RORSCHACH SIGNS, THINKING DISORGANIZATION, AND WITHDRAWAL IN PROCESS AND REACTIVE SCHIZOPHRENICS

Thesis for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY

Ross E. Carter

1969

This is to certify that the

thesis entitled

RORSCHACH SIGNS, THINKING DISORGANIZATION, AND WITHDRAWAL IN PROCESS AND REACTIVE SCHIZOPHRENICS

presented by

Ross E. Carter

has been accepted towards fulfillment
of the requirements for

Ph.D. degree in Dept. of Psychology

Major professor

Date Sept. 17, 1964

ABSTRACT

RORSCHACH SIGNS, THINKING DISORGANIZATION, AND WITHDRAWAL IN PROCESS AND REACTIVE SCHIZOPHRENICS

By

Ross E. Carter

The purpose of this study was to determine whether reactive schizophrenics tested during the acute stage produce more Rorschach protocols characteristic of schizophrenics than reactives in the non-acute stage. On the basis of prior research it was assumed that process subjects produce schizophrenic protocols regardless of length of hospitalization. It was furthermore assumed that differences in levels of adjustment, or recovery, would be related to differences in Rorschach diagnosis.

Sixty male hospitalized schizophrenics were classified as either process or reactive on the Phillips Premorbid History Scale. The subjects were then divided equally according to length of current hospitalization to form four groups: early reactive, late reactive, early process, and late process. All subjects were administered the Rorschach and rated for level of adjustment on the Thinking Disorganization and Withdrawal Scales of the Psychotic Reaction

Profile developed by Lorr, O'Conner and Stafford. A control group was formed by taking the protocols of 15 non schizophrenic psychiatric patients from hospital files for comparison purposes. The protocols were scored by two experienced psychologists according to Beck's system. The reliability of the judges was .92. An additional measure of adjustment was obtained by having the judges rate the protocols on a 6 point scale for emotional health.

A survey of the literature yielded 39 different Rorschach signs of schizophrenia which were employed in the present study. The non schizophrenics were compared with the entire group of schizophrenics as well as with each process and reactive group on the number of Rorschach signs of schizophrenia. None of these comparisons yielded significant differences. A tendency for early process subjects to produce more signs than the non schizophrenics was noted.

All possible comparisons were made between the process and reactive groups. None of these comparisons resulted in significant differences in the number of Rorschach signs of schizophrenia. A trend towards more signs was noted in early process subjects when compared with late process subjects.

Further comparisons between the groups were made for each of the Rorschach signs. No differences were found

between the non schizophrenics and the combined group of schizophrenics with respect to the presence of the signs.

The judges' global ratings of emotional health, based on the Rorschach, showed the non schizophrenics to be less disturbed than either the early reactive or early process subjects. No differences were found, however, between the process and reactive subgroups themselves. The same trend was noted when the process and reactive groups were compared on the Thinking Disorganization and Withdrawal Scales. These findings suggest that the process and reactive subjects may have been nearly equal in level of adjustment. The one exception was that early process subjects showed more thinking disorganization and withdrawal behavior than late reactives.

Finally, the schizophrenics and non schizophrenics were also compared with the Rorschach norms reported by Beck. Schizophrenics were found to differ significantly from the normals on 15 variables while non schizophrenics differed on only 6 variables. These findings tend to suggest that the Rorschach signs of schizophrenia may not be true indicators of schizophrenia and that the schizophrenics were in fact highly deviant in their Rorschach protocols. Inferences based on these findings are limited by the questionable parametric statistics used in the normative study.

The results of this study indicate that the Rorschach signs do not differentiate between non schizophrenic patients and schizophrenics as a group or as the latter are subdivided along the process-reactive dimension. These findings may be limited, however, only to the specific Rorschach signs of schizophrenia used in the study. The fact that the subjects in the study were taking drugs may also account, at least in part, for the findings. The effect of drugs on the Rorschach performance of schizophrenics is unknown, but it is entirely possible that they function to reduce the amount of pathology produced by schizophrenics in Rorschach protocols. The results also raise some serious questions regarding the utility of the process-reactive dimension.

It is suggested that future research should exercise caution in regards to the drug variable. All subjects should be taking the same drugs in the same amounts, or drug-free subjects should be used. The nature of the control group and the extent of its pathology is another important aspect to be considered in future research. Attention should be given to selecting subjects who are not disturbed and who can truly be regarded as non schizophrenic.

APPROVED:_____

DATE:_____

RORSCHACH SIGNS, THINKING DISORGANIZATION, AND WITHDRAWAL IN PROCESS AND REACTIVE SCHIZOPHRENICS

By

Ross E. Carter

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

Fall, 1969

To Charl

Thank you for helping build a bookcase one gray winter day so long ago and for being near me now that the sun has risen. Without you it would mean little.

ACKNOWLEDGMENTS

I would like to thank each of my committee members for helping with the dissertation. Particular thanks go to Dr. Rabin for his continued interest and guidance in carrying out the study. He gave freely of his time, even during his summer vacation, and was readily available when I needed assistance. Without his concern and help a very important deadline would never have been met. Dr. Karon's advice regarding the statistical analysis of the data was invaluable and served to reduce a great deal of my anxiety about the data. Dr. Thornton's suggestions regarding certain features of the design were relevant to the findings. Dr. Grummon aided in strengthening the final writeup.

The study could never have been completed without the help and cooperation of the people who, because of the nature of the research, were described as subjects. They were, however, more than just subjects.

I would also like to thank Dr. Stewart G. Armitage for his assistance in my collecting data at the VA hospital in Battle Creek. Dr. Marvin Hyman, of Herman Kiefer Hospital in Detroit, provided an additional and very important source of data.

Particular and very special thanks go to my wife Charlene for having worked, really worked, as one of the judges and as the typist for the difficult first draft. Her support, encouragement and solace at times of stress were exceptionally important to me.

Apart from the dissertation itself, I would like to thank the committee members as well as some non-committee members for the impact that they have had on my graduate education and on me as a person. I was fortunate in being able to study under Dr. Rabin whom I regard as an excellent teacher and as an expert. Dr. Karon has always shared what he knows and in a way which I found to be exciting and stimulating. Dr. Grummon provided me with a great deal of gentle guidance during the beginning stages of my experience as a therapist. Dr. Thornton was helpful with one of my first publications. Dr. Lee Erlandson gave much of himself in some very important and meaningful supervision sessions. I regard Dr. Bill Kell as having been essential and as a truly significant other. I will remember all of you and keep forever what you have all so generously given.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The purpose of this study was to investigate the Rorschach performance of process and reactive schizophrenics. Specifically, the study focused on the variable of recovery as it was related to differences in the Rorschach diagnosis of process and reactive schizophrenics. The study was based on the assumption that reactive schizophrenics do recover. Accordingly, it was expected that reactive schizophrenics who were tested at a point considerably past the initial period of hospitalization would differ in terms of Rorschach performance when compared with reactive schizophrenics tested during the initial period of hospitalization. It was furthermore assumed that the late tested reactive schizophrenics would differ from process schizophrenics tested either early or later in hospitalization.

A review of the literature on the use of the Rorschach with schizophrenics reveals a great deal of variability in findings. Such variability could suggest that the Rorschach may be invalid as a diagnostic tool for use with schizophrenics. On the other hand, observed differences between process and reactive schizophrenics tested early or

late would also suggest a possible means for explaining such variability.

Problems of Validation

The validity of the Rorschach as a measure of personality structure and functioning has been questioned since the instrument was first introduced. Herman Rorschach (1942) himself was acutely aware of the unproven and experimental status of his test. Pioneer workers such as Beck (1935) and Hertz (1941) called attention to the necessity for fundamental research on the Rorschach and to the need for validation using objective criteria and rigorous methodology.

Some workers have resisted efforts to deal with the validity of the Rorschach on an objective basis and have been content to accept personal success based on a clinical-intuitive approach as sufficient evidence in support of claims for validity. Resistance has been based on the notion that the Rorschach requires such complex, subjective skills of interpretation and integration that it is impossible to deal with the instrument in a rigorous manner without violating its very nature. Beck has characterized this position by saying that: "there has developed around this test the feeling that it is a sort of mysterious instrument, supra-mundane and sui generis, one resting on intuitive

insight and not required to follow the usual cannons of scientific method" (as quoted by Benton, 1950, p. 45).

There is no doubt that the Rorschach does require skill for its most effective use and that some workers are more proficient with the instrument than are others. Individual personal success, however, is insufficient as a basis on which to claim validity for the Rorschach. The reason for this, as Meehl (1965) has pointed out, is that it is impossible to determine the extent to which the test becomes confounded with the interpreter. Validation as well as invalidation becomes a matter of who uses the instrument and has little to do with the actual value of the Rorschach itself.

Another disadvantage to basing the validity of the Rorschach on personal use is that such an approach leads to assumptions about the generalized validity of the instrument. Even though the need for validation has been recognized for some time, it has only recently become apparent that both questions and assertions posed in blanket fashion about the validity of the Rorschach are misleading and grossly oversimplified. The matter is not <u>whether</u> the Rorschach is valid or invalid, but rather, <u>for what</u> the Rorschach is valid or invalid. Assumptions about a general type of validity lead only to misapplication of the Rorschach as, for example, when the instrument is used to predict success in aviation training (Guilford, 1947).

The distinctions made by the APA (French, Michael et al., 1966) regarding types of validity have served to reinforce the importance of focusing on the kind of validity which is of concern. Dana (1962) has stressed the need for construct validity and concludes that questions regarding content, predictive, or concurrent validity are inappropriate for projective tests at this time. One may, however, take issue with Dana's (1962) conclusions. The Rorschach is widely used on the clinical level for the purposes of personality assessment. Consequently, the most practical, if not the most pressing need, is to deal with the concurrent validity of the instrument.

Establishing concurrent validity for the Rorschach is not a simple matter, particularly as the instrument is considered to be a measure of psychopathology. The most serious difficulty is that of defining criterion groups against which the Rorschach is to be compared. Most often research attempts to validate the Rorschach have been made using groups formed on the basis of traditional diagnostic systems. The unreliability of these systems has frequently been noted (Ash, 1949; Mehlman, 1952) and poses a perplexing problem for validation studies, namely that of how to determine whether inconclusive research results are due to the inadequacy of the Rorschach or to the inadequacy of the criteria.

One approach to overcoming the limitations imposed by the use of traditional classification systems might be to focus on making gross rather than fine distinctions between types of pathology, and to test the validity of the Rorschach against criteria groups merely identified as psychotic, neurotic or normal. This method has been adopted to a large extent in those research studies which have investigated the use of the Rorschach with schizophrenics. Generalizations across all studies are difficult to make but the general practice has been to ignore traditional classification systems and to deal with samples of undifferentiated schizophrenics. Some studies have made noteworthy and laudable attempts to be more specific by further identifying samples with such clinical designations as chronic, severe, mild, or ambulatory. For the most part, however, diagnostic terms are used much less often than is needed for clarity in designating sample composition.

In general, the thrust of research on the use of the Rorschach with schizophrenics has taken one of two directions. One direction has sought to determine what Rorschach variables might be found to be characteristic of schizophrenics. The other direction has been to investigate particular Rorschach scores or patterns of scores as they are hypothesized to be related to some specific aspect of schizophrenia. One direction has thus mainly been exploratory while the other direction has been toward specific variables.

Both types of research have the common purpose of establishing the concurrent validity of the Rorschach as used with schizophrenia. Consequently, as different types of studies agree on Rorschach measures of schizophrenia, inferences may be drawn regarding the concurrent validity of the instrument.

Exploratory Studies

Included with the research which has been exploratory in focus are those studies which have sought to determine what, if any, scores or patterns of scores might be typical of schizophrenics.

One of the earliest exploratory studies was carried out by Rickers-Ovsiankina (1938) who compared 37 hospitalized chronic schizophrenics with 20 normal control subjects. All subjects were equated for age, sex and education. The results of her study showed schizophrenics to score higher than normals on the variables of W, D, Dd, C, CF, A% and shading determined responses. Schizophrenics scored lower than normals on F + %, and M. The protocols of the schizophrenics contained more fluctuations between good and poor form perception and showed poorer quality W. As these differences are interpreted according to the theory underlying the Rorschach, schizophrenics appear to be disturbed in the areas of thinking, emotional control, and perception of reality.

Another study comparing schizophrenics and normals was carried out by Friedman (1952) who differentiated between hebephrenic and catatonic subgroups within the schizophrenic sample. The findings of the study, however, are presented for the combined group of schizophrenics, implying that no differences were found between the subgroups. The results of the study showed that schizophrenics scored lower than normals on the Rorschach variables of D, F + % and P. Schizophrenics produced significantly more W, DW, and C responses.

Friedman (1952) also compared the responses of his schizophrenic subjects to the Spiegel norms published by Beck et al. (1950). This comparison showed schizophrenics to differ from normals in that schizophrenics scored lower on the variables of P, FC, M, H, Hd. No differences between schizophrenic subjects and either the Spiegel norms or the normal controls were found on the variables of A%, Hdx, Adx, Sex, or Anatomy. In line with the Rickers-Ovsiankina (1938) study, the results of Friedman (1952) show schizophrenics to be disturbed in the areas of thinking and affect control. In addition, Friedman's (1952) results indicate that schizophrenics withdraw from human contact and have little inner fantasy life. These findings tend to conform to a general clinical description of schizophrenia and suggest that the Rorschach has concurrent validity as a measure of schizophrenic process.

Sherman (1952) used the Rorschach to compare 71 hospitalized, prognostically good schizophrenics with 66 normals on 26 formal and 17 content scores. Schizophrenics and normals were found to differ on 20 of the 26 formal scores and on seven of the 17 content scores. The differences were significant at the .05 level of confidence and included the variables of R, F + %, P, D, Dd, S, M, FC and Shading as well as H and A. As part of his design, Sherman (1952) re-analyzed his data with controls for differences in education and differences in the number of responses. The new analysis showed schizophrenics to differ significantly from normals on only 10 formal factors and on only two content factors when level of education was controlled. Schizophrenics differed from normals on 15 formal factors and four content factors when number of responses was controlled. Since schizophrenics were found to differ from normals on some of the same variables as in the Rickers-Ovsiankina (1938) and Friedman (1952) studies, Sherman's (1952) research provides support for the notion that schizophrenics do produce different patterns of scores than normals. Sherman's (1952) study is most important, however, for the focus it places on the need for methodological controls.

The study which is most devastating to the notion that it is possible to identify Rorschach scores which are uniquely characteristic of schizophrenics is that of Rieman

(1953). The study made two independent comparisons of normals and ambulatory schizophrenics receiving out-patient treatment. Significant differences between groups were found on only five of the 86 variables studied: Average Form Level Rating, Average Form Level Rating (non-color), R + %, Confabulations, Pathogenic Verbalizations and Perseverations. Any three of these signs diagnosed as schizophrenic 27% of the normals and 65% of the schizophrenics. All five signs diagnosed as schizophrenic 1% of the normals and 18% of the schizophrenics.

The findings of Rieman's (1953) study clearly call into question the issue of whether schizophrenics can be differentiated from normals on the basis of formal scores since three of the five differences were found on non-formal factors. Rieman's (1953) study also points out that a great deal of overlap may exist between the protocols of normals and schizophrenics and suggests that the Rorschach is extremely weak in differentiating schizophrenics from normals. The conclusion is applicable only to ambulatory schizophrenics, however, and in no way applies to hospitalized schizophrenics or even ambulatory schizophrenics not receiving treatment.

In spite of the limitations on the generalizations which may be made from the Rieman (1953) study, it is noteworthy that ambulatory schizophrenics were found to differ from normals on the variables of confabulations, pathogenic

verbalizations and perseverations. These variables, together with position responses and contaminations, have been understood to be highly reliable indicators of schizophrenia (Beck, 1961; Kelly and Klopfer, 1939). A study by Knopf (1956), however, casts doubt on the absolute value of these signs as indicators of schizophrenia since contaminations and position responses were found to occur among groups of neurotics, psychopaths and schizophrenics.

The results of the studies reviewed so far present a great deal of variability in the extent to which they support the concurrent validity of the Rorschach as a diagnostic tool for schizophrenia. The only conclusion which may be drawn is that the Rorschach has been shown to produce different results when used with different samples. To the extent that the samples were homogeneous across studies, the conclusion would support the inference that the Rorschach lacks concurrent validity. In spite of their identification as schizophrenic, it is doubtful that the samples in the studies reviewed can be considered homogeneous. Descriptions such as chronic (Rickers-Ovsiankina, 1938), hebephrenic and catatonic (Friedman, 1952), prognostically good (Sherman, 1952), and ambulatory (Rieman, 1953) imply heterogeneity among samples and, moreover, point up the extreme limitation imposed on research by the lack of a reliable and standardized means for identifying criterion groups.

An attempt to deal with in-group variance as it may affect the Rorschach performance of schizophrenics was made by Beck (1954). The procedure in this study was to develop 120 statements describing the psychodynamic behavior of schizophrenics. Each statement was matched with a Rorschach score or pattern of scores which was defined as related to that behavior. Q sorts of the 120 statements were made for each subject in a sample of 50 schizophrenic adults and 60 schizophrenic children.

The frequency with which each of the 120 statements was used for each subject was ranked from highest to lowest. A comparison of these orderings resulted in the identification of six different types: four adult; one adult-children; and one children type. On the basis of these differences it was concluded that six types of schizophrenics had been distinguished, together with matching patterns of Rorschach scores.

In a follow-up study Molish and Beck (1958a, 1958b) added 50 statements to the original 120 statements. Q sorts were carried out for two samples of hospitalized schizophrenics. Six types were identified in each sample by factor analyzing the sorts. Patterns of intercorrelation between these types and the six types found in the study by Beck (1954) were significant, thereby supporting the assumption that the types were identifiable in samples other than the original.

Even though the studies of Beck (1954) and Molish and Beck (1958a, 1958b) show that it is possible to identify various types of schizophrenia, these findings have little practical value for use of the Rorschach itself. The Rorschach variables associated with each of the types are neither mutually exclusive nor internally consistent. Identification of a type depends on the rank ordering of the Q sort statement rather than the presence or absence of a Rorschach score in a particular protocol. For example, Q sort item five related to Rorschach variable "A" may be most descriptive of one type but least descriptive of another type. Merely observing Rorschach variable "A" does not, however, discriminate between types.

Another approach to using the Rorschach to identify schizophrenics has been taken in a series of studies carried out by Piotrowski and his co-workers (Piotrowski, 1955; Piotrowski and Lewis, 1950; Piotrowski and Berg, 1955). The focus of this work has been on the Alpha Schizophrenic defined by Piotrowski (1945) and elaborated on in other studies. The dynamics of the Alpha Schizophrenic are based in a disparity between the amount of available energy and the degree of control over expression of this energy. Conditions of equal amounts of energy and control are found in normal states with increases in disequilibrium related to increases in the severity of pathology. The Alpha Schizophrenic is characterized by an excess of energy over control

which is corrected by an increase in control. Thus, the Alpha Schizophrenic appears rigid, well-defended and may be wrongly diagnosed as non schizophrenic.

Diagnosis of the Alpha Schizophrenic on the Rorschach is based on a set of five Rorschach variables: Sum W, Sum C, the ratio of bright shading responses to Sum C, shock reactions to dark gray, and F + % less than 70%. Scores are assigned to the values which these variables may take on. Scores above and below three respectively define schizophrenics and neurotics with 90% accuracy (Piotrowski and Lewis, 1950). The magnitude of scores has been found to be related to follow-up ratings of emotional health (Piotrowski, 1955) and scores increase with increased length of hospitalization (Abrams, 1964).

The studies which have focused on the use of the Rorschach to distinguish among various forms of schizophrenia are clear in stressing the importance of patterns of scores rather than single signs in diagnosing schizophrenia. Even though the most ideal situation would be to discover one simple and single diagnostic indicator of schizophrenia, reality and the nature of the Rorschach would indicate that matters are somewhat more complicated. Indeed, as the Rorschach measures a number of functions and results in several measures of the same function, the search for single signs overlooks the possibility of finding significant results.

In line with the importance of using sets of scores rather than single signs, Thiesen (1952) developed five patterns of scores to be used in identifying schizophrenic protocols. The patterns are as follows. Pattern A: high Sex and Anatomy scores; Pattern B: low F + % and Z scores; Pattern C: low FC +, M, and A% scores; Pattern D: low F + %, P, and A% scores; Pattern E: high DW and low FC + scores. High and low scores were defined as either one sigma's distance above or below the mean of Beck's (1950) standardization sample.

Thiesen rated the protocols of 60 diagnosed schizophrenics for the occurrence of the above patterns. Using the norms reported by Beck (1950), a comparison was made between the schizophrenic subjects and normal controls. The results showed that significantly more schizophrenic subjects produced these patterns than normals (.001). 48.4% of the schizophrenic sample produced one or more patterns, while only 3.2% of the normals did so. 51.6% of the schizophrenic subjects produced none of the patterns, while the same was true of 96.8% of the normals. Among the schizophrenics, the most frequent patterns were patterns A and B, while the most frequent combination of patterns was a combination of Patterns A, B, C, and D.

Follow-up studies using Thiesen's Patterns have failed to provide strong support for the original study. Rubin and Lonstein (1953) analyzed the protocols of 42

hospitalized male schizophrenics. 16.7% of the subjects produced one or more patterns, while 82.8% of the subjects failed to produce any of the patterns. A comparison between Thiesen's (1952) normal subjects and the subjects in this study showed the only significant difference to occur on Pattern D.

A cross-validation study of the Thiesen Patterns is also reported by Taulbee and Sisson (1954). These investigators used 62 hospitalized schizophrenics and 157 normal controls. Significant differences were found between the groups on the number of subjects producing Patterns A, C, and D. The study provides practical support for the original study by Thiesen (1952) and contradicts the work of Rubin and Lonstein (1953).

A somewhat different emphasis on the use of the Rorschach with schizophrenics can be found in the work of Piotrowski and Lewis (1952). These authors were concerned with using Rorschach scores as prognostic indicators for recovery. The Long Term Prognostic Index (LTPI) was developed on the basis of 15 signs measuring intellectual maturity, fantasy life control, creative imagination, realistic planning and interest in others. The LTPI was applied to the protocols of 100 diagnosed schizophrenics. Subjects were rated as improved or unimproved at a three year follow-up and once again at a seven year follow-up. High scores on these variables were found in only 50% of the improved cases.

Minor revisions of the LTPI were carried out by Piotrowski and Bricklin (1961) and applied to two samples of schizophrenics. Successful predictions regarding improvement at the end of a three year period were made in 89% of the cases in one sample and 90% of the cases in the other sample. These results were supported by still another study carried out by Piotrowski and Efron (1966).

Stotsky (1952) has found improved schizophrenics to show more fantasy life, emotional control, anxiety, interest in human contact, and better form quality than unimproved schizophrenics when compared on the Rorschach. A study by Goldman (1960) confirms these findings. Remitting cases were found to score higher on the variables of M, F dominated responses, Y blends, H, Hd, and F + % than unimproved cases.

On the basis of the findings of the studies reviewed above, it may be concluded that the Rorschach can be used to predict future status of emotional health. The consistency of the studies in finding the same variables related to improvement is important in providing a practical basis for making decisions regarding plans for treatment.

Specific Variable Research

The research reported on in this section has focused on investigating specific Rorschach scores or patterns of scores as measures of particular types of schizophrenic functioning. Given the number of variables which could be

studied, it is noteworthy that most of the research has been restricted to those variables which are most likely to reflect schizophrenic personality functioning. Some range does exist, however, in terms of Rorschach variables which have been studied. Rather than deal with each variable separately, the research has been grouped in accordance with whether the variables studied measure the personality functions of thinking or affect.

Thinking

Disturbances of thought process, one of the prime characteristics of schizophrenia, is indicated in the Rorschach by a number of variables such as approach, the use of popular responses, and form quality.

Using the popular response as a measure of thinking disorganization, Molish (1951) attempted to differentiate among normal, neurotic, and schizophrenic subjects. Although a popular response is determined not only by the content of the response but also by the blot area to which the response is made, Molish (1951) studied the popular response in terms of both content and location. Two measures were taken. One measure, called Operation Group, was defined by the content of the response regardless of blot area. The second measure, Operation Stimulus, consisted of the number of popular responses as determined by both content and blot area.

The results of the study showed normal subjects to differ significantly from neurotics and schizophrenics on both Operation Group and Operation Stimulus, that is normals not only gave more popular responses, as defined by content alone, than did neurotics or schizophrenics, but also differed in the sense of giving these responses to the appropriate blot areas. The same relationship held when neurotics were compared with schizophrenics.

Warner (1951) investigated the popular response using schizophrenics who were subdivided into groups of paranoid and non-paranoid schizophrenics, and neurotics subdivided into groups of anxiety and non-anxiety neurotics. No significant difference was found among the groups on the number of popular responses given.

The findings of the Warner (1951) study support those of Molish (1951) so far as schizophrenics and neurotics are concerned. It should be noted, however, that the mean number of popular responses for the schizophrenic groups in the Warner (1951) study was 4.80 responses. This number is only slightly less than the number expected from normals. Even though extreme scores within the schizophrenic group may have functioned to elevate the group mean, the finding that schizophrenics produce a number of popular responses nearly equal to that of normals makes any conclusion regarding the use of popular responses as a diagnostic indicator of schizophrenic thinking extremely tentative.

McReynolds (1966) has used the Rorschach as a means for evaluating concept formation in schizophrenics as opposed to normals. The procedure used in this study was that of presenting subjects with each Rorschach card and asking if the blot could represent some named object. Three scores are derived: J scores, V scores and C scores. J scores represent a tendency to agree and V scores represent the degree of deviation from a normative group. C scores represent the number of correct responses. Mean J, V, and C scores for a group of 125 male schizophrenics were 42.33, 42.52, and 37.66 respectively. Compared to a standardized distribution with a mean of 50, all scores were significantly different ($p < .001$) indicating that schizophrenics tend to agree and deviate from normals, while obtaining fewer correct responses.

Although the McReynolds (1966) study did not focus on specific Rorschach scores, it is important for the use of the Rorschach with schizophrenics in that it supports the notion that schizophrenics are uncritical in their thinking and tend to give easy responses. Lack of critical thinking and a tendency to give easy responses are two processes measured by the Rorschach variables of A% and approach with W or D emphasized. No studies have been carried out directly investigating the variable of A%. The exploratory studies reviewed above have been contradictory regarding A% as a measure of schizophrenic functioning.

With regard to the variable of Approach, Stotsky (1952) reports on a factor-analytic study of the location scores in the protocols of 143 diagnosed schizophrenics. Two factors were isolated, one heavily loaded on D and Dd, and the other negatively loaded on W. These findings support the notion that schizophrenics do overuse either the whole blot area or some detailed portion of the blot.

A study by Watkins and Deabler (1952) investigated the uncritical aspect of schizophrenic thinking. The study was based on the assumption that schizophrenics form first impressions on the basis of minimal information and maintain these impressions even with a later opportunity for more information. Tachistoscopic presentations of Rorschach slides were made to 16 chronic schizophrenics at speeds increasingly from .001 second to unlimited exposures. More responses were made as length of presentation was increased but the content of these responses failed to change, thereby indicating an inability to shift the content of responses based on minimal information.

Another approach to the use of the Rorschach as a measure of thinking disorganization among schizophrenics was carried out by Stotsky and Lawrence (1955). These investigators used two groups of schizophrenics pre-experimentally defined as with and without perceptual impairment. Analysis of the protocols of the two types of subjects showed those with no impairment to score better in form determined

responses, to show more genetically good locations responses, and to have more shifts in determinants from Free Association to Inquiry. More P was noted in the impaired group than in the unimpaired group. These findings offer strong support for the assumption that the Rorschach does and can diagnose disturbances in thinking.

Other Rorschach variables which may indicate thinking disorganization are M, R, and tempo. Scott (1956) scored the Rorschach protocols of 37 schizophrenics for movement responses as defined by both Beck (1961) and Klopfer (1954). In spite of the fact that Klopfer's (1954) scoring is broader and, consequently, should produce more second responses, M scores were found to occur more frequently than FM or M scores. Scott (1956) concludes that M represents deterioration while FM and m are regressive in nature. Adams and Cooper (1961) found the number of responses among a group of 39 schizophrenics to be inversely related to severity of symptomatology. Weiner (1962) developed four indices of deviant tempo based on the number of responses to card pairs IV and V, V and VI, VIII and IX, and IX and X. Significant differences in tempo were found on the first three pairs when schizophrenics were compared with normals. These findings are supported by the follow-up studies of Weiner (1964b, 1965b).

Affect

Variability of emotional reactivity has long been regarded as schizophrenic symptomatology. Research on the use of the Rorschach with schizophrenics has been carried out to determine if the Rorschach does measure the emotional reactivity of schizophrenics.

Bucker and Williams (1951) investigated the color responsiveness of schizophrenics using standard sets of the five chromatic Rorschach cards, as well as black and white reproductions. Twenty-one subjects were included in a counterbalance design. Differences in response total were controlled by dividing subjects into high and low groups. No differences were found between experimental conditions except for the average time of the first response. This variable increased when color cards were used but decreased when achromatic cards were used. On the basis of these results, Bucker and Williams (1951) conclude that color does not affect the responses of schizophrenics. This conclusion, however, is contradictory to what the data indicate. The median pure C response for the subjects was 2.9. The usual interpretation is that even one pure C response indicates extreme emotional responsivity. Moreover, increased reaction time to color cards is one indication of color shock or responsivity to color.

Crumpton and Goot (1966) studied the effect of color on the connations of the Rorschach color cards as perceived

by schizophrenic patients. Fifty male hospitalized schizophrenics rated the five standard chromatic cards and five achromatic duplicates on a 15 point Semantic Differential Scale. Analysis of the ratings showed that color cards were rated higher on the dimensions of evaluation potency and activity than were their achromatic duplicates. On the basis of these findings it may be concluded that schizophrenics do respond with greater affect to colored stimuli than to achromatic stimuli. This conclusion is supported by the results of Taulbee, Sisson and Gaston (1956) who found schizophrenics to differ significantly from normals on the variable of affective ratio.

Weiner (1961) investigated the diagnostic efficiency of three Rorschach color variables: one or two CF; Sum C between 1.5 and 3; and at least one CF or C response with no c' responses. Two separate samples were used in the study. Each was composed of neurotic, character disorder and schizophrenic patients. Analysis of the results showed either one or none of these signs to be characteristic of the protocols of neurotics and diagnosed character disorders, while two or three of the signs were characteristic of the protocols of schizophrenics. Differences were statistically significant ($p < .001$). The results of this study were replicated in a follow-up study (Weiner, 1964a).

Considerable controversy developed over Weiner's (1961, 1964a) findings. Klinger and Roth (1964) attempted

to replicate the findings regarding Sum C. Their results showed Sum C in a group of schizophrenics to be less than 1.5 responses or more than 3.0 responses, not Sum C of between 1.5 and 3.0. Orme (1964) investigated all three color variables in a study using the same type of subjects as Weiner (1961, 1964a). Orme found all three signs to be more common in the protocols of neurotics. No significant differences were found, however.

In reply to the above studies, Weiner (1965a) points out that Klinger and Roth (1964) failed to fully report on their data. Reanalysis, according to Weiner, shows that 31% of 69 schizophrenic subjects produced between 1.5 and 3.0 responses. In the same article (Weiner, 1965a) critiques Orme (1964) on the basis of his failure to include the variable of Sum C in the analysis of the data. Reanalysis by Weiner showed schizophrenics to differ from normals on the color variable at the .07 level of confidence. In the final reply of this series of exchanges, Orme (1966) points out that a .07 level of confidence is not significant and that, furthermore, even with inclusion of the Sum C variable only 52% of the schizophrenics produced protocols with two of the three signs present as compared to 32% of the neurotics. The difference using Chi Square was found to be significant at the .10 level of confidence.

The importance of these studies rests not so much in the issue of differences in levels of probability but rather

in the findings that schizophrenics do tend to give color dominated responses.

Conclusions Regarding the Research

Overall, research on the use of the Rorschach has failed to produce unequivocal evidence supporting either the concurrent validity or invalidity of the Rorschach as a diagnostic tool for use with schizophrenics. It is only a slight exaggeration to say that for any study supporting the use of the Rorschach there is a like study failing to concur. Taken alone, without regard for content, the pattern of the research is very interesting. Indeed, it is somewhat akin to a promising maiden.

While it may be concluded that the inconsistency of the research findings are due to the Rorschach itself, such a conclusion is difficult to defend since it implies that the instrument can be valid and, at the same time, invalid. Neither can experimental design, nor statistical treatment of the data, nor even differences in scoring systems fully account for the variance of the research since there is no reason to suspect that these variables would be distributed in a skewed fashion either favorable or unfavorable to the Rorschach. It can be assumed, however, that the nature of the samples which have been used may account for the inconsistent research findings.

Indeed, it may not be feasible to attempt to establish concurrent validity for the Rorschach using such a gross definition of schizophrenia. As already suggested, differences in sample composition may be inferred from those studies which have specified the type of schizophrenics studied by such terms as chronic, paranoid, ambulatory or remitted. Since the exact referents for these terms are unclear, generalization to other studies is unwarranted. Moreover, neither these descriptions nor the more general label of schizophrenic provides any basis whatsoever for controlling within group variance.

The variance between samples as well as within samples on the defining variable of schizophrenia may be the chief source of difficulty. What is needed is some way to reduce this sample variance so as to produce more homogeneous groups. The process-reactive distinction may serve this need very well.

The Process-Reactive Dimension

The process-reactive dimension is a bipolar classification system which is defined on a continuum of severity of illness. Process and reactive schizophrenics are not defined as dichotomous types but, rather, as continuous entities. The process-reactive dimension developed out of research on favorable and unfavorable prognostic indicators. Good prognosis has been related to a rapid onset of illness

with some definite precipitating factor, better socio-economic adjustment prior to illness, and to marriage. Poor prognosis has been found to be related to the obverse of the factors (Hunt and Appel, 1936; Malamud and Render, 1939; Kant, 1940, 1941, 1944; Chase and Silverman, 1943). In terms of the process-reactive dimension, those with poor prognosis are defined as falling into the process range while those with good prognosis fall into the reactive range.

The development of scales for use in identifying process and reactive schizophrenics has greatly facilitated research which has focused on the contrast between process and reactive subjects. A wide variety of variables have been studied including factors such as organicity (Brackbill and Fine, 1956; Tutko and Spence, 1962), reactivity to internal stimulation (Judson and Katahn, 1963), cognitive functioning (Elisio, 1963; Strum, 1965), and perceptual functioning (Bleke, 1955; Zahn, 1959). For the purposes of this review, the most important comparisons of process and reactive schizophrenics are those which have focused on the use of the Rorschach.

Process-Reactive Schizophrenics and the Rorschach

A number of studies have been carried out using the Rorschach to investigate the hypothesis that process schizophrenics show less mature perceptual development than do

reactive schizophrenics. Becker (1956) hypothesized that process subjects would show less a differentiated and more global type of perception than reactive subjects. Rorschach protocols of process and reactive subjects were scored using Friedman's (1952) scoring system which measures the genetic level of perceptual development. The hypothesis of the study was supported and is in agreement with the results of Fine and Zimet (1959) and Zimet and Fine (1959). A study by Judson and Martin (1964), however, contradicts the findings of the Becker (1956) study.

The importance of the process-reactive dimension for use in the research on the concurrent validity of the Rorschach is clearly indicated in a study by Kantor and Herron (1966). The study was designated to test the hypothesis that subjects classed as either process or reactive subjects would vary in terms of severity of pathology. Ratings of Rorschach protocols confirmed the hypothesis. Pathology was more severe for process subjects than for reactive subjects. Very curiously, however, the Rorschach protocols of reactive subjects were judged as neurotic or normal, not as schizophrenic. Since reactive subjects were found to be less severely disturbed than process subjects, one might expect their Rorschach protocols to differ somewhat, but hardly to the extent that they would be rated as neurotic or normal since reactive subjects were defined as schizophrenic on the basis of psychiatric evaluation.

The study of Kantor, Wallner, and Winder (1953) supports the finding regarding the diagnosis of reactive subjects. These authors used the Rorschach protocols of process and reactive subjects as part of a study designed to investigate the use of a scale for distinguishing between process and reactive schizophrenics. The Rorschach protocols of process subjects were judged as psychotic while the Rorschach protocols of reactive subjects were judged as non-psychotic.

The findings of these two studies suggest an explanation for the fact that research has failed to provide conclusive support for the concurrent validity of the Rorschach as a measure of schizophrenia. It may simply be that reactive subjects have been included in the samples of the various studies. If reactive subjects are not diagnosed as schizophrenic on the Rorschach, their inclusion in research samples would act as a suppressor variable and lessen the extent to which the group as a whole did produce Rorschach indications of schizophrenic functioning. Moreover, as the proportion of reactive subjects in samples has differed among studies, the suppression effect would also differ. Contradictory findings would then be the rule among studies which have used the Rorschach with schizophrenics. This is, in fact, exactly the case.

The argument above would be important, however, only in so far as the Rorschach is valid as a measure of any type

of schizophrenic functioning, non-reactive or not. Finding that reactive subjects are not diagnosed as schizophrenic on the Rorschach in no way whatsoever implies that the Rorschach is valid for other forms of schizophrenia. Inconsistency in diagnosing subjects from the same population, in fact, suggest that it may be invalid for the entire population. Accordingly it is important to determine how process and reactive subjects differ on the Rorschach and to determine whether the instrument does or does not diagnose reactive subjects as schizophrenic. Several aspects of the Kantor, Wallner, and Winder (1953) and Kantor and Herron (1966) studies suggest that it may.

With regards to the Kantor, Wallner, and Winder (1953) study, there is some doubt about the adequacy of the judges who were used to rate the protocols as well as the judging procedure which was followed. Protocols were supposedly judged by trainee psychologists "each of whom had adequate previous training in the administration of the test" (p. 160). The analysis of the protocols was made with the assistance of an advanced trainee and "then reviewed by a staff psychologist who had prior interpretation experience with more than five hundred Rorschachs" (p. 160). Who actually made the judgments is unknown. Moreover, the basis for judging a protocol as non-psychotic or psychotic was not stated. The basis may have been inadequate particularly with

regards to reactive subjects since the greatest amount of disagreement came in the case of judging reactive subjects.

Kantor and Herron (1966) fail to deal with the finding that reactive subjects are not diagnosed as schizophrenic except to note that " . . . the Rorschach diagnosis count as neurotic or normal the reactive schizophrenics who compose about half the sample" (p. 77). Nothing further is mentioned by way of explanation. One is left to assume that the Rorschach protocols of the reactive subjects were judged as non schizophrenic without knowing the basis for judgment. Since the study used a scale of malignancy to rate each protocol in relation to the hypothesis, one may assume that the protocols of the reactive subjects were judged non-psychotic using this scale. The scale is composed of five items ranging from "No Schizophrenia" to "Severe Schizophrenia," and is shown below:

1. No Schizophrenia: 2-5 M, M/C equal, FC larger than CF, A% ranges from 33 to 59, about 5 to 9 P.

2. Mild Schizophrenia: well integrated, adequate reality contact, may be somewhat flat emotionally, shows neurotic overlay, color shock, low C.

3. Moderate Schizophrenia: some integration of personality, but distortion in some area such as thought process, marked anxiety, or lessened reality contact, low A%, M/C higher on C.

4. Strong Schizophrenia: somewhat disorganized, poor reality contact, some disruption of thought processes, affectively very flat or labile, may show pure C responses, high A%, more than three responses, abstract reactions, no M.

5. Severe Schizophrenia: completely disorganized, overtly disturbed, loss of reality contact, thought processes odd, few responses, low P, pure C, color naming, perseveration (p. 105).

Inspection of the scale shows that as the items indicate increasing severity, there is less consideration given to the scoring system. All five factors in the Item "No Schizophrenia" are taken entirely from the scoring summary while only two of the nine factors in the Item "Severe Schizophrenia" are so derived. No indication is given as to the basis for judging such factors as "lessened reality contact" ("Moderate Schizophrenia"), or "completely disorganized" ("Severe Schizophrenia"). Moreover, no indication is given as to how contradictions between such factors as "may show pure C responses" and "affectively very flat or labile" ("Strong Schizophrenia") were resolved.

With reference to the factors which are included in the Item "No Schizophrenia," it is questionable as to whether a diagnosis of "No Schizophrenia" required the presence of all factors or just some, and if just some, how many. Reference to Beck's (1945) sample protocols shows wide variance in terms of M, M:C, FC, CF, A% and P in the records of both schizophrenics and non schizophrenics. Indeed some schizophrenics may show some of the factors contained in the item "No Schizophrenia" while some non schizophrenics may show an absence of some of the same factors. Accordingly, to rate a protocol as "No Schizophrenia" on the basis of less than all of the factors

contained in this term would risk producing false negatives. Whether this did occur cannot be ascertained from the study as reported since the authors fail to describe the content of the protocols judged schizophrenic or non schizophrenic.

One critical variable which may have been left uncontrolled in both the Kantor, Wallner, and Winder (1953) study and in the Kantor and Herron (1966) study is the variable of time between hospital admission and administration of the Rorschach. Neither study reports on this variable. The time lapse between hospital admission and Rorschach administration is important since reactive subjects recover over time. If the Rorschach records of reactive subjects were taken at a time interval considerably past hospital admission, the findings that reactive subjects are not diagnosed as schizophrenic may actually be based on the protocols of recovered subjects. Accordingly, the conclusion that reactive schizophrenics are not diagnosed as schizophrenic on the Rorschach must be regarded as tentative. It is questionable as to whether the findings of the Kantor et al. (1953) and the Kantor and Herron (1966) studies came about because of the invalidity of the Rorschach or because of different levels of improvement among reactive subjects.

In view of the implications for the concurrent validity of the Rorschach, the question of whether or not reactive subjects are diagnosed as schizophrenic on the Rorschach deserves further study. The matter should be

approached using a more extensive and explicit basis for diagnosis, more experienced judges and controls for the effect of administering the Rorschach at an interval considerably past the time of hospital admission. Measures of improvement independent of Rorschach signs themselves should also be used in order to show a relation between recovery and differential performance on the Rorschach. This study was carried out under these conditions and was designed to investigate the Rorschach diagnosis of process and reactive schizophrenics as it may be affected by recovery.

PURPOSE

Finding that reactive schizophrenics are not diagnosed as schizophrenic on the Rorschach implies that the concurrent validity of Rorschach indices which hypothetically measure schizophrenia must be re-evaluated and questioned. Indeed, the notion that reactive subjects are not diagnosed as schizophrenic on the Rorschach clearly suggests that the Rorschach may have little if any validity as a measure of schizophrenic functioning.

The question, of course, is whether or not reactive subjects can be diagnosed as schizophrenic when an extensive set of Rorschach signs indicative of schizophrenia is used as the basis for diagnosis and when the time interval between hospital admission and administration of the Rorschach is controlled for the effect of recovery or improvement.

This study was conducted to answer this very question. Rorschach protocols of process and reactive subjects tested at the time of hospitalization and at a period of from three to six months after hospitalization were compared with the Rorschach protocols of non schizophrenics on the basis of a number of Rorschach variables which indicate schizophrenia. It was assumed that all groups of

schizophrenics would differ significantly from non schizophrenics on the Rorschach signs thereby providing support for the concurrent validity of the Rorschach as a measure of schizophrenic functioning. In order to determine how differences in the length of hospitalization may affect the Rorschach performance of process and reactive subjects, comparisons on the signs were made between groups of process and reactive subjects tested early in hospitalization and later in hospitalization.

The Thinking Disorganization and the Withdrawal Scales of the Psychotic Reaction Profile (Lorr, O'Conner, and Stafford, 1960) were used as an independent measure of improvement due to hospitalization. It was assumed that if differences on the Rorschach signs of schizophrenia were due to recovery or improvement during hospitalization, this effect would be observed by comparing the behavior ratings of process and reactive subjects tested early and later in hospitalization.

HYPOTHESES

In line with the purpose of this study, the following hypotheses were developed.

Hypothesis 1

More hospitalized schizophrenics show Rorschach signs of schizophrenia than do non schizophrenics.

Hypothesis 2

More reactive schizophrenics tested early in hospitalization show Rorschach signs of schizophrenia than do reactive schizophrenics tested later.

Hypothesis 3

There is no difference between reactive and process schizophrenics tested early with respect to the number of Rorschach signs of schizophrenia produced.

Hypothesis 4

There is no difference between process schizophrenics tested early and later with respect to the number of Rorschach signs of schizophrenia produced.

Hypothesis 5

Reactive schizophrenics tested early show more thinking disorganization and withdrawal behavior than reactive schizophrenics tested later.

Hypothesis 6

There is no difference in the levels of thinking disorganization and withdrawal behavior of reactive schizophrenics tested early and process schizophrenics tested early.

Hypothesis 7

There is no difference in the levels of thinking disorganization and withdrawal behavior of process schizophrenics tested early and process schizophrenics tested later.

METHOD

Description of Subjects

Schizophrenic Sample

Hospitalized schizophrenics were used by the experimenter to form a pool of potential subjects. Individual patients were included in the pool on the basis of information gathered from clinical files regarding diagnosis, age, date of hospitalization, level of education, and prior hospitalizations.

Potential subjects were taken from the pool one at a time and screened by the experimenter in order to ascertain whether their mental status would permit them to serve as subjects. It was necessary to reject several potential subjects because they were too disturbed to participate in the research. Those subjects judged able to serve were invited to volunteer. The research was explained by the experimenter as dealing with recently admitted and long-staying hospitalized patients. It was stressed that participation would in no way affect either current or future hospital status.

Those patients who agreed to serve as subjects were immediately tested and then classed on the basis of whether

they were process or reactive schizophrenics as well as according to whether they had just recently been hospitalized or whether they had been hospitalized for some time. The procedure described was followed until four groups of subjects had been formed: reactive subjects tested early in hospitalization; reactive subjects tested later in hospitalization; process subjects tested early in hospitalization; and process subjects tested later in hospitalization. Each group contained 15 subjects. Each subject carried a current hospital diagnosis of schizophrenia.

Four early reactive and four early process subjects were drawn from the population of a psychiatric receiving hospital. All other subjects were drawn from a VA hospital population. The procedure of testing subjects first and then classifying them necessarily resulted in extra subjects having been tested. The additional subjects were not included with the final sample of the study.

Early reactives and early process subjects had been hospitalized for a mean of 12.13 days (SD = 6.76) and 10.40 days (SD = 5.14), respectively. The difference between the number of days the subjects had been hospitalized was not significant ($t = .772$, $p < .25$, 28 df). Late reactive and late process subjects had been hospitalized for a mean of 5.30 months (SD = 2.38) and 5.35 months (SD = 1.32), respectively. The difference in the length of time these

subjects had been hospitalized was not significant ($t = 0.68$, 28 df).

All subjects were male and came from an urban background. The mean age for schizophrenic subjects was 35.29 years ($SD = 8.92$). A one-way analysis of variance comparing the ages of the schizophrenic was not significant ($F = 1.662$, $p < .25$, 3, 56 df). The mean level of education for schizophrenic subjects was 11.05 years ($SD = 1.75$). A one-way analysis of variance comparing levels of education was not significant ($F = 1.813$, $p < .25$, 3, 56 df). Further comparisons were made on the variables of the number of prior hospitalizations and length of time between last and current hospitalization. No significant differences were found.

Detailed statistics computed on the control variables are shown in Appendix A.

Non Schizophrenic Controls

In order to test the hypotheses of this study it was necessary to have a non schizophrenic comparison group. To provide such a group the Rorschach protocols of 15 hospitalized, non schizophrenics were taken from the files of the VA hospital. The diagnostic testing report as well as the clinical file for each non schizophrenic was checked in order to insure that they truly were not schizophrenic. The majority carried a diagnosis of anxiety reaction or anxiety

neurosis. The diagnosis for each of the control subjects is shown in the Appendix B.

The mean age for the non schizophrenic sample was 34.66 years (SD = 5.86). A one-way analysis of variance of the ages of the combined sample of schizophrenics and non schizophrenics was not significant ($F = 1.410$, 4, 70 df). The mean level of education for the non schizophrenic sample was 10.00 years (SD = 1.41). A one-way analysis of variance of the levels of education for the combined sample of schizophrenics and non schizophrenics was not significant ($F = 2.317$, $p < .10$, 4, 70 df).

Further comparisons using the combined sample of schizophrenics and non schizophrenics were carried out on the variables of number of prior hospitalizations, length of prior hospitalizations, and length of time between last and most recent hospitalization. No significant differences were found except for the variable of length of prior hospitalizations ($F = 3.695$, $p < .05$, 4, 45 df). Schizophrenics were found to have had longer prior hospitalizations than non schizophrenics. More complete statistics for these variables have been included in Appendix A.

Techniques and Instruments

The Rorschach

The Rorschach was administered to the subjects of this study by the experimenter. In all cases the Rorschach

was given prior to rating the subjects as process or reactive schizophrenic.

Very early in the data collection period the experimenter noted that many subjects became increasingly anxious as they progressed through the series of cards, presumably in response to the thoughts or feelings which were aroused by the stimulus configurations on the cards. Due to the nature of the sample, the experimenter questioned what impact the testing session might have on some subjects. It seemed advisable to devise some procedure for estimating this impact so that steps could be taken to avoid doing harm to the subjects.

The potent capacity of the Rorschach to upset a precariously balanced adjustment was clearly indicated by one incident with a particular subject. The subject in mind responded to the first cards of the series quickly, easily and in a flippant manner. Card IV, however, elicited the response "My mother." The subject's responses became increasingly pathogenic in content and were accompanied by an increase in the subject's tension level. Areas Dl, Dl3, and Dl5 on Card X were "things coming towards me, trying to get me." At the beginning of the Inquiry the subject threw down Card X and began to sob. At this point the session was aborted and the experimenter focused on calming the subject. An offered box of kleenex was forcibly knocked from the experimenter's hand and the subject began hitting the wall

with his knuckles. The incident finally abated, but only after the subject had broken an ear plug for a transistor radio by whipping it against a brick wall and smeared himself with paint from a nearby working area.

Although the incident described was the only one of its kind which occurred during the data collection period, it did emphasize the issue of potentially dangerous impact. Indeed, the matter was one of subjecting patients to a situation which could be stressful and which might be harmful to them.

To forestall any damaging effect, the experimenter adopted the procedure of inquiring regarding a subject's willingness to complete the testing session when increased tension was noted and continued without relief. In some cases the procedure acted as a tension reducer and allowed the testing session to be completed. Only one subject requested that the testing be terminated.

The Premorbid History Scale

The schizophrenic subjects in the study were defined as either process or reactive schizophrenic on the basis of scores obtained by rating each subject on the Premorbid History Scale (PMHS) of the Prognostic Rating Scale (Phillips, 1953). The six categories of the PMHS are shown below. Depending on the age of the subject, either category C or Category D is used.

A. Recent sexual adjustment

B. Social aspects of sexual life during adolescence

C. Social aspects of recent sexual life: 30 years of age and above

D. Social aspects of recent sexual life: below 30 years of age

E. Personal relations: history

F. Recent premorbid adjustment in personal relations

Each category contains from five to seven items arranged in step fashion from behaviors characteristic of reactive schizophrenics to behaviors characteristic of process schizophrenics. Subjects are rated on only one item in each category. Each item carries a value of from zero to six. A total score is obtained by summing the values of the items which are descriptive of a subject. Minimum and maximum scores are 0 and 30. In the original study (Phillips, 1953), subjects scoring from 0 to 15 were classed as reactive schizophrenics and subjects scoring from 16 to 30 were classed as process schizophrenics. The same cut-off points were used here. The PMHS is shown in Appendix C.

The mean ratings on the PMHS for early reactive and late reactive subjects were 8.60 (SD = 3.720) and 10.00 (SD = 2.309), respectively. The difference between these means was not significant ($t = 1.19633$, $p < .15$, 28 df). The mean ratings for early process and late process subjects were 21.86 (SD = 3.597) and 22.26 (SD = 3.419), respectively. The difference between these means was not significant

($t = .301$, $p < .40$, 28 df). All cross comparisons by time and process-reactive status were significant ($p < .001$).

Ratings on the PMHS have most often been reported as based in social history data taken from clinical files. It was impossible, however, to follow the procedure of using social history data to rate the subjects in the present study. Social history data was unavailable for some subjects due to recency of hospitalization. For other subjects, the only social history data available was that which had been gathered at the time of a previous hospitalization. This data contained no information about recent sexual, social or premorbid adjustment. In still other cases, social history data was current but incomplete in terms of the information required for the ratings.

As an alternative to using social history data, the experimenter chose to base the Premorbid History Scale ratings on an interview with each subject. These interview based ratings were checked against social history data when it was available and useable. In order to carry out the interviews, a series of questions were developed based on the content of the items in each category of the PHMS. The questions were designed in such a way that, except for the first question, the focus of any question was determined by the immediately preceeding answer. Accordingly, questions could be asked with increasing focus until the amount of information necessary for rating an item in each category

had been obtained. For example, with Category A (Recent Sexual Adjustment), the answer to an initial question regarding marital status would determine whether the second question focused on the information required by Item 2, Item 3, or Item 4b. The answer to the second question would determine whether the third question should focus on Item 3, Item 4a, or Item 5a, and so on.

All interviews were carried out by the experimenter. The ratings were completed as the interview progressed. All interviews were carried out after the Rorschach had been administered in order to control for possible bias due to knowing the process-reactive classification of subjects.

The Ullmann-Giovannoni Scale

A second measure used in the study to define subjects as process or reactive schizophrenics was the Ullmann-Giovannoni Scale (UGS) (Ullmann and Giovannoni, 1964). The UGS, shown in Appendix D, was included in the study to serve as a partial check on the procedure followed in rating subjects on the PMHS. Subjects were rated on the UGS immediately after ratings on the PMHS had been obtained.

The UGS consists of 24 items answered true or false. Item content deals with marital status, stress factors, work history, sexual relations, social relations and prior hospitalization. The ratings were made by the experimenter

who read the items to the subjects and recorded the affirmative or negative responses.

The original study (Ullmann and Giovannoni, 1964) reports the direction in which 638 reactive subjects were found to answer each item. A subject's score is obtained by summing the number of items answered in the reactive direction. Minimum and maximum scores are zero and 24, with high scores defining reactive subjects. The original study provides no information regarding the cut-off points for process and reactive schizophrenics, or for the amount of overlap which may be expected. For the present study, process subjects were defined by scores of from 0-11. Reactive subjects were defined by scores of from 14-24. An indeterminate range was defined by scores of 11, 12, and 13.

Using the cut-off scores, 20 subjects in the present study were defined as reactive schizophrenic and 22 subjects were defined as process subjects. The mean scores for the reactive and process subjects were 15.757 (SD = 1.568) and 7.875 (SD = 2.108), respectively. The mean scores for 11 reactive subjects tested early and 9 reactive subjects tested late were 16.182 (SD = 1.466) and 15.333 (SD = 1.564). The difference between the mean scores was not significant ($t = 1.251$, $p < .15$, 18 df). The mean scores for 10 process subjects tested early and 12 process subjects tested late were 7.500 (SD = 2.617) and 8.250 (SD = 1.479), respectively. The difference between these mean scores was not significant

($t = .8648$, $p < .250$, 10 df). Eighteen subjects fell into the indeterminate group with a mean score of 11.777 ($SD = 1.315$).

While the scores of the process and reactive subjects are in accord with what might be expected on the basis of the original study, the main question is that of the relationship between the UGS and PMHS scores. Reactive subjects are defined by high scores on the UGS and low scores on the PMHS. The converse is true for process subjects. Negative correlations are thus expected if the instruments are in basic agreement regarding classification of subjects. The correlation between scores on the UGS and the PMHS for those subjects defined as process or reactive schizophrenic by the UGS was $-.899$ ($p < .001$, 40 df). For those subjects defined as reactive schizophrenic, the correlation between the scores on the two instruments was $-.299$ (NS, 18 df). The correlation between the scores on the UGS and PMHS for subjects defined as process schizophrenic by the UGS was $-.584$ ($p < .005$, 20 df). The same relation of significant and non-significant correlations was observed for subjects defined as reactive schizophrenic and tested early ($r = -.252$, NS, 9 df) or late ($r = .342$, NS, 7 df), and for subjects defined as process schizophrenics and tested early ($r = -.586$, $p < .05$, 8 df) or late ($r = -.638$, $p < .025$, 10 df).

The correlation of the scores on the UGS and PMHS for those defined as either process or reactive schizophrenic by the UGS would indicate a high degree of agreement between the two instruments. Johnson and Ries (1967) compared PMHS scores and UGS scores for two samples of process and reactive subjects. The correlations between scores were -.75 ($n = 50$, $p < .01$) for one sample and -.58 ($N = 41$, $p < .01$) for the other. Comparing sample sizes, the correlation of -.899 obtained in this study is considerably higher than those obtained in the Johnson and Ries (1967) study.

The relation between the PMHS and UGS would appear to hold only for process subjects, however, since the correlation between the PMHS scores and UGS scores for subjects defined as reactive schizophrenics by the UGS, although in the expected direction, failed to reach significance. No comparisons between these results and those of the Johnson and Ries (1967) study are possible since the previous researchers failed to report on the correlations between the PMHS and UGS by subject class.

The low correlation between the PMHS scores and the UGS scores for reactive subjects as defined by the UGS may be attributed to the fact that, in this study, more reactive subjects than process subjects scored closer to the cut-off point for process and reactive subjects on the PMHS. Thirteen reactive subjects scored in the 8-15 range on the

PMHS, while 8 process subjects scored in the 16-22 range on the PMHS. The mean PMHS scores of these subjects were 11.00 and 19.00 respectively, indicating that they were within the acceptable reactive range and process range on the PMHS. The effect of the scores of the 13 reactive subjects on the UGS was to reduce the correlations between the PMHS and UGS.

In spite of the fact that the UGS defined fewer subjects as process or reactive schizophrenic than the PMHS, the PMHS ratings were used as the basis for identifying process and reactive subjects in this study. The PMHS is a widely used instrument and has been shown to correlate highly with other standard measures of the process-reactive continuum (Garfield and Sundland, 1966). Moreover, what actually constitutes a reactive score on the UGS needs further research, as does the issue of whether or not process schizophrenics can be identified by a set of questions which are answered in an opposite direction to the way in which reactive schizophrenics answer.

The Thinking Disorganization and Withdrawal Scales

The Thinking Disorganization and Withdrawal Scales of the Psychotic Reaction Profile (PRP) were used in this study as a measure of the emotional health of the subjects. The PRP was developed by Lorr, O'Conner, and Stafford (1960) for use by psychiatric attendants and ward nurses in rating

patient behavior. Minimum observation time necessary for use of the scales is three days. Reliability for the Thinking Disorganization Scale and the Withdrawal Scale has been reported as .90 and .94 respectively (Lorr, O'Conner, and Stafford, 1960).

The Thinking Disorganization Scale consists of 18 items which are descriptive of disorientation, irrelevant speech, hallucinations, and peculiar movements. The Withdrawal Scale consists of 38 items dealing with activity level, interest in the environment, and interpersonal relations. Each item is answered True or Not True and scores are derived by summing the number of items which are rated in a direction indicative of thinking disorganization and withdrawal.

In the present study, items from the Thinking Disorganization Scale and Withdrawal Scale were randomly combined into one composite scale. Also included in the questionnaire was an item regarding the procedure used in completing the questionnaire and an item asking about the length of time the rater had known the subject.

Instructions for the use of the Thinking Disorganization and Withdrawal Scales were printed at the top of each rating sheet used by the ward personnel. The instructions read as follows:

> Listed below are 56 items which describe types of behavior which you have probably seen before in working on psychiatric wards. Keeping in mind the

> patient whose name is shown above, answer each item according to whether it is true or not true of him. Cross out (T) if it is true--cross out (NT) if it is not true.
>
> This will take about 10 minutes. Work quickly. Put down your first impression, it's likely to be most accurate. Don't change your answers. And . . . Thank you very much for your help.

The experimenter interviewed each rater before the ratings were carried out in order to determine whether the instructions were understood and whether the raters knew the subjects well enough to rate them. Due to the demands on staff time, it was impossible to give the raters training with the scales.

As a basis for estimating the reliability of the ratings, 23 subjects were rated by two different raters. The product-moment correlation for the ratings on the combined Thinking Disorganization and Withdrawal Scale was .635, significant at the .005 level of confidence (44 df). The correlation for the ratings on the Thinking Disorganization Scale was .505, significant at the .01 level of confidence (21 df). The correlation for the ratings on the Withdrawal Scale was .252 and not significant (21 df).

The correlation between the length of time the raters knew the subjects and the ratings on the Thinking Disorganization Scale and Withdrawal Scale were not significant. Additional correlations between ratings for subjects by groups are shown in Appendix F. The Thinking Disorganization and Withdrawal Scale is shown in Appendix E.

Scoring of the Instruments

The Rorschach: Reliability Training

Two Ph.D. clinical psychologists were used to score the Rorschach protocols in this study. Each judge had completed course work on the Rorschach and had also used the Rorschach in a professional capacity. In spite of this experience, both judges were given intensive training before scoring the actual data of the study.

The judges were trained to score according to Beck's (1961) system. They were also trained to score 11 variables not formally included in the system: Card Edging, Color-naming, Clang associations, Contaminations, Cosmic Themes, Excessive Card Turning, Pathogenic Verbalizations, Personal Intrusions, Perseverations, Rejections, and Vivid Descriptions. As part of the training each judge scored 11 Rorschach protocols of schizophrenics and non schizophrenics. The protocols were taken from a different project and were not a part of the data of this study. Both judges scored the same protocols. The training protocols were grouped in four sets of 3, 3, 2, and 3 protocols each. After scoring each set, the judges met and discussed the scoring procedures. Correlation data computed on the scoring of the two judges were presented during these discussions and reviewed as the data indicated points of agreement and disagreement. The data proved invaluable as the correlations

quickly indicated that the largest amount of disagreement occurred in scoring for Pathogenic Verbalizations, Personal Intrusions, Contaminations, and Confabulations. Extensive effort was made to define these variables in a rigorous and meaningful way so that the exact definitions could be used by the judges in judging the scoring task.

The correlation between the judgments for all variables scored on the last five training protocols ranged from +.75 to +1.00, indicating a satisfactory degree of reliability.

The Rorschach: Scoring the Protocols

The protocols of the non schizophrenic sample were recopied to make them indistinguishable from the schizophrenic protocols. All protocols were coded and scored according to Beck's (1961) system and for the 11 variables listed above. In addition, the judges were asked to make global ratings for each protocol on a 6-point scale of Emotional Health with 1 indicating high health and 6 indicating high pathology. The judges were instructed to make their ratings on the basis of their clinical feelings regarding the protocols. No attempt was made to define emotional health and no practice was given in making the ratings.

Thirty protocols were randomly selected from the total 75 and designated as Reliability Protocols. In turn, these 30 protocols were randomly assigned to three

Reliability sets: Set R1, Set R2, and Set R3. Each set contained 10 protocols. The remaining 45 protocols were designated as Non-Reliability Protocols and randomly assigned to six Non-Reliability sets: Set NR1, Set NR2, Set NR3, Set NR4, Set NR5, and Set NR6. Sets NR5 and NR6 contained two and three protocols, respectively. All other Non-Reliability sets contained 10 protocols.

The Reliability (R) and Non-Reliability (NR) sets were arranged in alternate fashion over a series of six trials. Odd numbered trials were designated Reliability Trials and even numbered trials were designated Non-Reliability Trials. Both judges scored the same set of protocols on Reliability Trials. Each judge scored different sets of protocols on Non-Reliability Trials. The protocols were scored as follows: Set R1 was scored on Reliability Trial 1; Sets NR1 and NR2 were scored on Non-Reliability Trial 2; Set R2 was scored on Reliability Trial 3; Sets NR3 and NR4 were scored on Non-Reliability Trial 4; Set R3 was scored on Reliability Trial 5; Sets NR5 and NR6 were scored on Non-Reliability Trial 6.

Following each Reliability Trial and before the next Non-Reliability Trial, product-moment correlations were computed for each variable scored in the reliability protocols. Accordingly, a continuous check was made on the judges' scoring. This procedure also permitted the experimenter to provide the judges with feedback information about the

scoring and to pinpoint those variables which required greater scoring accuracy.

The correlation between the judges' scoring of FC, FV, FT, Contaminations and Pathogenic Verbalizations fell below the .05 level of significance on Reliability Trial 1. For Reliability Trial 2 the correlations for CF, S% and Perseverations were below a .05 level of significance. All other variables were significant at a level of .05 or better on both Reliability Trials 1 and 2.

In computing the reliability of the judges' scoring of the Rorschach variables, it was difficult to interpret the meaning of the correlations which resulted from two types of patterns which the scores took on. The correlations resulting from the patterns referred to were termed Indeterminate Correlations. Correlations resulting from all other patterns were termed Determinate Correlations. The first pattern was that of perfect agreement between the judges regarding the absence of some variable, that is where O-A/O-B scores were observed for some variable in all protocols in a reliability set, and where O-A and O-B are defined as zero scores assigned by Judge A and Judge B. The formula for the product-moment correlation in this case reduced to

$$\frac{0}{0},$$

an impossible mathematical operation since a division by zero is not permitted. The most feasible method for

interpreting this case was to define the correlation coefficient as Indeterminable but to report it as +1.00, thus reflecting the important fact that both judges did agree on the absence of the variable.

The second pattern occurred when both judges agreed on the absence of some Rorschach variable in all but one protocol in a reliability set, and when the variable for this protocol was given a numerical score by one judge but a zero score by the other judge. That is, where some variable for 9 protocols was scored O-A/O-B, but X-A/O-B, or O-A/X-B for 1 protocol, where O-A, O-B are defined as zero scores assigned by Judge A and Judge B, and where X-A and X-B are defined as numerical scores assigned by Judge A or Judge B. The pattern described above resulted in a correlation of 0.00 which was defined as Indeterminate and reported as 0.00. It should be noted, however, that the correlation failed to reflect the agreement of the judges in 9 out of 10 cases regarding the absence of the variable. As the number of O-A/O-B scores decreased to 8 and as the number of X-A/O-B, or O-A/X-B scores increased to 2, the sign of the 0.00 correlation became negative. As the ratio of O-A/O-B scores to X-A/O-B scores (or O-A/X-B scores) increased beyond 8:2, the correlation took on a negative numerical value which reflected the difference in the judges' scoring.

Product-moment correlations were used to compute the final reliability of the judges' scoring of the 30 reliability protocols. Following Guilford's procedure (1965, pp. 348-349), correlation coefficients for each variable were transformed to z' scores which, weighted by the degrees of freedom, were summed and divided by the total degrees of freedom. The resulting z' score was transformed back to r, the over-all correlation coefficient.

Combining Determinate and Indeterminate correlations resulted in an over-all correlation coefficient of .921 ($p < .001$, 49 df). For Determinate correlations, an over-all correlation coefficient of .920 was obtained ($p < .001$, 33 df). The over-all correlation coefficient for Indeterminate correlations was .928 ($p < .001$, 14 df). The correlations for each variable scored by the judges are included in Appendix G.

The correlation for the judges ratings of Emotional Health was .546 ($p < .001$, 28 df).

Treatment of the Data

The Rorschach

Four hypotheses of this study were concerned with Rorschach signs of schizophrenia (RSS). A total of 39 such signs were drawn from Beck (1945, 1954), Goldman (1960), Kelly and Klopfer (1939), and Piotrowski (1952) for use in this study. The RSS are shown in Appendix H.

In order to test the hypotheses it was first necessary to determine the number of RSS in each protocol. For the reliability protocols the mean score of Judge A and Judge B for each variable was used. The Median Test was used for each hypothesis. Yates Correction was applied in the Chi Square tests which were carried out in order to test for the significance of the difference in the number of subjects in the comparison groups falling above and below the common median. Fisher's Exact Test was substituted for Chi Square when the expected frequency was less than five.

Additional analyses was made for each RSS on the basis of the number of subjects in the comparison groups showing the presence or absence of each RSS. Chi Square with Yates Correction was used in these analyses. Fisher's Exact Test was substituted for Chi Square when the expected frequency was less than five.

The Thinking Disorganization and Withdrawal Scales

Three hypotheses of this study were concerned with the level of adjustment of the subjects as measured by the Thinking Disorganization and Withdrawal Scales. Level of adjustment as measured by these scales was defined as the number of items rated in a direction indicating thinking disorganization or withdrawal behavior. The mean score of the raters was used for those subjects on which the reliability of the ratings was based.

In order to test the hypotheses, scores on the Thinking Disorganization Scale were analyzed separately from the scores on the Withdrawal Scale. The analysis for each scale was carried out in two steps. The first step consisted of using a 2 X 2 analysis of variance to compare the scores of the subjects classed as process or reactive, tested early or late. The second step consisted of comparing the mean scores of each of the groups using the Newman-Keuls procedure.

RESULTS

Hypothesis 1: More hospitalized schizophrenics show Rorschach signs of schizophrenia than do non schizophrenics.

The first hypothesis was based on the notion that while non schizophrenics might produce protocols which contained Rorschach signs of schizophrenia (RSS), more schizophrenics would produce protocols which contained RSS. Indeed, this would be expected if the Rorschach does diagnose schizophrenia. Even though one of the major variables of interest in this study was the process-reactive dimension, it was decided to compare non schizophrenics with the entire group of schizophrenics as well as with each process and reactive group.

Accordingly, in testing Hypothesis 1, the first comparison was made on the basis of the number of schizophrenics and non schizophrenics scoring above and below the median RSS for the combined schizophrenic and non schizophrenic group. The median RSS and the Chi Square value for this comparison are shown in Table 1. With 1 df, a Chi Square > 0.9744 is clearly not significant.

A second set of comparisons was made in which each process and each reactive group was paired with the

Table 1. Median number of RSS for each group comparison with Chi Squares for the number of subjects scoring above and below the median RSS. The greater number of subjects showing the RSS is underlined.

Group Comparison	Median	Chi Square*	p+
Non Schizophrenic-Combined Process and Reactive	9.64	0.9744	.50
Non Schizophrenic-Early Reactive	9.50	0.5333	.50
Non Schizophrenic-Late Reactive	8.50	0.0000	0.00
Non Schizophrenic-Early Process	10.00	3.3333	.10
Non Schizophrenic-Late Process	8.90	0.5430	.50
Early Reactive-Late Reactive	9.50	0.5333	.50
Early Reactive-Early Process	11.50	0.0000	0.00
Early Reactive-Late Process	9.50	0.5333	.50
Late Reactive-Early Process	10.50	0.5333	.50
Late Reactive-Late Process	9.00	0.000	0.00
Early Process-Late Process	10.00	3.333	.10

*1 df

+p values are for two tailed tests. For one tailed tests the p values are halved.

non schizophrenic group. The median RSS and the Chi Square values for each of these comparisons is shown in Table 1. The only comparison which approached significance was the non schizophrenic early process comparison. With 1 df, p (Chi Square $\geq$ 3.333) = .10*. These results do not support Hypothesis 1. Rorschach signs of schizophrenia were not shown by more schizophrenics than non schizophrenics. The number of early reactive, late reactive, and late process subjects showing Rorschach signs of schizophrenia was not significantly different from the number of non schizophrenic subjects. There was a trend, however, for a significantly greater number of early process subjects than non schizophrenics to show Rorschach signs of schizophrenia.

Hypothesis 2: More reactive schizophrenics tested early in hospitalization show Rorschach signs of schizophrenia than do reactive schizophrenics tested later.

The second hypothesis, the central and the most important hypothesis of the study, is based directly on the notion that reactive schizophrenics do recover. Accordingly, it was assumed that the number of reactive schizophrenics producing RSS would be a function of recovery, where recovery increases over time and with lengthened hospitalization. It was furthermore assumed that the effect of

---

*A two tailed test was used in these comparisons. One tailed tests were also carried out and resulted in a significant difference for the non schizophrenic--early process comparison ($p < .05$).

recovery on the production of RSS would be most clearly demonstrated by comparing reactive subjects tested early with reactive subjects tested later in hospitalization.

The median RSS for the combined group of early and late tested reactive subjects is shown in Table 1 together with the Chi Square value for this comparison. With 1 df, the Chi Square value is not significant. Accordingly, Hypothesis 2 was not supported. There is no significant difference between the number of reactive subjects tested early and later in hospitalization who show Rorschach signs of schizophrenia.

Hypothesis 3: There is no difference between reactive and process schizophrenics tested early with respect to the number of Rorschach signs of schizophrenia produced.

The third hypothesis focuses on the issue of whether process schizophrenics are in fact more severly disturbed than reactive schizophrenics. An important factor in making such a comparison would seem to be the period at which process and reactive schizophrenics are compared relative to the point of recovery for reactive schizophrenics. It is reasonable to expect more similarity in degree of disturbance when process and reactive subjects are compared early in hospitalization than when compared later in hospitalization. The very fact of recent hospitalization would indicate a level of disturbance unaffected by the variable of recovery.

The results of testing Hypothesis 3 are shown in Table 1. With a common median of 11.50 RSS for the combined group of early process and early reactive subjects, the Chi Square value was not significant. Accordingly, Hypothesis 3 was supported. The number of early tested reactive subjects showing Rorschach signs of schizophrenia is not significantly different from the number of early tested process subjects.

Hypothesis 4: There is no difference between process schizophrenics tested early and later with respect to the number of Rorschach signs of schizophrenia produced.

The assumption underlying the fourth hypothesis was that process schizophrenics, contrary to reactive schizophrenics may never improve to any substantial degree. If this assumption is correct, then there would be no difference between process subjects tested at different points in the period of hospitalization with regard to Rorschach performance.

The results of testing Hypothesis 4 are shown in Table 1. With a common median of 10.00 RSS, the comparison between the number of early and late tested process subjects scoring above and below the median resulted in a Chi Square of 3.333. With 1 df, p (Chi Square $\geq$ 3.333) = .10. On the basis of this result Hypothesis 4 was supported. There was, however, a trend for more early process than late process subjects to show Rorschach signs of schizophrenia.

Hypothesis 5: Reactive schizophrenics tested early show more thinking disorganization and withdrawal behavior than reactive schizophrenics tested later.

Hypothesis 6: There is no difference in the levels of thinking disorganization and withdrawal behavior of reactive schizophrenics tested early and process schizophrenics tested early.

Hypothesis 7: There is no difference in the levels of thinking disorganization and withdrawal behavior of process schizophrenics tested early and process schizophrenics tested later.

Although the fifth, sixth, and seventh hypotheses of this study were stated individually, all three hypotheses rest on the assumption that process and reactive schizophrenics differ in potential for recovery so that, over time, recovery increases for reactive schizophrenics but is invariant for process schizophrenics. Implicit in this assumption is the notion that there is a maximum level of recovery for process schizophrenics which is less than the potential level of recovery for reactive schizophrenics. It was not assumed, however, that the same relation would hold true for degree of pathology. That is, process and reactive subjects should not differ in potential for emotional disturbance. If the assumption is correct, then different levels of adjustment would be characteristic of process and

reactive subjects, depending on the point in hospitalization at which they were tested. These observed differences would explain differences as well as similarities in the Rorschach protocols of process and reactive subjects tested early and late.

Table 2 shows the mean scores and standard deviations of early and late tested process and reactive subjects on the Thinking Disorganization and Withdrawal Scales. Lorr, O'Conner, and Stafford (1960) report the mean scores of open and closed ward patients on the Thinking Disorganization Scale as 2.66 and 4.16, respectively. The mean scores of open and closed ward patients on the Withdrawal Scale were reported as 14.35 and 17.13, respectively. The Thinking Disorganization Scale scores of the late tested subjects in the present study are most like the scores of open ward patients, while the scores of the early tested subjects are most like the score of closed ward patients. The Withdrawal Scale scores of the reactive subjects in the present study are most like those of open ward patients while the scores of the process subjects are most like those of closed ward patients.

Hypotheses 5, 6, and 7 were tested together and in two steps. In the first step a 2 X 2 analysis of variance was carried out comparing the scores of the early and late tested process and reactive subjects on the Thinking Disorganization Scale. A summary of the analysis of variance is shown in Table 3.

Table 2. The means and standard deviations of early and late tested process and reactive subjects on the Thinking Disorganization and Withdrawal Scales.

	Early Reactive	Late Reactive	Early Process	Late Process	All Process	All Reactive	All Early Tested	All Late Tested
Thinking Disorganization								
Mean	4.433	2.166	5.566	3.233	4.400	3.300	5.000	2.700
SD	5.45	3.59	5.03	3.34	4.42	4.75	5.274	3.51
Withdrawal Scale								
Mean	12.433	10.866	18.733	19.300	19.016	11.650	15.583	15.083
SD	7.86	7.20	9.43	9.38	9.41	7.59	9.24	9.365

Table 3. Summary table of the 2 X 2 ANOVA for early and late tested process and reactive subjects on the Thinking Disorganization Scale.

Source of Variation	Sum of Squares	df	Mean Square	F
Process - Reactive	79.35	1	79.35	6.419[b]
Early - Late	18.15	1	18.15	1.468
Interaction	493.45	1	493.45	39.923[a]
Error	692.70	56	12.36	
Total	1283.65			

[a] $p < .01$

[b] $p < .05$

The significant F for the process-reactive effect and the interaction effect indicates that the main determinants of scores on the Thinking Disorganization Scale were the process-reactive classification in interaction with the early-late variable. As a main effect, being tested early or late had no effect on the scores of the process or reactive subjects.

In order to determine which of the groups contributed to the results of the analysis of variance, the means of the early and late tested process and reactive subjects were compared using the Newman-Keuls procedure (Winer, 1962, pp. 77-85). The results of these comparisons showed the only significant difference to occur in the early

process - late reactive comparison ($p < .05$). The prediction made in Hypothesis 5 was not supported. Early reactive and late reactive subjects did not differ in terms of thinking disorganization. Hypotheses 6 and 7 were supported. Early reactive subjects and early process subjects, as well as early process and late process subjects did not differ in degree of thinking disorganization.

In the second step of testing Hypotheses 5, 6, and 7, a 2 X 2 analysis of variance was carried out comparing the scores of the early and late tested process and reactive subjects on the Withdrawal Scale. A summary of the analysis of variance is shown in Table 4.

Table 4. Summary table of the 2 X 2 ANOVA for early and late tested process and reactive subjects on the Withdrawal Scale.

Source of Variation	Sum of Squares	df	Mean Square	F
Process - Reactive	813.69	1	813.69	10.444[a]
Early - Late	3.75	1	3.75	0.048
Interaction	17.40	1	17.40	0.223
Error	4363.00	56	77.91	
Total	5197.84			

[a] $p < .01$

The highly significant F for the process-reactive effect indicates that the process-reactive classification was the main determinant of scores on the Withdrawal Scale. The period of hospitalization at which subjects were tested had no effect on the scores either alone or in interaction with the process-reactive classification.

In order to determine which of the groups contributed to the effect of the process-reactive classification, the means of the early and late tested process and reactive subjects were again compared using the Newman-Keuls procedure. The results of these comparisons showed that the differences between late reactive and early process subjects and between the late reactive and late process subjects were significant ($p < .05$).

The prediction made in Hypothesis 5 was not supported. Early reactive and late reactive subjects were not found to differ on level of adjustment as measured by the Withdrawal Scale. Hypothesis 6 and Hypothesis 7 were supported. Early reactive and early process subjects as well as early process and late process subjects did not differ in level of adjustment as measured by the Withdrawal Scale.

The relation between the hypothesized and observed extent of thinking disorganization and withdrawal behavior may be clearly seen by reference to Figures 1 and 2. Although Hypothesis 5 was not supported, the observed relation between early and late tested reactive subjects was in the

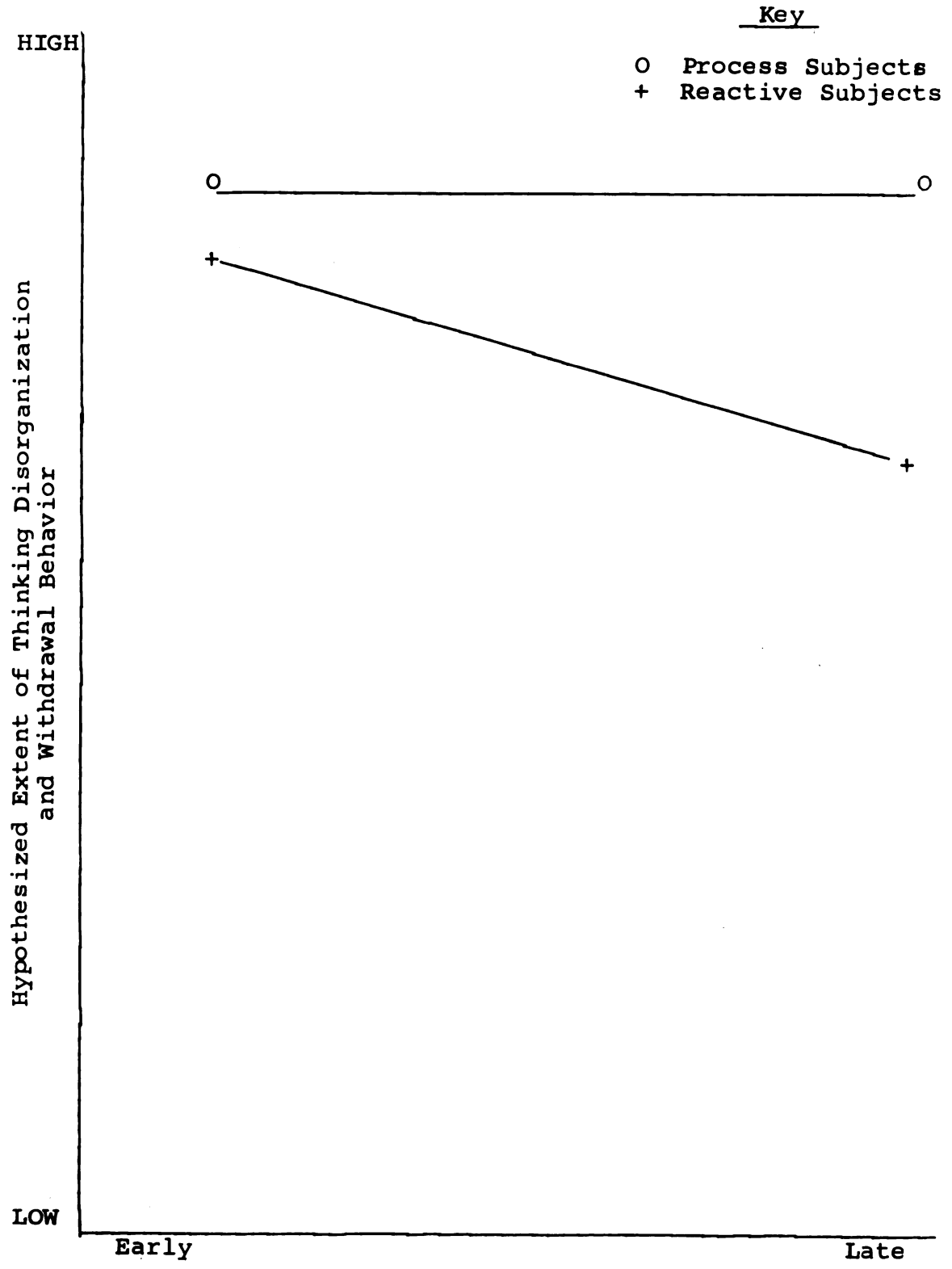

Figure 1. The hypothesized extent of thinking disorganization and withdrawal behavior for early and late tested process and reactive subjects.

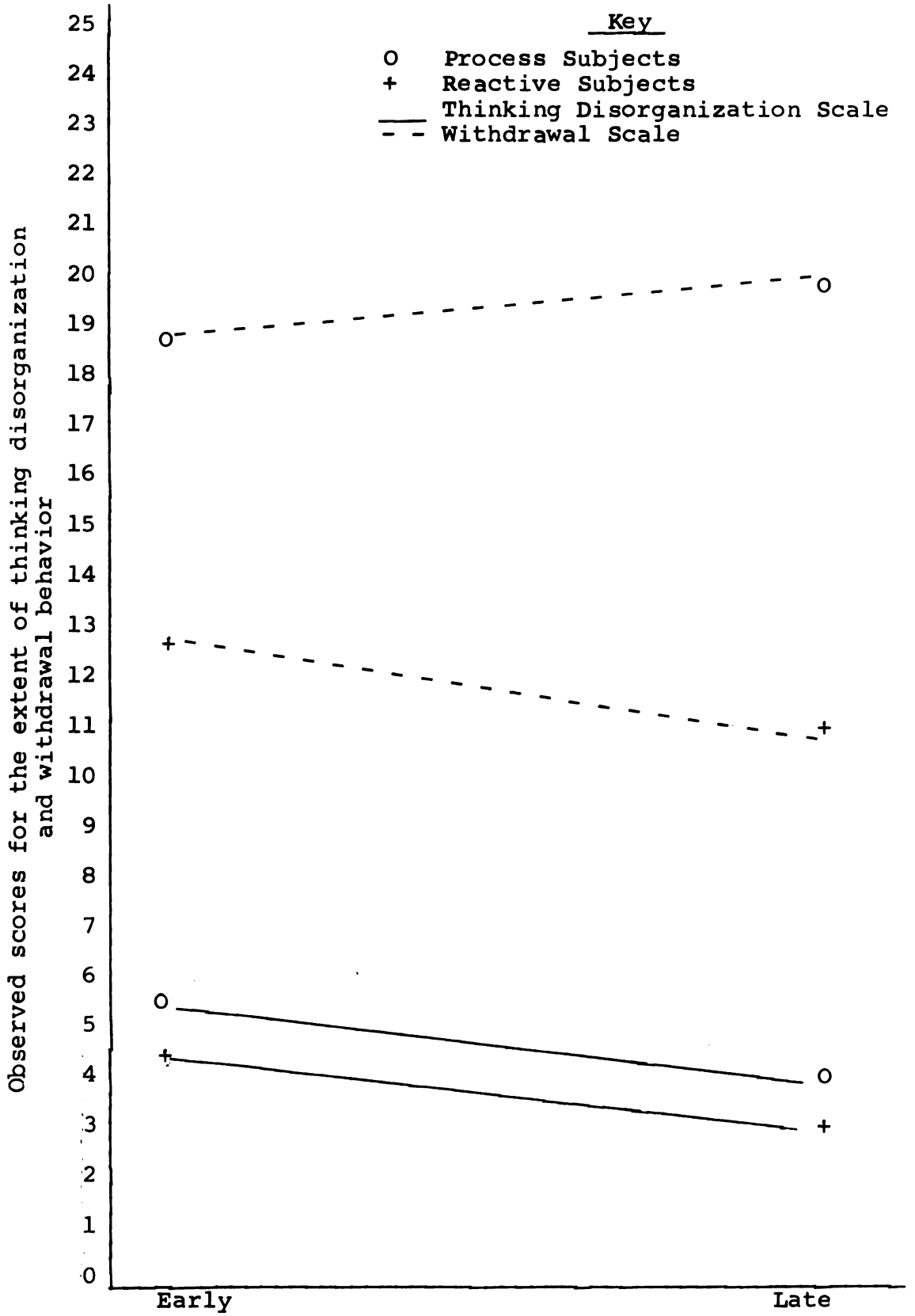

Figure 2. The observed scores of the early and late tested process and reactive subjects on the Thinking Disorganization and Withdrawal Scales

direction hypothesized on both the Thinking Disorganization and Withdrawal Scales. Even though Hypothesis 7 was supported, the observed scores of late process subjects do not fall in the expected direction. It should be noted that there were consistent differences between process and reactive subjects as well as between the conditions of being tested early or late. The one exception is the late process subjects on the Withdrawal Scale.

Comparisons on Individual RSS

Even though the RSS used in this study were defined as indicating schizophrenia, some of the RSS may have been characteristic of both schizophrenics and non schizophrenics while other RSS may have been characteristic of schizophrenics only. Moreover, some RSS may have been characteristic of only the process or reactive subgroups. Combining heterogeneous RSS would result in cancellations and function to reduce the overall discriminatory power of the entire set of RSS.

Accordingly, it was necessary to make comparisons among the groups on each RSS. Chi Square with Yates Correction was used to test for the significance of the difference in the number of subjects showing the presence or absence of each RSS. Fisher's Exact Test was substituted for Chi Square when an expected frequency was less than five.

Those RSS which were found to be produced by more subjects in one group than in another at the .05 level of significance or better are shown in Table 5. Included also are those differences which approached the .05 level of significance. The notation in parentheses next to the level of significance identifies the group containing the greater number of subjects producing the RSS. The incidence of each RSS in each group is shown in Appendix I.

The results of these comparisons fail to provide strong support for the notion that any group could be characterized by a unique pattern of RSS. Inspection of Table 5 does show however that several RSS were consistently found to be associated with one or the other groups over several comparisons and at different levels of probability.

The notion that the RSS were heterogenous with some RSS characteristic of one but not of another group is not supported by the data reported in Table 6. Reference to Table 6 shows that all groups were highly similar in terms of the median RSS which were produced as well as in term of the range of RSS which were produced. The range for each Rorschach variable on which the RSS were based is shown in Appendix J.

Table 5. The results of the comparisons for each RSS.

RSS	S-NS	ER-NS	LR-NS	EP-NS	LP-NS	ER-LR	ER-EP	ER-LP	LR-EP	LR-LP	EP-LP
15 < R > 50	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
2:1 < W:M > 2:1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
DW ≥ 1	NS	NS	NS	.05 (EP)	.05 (LP)	NS	NS	NS	NS	NS	NS
DdW ≥ 1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
W!	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Dd!	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sequence: Irregular-Confused	NS	NS	NS	NS	NS	.10 (ER)	NS	NS	NS	NS	NS
Afr ≤ .60	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sum M < 2	NS	NS	NS	NS	NS	NS	NS	NS	NS	.20 (LR)	NS
Sum M - > 2	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sum M Blends > M	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sum CF + C > 3	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
F+, F- Fluctuations	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sum FC + FY + FV < Sum CF + C + YF + Y + VF + V	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Sum M > Sum C	NS	.20 (ER)	NS	NS	NS	NS	NS	NS	NS	NS	NS

Table 5 (cont'd.)

RSS	S-NS	ER-NS	LR-NS	EP-NS	LP-NS	ER-LR	ER-EP	ER-LP	LR-EP	LR-LP	EP-LP
Sum C > Sum M	NS	.20 (NS)	NS	NS	NS	NS	NS	NS	NS	NS	NS
Absence: H - Hd	NS	NS	NS	NS	NS	.025 (LR)	.05 (EP)	NS	NS	NS	NS
Presence: Sex Responses	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Presence: Anatomy Responses	NS	.20 (NS)	NS	NS	NS	NS	NS	.20 (LP)	NS	NS	NS
F + % $\leq$ 55%	.20 (S)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
A% $\leq$ 44%	NS	NS	.025 (NS)	NS	NS	NS	NS	NS	NS	NS	NS
A% $\geq$ 60%	NS	NS	.05 (LR)	.05 (EP)	NS	.05 (LR)	.05 (EP)	NS	NS	.20 (LR)	.20 (EP)
Populars $\leq$ 5	NS	NS	NS	NS	NS	NS	NS	NS	.20 (EP)	NS	NS
S% $\geq$ 6%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
X Responses $\geq$ .42	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Color Naming	NS	NS	NS	NS	NS	NS	.05 (ER)	NS	NS	NS	NS
Excessive Card Turning	NS	.10 (ER)	NS	NS	NS	.05 (ER)	.01 (ER)	.02 (ER)	NS	NS	NS

Table 5 (cont'd.)

RSS	S-NS	ER-NS	LR-NS	EP-NS	LP-NS	ER-LR	ER-EP	ER-LP	LR-EP	LR-LP	EP-LP
Clang Associations	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Contaminations	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Cosmic Themes	NS	.05 (ER)	NS	NS	NS	.05 (ER)	NS	.05 (ER)	NS	NS	NS
Card Edging	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pathogenic Verbalizations	NS	NS	NS	.10 (EP)	NS	.01 (ER)	NS	NS	.001 (EP)	NS	.20 (EP)
Personal Intrusions	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	.05 (EP)
Perseverations	NS	NS	NS	NS	NS	NS	NS	NS	NS	.05 (LR)	.025 (EP)
Position Responses	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Rejections $\geq$ 1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Vivid Descriptions	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Lambda $\leq$ 57%	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Narrow Content Categories	NS	.05 (ER)	.01 (LR)	NS	NS	NS	NS	NS	.05 (LR)	.20 (LR)	NS
Total Number of Significant Differences (.05 or better)	0	2	3	2	1	5	4	2	2	1	2

Table 6. Median number of RSS for each group together with the range for the number of RSS produced by the subjects in each group.

Group	Median RSS	Range of RSS
Combined Process	10.00	5 - 15
Early Process	11.75	5 - 15
Late Process	9.13	6 - 11
Combined Reactive	9.50	5 - 19
Early Reactive	10.25	5 - 19
Late Reactive	8.50	6 - 14
Non Schizophrenic	7.40	5 - 15

Comparisons with Normals

In order to provide another basis for evaluating the Rorschach performance of the subjects in this study, the schizophrenics and non schizophrenics were compared with the norms reported by Beck *et al*. (1950).

The mean scores of normals for 23 variables are shown in Table 7 together with the corresponding mean scores for the schizophrenics and non schizophrenics. The t test was used to test for the significance of the difference between the means. It was not possible to carry out t tests for four of the 23 variables since Beck failed to provide information regarding the standard deviations. These four

Table 7. The means and standard deviations of the schizophrenics, non schizophrenics, and Beck's normals for 23 Rorschach Variables.

		Normals (N = 157)	All Schizophrenics (N = 60)	Non Schizophrenics (N = 15)
R	M	32.65	16.82[a]	22.07[b]
	SD	17.68	5.85	12.71
W	M	5.50	4.50[b]	5.73[c]
	SD	3.76	2.45	4.19
DW	M	0.02	0.31	0.00
	SD	Not Reported	0.60	0.00
D	M	22.85	11.13[a]	14.25[a]
	SD	10.49	4.90	11.50
Dd	M	3.02	0.78[a]	1.27[b]
	SD	3.38	1.50	2.35
C	M	0.49	0.52[c]	0.23[c]
	SD	0.81	0.85	0.48
CF	M	1.44	0.95[c]	1.43[c]
	SD	1.77	1.24	1.70
FC	M	1.36	0.90[a]	1.97[c]
	SD	1.21	1.16	1.85
Sum C	M	3.11	2.11[a]	2.40
	SD	2.74	1.92	2.04
M	M	3.50	1.96[a]	1.63[b]
	SD	3.24	1.60	1.56
Y	M	1.96	0.05[a]	0.00
	SD	2.22	0.24	0.00
V	M	1.84	0.00	0.00
	SD	2.05	0.00	0.00
F + %	M	79.25	64.30[a]	77.27[c]
	SD	10.20	18.70	14.48

Table 7 (con't.)

		Normals (N = 157)	All Schizophrenics (N = 60)	Non-Schizophrenics (N = 15)
P	M	6.79	5.08[a]	5.83[c]
	SD	2.41	2.36	2.70
A%	M	46.45	55.58[a]	48.13[c]
	SD	13.12	5.54	15.55
H	M	4.02	2.23[a]	2.53[c]
	SD	3.62	1.92	1.75
Hd	M	1.78	0.91[a]	2.20[c]
	SD	1.95	1.46	3.71
X	M	0.13	0.00	0.00
	SD	Not Reported	0.00	0.00
Anatomy Responses	M	1.55	0.86[b]	1.80 (NS)
	SD	1.97	1.55	2.07
Sex Responses	M	0.03	0.06	0.00
	SD	Not Reported	0.23	0.00
White Space	M	1.90	0.65[a]	0.53[b]
	SD	2.14	0.92	0.81
Lambda	M	1.5-2.5	2.06	2.02
	SD	Not Reported	1.89	1.25
Afr	M	0.60	0.51[c]	0.49[b]
	SD	0.19	0.19	0.71

[a] $p < .005$

[b] $p < .025$

[c] Not significant

variables have been included for purposes of non-statistical comparisons. Due to zero scores it was not possible to make comparisons on two of the variables for the schizophrenics and on four of the variables for the non schizophrenics.

The results of these comparisons showed schizophrenics to differ from the normals on 15 of the 19 variables at the .025 level of significance or better. The non schizophrenics were found to differ from the normals on 6 of the 19 variables at the .025 level of significance or better.

ADDITIONAL FINDINGS

The Rorschach

Since the process-reactive dimension was the major focus in this study, further comparisons were made among the different groups of process and reactive subjects.

A major question which may be raised is whether more process or more reactive subjects produce RSS when the early-late distinction is ignored. In order to answer this question the combined group of process subjects was compared with the combined group of reactive subjects. This comparison was made using the Median Test and resulted in a Chi Square of 0.00, with 1 df. There is no difference in the number of process and reactive subjects producing RSS when considered without regard for the period in hospitalization when tested.

A second major question which may be asked is whether more early tested subjects or more late tested subjects produce RSS when the distinction between the process-reactive subjects is ignored. In order to answer this question the combined group of early tested process and reactive subjects was compared to the combined group of late tested process and reactive subjects. The Median Test for

this comparison resulted in a Chi Square value of 0.685 with 1 degree of freedom. There is no difference in the number of early tested and late tested subjects producing RSS when considered without regards for the process-reactive distinction.

Three additional comparisons were carried out between groups of early and late tested process and reactive subjects. The groups compared were as follows: early reactive and late process subjects; late reactive and early process subjects; late reactive and late process subjects. The Median Test was used again to make each comparison. The median RSS and the Chi Square values for the comparisons are shown in Table 1. Reference to Table 1 will show that none of these three comparisons was significant.

Adjustment Scales and Ratings

The Thinking Disorganization and Withdrawal Scales

Additional comparisons for the Thinking Disorganization and Withdrawal Scales were carried out with attention given to the process-reactive dimension and to the variable of early and late testing. Specifically, one comparison involved the combined group of early tested reactive and process subjects and the combined group of late tested reactive and process subjects. Another comparison was made between

the combined group of reactive subjects and the combined group of process subjects.

Using t for each comparison of scores on each scale, the only significant difference found was in the process-reactive comparison on the Withdrawal Scale. Process subjects showed more Withdrawal behavior than reactive subjects ($t = 4.720$, $p \leq .005$, 58 df). There was a trend for early tested subjects to show more thinking disorganization than late tested subjects.

In a different focus an attempt was made to relate scores on the Thinking Disorganization and Withdrawal Scales to Rorschach performance. Produce moment correlations were computed for the number of RSS produced by the combined group of early and late tested process and reactive subjects and subjects' scores on the Thinking Disorganization and Withdrawal Scales. A correlation of .175 was found for the Thinking Disorganization Scale and a correlation of .107 was found for the Withdrawal Scale. With 58 df, neither correlation was significant. Further correlations were carried out for the subjects in each group. The number of RSS produced by early process subjects was significantly correlated with scores on the Thinking Disorganization Scale ($p < .05$). For the same group the relation between the number of RSS and scores on the Withdrawal Scale approached significance. None of the other correlations was significant. The correlations for all groups are shown in Appendix K.

Judges' Ratings

The mean rating and standard deviation of the judges' global ratings of emotional health for the schizophrenic and non schizophrenic groups are shown in Table 8.

Table 8. Judges' ratings of emotional health.

	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
Mean	4.183	3.500	4.083	3.133	2.566
SD	1.380	1.155	1.274	0.718	0.887

A one way analysis of variance carried out to compare the global ratings resulted in a significant $F = 5.148$ ($p < .01$, 4, 70 df). The Newman-Keuls procedure was followed in comparing the means of the groups. The results of this comparison showed the ratings for the early reactive and early process subjects to differ significantly from the ratings for the non schizophrenic subjects ($p < .01$).

A one way analysis of variance on the health ratings for the process and reactive subjects only, however, was insignificant ($F = 2.567$, 3, 56 df). A comparison of the mean health ratings of the groups using the Newman-Keuls procedure showed none of the mean ratings to differ significantly.

In order to obtain some measure of the extent to which the judges followed the instructions to make their ratings on the basis of their clinical judgments correlations were computed for the health ratings of each subject and the number of RSS in each subject's protocol. These correlations are reported in Table 9. With the exception of the late process subjects all correlations are highly significant.

Table 9. Product moment correlations for the number of RSS produced by the subjects and the corresponding rating of emotional health.

Group	Correlation	Level of Significance*
Early Reactive	0.757	.005
Late Reactive	0.686	.005
Early Process	0.520	.025
Late Process	0.137	Not Significant
Non Schizophrenic	0.536	.025

*13 degrees of freedom

The results of these comparisons would suggest that the judges' ratings were at least in part based on some of the formal scoring variables in the Rorschach protocols.

DISCUSSION

The results of this study clearly indicate that the Rorschach has little, if any, concurrent validity as a diagnostic tool for use with schizophrenics. In none of the five comparisons did more schizophrenics than non schizophrenics produce Rorschach signs of schizophrenia. Regardless of whether they were tested early or late, reactive subjects were not found to differ significantly from non schizophrenics. A trend was noted, however, for more early process than non schizophrenic subjects to produce Rorschach signs of schizophrenia.

These findings offer support, albeit weak support, for the results of the Kantor, Wallner, and Winder (1953) and Kantor and Herron (1966) studies which showed process subjects but not reactive subjects to be diagnosed as schizophrenic on the Rorschach. An important aspect of the findings of the present study is that the early tested process subjects tended to differ from late tested process subjects in producing RSS.

In terms of accounting for the findings of the present study, the nature of the non schizophrenic sample may have been a factor which operated to bring about the

results of the non schizophrenic and schizophrenic comparisons. All non schizophrenics were hospitalized. For the two subjects with a physical and a psychosomatic diagnosis, hospitalization may possibly have been warranted purely on the basis of somatic reasons. According to conventional practice, however, hospitalization would not have been warranted for the remaining 13 subjects unless their symptoms were extreme.

Indeed, the very fact of hospitalization would indicate that the non schizophrenic subjects were so disturbed as to require institutional care and custody. Accordingly, at least 87% of the non schizophrenic subjects in the present study could not be categorized as mild neurotic. The implication, of course, is that the non schizophrenics were as disturbed, or nearly as disturbed, as the schizophrenics and that this factor operated in such a way as to reduce the possibility of finding differences in the non schizophrenic and schizophrenic comparisons.

The level of disturbance among the non schizophrenic subjects may have, in fact, reduced the number of possible differences. However, the findings of this study cannot entirely be accounted for on the basis of this one factor. It was not possible to obtain ratings for the non schizophrenic subjects on the Thinking Disorganization and Withdrawal Scales since they had been discharged from the hospital at the time of the study. The global ratings of

emotional health made by the judges, however, does indicate that in spite of being hospitalized, the non schizophrenics were the least disturbed of all of the groups. Accordingly, the most appropriate conclusion is that the non schizophrenic sample was truly different from the schizophrenic samples.

If mutually exclusive patterns of RSS had been found to be associated with the non schizophrenic and schizophrenic groups, the results of the non schizophrenic comparisons might have been accounted for on the basis of a cancellation effect occurring when the groups were compared without regard for differences on individual RSS. Finding that the non schizophrenic and the schizophrenic subjects failed to differ to a significant extent on any of the RSS rules out this explanation.

In spite of the fact that the RSS were by definition indicative of schizophrenia, they were also produced by the non schizophrenics. The data regarding the range and median number of RSS produced by the groups clearly shows that there was a high degree of overlap among the groups. While this finding might be interpreted as supporting the notion that the non schizophrenics were more severely disturbed than their diagnostic labels would suggest, it is more appropriate to conclude that the RSS used in this study are not exclusive signs of schizophrenia. Indeed, non schizophrenics as well as schizophrenics may produce

Rorschach variables which have been claimed to be characteristic of schizophrenics only.

The finding that the RSS were produced by both schizophrenics and non schizophrenics strongly suggests that relying on signs alone in order to make a diagnosis at the clinical level may result in a mis-diagnosis. This would be true particularly in the case where one was concerned with identifying some disorder as either schizophrenic or non schizophrenic. Use of the RSS may be less severely limited, however, if one is concerned with the degree of disturbance rather than with the type of disturbance. Indeed, a more valid application of the RSS might be one where the RSS were considered not as signs of schizophrenia but rather as signs of disturbance. In order to test this assumption it would be necessary to determine whether the RSS, or RSD, were produced by non-hospitalized, non schizophrenics. The design of the present study can be criticized because it failed to include a second control group composed of this very type of subject. Future research should consider this variable.

Further questioning of the notion that the RSS were diagnostic of schizophrenia comes from the comparisons which were made with the Beck *et al*. (1950) norms. The differences between the schizophrenics and normals indicate that the schizophrenics were highly deviant in terms of their Rorschach performance. On the other hand, the non schizophrenics were not as strikingly different from the

normals. These findings would suggest that the schizophrenics and non schizophrenics were different in degree of pathology. Accordingly, if the RSS were valid indicators of schizophrenia the same relations should have been observed when the schizophrenic and non schizophrenic groups were compared on the RSS. This was not the case.

The findings regarding the normal comparisons however are severely limited by the use of the statistic t. The t test is appropriate only when N's do not differ markedly and when variables can be assumed to be approximately normal in distribution. The normal comparisons were made with samples of sizes 157, 60, and 15. Furthermore, Rorschach variables are not normally distributed as pointed out by Cronbach (1949). The t test, however, was the only statistic which could be used in making the comparisons since Beck (1950) reports his data using means and standard deviations.

Another factor which may account for the results of the non schizophrenic and schizophrenic comparisons on the Rorschach is the effect of the drugs which were being taken by the subjects. The type of drugs and the amount of drugs being taken by each subject in each group is shown in Appendix L. Since different subjects were taking not only different types of drugs but also different amounts of drugs, it is extremely difficult if not impossible to determine what effect the drugs might have had on the Rorschach.

Comparisons made on the basis of dosage in milligrams is misleading since several subjects were taking Haladol and Navane, both of which are potent in effect and which are given in lesser amounts than such drugs as Mellaril or Thorazine.

Even though there are limitations on the inferences which can be made about the effects of the drugs, it is clear that regardless of type or amount, more schizophrenics were taking drugs than were non schizophrenics. It is entirely possible that the drugs did in fact produce a leveling effect such that the degree of pathology for the schizophrenics was reduced to that of the non schizophrenics. How this effect may have operated is unclear. Indeed, the effects of drugs on personality functioning is, at this time, not completely understood.

Dramatic changes in behavior, however, have been brought about through the use of drugs. Enelow and Wexler (1966) report cases in which drugs have resulted in reducing or eliminating a variety of psychotic behaviors such as somatic delusions, hallucinations, extreme hyperactivity, incoherent speech, and mental confusion.

Accordingly, it is possible that the drugs which were being taken by the subjects in the present study did affect those personality functions which were measured by the Rorschach. Future research should give careful attention to the matter of drugs and either use subjects who

are taking the same drugs in the same dosages, or subjects who are not taking drugs.

The Process Reactive Dimension

One of the major thrusts of the present study was to show that the Rorschach diagnosis of reactive schizophrenics would be directly related to that point in hospitalization at which the Rorschach was administered. It was assumed that the variable of recovery would function in such a way that reactive subjects tested early in hospitalization would be diagnosed as schizophrenic while reactive subjects tested later would not be diagnosed as schizophrenic. It was furthermore assumed that the variable of recovery would not function to produce differences in the Rorschach performance of early and late tested process subjects.

The results failed to support these assumptions. No substantial differences were found in the Rorschach performances of early and late tested reactive subjects. Early and late tested process subjects did, however, tend to differ significantly.

The lack of differences among the groups in terms of Rorschach performance could be explained on the basis of equal or near equal levels of adjustment. The findings of the study regarding level of adjustment as measured by the Thinking Disorganization and Withdrawal Scales does suggest that the process and reactive groups were highly similar in

adjustment. The notion is furthermore strengthened by finding no significant differences among the groups when compared on the basis of the judges' global ratings of emotional health.

The one exception to the notion of equal or near equal levels of adjustment rests with the early process subjects. In the early process-late reactive comparison, early process subjects scored significantly higher on the Thinking Disorganization and Withdrawal Scales. Moreover, the only group showing a significant correlation between the number of RSS produced and subjects' scores on the Thinking Disorganization Scale was the early process group. The correlation between the number of RSS produced and scores on the Withdrawal Scale was very nearly significant for the early process group as well.

These findings would suggest that the early process group was in fact the least adjusted of the process and reactive groups, and may explain, in turn, the trend for significantly more early process subjects than non schizophrenics to produce RSS.

With regard to the judges' ratings it is interesting to note that while no differences were found when the schizophrenic groups were compared, the ratings for the early process as well as for the early reactive subjects were significantly different from the ratings for the non schizophrenics. These findings suggest that the judges may

have been making their judgments on more than a mere appraisal of the Rorschach scores. With the exception of the late process subjects the ratings for the groups are in line with what was expected. This may indicate, in fact, that the best use of the Rorschach involves the use of not only signs and scores, but also, and perhaps even more important, that ill defined element often called clinical judgment.

When used in research on such variables as physiological reactivity (Judson and Katah, 1963), perceptual functioning (Bleke, 1955), and organicity (Brackbill and Fine, 1956), the process-reactive dimension has proved to be valuable as a means for distinguishing between types of schizophrenics. The findings of the present study, however, suggest that the process-reactive dimension may lack utility in that type of clinically orientated research which is designed to study differences in personality functioning. Further studies investigating differences in the personality functioning of process and reactive schizophrenics are needed in order to be able to completely ascertain the heuristic value of the process-reactive dimension in clinical research.

Suggestions for Further Research

Although the number of RSS found to be associated with the process and reactive groups in the present study was too small to rule out the possibility of chance occurrence, it is possible that some of the RSS may be

characteristic of either process or reactive schizophrenics. Accordingly, it is suggested that further research should be carried out in order to investigate the question of whether process or reactive schizophrenics can be characterized by different patterns of Rorschach variables.

Further research is needed on the Ullmann-Giovannoni Scale. Norms for the scale are needed particularly in regards to the average number of questions answered by reactive subjects. Reliable cut-off points should also be developed for distinguishing between process and reactive subjects.

It is also suggested that further research should deal with the compatibility of using social history data and the interview method for arriving at a process-reactive classification for research subjects. Meichenbaum (1969) has used a verbal administration method with the Ullmann-Giovannoni Scale. No research, however, has been carried out on the use of the same method with Premorbid History Scale, or in comparing across methods and scales. Verbal administration is not only a useful method but may at times be necessary as, for example, when social history data is inadequate, or when, in the case of the Ullmann-Giovannoni Scale, subjects are unable to perform a pencil and paper task.

Finally and perhaps most important, further research should deal with the issue of the effect of drugs on

Rorschach performance. The best design for such research would be Solomon's Four Group Design (Campbell and Stanley, 1967). As used in research on the Rorschach and drugs the design can be diagrammed as follows:

Group A	Pre-Test 1	Drugs	Post-Test 2
Group B	Pre-Test 3	No Drugs	Post-Test 4
Group C		Drugs	Post-Test 5
Group D			Test 6

The effect of drugs on the Rorschach could readily be ascertained by the following four comparisons: Post-Test 2 and Pre-Test 1; Post-Test 2 and Post-Test 4; Post-Test 5 and Test 6; Post-Test 5 and Pre-Test 3. The design could also be carried out under the reversed experimental conditions, and indeed, this procedure might be necessary if the subjects were hospitalized patients, particularly since the use of drugs is the rule rather than an experimental condition.

SUMMARY AND CONCLUSIONS

The purpose of this study was to determine whether reactive schizophrenics tested during the acute stage produce more Rorschach protocols characteristic of schizophrenics than reactives in the non-acute stage. On the basis of prior research it was assumed that process subjects produce schizophrenic protocols regardless of length of hospitalization. It was furthermore assumed that differences in levels of adjustment, or recovery, would be related to differences in Rorschach diagnosis.

Sixty male hospitalized schizophrenics were classified as either process or reactive on the Phillips Premorbid History Scale. The subjects were then divided equally according to length of current hospitalization to form four groups: early reactive, late reactive, early process, and late process. All subjects were administered the Rorschach and rated for level of adjustment on the Thinking Disorganization and Withdrawal Scales of the Psychotic Reaction Profile developed by Lorr, O'Conner and Stafford. A control group was formed by taking the protocols of 15 non schizophrenic psychiatric patients from hospital files for comparison purposes. The protocols were scored by two

experienced psychologists according to Beck's system. The reliability of the judges was .92. An additional measure of adjustment was obtained by having the judges rate the protocols on a 6 point scale for emotional health.

A survey of the literature yielded 39 different Rorschach signs of schizophrenia which were employed in the present study. The non schizophrenics were compared with the entire group of schizophrenics as well as with each process and reactive group on the number of Rorschach signs of schizophrenia. None of these comparisons yielded significant differences. A tendency for early process subjects to produce more signs than the non schizophrenics was noted.

All possible comparisons were made between the process and reactive groups. None of these comparisons resulted in significant differences in the number of Rorschach signs of schizophrenia. A trend towards more signs was noted in early process subjects when compared with late process subjects.

Further comparisons between the groups were made for each of the Rorschach signs. No differences were found between the non schizophrenics and the combined group of schizophrenics with respect to the presence of the signs.

The judges' global ratings of emotional health, based on the Rorschach, showed the non schizophrenics to be less disturbed than either the early reactive or early process subjects. No differences were found, however,

between the process and reactive subgroups themselves. The same trend was noted when the process and reactive groups were compared on the Thinking Disorganization and Withdrawal Scales. These findings suggest that the process and reactive subjects may have been nearly equal in level of adjustment. The one exception was that early process subjects showed more thinking disorganization and withdrawal behavior than late reactives.

Finally, the schizophrenics and non schizophrenics were also compared with the Rorschach norms reported by Beck. Schizophrenics were found to differ significantly from the normals on 15 variables while non schizophrenics differed on only 6 variables. These findings tend to suggest that the Rorschach signs of schizophrenia may not be true indicators of schizophrenia and that the schizophrenics were in fact highly deviant in their Rorschach protocols. Inferences based on these findings are limited by the questionable parametric statistics used in the normative study.

The results of this study indicate that the Rorschach signs do not differentiate between non schizophrenic patients and schizophrenics as a group or as the latter are subdivided along the process reactive dimension. These findings may be limited, however, only to the specific Rorschach signs of schizophrenia used in the study. The fact that the subjects in the study were taking drugs may also account, at least in part, for the findings. The effect of drugs on the Rorschach

performance of schizophrenics is unknown, but it is entirely possible that they function to reduce the amount of pathology produced by schizophrenics in Rorschach protocols. The results also raise some serious questions regarding the utility of the process-reactive dimension.

It is suggested that future research should exercise caution in regards to the drug variable. All subjects should be taking the same drugs in the same amounts, or drug-free subjects should be used. The nature of the control group and the extent of its pathology is another important aspect to be considered in future research. Attention should be given to selecting subjects who are not disturbed and who can truly be regarded as non schizophrenic.

APPENDICES

APPENDIX A

MEANS AND STANDARD DEVIATIONS FOR EACH GROUP ON THE VARIABLES OF AGE, EDUCATION, AND HOSPITALIZATION

	Early Process	Late Process	Early Reactive	Late Reactive	Non Schizophrenic
Age	34.33 7.06	33.60 8.22	33.53 9.57	39.66 9.12	34.66 5.86
Education	10.93 1.81	11.46 1.35	11.13 1.67	10.07 0.81	10.00 1.41
Length of Current Hospitalization	10.40[a] 5.14	5.35[b] 1.32	12.13[a] 6.76	5.30[b] 2.38	Not Available
Subjects with Prior Hospitalizations	8	14	9	12	7
Number of Prior Hospitalizations	1.87 1.05	1.57 .729	1.66 1.56	1.66 .746	1.00 .00
Number of Months between Last and Current Hospitalization	13.68 16.44	15.46 15.06	11.16 5.81	36.71 75.6	Not Available
Length of Prior Hospitalizations in Months	46.90 42.18	20.41 21.03	11.08 18.56	25.85 20.07	1.195 .606

[a] days

[b] months

APPENDIX B

HOSPITAL DIAGNOSIS OF NON SCHIZOPHRENIC SUBJECTS

Diagnosis	N
Anxiety Neurosis	1
Anxiety Reaction	4
Anxiety Reaction: Chronic	2
Anxiety State	1
Chronic Brain Syndrome	1
Character Disorder	1
Emotionally Unstable Personality	1
Passive Aggressive Personality	3
Psychophysiological Gastrointestinal Reaction	1
TOTAL	15

APPENDIX C

THE PREMORBID HISTORY SCALE

Shown below is the Premorbid History Scale of the Prognostic Rating Scale (Phillips, 1953). A rating of from zero to six is assigned for each category according to the value of the item best describing a subject. Subjects receiving a total rating of from zero to 15 were defined as reactive schizophrenics. Subjects receiving a total rating of from 16 to 30 were defined as process schizophrenics.

Premorbid History Subscale

		Ratings
A.	Recent Sexual Adjustment	
1.	Stable heterosexual relations and marriage.	0
2.	Continued heterosexual relation and marriage but unable to establish home.	1
3.	Continued heterosexual relation and marriage broken by permanent separation.	2
4.	(a) Continued heterosexual relation and marriage but with low sexual drive.	3
	(b) Continued heterosexual relation with deep emotional meaning but emotionally unable to develop it into marriage.	3

		Ratings
5.	(a) Casual but continued heterosexual relations, i.e., affairs, but nothing more.	4
	(b) Homosexual contacts with lack of or chronic failure in heterosexual experiences.	4
6.	(a) Occasional casual heterosexual or homosexual experience with no deep emotional bond.	5
	(b) Solitary masturbation with no active attempt at homosexual or heterosexual experience.	5
7.	No sexual interest in either men or women.	6
B.	Social Aspects of Sexual Life During Adolescence and Immediately Beyond	
1.	Always showed a healthy interest in girls with a steady girl friend during adolescence.	0
2.	Started taking girls out regularly in adolescence.	1
3.	Always mixed closely with boys and girls.	2
4.	Consistent deep interest in male attachments with restricted or no interest in girls.	3
5.	(a) Casual male attachments with inadequate attempts at adjustment to going out with girls.	4
	(b) Casual contacts with boys and girls.	4
6.	(a) Casual contacts with boys and with lack of interest in girls.	5
	(b) Occasional contacts with girls.	5
7.	No desire to be with boys and girls; never went out with girls.	6

	Ratings
C. Social Aspects of Recent Sexual Life; 30 years of Age and Above	
1. Married and has children, living as a family unit.	0
2. Married and has children but unable to establish or maintain a family home.	1
3. Has been married and had children but permanently separated.	2
4. (a) Married but considerable marital discord.	3
(b) Single, but has had engagement or deep heterosexual relationships but emotionally unable to carry it through to marriage.	3
5. Single, with short engagements or relationships with women which do not appear to have had much emotional depth for both partners, i.e., affairs.	4
6. (a) Single, has gone out with a few girls but without other indications of a continuous interest in women.	5
(b) Single, consistent deep interest in male attachments, no interest in women.	5
7. (a) Single, occasional male contacts, no interest in women.	6
(b) Single, interested in neither men or women.	6
D. Social Aspects of Recent Sexual Life; Below 30 Years of Age	
1. Married living as a family unit, with or without children.	0

		Ratings
2.	(a) Married, with or without children, but unable to establish or maintain a family home.	1
	(b) Single but engaged or in a deep heterosexual relationship (presumably leading towards marriage).	1
3.	Single, has had engagement or deep heterosexual relationship but has emotionally been unable to carry it through to marriage.	2
4.	Single, consistent deep interest in male attachments, with restricted or lack of interest in women.	3
5.	Single, casual male relationships with restricted or lack of interest in women.	4
6.	Single, has gone out with a few girls casually but without other indications of a continuous interest in women.	5
7.	(a) Single, never interested in or never associated with either men or women.	6
	(b) Antisocial.	6
E.	Personal Relations: History	
1.	Always has had a number of close friends but did not habitually play a leading role.	1
2.	From adolescence on had a few close friends.	3
3.	From adolescence on had a few casual friends.	3
4.	From adolescence on stopped having friends.	4
5.	(a) No intimate friends after childhood.	5
	(b) Casual but never any deep intimate mutual friendships.	5
6.	Never worried about boys or girls; no desire to be with boys and girls.	6

	Ratings
F. Recent Premorbid Adjustment in Personal Relations	
1. Habitually mixed with others, but not a leader.	1
2. Mixed only with a close friend or group of friends.	3
3. No close friends; very few friends; had friends but never quite accepted by them.	4
4. Quiet; aloof; seclusive; prefered to be by self.	5
5. Antisocial.	6

APPENDIX D

THE ULLMANN-GIOVANNONI SCALE

Shown below is the Ullmann-Giovannoni Scale (Ullmann and Giovannoni, 1964) with the answers indicating reactive schizophrenia. One point is given for each item answered in the reactive direction. Reactive subjects were defined by scores of 14 or more. Process subjects were defined by scores of 11 or less.

1. When I leave the hospital, I will live with my wife. (T)
2. I am married now. (T)
3. I have fathered children. (T)
4. I have been married. (T)
5. Before I was seventeen I had left the home I was raised in and never went back except for visits. (T)
6. When I leave the hospital, I will live with one or both of my parents. (F)
7. As a civilian I have worked steadily at one job or for one employer for over two years. (T)
8. I finished at least one year of education after high school--trade apprenticeship, business school, college, etc. (T)
9. Adding up all the money I earned for the last three years, it comes to less than $700, before deductions. (F)
10. In my teens I was a member of a group of friends who did things together. (T)

11. I hardly ever went out to another kid's house after school or on weekends. (F)

12. When I was in school I didn't like Physical Education classes. (F)

13. Alcohol has nothing to do with my difficulties. (F)

14. I have paid regularly to buy a house. (T)

15. More than once in the last year I have stayed on after some group meeting and talked with some other members about something that went on. (T)

16. Shortly before I came into the hospital there was some major change in my life--such as marriage, birth of a baby, death, injury, loss of job, etc. (T)

17. I have been deeply in love with someone and have told them about it. (T)

18. In the kinds of work I do, it is expected that people will stay for at least a year. (T)

19. My top wage in the last five years was less than $1.25 an hour. (F)

20. I have earned my living for longer than a year at fulltime civilian work. (T)

21. I have had to stay in a mental hospital for more than one year at a time. (F)

22. Within the last five years I have spent more than half of the time in a mental hospital. (F)

23. In my teens I was a regular member of a club or organization that had a grown-up who came to meetings. (Scouts, school club, 4-H, church youth club, etc.) (T)

24. In my teens there was more than one girl with whom I had more than two dates. (T)

APPENDIX E

THE THINKING DISORGANIZATION AND WITHDRAWAL SCALES

Shown below are the 38 items of the Withdrawal Scale and the 18 items of the Thinking Disorganization Scale taken from the Psychotic Reaction Profile (Lorr, O'Conner, and Stafford, 1960) as used in this study. Letters in parentheses following each item indicate the scale to which the item belongs. Maximum scores on the Withdrawal Scale and the Thinking Disorganization Scale are 38 and 18 respectively.

1. Never says more than three or four words at a time. (W)
2. Has to be helped along to stick to any activity. (W)
3. Says thanks when something is done for him. (W)
4. Talks whether anyone is listening or not. (TD)
5. Asks for things; doesn't wait for things to be given to him. (W)
6. Is always doing something. (W)
7. Never asks for anything; waits for things to be given to him. (W)
8. Doesn't take part in back and forth conversation. (W)
9. Often messey in eating habits. (TD)
10. Is able to talk about his own problems. (W)
11. Makes faces and strange movements that do not make sense. (TD)

12. Seldom listens to radio or watches TV. (W)

13. Reads newspaper. (W)

14. Doesn't mix with other patients. (W)

15. Seems always busy with plans and projects. (W)

16. Shows no response to entertainment. (W)

17. Will do anything for recreation that comes up. (W)

18. Sometimes giggles in a silly way. (TD)

19. Spends a lot of time talking to himself. (TD)

20. Speaks softly; often difficult to hear. (W)

21. Smiles to himself a lot without any sensible reason. (TD)

22. Is backward about talking to you. (W)

23. Has no friends on the ward. (W)

24. Seems concerned about what others think of him. (W)

25. Answers sensibly when talked to. (TD)

26. Talks to himself about imaginary or real faults. (TD)

27. Would sit all day unless directed into activity. (W)

28. Occasionally talks to himself. (TD)

29. Nearly always chatting with somebody. (W)

30. Usually knows what time it is. (TD)

31. Has little interest in the problems of others. (W)

32. It is difficult to understand what he is saying most of the time. (TD)

33. Drifts off the subject when he talks. (TD)

34. Starts conversations with aides to become better acquainted. (W)

35. Tries to be friendly with other patients. (W)

36. Repeats words and phrases in a meaningless way. (TD)

37. Asks for help from other patients when he needs it. (W)

38. Talk is mostly not sensible. (TD)

39. Acts dead to the world; doesn't seem to care what is going on. (W)

40. Never volunteers information about himself. (W)

41. Shows real friendliness towards at least one other patient. (W)

42. Usually is slow moving and sluggish. (W)

43. Sometimes uses words that aren't understandable. (TD)

44. Interested in nothing. (W)

45. Ignores the activities around him. (W)

46. Shows occasional interest in news and current events. (W)

47. Likes to go for exercise. (W)

48. Has to be pushed to follow routine. (W)

49. Is slow thinking and a little confused. (W)

50. Sees and hears things that are not there. (TD)

51. Usually stays by himself. (W)

52. Does not know where he is. (TD)

53. Laughs or smiles at funny comments or events. (W)

54. Is good company. (W)

55. Laughs if he is kidded. (W)

56. Does not know the names of aides. (TD)

APPENDIX F

PRODUCT MOMENT CORRELATIONS FOR THE SCORES OF THE RELIABILITY RATERS ON THE THINKING DISORGANIZATION SCALE AND THE WITHDRAWAL SCALE

Groups	Thinking Disorganization Scale	Withdrawal Scale
All Groups	.505[c]	.252[e]
Combined Early Tested	.915[a]	.296[e]
Combined Late Tested	.512[b]	.232[e]
Combined Reactives	.546[d]	.166[e]
Combined Process	.531[e]	.235[e]
Early Reactives	.943[d]	.588[e]
Late Reactives	.487[e]	.270[e]
Early Process	----[f]	----[f]
Late Process	.591[e]	.249[e]

[a] $p < .005$

[b] $p < .025$

[c] $p < .01$

[d] $p < .05$

[e] Not significant

[f] r non-determinate: 2 subjects rated

APPENDIX G

PRODUCT MOMENT CORRELATIONS BETWEEN JUDGES FOR EACH RORSCHACH VARIABLE SCORED. EXCEPT WHERE NOTED ALL CORRELATIONS WERE SIGNIFICANT AT A LEVEL OF .005 (28 df)

Determinate		Indeterminate	
W	.961	DdW	1.000
DW	1.000	DdD	1.000
D	.988	MY	-.049[b]
Dd	.984	MV	0.00[b]
Approach	.905	MC	-.345[b]
Sequence	.767	Y	0.00[b]
Afr	1.000	VF	-.035[b]
		V	0.00[b]
Sum M	.921	TF	0.00[b]
M	.920	T	1.00
M-	.875	Sex	0.00[b]
		Clang Associations	1.00
C	.919	Cosmic Themes	-.045[b]
CF	.851	Card Edging	.981
FC	.871	Position Responses	.049[b]
		Vivid Descriptions	1.00
YF	.612		
FY	.841		
FV	.283[b]		
FT	.123[b]		
F+	.810		
F-	.802		
EB	.925		
H	.899		
Hd	.889		
A	.985		
Ad	.779		
AN	.979		

Determinate	
Secondary Content	.697
F + %	.691
A%	.986
Populars	.919
Color Naming	.977
Excessive Card Turning	.909
Contaminations	.416[a]
Pathogenic Verbalizations	.835
Personal Intrusions	.773
Perseverations	.135[b]
Rejections	.964

[a] $p < .025$

[b] Not significant

APPENDIX H

RORSCHACH SIGNS OF SCHIZOPHRENIA

Shown below are the Rorschach signs of schizophrenia which were used in this study. Each criterion is listed under the source from which it was taken.

A. Beck (1945)

1. R less than 15 or greater than 50
2. 1 or more rejections
3. Irregular or confused sequence
4. Sum M - greater than 2
5. Fluctuations between F+ and F- with at least 2 peaks and valleys
6. Card edging
7. Position responses

B. Beck (1954)

1. 1 or more DW
2. 1 or more DdW
3. Afr less than or equal to .60
4. F+% less than 55%
5. Sum M less than 2
6. Sum M blends greater than M
7. Sum M greater than Sum C
8. Sum CF + C greater than 3
9. A% equal to or less than 44%
10. A% equal to or greater than 60%
11. P equal to or less than 5
12. Lambda equal to or less than 57%
13. S% equal to or greater than 6%
14. x equal to or greater than .42
15. Excessive card turning
16. Clang Associations
17. Pathogenic verbalizations
18. Narrow content categories
19. Cosmic themes

20. Personal intrusions
21. Sex responses present
22. Anatomy responses present

C. Goldman (1960)

1. Sum FC + FY + FV greater than Sum CF + C + YF + Y + VF + V

D. Kelly and Klopfer (1939)

1. Emphasis on W
2. Emphasis on Dd
3. Sum C > Sum M
4. W : M is less than or greater than 2 : 1
5. Color naming
6. Contaminations

E. Piotrowski (1952)

1. No H or Hd
2. Perseverations: 2 or more on one card or 1 or more on two cards
3. Vivid descriptions but unclear concepts.

Total 39

APPENDIX I

THE NUMBER OF SUBJECTS SHOWING THE PRESENCE OF EACH RSS IN EACH GROUP
(N = 15 each group)

RSS	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
15 < R > 50	6	6	5	9	7
2:1 < W:M > 2:1	13	14	15	14	15
DW ≥ 1	2	3	4	4	0
DdW ≥ 1	0	0	0	0	0
W!	7	6	7	6	8
Dd!	2	0	1	0	1
Sequence: Irregular or Confused	6	1	4	2	2
Afr ≲ .60	11	12	12	12	12
Sum M < 2	6	9	8	4	8
Sum M - > 2	1	0	1	1	1
Sum M Blends > M	0	0	0	0	0
Sum CF + C > 3	3	2	2	0	3
F+, F- Fluctuations	7	6	3	4	3
Sum FC + FY + FV < Sum CF + C + YF + Y + VF + V	5	3	5	6	4
Sum M > Sum C	9	6	6	8	4
Sum C > Sum M	5	6	9	7	10

RSS	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
Absence: H - Hd	0	5	4	1	1
Presence: Sex Responses	0	1	3	0	0
Presence: Anatomy Responses	4	6	8	9	9
F + % $\leq$ 55%	5	3	4	4	1
A% $\leq$ 44%	5	1	5	5	7
A% $\geq$ 60%	4	11	11	6	5
Populars $\leq$ 5	7	6	11	9	7
S% $\geq$ 6%	5	5	2	3	3
Color Naming	5	3	0	1	2
Excessive Card Turning	11	4	3	3	5
Clang Associations	0	0	1	0	0
Contaminations	4	3	4	2	2
Cosmic Themes	4	0	2	0	0
Card Edging	3	3	0	1	0
Pathogenic Verbalizations	7	0	8	3	2
Personal Intrusions	5	2	6	1	3
Perseverations	3	4	5	0	2
Position Responses	1	0	3	0	0
Card Rejections	3	5	7	4	4

RSS	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
Vivid Descriptions	1	0	0	0	0
Lambda $\leq$ 57%	3	0	1	2	0
x Responses $\geq$ .42	0	0	0	0	0
Narrow Content	6	9	4	5	1

APPENDIX J

RANGE OF THE RORSCHACH VARIABLES ON WHICH THE RSS WERE BASED. SHOWN ARE THOSE VARIABLES WHICH MAY VARY BEYOND PRESENCE OR ABSENCE

Rorschach Variables	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
R	10-26	10-22	10-40	10-27	10-54
W:M	1:0-6:7	0:0-9:5	0:5-9:2	1:1-8:2	0:0-19:2
DW	0-2	0-1	0-1	0-2	None
DdW	None	None	None	None	None
Afr	.09-.71	.10-.86	.23-.87	.19-.75	.20-.75
Sum M	0-7	0-5	0-3	0-6	0-5
Sum M-	0-3	0-1	0-2	0-3	0-2
Sum M Blends	0-1	None	0-1	0-2	0-1
C	0-3	0-1	0-4	0-2	0-2
CF	0-4	0-4	0-3	0-3	0-5
FC	0-4	0-3	0-5	0-1	0-5
FY	0-3	0-4	0-6	0-4	0-4
YF	0-1	0-3	0-1	0-3	0-2
Y	None	None	0-1	0-1	None
FV	0-2	0-2	0-2	0-1	0-5
VF	0-1	0-1	0-1	None	0-2

Rorschach Variables	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
V	None	None	0-1	None	None
H	1-8	0-6	0-5	0-9	0-6
Hd	0-3	0-3	0-8	0-3	0-15
Sex Responses	None	0-7	0-1	None	None
Anatomy Responses	0-6	0-7	0-6	0-1	0-6
F + %	43%-86%	33%-100%	0%-100%	41%-86%	44%-100%
A%	27%-93%	11%-86%	23%-79%	31%-90%	21%-71%
Populars	0-8	2-10	1-8	3-10	2-12
S%	0%-19%	0%-12%	0%-7%	0%-31%	0%-11%
x Responses	None	None	None	None	None
Color Naming	0-4	None	0-3	0-1	0-1
Excessive Card Turning	0-7	0-5	0-2	0-5	0-4
Clang Associations	None	None	0-2	None	None
Contaminations	0-4	0-1	0-3	0-1	0-2
Cosmic Themes	0-6	None	0-5	None	None
Card Edging	0-7	0-1	None	0-1	None
Pathogenic Verbalizations	0-10	None	0-16	0-1	0-2
Personal Intrusions	0-7	0-1	0-4	0-1	0-2
Perseverations	0-1	0-1	0-1	None	0-1

Rorschach Variables	Early Reactive	Late Reactive	Early Process	Late Process	Non Schizophrenic
Position Responses	None	None	0-1	None	None
Rejections	0-2	0-2	0-3	0-2	0-3
Vivid Descriptions	None	None	None	None	None
Lambda	0%-4.2%	0%-4.0%	50%-6.5%	36%-4.6%	63%-5.0%

APPENDIX K

PRODUCT MOMENT CORRELATIONS FOR SUBJECTS' SCORES ON THE THINKING DISORGANIZATION AND WITHDRAWAL SCALES AND THE NUMBER OF RSS PRODUCED BY THE SUBJECTS. (N = 15 each group)

Groups	Thinking Disorganization Scale	Withdrawal Scale
Early Reactive	0.204	0.212
Late Reactive	-0.399	-0.423
Early Process	0.486[a]	0.438
Late Process	-0.191	0.293
All Groups	0.175	0.107

[a] $p < .05$

APPENDIX L

TYPE OF DRUGS AND DRUG DOSAGE IN MILLIGRAMS BEING TAKEN BY SCHIZOPHRENIC AND NON SCHIZOPHRENIC SUBJECTS

	Mellaril	Artane	Stelazine	Thorazine	Librium	Haladol	Navane
Early Reactives							
A01	800	4					
A02	150	4	4	150			
A03					30		
A04	2000	4				6	
A05				100	40		
A06				200			
A07		No Drugs					
A08	100						
A09	250		10	100			
A10	600						
A11				100			
A12				200			30
A13	400	4					
A14	200	4	20	150			
A15				100			
Late Reactives							
B01		6					40
B02		6				12	
B03	400						
B04		2					
B05	300	4	15				
B06	150						
B07			10	600			
B08		2		200		1	
B09		8					
B10	400						40
B11		2					

	Mellaril	Artane	Stelazine	Thorazine	Librium	Haladol	Navane
Late Reactive							
B12				200			
B13		2		1300			
B14			20	600			
B15	300	4	30				
Early Process							
C01		4	40				
C02	100						
C03				700			
C04		No Drugs					
C05				100			
C06		4		900			
C07	400	4				4	
C08				100			
C09	2000	2					
C10	600	2					
C11	800						
C12	150						
C13				900			
C14	100						
C15				400			
Late Process							
D01		No Drugs					
D02		2		1000			
D03	200	2				3	
D04	300	4	4				
D05			15				
D06				600			
D07	200						
D08	400	2				3	
D09	100	2				1	
D10		4	40				

	Mellaril	Artane	Stelazine	Thorazine	Librium	Haladol	Navane
Late Process							
D11	1200	4					
D12			10				
D13			20	400			
D14				600			
D15			15				

	Mellaril	Thorazine	Seconal	Promazine	Dilantin
Non Schizophrenic					
E01		No Drugs			
E02	300				
E03		No Drugs			
E04		No Drugs			
E05		No Drugs			
E06				4 Cap	
E07		No Drugs			
E08		100			
E09	100				
E10		100			
E11					100
E12			25		
E13		No Drugs			
E14		No Drugs			
E15	200				

REFERENCES

REFERENCES

Abrams, S. A validation of Piotrowski's Alpha formula with schizophrenics varying in duration of illness. American Journal of Psychiatry, 1964, 121, 45-47.

Adams, H. B., and Cooper, G. D. Rorschach response productivity and overt psychiatric symptomology. Journal of Clinical Psychology, 1961, 17, 355-357.

Ash, P. The reliability of psychiatric diagnosis. Journal of Abnormal and Social Psychology, 1949, 44, 272-277.

Beck, S. J. Problems of further research in the Rorschach test. American Journal of Orthopsychiatry, 1935, 5, 100-115.

Beck, S. J. Rorschach's Test, Vol. II. A variety of personality pictures. New York: Grune and Stratton, 1945.

Beck, S. J. The six schizophrenias. Research Monograph No. 6 American Orthopsychiatric Association, New York, 1954.

Beck, S. J. Rorschach's Test, Vol. I. New York: Grune and Stratton, 1961.

Beck, S. J., Rabin, A. I., Thiesen, W. G., Molish, H. B., and Thetford, W. N. The normal personality as projected in the Rorschach test. Journal of Psychology, 1950, 30, 241-298.

Becker, W. A genetic approach to the interpretation and evaluation of the process-reactive distinction. Journal of Abnormal and Social Psychology, 1956, 53, 229-235.

Benton, A. L. The experimental validation of the Rorschach test. British Journal of Medical Psychology, 1950, 23, 45-58.

Bleke, R. Reward and punishment as determiners of reminiscence effects in schizophrenics and normals. Journal of Personality, 1955, 23, 479-498.

Brackbill, G., and Fine, H. Schizophrenia and central nervous system pathology. Journal of Abnormal and Social Psychology, 1956, 52, 310-313.

Bucker, S. L., and Williams, M. Color as a determinant of responsiveness to Rorschach cards in schizophrenia. Journal of Consulting Psychology, 1951, 15, 196-202.

Campbell, D. T., and Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1967.

Chase, L., and Silverman, E. Prognosis in schizophrenia: An analysis of criteria in 150 schizophrenics treated with metrazol or insulin. Journal of Nervous and Mental Disease, 1943, 98, 464, 473.

Crumpton, E., and Groot, H. The "meaning" of Rorschach color cards as a function of color. Journal of Projective Techniques, 1966, 30, 359-363.

Dana, R. H. The validation of projective tests. Journal of Projective Techniques, 1962, 26, 182-186.

Elisio, T. Overinclusive thinking in process and reactive schizophrenics. Journal of Consulting Psychology, 1963, 27, 447-449.

Enelow, A. J., and Wexler, M. Psychiatry in the practice of medicine. New York: Oxford University Press, 1966.

French, J. W., and Michael, W. B., et al. Standards for Educational and Psychological Tests and Manuals. Washington: American Psychological Association, 1966.

Fine, H., and Zimet, C. Process and reactive schizophrenia and genetic levels of perception. Journal of Abnormal and Social Psychology, 1959, 59, 83-85.

Friedman, H. A comparison of a group of hebephrenic and catatonic schizophrenics with two groups of normal adults by means of certain variables in the Rorschach. Journal of Projective Techniques, 1952, 16, 352-360.

Friedman, H. Perceptual regression in schizophrenia: An hypothesis suggested by the use of the Rorschach test. Journal of Projective Techniques, 1953, 17, 171-185.

Garfield, S. L., and Sundland, D. M. Prognostic scales in schizophrenia. Journal of Consulting Psychology, 1966, 30, 18-24.

Goldman, R. Changes in Rorschach performance and clinical improvement in schizophrenia. Journal of Consulting Psychology, 1960, 24, 403-407.

Guilford, J. P. (Ed.). Printed classification tests. AAF Aviation Psychology Program Research Reports, No. 3. Washington: U.S. Government Printing Office, 1947.

Guilford, J. P. Fundamental statistics in psychology and education. New York: McGraw-Hill, 1965.

Hertz, M. R. The validity of the Rorschach method. American Journal of Orthopsychiatry, 1941, 11, 512-520.

Hunt, R. C., and Appel, H. E. Prognosis in psychosis lying midway between schizophrenia and maniac depressive psychosis. American Journal of Psychiatry, 1936, 93, 313-319.

Johnson, M. H., and Ries, H. A. Validation of the self-report scale for process and reactive schizophrenics. Journal of Consulting Psychology, 1967, 31, 321-322.

Judson, A., and Katahn, M. The relationship of automatic responsiveness to process-reactive schizophrenia and abstract thinking. Psychiatric Quarterly, 1963, 37, 19-24.

Judson, A., and Martin N. Levels of personality organization and production of associative sequences in process and reactive schizophrenics. Journal of Consulting Psychology, 1961, 28, 208-213.

Kant, O. Differential diagnosis of schizophrenia in light of concepts of personality stratification. American Journal of Psychiatry, 1940, 97, 324-357.

Kant, O. A comparative study of recovered and deteriorated schizophrenic patients. Journal of Nervous and Mental Disease, 1941, 93, 616-624.

Kant, O. The evaluation of prognostic criteria in schizophrenia. Journal of Nervous and Mental Disease, 1944, 100, 598-605.

Kantor, R., and Herron, W. Reactive and process schizophrenia. Palo Alto: Science and Behavior Books, 1966.

Kantor, R., Wallner, J., and Winder, C. Process and reactive schizophrenia. Journal of Consulting Psychology, 1953, 17, 157-162.

Kelley, D. M., and Klopfer, B. Application of the Rorschach method to research in schizophrenia. Rorschach Research Exchange, 1939, 3, 55-66.

Klinger, E., and Roth, I. Diagnosing schizophrenics with Rorschach color responses. Journal of Clinical Psychology, 1964, 20, 386-388.

Klopfer, B., Ainsworth, M., Klopfer, W., and Holt, R. Developments in the Rorschach Technique, Volume I: Technique and Theory. New York: Harcourt, Brace, 1954.

Knopf, I. Rorschach summary scores in differential diagnosis. Journal of Consulting Psychology, 1956, 20, 99-104.

Lorr, M., O'Connor, J., and Stafford, J. W. The Psychotic Reaction Profile. Journal of Clinical Psychology, 1960, 16, 241-245.

McReynolds, P. A comparison of normals and schizophrenics on a new scale of the Rorschach CET. Journal of Projective Tests, 1966, 30, 262-264.

Malamud, W., and Render, N. Course and prognosis in schizophrenia. American Journal of Psychiatry, 1939, 95, 1039-1057.

Meehl, P. Structured and projective tests: Some common problems in validation. In B. I. Murstein (Ed.), Handbook of projective techniques. New York: Basic Books, 1965.

Mehlman, B. The reliability of psychiatric diagnosis. Journal of Abnormal and Social Psychology, 1952, 47, 577-578.

Meichenbaum, D. Validation of marital status and the self-report scale for process-reactive schizophrenia. Journal of Consulting and Clinical Psychology, 1969, 33, 351-356.

Molish, H. B. The popular response in Rorschach records of normal, neurotic and schizophrenics. American Journal of Orthopsychiatry, 1951, 21, 523-531.

Molish, H. B., and Beck, S. J. Further explorations of the "six schizophrenias": Type S-3. American Journal of Orthopsychiatry, 1958a, 28, 483-505.

Molish, H. B., and Beck, S. J. Further explorations of the "six schizophrenias": Type S-3 (concluded). American Journal of Orthopsychiatry, 1958, 28, 809-827.

Orme, J. E. A study of Weiner's Rorschach schizophrenic indicators. Journal of Clinical Psychology, 1964, 20, 531-532.

Orme, J. E. A further comment on Weiner's Rorschach color indicators. Journal of Clinical Psychology, 1966, 22, 223.

Phillips, L. Case history data and prognosis in schizophrenia. Journal of Nervous and Mental Disorders, 1953, 117, 515-525.

Piotrowski, Z. A. Experimental psychological diagnosis of mild forms of schizophrenia. Rorschach Research Exchange, 1945, 9, 189-200.

Piotrowski, Z. A. A defense attitude associated with improvement in schizophrenia and measurable with a modified Rorschach test. Journal of Nervous and Mental Disease, 1955, 122, 36-41.

Piotrowski, Z. A. Perceptanalysis. New York: Macmillan, 1957.

Piotrowski, Z. A., and Berg, D. A. Verification of the Rorschach Alpha diagnostic formula for underactive schizophrenics. American Journal of Psychiatry, 1955, 112, 443-450.

Piotrowski, Z. A., and Bricklin, B. A. A second validation of a long-term Rorschach prognostic index for schizophrenic patients. Journal of Consulting Psychology, 1961, 25, 123-128.

Piotrowski, Z. A., and Efron, N. Evaluation of outcome in schizophrenia. In P. Hock and J. Zubin (Eds.), Psychopathology of Schizophrenia. New York: Grune and Stratton, 1966.

Piotrowski, Z. A., and Lewis, N. D. C. An experimental Rorschach diagnostic aid for some forms of schizophrenia. American Journal of Psychiatry, 1950, 107, 360-366.

Piotrowski, Z. A., and Lewis, N. D. C. An experimental criterion for the prognostication of the status of schizophrenics after a three-year interval. In P. Hoch and J. Zubin, Relation of Psychological Tests to Psychiatry. New York: Grune and Stratton, 1952.

Rickers-Ovsiankina, M. The Rorschach test as applied to normals and schizophrenic subjects. British Journal of Medical Psychology, 1938, 17, 227-257.

Rieman, G. W. The effectiveness of Rorschach elements in the discrimination between neurotic and ambulatory schizophrenic subjects. Journal of Consulting Psychology, 1953, 17, 25-31.

Rorschach, H. Psychodiagnostics. New York: Grune and Stratton, 1942.

Rubin, H., and Lonstein, M. A cross validation of suggested Rorschach patterns associated with schizophrenia. Journal of Consulting Psychology, 1953, 17, 371-372.

Scott, E. M. Regression or disintegration in schizophrenia? Journal of Clinical Psychology, 1956, 12, 298-300.

Sherman, M. A comparison of formal and content factors in the diagnostic testing of schizophrenia. Genetic Psychology Monographs, 1952, 46, 183-234.

Stotsky, B. A. A comparison of remitting and non-remitting schizophrenics in psychological tests. Journal of Abnormal and Social Psychology, 1952, 47, 489-496.

Stotsky, B. A. Factor analysis of Rorschach scores of schizophrenia. Journal of Clinical Psychology, 1957, 13, 275-278.

Stotsky, B. A., and Lawrence, J. F. Various Rorschach indices as discriminators of marked and little conceptual disorganization among schizophrenics. Journal of Consulting Psychology, 1955, 19, 189-193.

Strum, E. Overinclusion and concreteness among pathological groups. Journal of Consulting Psychology, 1965, 29, 9-18.

Taulbee, E. S., and Sisson, B. D. Rorschach pattern analysis in schizophrenia: A cross validation study. Journal of Clinical Psychology, 1954, 10, 80-82.

Taulbee, E. S., Sisson, B. D., and Gaston, C. Affective Ratio and 8-9-10 percent on the Rorschach test for normals and psychiatric groups. Journal of Consulting Psychology, 1956, 20, 105-108.

Thiesen, J. W. A pattern analysis of structural characteristics of the Rorschach test in schizophrenia. Journal of Consulting Psychology, 1952, 16, 365-370.

Tutko, T., and Spence, J. The performance of process and reactive schizophrenics and brain injured subjects on a conceptual task. Journal of Abnormal and Social Psychology, 1962, 65, 387-394.

Ullmann, L. P., and Giovannoni, J. M. The development of a self-report measure of the process-reactive continuum. Journal of Nervous and Mental Disease, 1964, 138, 38-42.

Warner, S. J. An evaluation of the validity of Rorschach popular responses as differential of ambulatory schizophrenics. Journal of Projective Techniques, 1951, 15, 268-275.

Watkins, C., and Deabler, H. L. Responses of chronic schizophrenic patients to tachistoscopic presentation of Rorschach figures. Journal of Projective Techniques, 1957, 21, 404-409.

Weiner, I. B. Three Rorschach scores indicative of schizophrenia. Journal of Consulting Psychology, 1961, 25, 436-439.

Weiner, I. B. Rorschach tempo as a schizophrenic indicator. Perceptual and Motor Skills, 1962, 15, 139-141.

Weiner, I. B. Pure C and color stress as Rorschach indicators of schizophrenia. Perceptual and Motor Skills, 1964a, 18, 484.

Weiner, I. B. Follow-up validation of Rorschach tempo and color use as schizophrenic indicators. American Psychologist, 1964b, 19, 494.

Weiner, I. B. Rorschach color stress as a schizophrenic indicator--A reply. Journal of Clinical Psychology, 1965a, 21, 313-314.

Weiner, I. B. Follow-up validation of Rorschach tempo and color use as schizophrenic indicators of schizophrenia. Journal of Projective Techniques, 1965b, 29, 387-391.

Winer, B. J. Statistical principles in experimental design. New York: McGraw Hill, 1962.

Zahn, T. Acquired and symbolic affective values as determinants of size estimation in schizophrenia and normal subjects. Journal of Abnormal and Social Psychology, 1959, 58, 39-47.

Zimet, C., and Fine, H. Perceptual differentiation and two dimensions of schizophrenia. Journal of Nervous and Mental Disease, 1959, 129, 435-441.