of the analysis served to emphasize the extreme variability in form quality which was present in the records of the unimproved patients. No contamination was found and the incidence of Po responses was negligible. The distribution in the location categories confirmed findings reported above.

Besides these isolated factors, the present study was in general agreement with other investigators who studied the twenty Rorschach signs frequently found in schizophrenia.

The statistically significant findings of the present study might be briefly summarized for the entire group as

1) increased rigidity and 2) fewer pure C responses, for the improved group as 1) emphasis on small details, especially human and animal details, 2) improved form quality, and 3) increased sum C while the unimproved produce markedly less pure C responses, and for the paranoid group as 1) increased rigidity and 2) fewer pure C responses.

These findings are all significant at the .05 level of confidence or higher. Cronbach claims, however, that in testing differences on many Rorschach scores significance levels may be inflated. It is not known whether the nineteen scores tested for differences in the present study would be considered "many", but Cronbach also states that "of the differences reported in the Rorschach literature as 'significant at the 5% level,' probably the majority are due to chance."<sup>1</sup> He feels that the nature of the Rorschach Test makes it peculiarly prone to statistical error and that the Rorschach investigator should, therefore, demand a higher level of confidence than the 5% level before labelling any findings "significant." Accepting this cautious attitude and applying it toward the present study we find that only the increased rigidity of the entire group remains statistically as well as psychologically

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1 Lee J. Cronbach, "Statistical Methods Applied to Rorschach Scores: A Review," Psychological Bulletin, XLVI, 1949, 400.

significant at the .02 level.

A specific variable in the present study modifies its validity to a certain degree. In three cases (cases B, R, and M) it was necessary to test the patient within a few hours of the termination of treatment. Although the study by Löwenback and Stainbrook<sup>2</sup> suggests that patients reach a "steady state" no longer than one hour after shock treatment, it is usually considered more favorable if at least a day or two intervene between shock treatment and any subsequent testing to allow the confusion to subside.

All of the statistical evidence produced in the present study suggests, however, only one conclusion, namely, that electric shock therapy by itself does not penetrate the deeper strata of the personality of schizophrenic patients. The fact that superficial changes are effected, however, is undeniable. The psychiatrist's pronouncement of improvement is undoubtedly influenced by factors such as improved rapport with the patient, disappearance of gross psychotic symptomatology (hallucinations, delusions, etc.), and similar observational data which is not amenable to statistical manipulation.

The conclusion proposed above, however, cannot be

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2 Löwenback and Stainbrook, "Observations on Patients after Electro-Shock," American Journal of Psychiatry, XCVIII, 832.



held without several modifications. Although the diagnoses of schizophrenia by psychiatrists were accepted as correct in the present study, psychiatric classification leaves much to be desired. Furthermore, pure and unmixed schizophrenic types are rare and consequently Rorschach patterns of schizophrenia are extremely varied.

Another variable lies in the nature of the tabular procedure used in the present study. Although this approach minimizes the possibility of subjective distortion by the investigator, it also minimizes an important element in the theoretical basis on which projective techniques are designed. Diagnosis of schizophrenia is usually made by inference from the Rorschach Test, but in using a tabular procedure no attention is paid to the dynamic relationships between the various psychological processes indicated by different scoring symbols.

This study emphasizes the need for further research. Only one study, that of Rabin's, was limited to electric shock treatment alone. Findings based on eight subjects, however, are inconclusive. Larger groups should be studied, therefore, in ascertaining the effects of electric shock when used in the cure of schizophrenia. Furthermore, to assume any significance, the resulting data should be submitted to careful inspection through a logical and discriminating use of statistical tools.

Finally, considerable research is necessary in the development of more refined methods of investigating Rorschach data, methods which adequately evaluate the dynamic aspects of the test.

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# APPENDIX I

## A SAMPLE RORSCHACH PROTOCOL OF A SCHIZOPHRENIC PATIENT, CASE G, BEFORE ELECTRIC SHOCK TREATMENT

	Performance Proper	Inquiry	
I (40")1	Sort of a butterfly effect which will be interpreted no doubt as something else	The antennae, wings, the entire picture	W F A P
45"			
II (5")	(Laughed) Doesn't remind me of anything in particular		Reject
55"			
III (2") 3'0"	Doesn't look like much of anything		Reject
IV (1'10")	(Returned card)	Bug of some sort, the whole thing	(W F A )
V (5")1 10"	See a butterfly effect	The whole picture, wings, antennae	W F A P
VI (5")1 10"	Same thing, butterfly effect	I didn't say that	(W F- A)
VII (55")1 1'0"	Looks like a map	Reminded me of some animal, general outline	(W F Map) (W F A)
VIII (2')1 2'5"	More like a map	Colors, I believe	W C/F Map

A SAMPLE RORSCHACH PROTOCOL OF A SCHIZOPHRENIC PATIENT,  
CASE G, BEFORE ELECTRIC SHOCK TREATMENT (continued)

	Performance Proper	Inquiry	
IX (1'20")			
1	Looks like a woman I used to work with	That was spiteful, I used to work with an old hairpin, her nose and her ability to gos- sip, why don't you put that down? (Laughed)	Reject
1'25"			
X	She sat in front of me, by the way, you can put that down		Reject
4'45"			

A SAMPLE RORSCHACH PROTOCOL OF A SCHIZOPHRENIC PATIENT,  
CASE G, AFTER ELECTRIC SHOCK TREATMENT

	Performance Proper	Inquiry	
I (3") 1 55"	Looks like a butterfly, I think it's about all	Center and the two wings, tail	W F A P
II (8") 1	Looks like two dogs - - still two dogs	It seems to be the out- line of two puppies, just the heads, don't know what these would be (red D's)	W F AdP
50"			
III (20") 1	Two men pulling on some- thing, I don't know what in the world they have but - - I don't know what these red things are	The whole outline right here, hands seem to have ahold of some- thing, I don't know why but they seem to be pulling - - this has the shape of a but- terfly, these have the	W M H P (D F A P)  (D F A)



A SAMPLE RORSCHACH PROTOCOL OF A SCHIZOPHRENIC PATIENT  
CASE G, AFTER ELECTRIC SHOCK TREATMENT (continued)

	Performance Proper	Inquiry	
III (cont'd)			
50"		shape of dogs or something, shape of them, not that tail	
IV (8") 1	Looks like an animal skin, seems to be a center mark but it's still a skin	The whole thing, center line here, seem to be eyes, looked like an animal skinned, don't know why (running finger over surface) - of course, it does look a little like a dog's head, snout, ears	W Fc Aobj (dr F Ad)
35"			
V (8") 1	Looks like a butterfly or a moth	Whole outline, the antennae	W F A P
33"			
VI (3") 1	That looks like a fox, a skin	A fox skin, looks as if it's severed right down the middle, head, neck, body, outside, you can tell by the head	W Fc Aobj P
20"			
VII (18") 1	Like a map of some sort	Just about evenly divided, the shaded area suggests rugged country	D Fk Map
2	Or it could be two dwarfs or elfs or something on that order	The hat, pointed features, short stumpy body, shape	D F (H)
1'0"			

A SAMPLE RORSCHACH PROTOCOL OF A SCHIZOPHRENIC PATIENT  
CASE G, AFTER ELECTRIC SHOCK TREATMENT (continued)

	Performance Proper	Inquiry	
VIII (30")1	Oh, my heavens, that looks like it's some kind of a diagram, doctor's diagram or something, looks like a part of a human body, I don't know what it would be though, some kind of diagram	Evenly divided, used the whole thing, the form, wouldn't know what part of the body	W F At
1'35"			
IX (28")1	Well, that might be a diagram of some part of the body	Well, it looks to me like a diagram I've seen in a book on science	W F At
2	Or it looks sort of like witches up here	Pointed hats, right in here, I don't know, too long for a nose, like a caricature	D F (H)
1'8"			
X (20")1	That looks like some part of the body diagrammed, looks almost like the windpipe and the lungs but I don't know if it would be that or not - - close as I can come	The windpipe, don't know what that would be (blue D) but this looks like the lungs, sort of a red, spongy matter, shaded	D FC At (c)
1'2"			

Testing of limits:

Patient accepts all populars, but only after they are pointed out to her.

Card liked most: V, "easiest to see"

Card liked least: IX, "I don't know why"

## APPENDIX II

Since the data of this study are rather extensive, the tables contained in this appendix are briefly summarized below to facilitate the location of specific data by the reader.

Table I series: Rorschach data on the entire group of twenty schizophrenics before electric shock treatment.

- Table I-A - Location categories
- Table I-B - Determinants
- Table I-C - Content
- Table I-D - Miscellaneous data

Table II series: Rorschach data on the entire group of twenty schizophrenics after electric shock treatment.

- Table II-A - Location categories
- Table II-B - Determinants
- Table II-C - Content
- Table II-D - Miscellaneous data

Table III series: Distribution of Rorschach scores for the improved and unimproved schizophrenics before and after electric shock treatment.

- Table III-A - Nine improved patients before therapy
- Table III-B - Nine improved patients after therapy
- Table III-C - Eleven unimproved patients before therapy
- Table III-D - Eleven unimproved patients after therapy

Table IV series: Distribution of Rorschach scores for the paranoid and other types of schizophrenia before and after electric shock treatment.

Table IV-A - Eleven paranoids before treatment  
Table IV-B - Eleven paranoids after treatment  
Table IV-C - Nine mixed types before treatment  
Table IV-D - Nine mixed types after treatment

Table V series: Distribution of the twenty Rorschach signs occurring in the records of the entire group of twenty schizophrenics before and after electric shock treatment.

Table V-A - Before treatment  
Table V-B - After treatment

TABLE IA

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS BEFORE ELECTRIC  
SHOCK TREATMENT: LOCATION CATEGORIES

Case	W	D	d	Dd	S	W%	D%	d%	Dd/S%
A	2	5				30	71		
B	2			1		67			33
C	6	4		1		54	36		10
D	8	4		2		67	29		15
E	10	2	1	1		71	14	7	7
F	5	5				50	50		
G	3						100		
H	5	3	1			56	33	11	
I	0	3					100		
J	8	11		1		40	55		5
K	7	3	1	2		54	23	8	15
L	12	2				86	14		
M	10	3				80	20		
N	6	3				67	33		
O	7	8	1			44	50	6	
P	3	8	4	12		11	29	15	44
Q	25	17	1	3	1	53	36	2	9
R	4	7		2		33	50		17
S	9	3		1		69	24		7
T	2	5				28	72		

TABLE IB

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS BEFORE ELECTRIC  
SHOCK TREATMENT: DETERMINANTS

Case	M	FM	m	k	K	FK	F	F-	Fc	c	C'	FC	CF	C
A	1	3					3							
B							2	1						
C				1			5		1		1	1		2
D	3	3					7		1					
E			2	1			4		2			1		4
F		1					6	2						1
G							2						1	
H							8						1	
I							1							2
J	3	4					8	2	1			1		1
K	2	3					3	4					1	
L								3	2	1	2	1	5	
M	2						1				1			9
N	1						5	2			1			
O		3	4				7							2
P	1						18	8						
Q	2	4		3	1		18	3	3		5	2	6	
R			1				7	1					2	2
S											8		1	4
T							7							



TABLE ID

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS BEFORE ELECTRIC  
SHOCK TREATMENT: MISCELLANEOUS DATA

Case	R	F%	F+%	A%	H+A: Hd+Ad	M:sum C	W:M	Succession
A	7	43	100	71	6:1	1:0	2:0	Confused
B	3	100	67	33	1:0	0:0	2:0	Confused
C	11	45	100	56	2:4	0:3.5	4:0	Confused
D	14	50	100	42	8:0	3:0	9:3	Loose
E	14	29	100	22	3:1	0:6.5	10:0	Confused
F	10	80	75	90	6:3	0:1.5	5:0	Confused
G	3	67	100	67	2:0	0:1	3:0	Confused
H	9	89	100	67	4:2	0:1	5:0	Confused
I	3	33	100	33	1:0	0:3	0:0	Confused
J	20	50	80	65	13:5	3:2	8:3	Loose
K	13	54	43	77	11:1	2:1	7:2	Confused
L	14	21	0	0	0:0	0:5.5	12:0	Confused
M	13	8	100	8	3:0	2:14.5	10:2	Confused
N	9	78	71	22	5:0	1:0	6:1	Confused
O	16	44	100	44	6:1	0:3	7:0	Confused
P	27	96	69	59	9:15	1:0	3:1	Loose
Q	47	45	90	36	17:6	2:7	25:2	Confused
R	13	67	88	25	3:0	0:5	4:0	Confused
S	13	0	0	25	2:1	0:7	8:0	Confused
T	7	100	100	72	5:0	0:0	2:0	Confused



TABLE IIA

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS AFTER ELECTRIC  
SHOCK TREATMENT: LOCATION CATEGORIES

Case	W	D	d	Dd	S	W%	D%	d%	Dd/S%
A	1	5		1		14	71		14
B	3	2		3	2	30	20		50
C	8	5				62	38		
D	12	10	1	3		46	38	4	12
E	7	16	2	4		24	55	7	14
F	4	2				67	33		
G	8	4				67	33		
H	10					100			
I	2	11	1	3		12	65	6	17
J	4	5		1		40	50		10
K	8	5				62	38		
L	10	3	1	1		67	19	7	7
M	5	1		1		72	14		14
N	10	10		2	1	43	43		14
O	6	5				54	45		
P	9	2	1	1		72	16	6	6
Q	6	10	1	2		32	53	5	10
R	8	3		1		67	25		8
S	9	1				90	10		
T	2	6		1	2	18	54		28

TABLE IIB

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS AFTER ELECTRIC  
SHOCK TREATMENT: DETERMINANTS

Case	M	FM	m	k	K	FK	F	F-	Fc	c	C'	FC	CF	C
A	2	2					3							
B		1					2	5				1	1	
C				2			4		2		2			3
D	3	2					13	4	1		1	1		
E	1	1	3	2		1	12		7		1		1	
F		1					5							
G	1			1			7		2			1		
H							7	1	1			1		
I							8	4			1	1	1	2
J	1	1					6		1		1			
K		3					7	3						
L	1						5	3					3	
M	2	2					2							1
N							20	1				2		
O		1		1			6					1	2	
P							6	6	1					
Q	1	1					13		1				3	
R		1					5	5					1	
S							5	4			1			
T							8	3						

TABLE IIC

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS AFTER  
ELECTRIC SHOCK TREATMENT: CONTENT

Case	H	Hd	A	Ad	Aobj	At	Sex	Obj	Pl	N	Geo	Art	Arch	Blood	Fire	Ice	X-ray	Color	P	O
A		2	3	1				1											3	
B			1			8	1												1	
C			2	2	3	1	1								1			3	3	
D	3	1	4	1	4			4	2	4	2	1							4	
E	1	1	6	1		4		9		3	1				3				4	1
F			5	1															3	
G	3		2	1	2	3					1								5	
H			3		2	2			3										3	
I			9	2		3	2							1					2	
J	1	1	4	2				1	1										5	
K			10	1		2													3	
L	1		3	1		1				9									1	
M	3		3							1									2	
N	1	1	8	6		1		1	1	2	2								5	
O			6	1				2	1						1				2	
P	1		7	2			3												2	
Q	1		8	1			1	2		3	1			1			1		1	
R			4				7	1											3	
S			6	1					2	1									1	
T	1	1	3			3		2					1						2	

TABLE IID

RORSCHACH DATA ON TWENTY SCHIZOPHRENICS AFTER ELECTRIC  
SHOCK TREATMENT: MISCELLANEOUS DATA

Case	R	F%	F+%	A%	H+A: Hd+Ad	M:sum C	W:M	Succession
A	7	43	100	57	3:3	2:0	1:0	Confused
B	10	70	28	10	1:0	0:1.5	3:0	Confused
C	10	40	100	40	2:2	0:3	5:0	Loose
D	26	65	76	19	7:2	3:1.5	12:3	Loose
E	29	41	100	23	7:2	1:1	7:1	Loose
F	6	85	100	100	5:1	0:0	3:0	Confused
G	12	58	100	25	5:1	1:1.5	8:1	Loose
H	10	80	88	30	3:0	0:1.5	10:0	Rigid
I	17	71	67	65	9:2	0:4.5	2:0	Confused
J	10	60	100	60	5:3	1:0	4:1	Loose
K	13	77	70	85	10:1	0:0	8:0	Confused
L	15	53	63	27	4:1	1:3	10:1	Loose
M	7	28	100	42	6:0	2:1.5	5:2	Loose
N	23	92	95	60	9:7	0:1	10:0	Loose
O	11	54	100	63	6:1	0:2.5	6:0	Loose
P	13	92	50	68	8:2	0:0	9:0	Loose
Q	19	68	100	46	9:1	1:3	6:1	Loose
R	12	84	50	33	4:0	0:1	8:0	Confused
S	10	90	56	70	6:1	0:0	9:0	Confused
T	11	100	73	27	4:1	0:0	2:0	Confused

TABLE IIIA

DISTRIBUTION OF RORSCHACH SCORES OF NINE IMPROVED  
SCHIZOPHRENICS BEFORE ELECTRIC SHOCK TREATMENT

Score	B	D	E	G	I	L	M	N	Q
W	2	8	10	3		12	10	6	25
D		4	2		3	2	3	3	17
d			1						1
Dd	1	2	1						3
S									1
W%	67	67	71	100		86	80	67	53
D%		29	14		100	14	20	33	36
d%			7						2
Dd/S%	33	15	7						9
M		3					2	1	2
FM		3							4
m			2						
k			1						3
K									1
F	2	7	4	2	1		1	5	18
F-	1					3		2	3
Fc		1	2			2			3
c						1			
C						2	1	1	5
FC			1			1			2
CF				1		5			6
C			4		2		9		
R	3	14	14	3	3	14	13	9	47
F%	100	50	29	67	33	21	8	78	45
F+%	67	100	100	100	100	0	100	71	90
A%	33	42	22	67	33	0	8	22	36
H+A: Hd+Ad	1:0	8:0	3:1	2:0	1:0	0:0	3:0	5:0	17:6
M: sum C	0:0	3:0	0:6.5	0:1	0:3	0:5.5	2:14.5	1:0	2:7
W:M	2:0	9:3	10:0	3:0	0:0	12:0	10:2	6:1	25:2
Succ*	C	L	C	C	C	C	C	C	C

\* Succession: C - confused, L - loose

TABLE IIIB

**DISTRIBUTION OF RORSCHACH SCORES OF NINE IMPROVED  
SCHIZOPHRENICS AFTER ELECTRIC SHOCK TREATMENT**

Score	B	D	E	C	I	L	M	N	Q
W	3	12	7	8	2	10	5	10	6
D	2	10	16	4	11	3	1	10	10
d		1	2		1	1			1
Dd	3	3	4		3	1	1	2	2
S	2							1	
W%	30	46	24	67	12	67	72	43	32
D%	20	38	55	33	65	19	14	43	53
d%		4	7		6	7			5
Dd/3%	50	12	14		17	7	14	14	10
M		3	1	1		1	2		1
FM	1	2	1				2		1
m			3						
k			2	1					
K									
FK			1						
F	2	13	12	7	8	5	2	20	13
F-	5	4			4	3		1	
Fc		1	7	2					1
c									
C'		1	1		1				
FC	1	1		1	1			2	
CF	1		1		1	3			3
C					2		1		
R	10	26	24	12	17	15	7	23	19
F%	70	65	41	58	71	53	28	92	68
F+%	28	76	100	100	67	63	100	95	100
A%	10	19	23	25	65	27	42	60	46
H+A: Hd+Ad	1:0	7:2	7:2	5:1	9:2	4:1	6:0	9:7	9:1
M: sum C	0:1.5	3:1.5	1:1	1:1.5	0:4.5	1:3	2:1.5	0:1	1:3
W:M	3:0	12:3	7:1	8:1	2:0	10:1	5:2	10:0	6:1
Succession*	C	L	L	L	C	L	L	L	L

\* C - confused, L - loose

TABLE IIIC

DISTRIBUTION OF RORSCHACH SCORES OF ELEVEN UNIMPROVED  
SCHIZOPHRENICS BEFORE ELECTRIC SHOCK TREATMENT

Score	A	C	F	H	J	K	O	P	R	S	T
W	2	6	5	5	8	7	7	3	4	9	2
D	5	4	5	3	11	3	8	8	7	3	5
d				1		1	1	4			
Dd		1			1	2		12	2	1	
S											
W%	30	54	50	56	40	54	44	11	33	69	28
D%	70	36	50	33	55	23	50	29	50	24	72
d%				11		8	6	15			
Dd/S%		10			5	15		44	17	7	
M	1				3	2		1			
FM	3		1		4	3	3				
m							4		1		
k		1									
K											
FK											
F	3	5	6	8	8	3	7	18	7		7
F-			2		2	4		8	1		
Fc		1			1						
c											
C'		1								8	
FC		1			1						
CF				1		1			2	1	
C		2	1		1		2		2	4	
R	7	11	10	9	20	13	16	27	13	13	7
F%	43	45	80	89	50	54	44	96	67	0	100
F+%	100	100	75	100	80	43	100	69	88	0	100
A%	71	56	90	67	65	77	44	59	25	25	72
H+A:Hd+Ad	6:1	2:4	6:3	4:2	13:5	11:1	6:1	9:15	3:0	2:1	5:0
M:sum C	1:0	0:3.5	0:1.5	0:1	3:2	2:1	0:3	1:0	0:5	0:7	0:0
W:M	2:0	4:0	5:0	5:0	8:3	7:2	7:0	3:1	4:0	8:0	2:0
Succ*	C	C	C	C	L	C	C	L	C	C	C

\* Succession: C - confused, L - Loose

TABLE IIID

**DISTRIBUTION OF RORSCHACH SCORES OF ELEVEN UNIMPROVED  
SCHIZOPHRENICS AFTER ELECTRIC SHOCK TREATMENT**

Score	A	C	F	H	J	K	O	P	R	S	T
W	1	8	4	10	4	8	6	9	8	9	2
D	5	5	2		5	5	5	2	3	1	6
d								1			
Dd	1				1			1	1		1
S											2
W%	14	62	67	100	40	62	54	72	67	90	18
D%	72	38	33		50	38	46	16	25	10	54
d%								6			
Dd/s%	14				10			6	8		28
M	2				1						
FM	2		1		1	3	1		1		
m											
k		2					1				
K											
FK											
F	3	4	5	7	6	7	6	6	5	5	8
F-				1		3		6	5	4	3
Fc		2		1	1			1			
c											
C'		2			1					1	
FC				1			1				
CF							2		1		
C		3									
R	7	10	6	10	10	13	11	13	12	10	11
F%	43	40	85	80	60	37	54	92	84	90	100
F+%	100	100	100	88	100	70	100	50	50	56	73
A%	57	40	100	30	60	85	63	68	33	70	27
H+A:Hd+Ad	3:3	2:2	5:1	3:0	4:3	10:1	6:1	8:2	4:0	6:1	4:1
M:sum C	2:0	0:3	0:0	0:5	1:0	0:0	0:2.5	0:0	0:1	0:0	0:0
W:M	1:0	5:0	3:0	10:0	4:1	8:0	6:0	9:0	8:0	9:0	2:0
Succ*	C	L	C	R	L	C	L	L	C	C	C

\* Succession: C - confused, L - Loose, R - rigid



TABLE IVA

DISTRIBUTION OF RORSCHACH SCORES OF ELEVEN PARANOID  
SCHIZOPHRENICS BEFORE ELECTRIC SHOCK TREATMENT

Score	B	D	E	F	G	H	I	K	O	Q	R
W	2	8	10	5	3	5		7	7	25	4
D		4	2	5		3	3	3	8	17	7
d			1			1		1	1	1	
Dd	1	2	1					2		3	2
S										1	
W%	67	67	71	50	100	56		54	44	53	33
D%		29	14	50		33	100	23	50	36	50
d%			7			11		8	6	2	
Dd/S%	33	15	7					15		9	17
M		3						2		2	
FM		3		1				3	3	4	
m			2						4		1
k			1							3	
K										1	
FK											
F	2	7	4	6	2	8	1	3	7	18	7
F-	1			2				4		3	1
Fc		1	2							3	
c											
C'										5	
FC			1							2	
CF					1	1		1		6	2
C			4	1			2		2		2
R	3	14	14	10	3	9	3	13	16	47	13
F%	100	50	29	80	67	89	33	54	44	45	67
F+%	67	100	100	75	100	100	100	43	100	90	88
A%	33	42	22	90	67	67	33	77	44	36	25
H+A:Hd+Ad	1:0	8:0	3:1	6:3	2:0	4:2	1:0	11:1	6:1	17:6	3:0
M:sum C	0:0	3:0	0:6.5	0:1.5	0:1	0:1	0:3	2:1	0:3	2:7	0:5
W:M	2:0	9:0	10:0	5:0	3:0	5:0	0:0	7:2	7:0	25:2	4:0
Succ*	C	L	C	C	C	C	C	C	C	C	C

\* Succession: C - confused, L - loose

TABLE IVB

DISTRIBUTION OF RORSCHACH SCORES OF ELEVEN PARANOID  
SCHIZOPHRENICS AFTER ELECTRIC SHOCK TREATMENT

Score	B	D	E	F	G	H	I	K	O	Q	R
W	3	12	7	4	8	10	2	8	6	6	8
D	2	10	16	2	4		11	5	5	10	3
d		1	2				1			1	
Dd	3	3	4				3			2	1
S	2										
W%	30	46	24	67	67	100	12	62	54	32	67
D%	20	38	55	33	33		65	38	45	53	25
d%		4	7				6			5	
Dd/S%	50	12	14				17			10	8
M		3	1		1					1	
FM	1	2	1	1				3	1	1	1
m			3								
k			2		1				1		
K											
FK			1								
F	2	13	12	5	7	7	8	7	6	13	5
F-	5	4				1	4	3			5
Fc		1	7		2	1				1	
c											
C'		1	1				1				
FC	1	1			1	1	1		1		
CF	1		1				1		2	3	1
C							2				
R	10	26	29	6	12	10	17	13	11	19	12
F%	70	65	41	85	58	80	71	77	54	68	84
F+%	28	76	100	100	100	88	67	70	100	100	50
A%	10	19	23	100	25	30	65	85	63	46	33
H+A:Hd+Ad	1:0	7:2	7:2	5:1	5:1	3:0	9:2	10:1	6:1	9:1	4:0
M:sum C	0:1.5	3:5	1:0	0:0	1:5	0:5	0:4.5	0:0	0:2.5	1:3	0:1
W:M	3:0	12:3	7:1	3:0	8:1	10:0	2:0	8:0	6:0	6:1	8:0
Succ*	C	L	L	C	L	R	C	C	L	L	C

\* Succession: C - confused, L - loose, R - rigid

TABLE IV C

DISTRIBUTION OF RORSCHACH SCORES OF NINE SCHIZOPHRENICS,  
MIXED TYPES, BEFORE ELECTRIC SHOCK TREATMENT

Score	A	C	J	L	M	N	P	S	T
W	2	6	8	12	10	6	3	9	2
D	5	4	11	2	3	3	8	3	5
d							4		
Dd		1	1				12	1	
S									
W%	30	54	40	86	80	67	11	69	28
D%	71	36	55	14	20	33	29	24	72
d%							15		
Dd/S%		10	5				44	7	
M	1		3		2	1	1		
FM	3		4						
m									
k		1							
K									
FK									
F	3	5	8		1	5	18		7
F-			2	3		2	8		
Fe		1	1	2					
c				1					
C'		1		2	1	1		8	
FC		1	1	1					
CF				5				1	
C		2	1		9			4	
R	7	11	20	14	13	9	27	13	7
F%	43	45	50	21	8	78	96	0	100
F+%	100	100	80	0	100	71	69	0	100
A%	71	56	65	0	8	22	59	25	72
H+A: Hd+Ad	6:1	2:4	13:5	0:0	3:0	5:0	9:15	2:1	5:0
M: sum C	1:0	0:3.5	3:2	0:5.5	2:14	1:0	1:0	0:7	0:0
W:M	2:0	4:0	8:3	12:0	10:2	6:1	3:1	8:0	2:0
Succ*	C	C	L	C	C	C	L	C	C

\* Succession: C - confused, L - loose

TABLE IVD

DISTRIBUTION OF RORSCHACH SCORES OF NINE SCHIZOPHRENICS,  
MIXED TYPES, AFTER ELECTRIC SHOCK TREATMENT

Score	A	C	J	L	M	N	P	S	T
W	1	8	4	10	5	10	9	9	2
D	5	5	5	3	1	10	2	1	6
d				1			1		
Dd	1		1	1	1	2	1		1
S						1			2
W%	14	62	40	67	72	43	72	90	18
D%	72	38	50	19	14	43	16	10	54
d%				7			6		
Dd/s%	14		10	7	14	14	6		28
M	2		1	1	2				
FM	2		1		2				
m									
k		2							
K									
FK									
F	3	4	6	5	2	20	6	5	8
F-				3		1	6	4	3
Fc		2	1				1		
c									
C'		2	1					1	
FC						2			
CF				3					
C		3			1				
R	7	10	10	15	7	23	13	10	11
F%	43	40	60	53	28	92	92	90	100
F+%	100	100	100	63	100	95	50	56	73
A%	57	40	60	27	42	60	68	70	27
H+A:Hd+Ad	3:3	2:2	5:3	4:1	6:0	9:7	8:2	6:1	4:1
M:sum C	2:0	0:3	1:0	1:3	2:1.5	0:1	0:0	0:0	0:0
W:M	1:0	5:0	4:1	10:1	5:2	10:0	9:0	9:0	2:0
Succ*	C	L	L	L	L	L	L	C	C

\* Succession: C - confused, L - loose

TABLE VA

DISTRIBUTION OF THE TWENTY RORSCHACH SIGNS IN SCHIZOPHRENIA  
OF TWENTY PATIENTS BEFORE ELECTRIC SHOCK TREATMENT

Sign	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1. Approach, emphasis on wholes, confused	V	V	V	V	V	V	V	V		V	V	V	V	V	V		V	V	V	
2. W, higher than normal	V	V	V	V	V	V	V	V		V	V	V	V	V	V		V	V	V	
3. Confabulatory DW										V								V		
4. Contamination																				
5. Rare detail (Dd high)		V	V	V							V					V			V	
6. M (low)		V	V		V	V	V	V	V			V			V			V	V	V
7. Color (area emphasized)			C		C	C	CF	CF	C	FC	CF	CF	C		C		CF	CF	C	
8. Erlebnistyp (area dominant)	M		C	M	C	C	C	C	C	M	M	C	C	M	C	M	C	C		
9. C <sub>n</sub>					V	V							V						V	
10. F+ (low)		V				V				V	V	V	V	V		V		V	V	
11. P% (low)			V	V	V				V		V	V	V	V	V	V	V	V		
12. Variability in quality (F- to F)		V				V				V	V	V	V	V		V		V		
13. Blocking (rejections)	V	V	V			V	V	V	V				V		V			V		V
14. Original responses										V	V					V				
15. A% (high)	V		V			V	V	V	V	V	V					V				V
16. Shading (presence of any type)			V	V	V					V		V	V	V			V		V	
17. Po									V											
18. Abstract and personal references			V				V						V							V
19. Perseveration												V	V	V						
20. Description of card			V										V							



APPROVAL SHEET

The thesis submitted by Anthony B. Tabor has been read and approved by three members of the Department of Psychology.

The final copies have been examined by the director of the thesis and the signature which appears below verifies the fact that any necessary changes have been incorporated, and that the thesis is now given final approval with reference to content, form and mechanical accuracy.

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

April 15, 1952  
Date

Frank J. Koller  
Signature of Adviser