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Rater Sensitivity to Behavioral and Inferential Phenomena of Schizophrenics

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RATER SENSITIVITY TO BEHAVIORAL AND INFERENTIAL PHENOMENA OF SCHIZOPHRENICS

by

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VITA

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

PURPOSE

The scientific study of man since the late 1800's has been approached in two ways. One approach has emphasized the structural or phenomenological make-up of man, while the other has focused on the dynamic aspects of man. The structural approach has been characterized by descriptions of various phenomena, and their organization into logical groupings. The structural approach attempts to describe groups of people in order to evolve theories which would explain their communalities among people. The dynamic approach has focused on the changes that phenomena undergo, while underemphasizing their structure. This approach has usually focused on the individual in an attempt to evolve theories of psychological functioning.

There are limitations in each approach. The structural approach has emphasized the phenomenological make-up, and has attempted to order and classify the various observable symptoms, while underemphasizing the dynamic motives which may be responsible for these symptoms. In scientific studies, this approach is responsible for psychological views of man that are experimentally accurate, but represent a composite stereotype that is often meaningless when describing individuals. The dynamic approach, which has generally attempted to evolve psychological theories by thoroughly studying the individual, has often evolved very exciting theories, replete with motives, feelings, changes, etc., into which theory it may be convenient to fit an

individual. But extrapolations from the individual to the group has often resulted in over-generalized theories of man which are difficult to validate through traditional experimental means.

Kraepelin (Arieti, 1955) and Bleuler (1950) represent the structural approach to the study of psychopathology. On the basis of their experience with severely disturbed mental patients, they listed and classified the various symptoms, while not emphasizing the dynamic factors except to classify them. But on the basis of their observations, a classificatory system of psychopathology was devised which has had considerable influence on current diagnostic categories. Kraepelin's "dementia praecox" was separated into three classifications; hebephrenic, catatonic, and paranoid. The symptoms common to each classification were outlined in detail. Bleuler (1950) went beyond Kraepelin's descriptive approach, increasing the groupings by adding "simple" to Kraepelin's three categories, and classifying the symptoms into "fundamental" and "accessory." Freud is an example of more emphasis on process than structure in a theory of psychopathology.

The Bleulerian and Kraepelinian approach has been criticized in many ways. Meyer (Arieti, 1955), and Sullivan (Arieti, 1955) have criticized Bleuler's contention that "defect in association" is the basis of schizophrenia. Their nosological schemata have been criticized and revised often. Freud (Arieti, 1955) did not accept the behavioral symptoms described by Bleuler and Kraepelin as representing the essence of schizophrenia, but believed these symptoms were symbolic representations of unconscious conflicts.

Kraepelin and Bleuler represent a particular approach in the study of psychopathology. Although it does not stress an understanding of process, and

the "deeper" dynamics of man, it states that before one can understand the motives underlying behavior, there should be some agreement as to what that behavior is. This assumption is the basis of this dissertation.

In analyzing the approach of Bleuler, Kraepelin, Freud, or any other contributor to the theory of schizophrenia, there are certain communalities among them. All had reached a certain stage of professional training; they dealt with patients at a clinical level; they observed the behavior of their patients; they classified their observations in some organized manner; and each interpreted the observed behavior in his unique manner. In terms of this common approach, particular theoreticians emphasized specific aspects as most important in understanding schizophrenia, i.e., Freud, although he observed the same behavior as Kraepelin, emphasized the interpretation of that behavior rather than its classification.

In constructing a theory of schiozphrenia, the theoretician works through each stage. But what occurs when there are numerous theories of schizophrenia and one has received training in a particular school? Or what occurs when one has received little formal theoretical training in a particular theory? Grinker (1960) has data indicating that experienced psychiatrists showed more agreement among themselves in regard to theoretical models of depression than did less experienced psychiatrists. But he also found that inexperienced psychiatrists showed more agreement about behavioral data than the experienced psychiatrists. He also found that experienced psychiatrists were more sensitive to inferential data about patients than to behavioral data.

In dealing with psychiatric patients in a mental hospital setting, there is a tendency to discuss patients in terms of a particular theoretical

framework. One's theoretical model may be explicit or implicit, but it appears to influence the interpretation of the patient's behavior. Observations about a patient are usually discussed in terms of inferential or speculative statements concerning his behavior. Since these speculative statements are based upon observed behavior, the question then arises: when dealing with patients, in this case schizophrenics, to what degree is the observer sensitive to the patient's manifest behavior as compared to the observer's interpretations of that behavior. In addition, does the observer's formal training (psychiatric, nursing, aide) influence his emphasis regarding manifest or speculative behavior.

This dissertation will investigate differences which occur between psychiatrists, psychiatric nurses, and psychiatric aides, in rating acute schizophrenic patients at "behavioral" and "inferential" levels. "Behavioral" and "inferential" levels will refer to two scales which were constructed for this study. The "behavior" scale was comprised of items selected as being objective and non-inferential descriptions of schizophrenic behavior. The "inferential" scale was constructed with items of schizophrenic behavior that were on a less objective level. Since the behavior scale was comprised of fairly objective items, and the inferential scale contained items on a more speculative level, it would be possible to measure differences in rater sensitivity to behavioral phenomena as compared to more inferential phenomena.

The scales utilize the Q sort method devised by Stephenson (1953), which permits the comparison of rater differences, one patient at a time. In this method, large numbers of test items rather than large numbers of subjects are employed. Any trends which occur in one patient will be further analyzed to

determine if they occur throughout the patient sample.

Because a particular psychological instrument influences the manner in which one observes patients, the psychometric properties of each scale are analyzed. In this manner it is possible to determine which items are useful in describing schizophrenic behavior, and which items are not as useful.

Bleuler and Kraepelin devised a classificatory system of schizophrenia, but there has been some dispute by others regarding this system. The factor analytic studies of Guertin (1952, 1954, 1956) and Lorr (1951) have consistently indicated three or four groupings of schizophrenia. The patients in this study will also be factor-analyzed to investigate if they approximate the groupings isolated by the Lorr and Guertin studies.

In summary, this dissertation will study three issues: 1) the differences between three groups of raters in a psychiatric setting in rating manifest and inferential phenomena or schizophrenic patients. It is hypothesized that a) psychiatrists should show greater agreement than nurses and aided, and nurses should show greater agreement than aides, on the inferential scale; that b) aides should have greater agreement than nurses and psychiatrists, and nurses should show greater agreement than psychiatrists on the behavior scale; that c) psychiatrists should have higher agreement on the inferential than on the behavioral scale; and d) that aides should have higher agreement on the behavioral scale than on the inferential scale.

2) The psychometric properties of the rating scales will be determined through item analysis.

3) The subgroupings of schizophrenia will be determined by factor-analyzing the patients used in the study, and these subgroupings will be

compared with those clusters isolated by other factor-analytic studies of schizophrenia.

CHAPTER II

REVIEW OF THE RELATED LITERATURE

A. Theoretical viewpoints of schizophrenia.

Schizophrenia has been the subject of a multitude of scientific investigations. However, there is some dispute whether schizophrenia represents a single disease entity, or whether it is a syndrome of various separate disease entities. Kraepelin (Arieti, 1955) was the first to formally describe schizophrenia, to characterize its symptoms, and to separate its symptoms into the three groupings, "hebephrenic," "catatonic," and "paranoid." Kraepelin believed its primary characteristic to be its outcome, that is, its progressive tendency toward dementia. Kraepelin was primarily concerned with the structure of schizophrenia, rather than its context.

Bleuler (1950), who was responsible for the name "schizophrenia," believed that it was characterized by the splitting of "psychic functions" rather than its being a progression toward dementia. He enlarged the groupings, adding "simple" to Kraepelin's other three groupings, and also recognized the possibility of "latent" schizophrenia. Bleuler classified symptoms into (1) "fundamental" and (2) "accessory." The fundamental symptoms (association, autism, ambivalence, and affect) were not necessarily primary symptoms, but were present in all schizophrenia, latent or manifest. The accessory symptoms (delusions, hallucinations, postures, etc.) may or may

not occur, but are often present. The primary symptoms were directly related to the disease process, and the secondary symptoms were caused by the combination of primary and psychogenic factors. Bleuler did not elaborate on the motivation behind schizophrenia. He seemed amenable to Freud's theory of unconscious motivation, but did not incorporate this into his theory of schizophrenia. Bleuler and Kraepelin represent the emphasis on the structural components of schizophrenia.

Adolf Meyer (Arieti, 1955), in his psychobiological approach, believed that the basis of schizophrenia was the substitution of faulty habits of adjustment. When the habits became distorted enough, the schizophrenia became full-fledged.

Sigmund Freud (Arieti, 1955), although he accepted the symptomatology described by Bleuler, believed that the symptoms should not be accepted at a phenomenological level, but represented unconscious, unresolved conflicts. The fundamental characteristic of schizophrenia was regression to an earlier psychosexual stage.

Karl Jung (Arieti, 1955) considered the schizophrenic to be an introverted type. The potential of schizophrenic development was in the "collective unconscious" where the symptoms of schizophrenia were considered to be the reproduction of the archetypes. Schizophrenia was considered to be due to the relative strength of the unconscious and the number of atavistic tendencies which could not adjust to stress.

Sullivan criticized Bleuler's formulation of schizophrenia as due to the impairment of association of ideas. Sullivan believed that the primary disorder was of mental deterioration where "...disintegrated portions regress

in function to earlier levels of mental ontology" (Arieti, 1955).

These, then, are some of the major contributors to theories of schizophrenia. They are characterized by intimate dealings with schizophrenic patients, and the formation of theories with considerable impact and subsequent investigation of schizophrenia.

B. Rating Scales of psychoses.

A common psychological technique employed in the study of schizophrenia is rating the patient's behavior. A number of rating scales for mental patients have been devised.

The "Gardner Behavior Chart" (Lorr, 1954) was devised to be used with psychotic patients. The scale contains reports of easily observed patients' ward behavior and is primarily aimed for use by nurses and ward attendants. There are 15 categories, with five phrases under each category, with ratings ranging from 0 - 4 for each phrase. This yields a total score for each patient, and is used primarily to evaluate change in behavior after lobotomy.

The "Fergus Falls Behavior Rating Sheet" (Lucero and Meyers, 1951) is designed to measure behavior of mute, hyperactive, or generally unintelligible patients. There are 11 categories containing five descriptions per category, with each phrase to be rated on a five-point scale. The scale is designed for use by untrained raters such as psychiatric aides. An agreement index of correlation .94 for male raters was achieved by 8 raters rating 28 patients.

The "Norwich Rating Scales" (Lorr, 1954) are designed for rating disturbed war patients by nurses or attendants. The statements are organized into five categories of activity. The rater reliability was determined by two raters rating 10 patients, which yielded a correlation of .76. Since only

two raters were used to determine the reliability, this may be a spuriously high estimate.

The "Hospital Adjustment Scale" (Guertin, 1955) is comprised of 91 statements of patients behavior to be ranked into TRUE, FALSE, and DOES NOT APPLY. The authors report the scale is able to differentiate those patients approaching release from the hospital from extremely disturbed or chronic hospital residence.

The "Scherer Activity Rating Scale" (Lorr, 1954) contains 44 items of behavior to be rated on a four-point scale. The items contained behavior pertaining to occupational therapy, manual arts, etc.

The "Elgin Prognostic Scale" (Lorr, Wittman, Schanberger, 1951: Lorr, 1954) is comprised of 20 rating scales weighted according to prognostic importance in predicting recovery from schizophrenia.

The "Wittenborn Scale" (Wittenborn, 1951: Wittenborn and Holzberg, 1951) was constructed to permit the psychologist, psychiatrist, or nurse to rate discernable symptoms of mental hospital patients and to prepare a profile based on factorially defined syndromes. The ratings were devised so as to be independent of the theoretical background of the raters and of the dynamic interpretations or insights of the raters. The scale contains 55 items of behavior, which, through factorial analysis, have been separated into seven symptom clusters. There are no reports of reliability or amount of agreement between judges.

The "Multi-dimensional Scale for Rating Psychiatric Patients" (Lorr, 1953; Lorr, 1954) contains quantitative descriptions as seen in diagnostic or therapeutic interviews, and measures of change in clinical status. The 49

scales contain items of manifest behavior, symptoms, inferred attitudes, and needs. A factor analysis of the scale with 184 veteran patients receiving psychotherapy in 4 mental hygiene clinics extracted 14 clusters.

These are the major scales that have been constructed to measure the behavior of the hospitalized mental patients, although there are other scales that have been devised for specific purposes. These will be described later. Most of the items in these scales differ.....from the scales proposed in this study in that items of manifest behavior are not separated from items of inferential behavior.

C. Rater agreement in rating psychotic behavior.

This next section will review some of the studies that have used the above mentioned rating scales and some of the studies pertaining to the degree of accuracy of raters in rating the behavior of schizophrenics and various types of productions of schizophrenics.

Sines (1959) determined the contribution of the Biographical Data Sheet, the MMPI, the Rorschach test, and the diagnostic interview to accuracy in describing personality. Using patients from the Veterans' Administration, he formed Q sorts of 97 items of genotypic and phenotypic data. The Q sorts of each patient, using these items, were done after the clinicians considered each kind of data. Reliability sorts, in which the clinicians rated the same patient within one to 42 days after rating him initially, indicated correlation coefficients of .80 to .94. Sines' results suggested that the diagnostic interview contributed to the greater accuracy of judgments of personality characteristics and that the interview was most useful when held early in diagnostic sequence. The overall agreement between the diagnosticians

and the therapists was R equals .48, "... indicating that different frames of reference were emphasized by each." Sines' study suggests that a face to face interview is a more accurate method of rating a patient than written data. However, this finding appears to contradict some of the results of Hunt and associates. (Hunt, 1962), that will be described later.

Ash (1949) attempted to determine the reliability of psychiatric diagnoses. He used 54 subjects and three psychiatrists. Five categories of agreement were used. His results indicated that the degree of agreement among the psychiatrist with respect to a specific diagnostic category was 20 per cent when three psychiatrists were used and 31 to 43 per cent when two of the three psychiatrists were used. These results are consistent with other studies in that, in comparing the amount of agreement between judges, the larger the number of judges, the lower the degree of agreement appears to be.

A study by Rowell (1951) attempted to devise a graphic rating scale to portray the behavior of psychotics in ward environments with the Psychiatric Behavior scale. He selected 24 "behaviors" which were to be rated on a 5 point scale. These behaviors were given to 22 psychiatric nurses and 20 final behaviors were selected on the basis of their recommendations. A period of instruction with the nursing staff was held where the boundaries of each item and the mechanics of recording were discussed. The day nurses evaluated the day behavior and the evening nurses evaluated the night behavior of the patients. Forty-four patients at the Neuropsychiatric Institute of the University of Michigan were administered the scale for 31 days in succession. The day and the night scores were averaged and the average scores for each day were plotted graphically. Test re-test reliability, in which the scale

was readministered immediately after the first rating resulted in a Pearson product moment correlation of .95. A reliability estimate was determined by two nurses rating the same patients for the same period of time. A Pearson coefficient of .85 was indicated here. Powell also reports a measure of validity by having eight psychiatrists checking the scale weekly. The rating by the psychiatrists were paired with the mean rating by the nurses on the ward which resulted in an average correlation of .78. The correlations ranged from .65 to .87. The daily behavior of the patients was then graphed and differences between deviant behavior and normal behavior could be differentiated. The results of this study suggest that the behavior of mental patients can be accurately rated by staff members if the staff is trained before the testing.

A large scale study of schizophrenia has been conducted at the University of Michigan during the past few years. Gerard (1963) indicates the overall hypothesis behind the study. "At present, the clinical diagnosis of mental illness, including schizophrenia and its division into sub-types, is little past the alchemist stage." Gerard and his associates consider schizophrenia to be a nosological mixture that can be differentiated through a variety of tests by the use of a sufficient number of subjects, into clusters which would identify sub-types of the population. If certain test clusters shifted under drug action during longitudinal study, this would provide a separate validation." The initial study used 100 schizophrenics and 100 control patients. Fifty patients were rated by three psychiatrists who all listened to the same tape recorded interview and were also rated by two Rorschach raters. The raters used the Lorr scale and the Wittenborn Scale. The average

agreement among the three psychiatrists on the scales was between r = .30 to r = .40. Eleven of the thirty intercorrelations were above .44. This promises to be an excellent over-all study when more results are obtained. The degree of agreement among the psychiatrists suggests that it is difficult to measure the behavior of schizophrenic patients accurately.

Grigg (1958) investigated the hypothesis that clinical experience per se does not insure more accurate clinical judgments about clients. Grigg used the voice of the interviewee, the content of the interview statement, and the training and experience of the judge as variables in his study. He tape recorded the first counseling interviews of three male clients. The clients appraised themselves through the use of Q sorts and self report questionnaire and these tape recordings were then transcribed onto a written script. The method of presentation was (a) the actual tape recorded selection (b) the tape recorded selection re-enacted by an actor and (c) the exact typed script of the interview. The judges included 24 male Ph.D.'s in clinical psychology, 24 male trainees in clinical psychology and 24 male undergraduates in introductory psychology. The judges were asked to predict how the client responded to three personality tests that were administered. The results indicated that the judges with clinical training, (the Ph.D.'s and the trainees) predicted the client responses more accurately than the naive judges. However, there were no differences found between the Ph.D. judges and the trainees in ability to predict how the client would respond to the personality tests. Grigg also discovered that the written, typed script, without the voice, was the most accurate predictor of the patient responses on the personality tests.

W. A. Hunt and his associates have been conducting a number of experiments of ability to rate schizophrenic responses or intelligence tests between experienced and non-experienced raters. Hunt's hypothesis suggests that "Clinicians have been concerned more with patient behavior than with their own behavior in the clinical situation. Yet the subjective decisions of the clinician.....are influenced by other factors than the patient's behavior." (Hunt, 1962). In other words, Hunt believes that the ability of the raters to rate must be investigated as well as the behavior of the patient. In regard to this, Hunt further hypothesizes that although intuition may be necessary in describing patients, basic facts and experience must be acquired before one can use intuition. Intuition is not considered to be mystical but must be subjected to empirical investigation. Hunt believes that scales of behavior, when constructed, should be descriptive rather than dynamic in nature in order to avoid confusing the observed behavior with the theory. In a number of experimental investigations, Hunt has concluded that three kinds of experience contributes to a judge's level of ability in rating schizophrenic items. The first is the general level of clinical experience. The second is the number of times a particular judgmental task has been performed. The third is the particular stimulus to be judged. This suggests considerable emphasis on the role of experience in judgmental situations. Hunt has also stated that primacy is more important than recency in making clinical judgments.

Hunt and Arnhoff (1955) constructed a scale of vocabulary items to determine if there was a sufficient agreement among clinicians for scaling purposes. Fifty responses from schizophrenic subjects on the Wechsler

Bellevue Vocabulary and on the Comprehension sub-tests were selected. The judges were asked to rate the responses on a 7 point scale according to the severity of pathology. The group repeat reliability, in which the judges were asked to rate the responses again, was .97 for vocabulary and .96 for comprehension. The test-re-test reliability varied from .65 to .92 for vocabulary and from .68 to .90 for comprehension. The degree of Agreement using the Pearson Product-Moment correlation was from .73 to .92 for vocabulary and .64 to .88 for comprehension.

Hunt, Jones, and Hunt (1957) studied the anchoring effects in judgment in which subjects with varying amounts of clinical experience rated the disorganization manifested in schizophrenic responses to vocabulary test items. A summary of this study indicated "naive and trained groups showed good agreement in their evaluation of the stimuli, with the effect of clinical training showing significance only in the improved reliability of higher inter-judged agreement manifested by the professional clinical psychologists."

Hunt and Jones (1958) further studied this high reliability found in naive judges and in experienced clinicians in rating the vocabulary responses of schizophrenics. They wanted to evaluate whether the high reliability would continue when the judgments became more specific, or if the gap in judgment ability between trained clinicians and naive judges increased when the task became more discriminant. Fifty schizophrenic vocabulary responses were used from the Wechsler-Bellevue. Judgments were to be made on a 7 point scale using dimensions of (1) potential intelligence, (2) communicability, and (3) concrete abstract. The subjects were 31 Ph.D.'s with at least four years of

job experience and 90 undergraduates separated into three groups of thirty. The results were obtained by comparing each subject's judgments with the mean of the group. The results indicated that clinicians' reliability remained high when the judgment became more specific, but the range of responses was wider. The correlations range from .55 to .88. The reliability correlations of the students remained high, although their correlations were lower than the clinicians, but their range of responses were wider than the clinicians. Hunt and Jones concluded that the reliability of clinicians on more differentiated tasks remained high and that undergraduate reliability remained high but the undergraduates were not as able to distinguish accurately between the three dimensions of potential intelligence, communicability and concrete abstract.

Jones (1959) followed up on the finding reported in the previous study by attempting to determine if clinicians and naive judgments could make global appraisments of complete intelligence test protocols with as great reliability as they can judge single test items. He used 48 trained clinicians and 48 undergraduate students. They ranked three amounts of vocabulary and comprehension sub-test responses according to the degree of schizophrenic pathology. Both the clinicians and the undergraduates rated more reliably than chance. However, as the amount of material increased the reliability for each group decreased. The clinicians were not better in handling the increased amounts of material than were the students.

The studies by Hunt and associates are carefully designed and heuristic in that each finding suggests other hypotheses to be tested and are tested. The results suggest that the reliability of experienced clinicians in rating schizophrenic behavioral items is quite high when the responses are written.

They also suggest that when the task becomes more global and complex the reliability estimate or the estimate of group agreement becomes lower.

Cline (1955) studied the differences between trained and untrained raters in judging personalities during stress interviews. He made motion pictures recordings of employment interviews of nine male college students. Judges were then asked to make predictions about real life behavior of those interviewed. There were three phases of the interviews: (a) the standard interview, (b) the stress session where the employer was abusive and (c) the abreactive session. Five groups of judges were employed: (a) 109 college students, (b) 106 psychologists and psychiatrists, (c) adult members of a church organization, (d) 43 nurses, and (e) eleven engineering trainees. The results indicated that the most accurate judges of the interviewees behavior were the professionals. The second most accurate were the nursing trainees; third, were the students, the church members and the engineers. Also, interesting enough, the increase of professional experience was related to decreased accuracy in predicting real-life social behavior.

A classic study of comparing the rating ability and degree of agreement between experienced and unexperienced raters was done by Fiedler (1951). Fiedler attempted to explore the therapeutic relationships. Again, this study stresses what previous researchers have found; that experience appears to create more agreement among judges in rating patients, particularly at theoretical levels.

Beck (1956) conducted some research at the Orthogenic school in attempting to investigate how psychologists differ from psychiatrists in terms of describing schizophrenic children. He used 170 items of behavior descriptive

of schizophrenic children. Two psychiatrists and two psychologists, who rated on the basis of the Rorschach, participated in the study. Each rater rated the 170 items on a 13 point scale on severity of schizophrenia. Beck concluded that the psychologists agreed more in their description of schizophrenia indicating that co-operative work teaches two judges to agree. The accuracy of Beck's results would appear to be tenuous considering that only two judges within each category were used.

Grinker et. al. (1961), reported on a project to classify the characteristics of depression at a phenomenological level. Grinker was interested not only in the amount of agreement between experienced and inexperienced psychiatrists in rating the behavior of depressed patients, but also differences in the ability to rate items at a "behavioral" level and at a "feelings and concerns" level. Two scales were prepared on the Q sort principle: (1) a scale of items of behavior and (2) a scale of feelings and concerns. Psychiatrists were asked, on the basis of interviews and therapeutic treatment of the patient, and on the basis of typewritten case histories of the patient, to rate each patient with these scales. Grinker averaged the correlations of agreement between the psychiatrists. The correlations of agreement varied from -.19 to .60 with an average correlation of agreement of .43. Grinker had the judges provide a stereotype of depression using the scales. In this type of situation the experienced psychiatrist agreed more highly among themselves than did the inexperienced psychiatrists, suggesting that the more experienced psychiatrists had formed a more common theoretical viewpoint of depression. Grinker suggested that, "Perhaps this means that the older men are more rigid and the younger ones are more open

to the actual data of the individual, live patients." Grinker also reported that the degree of agreement among nurses in rating patients was similar to that of the resident psychiatrists. Grinker factor-analyzed the feelings and concerns check list and obtained four factors of depression. This was a carefully devised and well carried out study. It reflects the concern of psychiatrists that not enough emphasis has been placed on the actual behavior of mental patients as compared to inferences about their behavior, and that it is necessary to investigate the actual behavior of patients, in addition to speculations about their behavior.

In analyzing the results of studies of agreement among judges in rating the behavior of mental patients, a number of conclusions seem to be apparent. Ratings of behavior of mental patients results in correlations generally in the .40's and .50's. When the test requires the judges to rate on the basis of written descriptions of behavior, the degree of correlation rises somewhat. It also appears that when isolated items of psychopathology are used the degree of agreement among raters can be in the .90's. However, as the complexity of the task increases, the degree of agreement decreases. The effect of experience on the degree of agreement among raters is not as clear. It would appear that under certain situations, for example in Hunt's experiment on the rating of pathological vocabulary and comprehension responses, an increase in experience provides higher agreement among experienced raters as compared to naive raters. On the other hand, for example in Grinker's studies, the less experienced psychiatrists were able to reach a higher agreement about a particular patient than did the more experienced psychiatrists.

D. The Q sort technique

The Q sort technique of rating was selected for use in this study because it provides a method of describing each person individually, and it also lends itself to eventual factor analysis of patients. The Q technique was developed by Stevenson (1953). It is an ipsative method of measurement which is particularly useful for the study of small groups of patients, because it provides the rater with a large number of statements with which to rate each patient. Ipsative measurements also provide a set of scores which are ordered relative to the individual's own mean rather than to the mean of a group of individuals (Block, 1957). This type of measurement has lent itself to the study of individuals in therapy. In the studies by Rogers and Dymond (1954), individuals described their own behavior with Q sorts before therapy and at the end of therapy, and changes in individual perception of self were measured.

Block has attempted to compare differences in measurement between ipsative and normative ratings of personality. He defined ipsative measurement as the set of scores ordered relative to the individual's own mean, and normative measurement as the score of the individual evaluated relative to the mean score of the group. One hundred males were observed by eight psychologists. Each psychologist rated each subject on 30 aspects of personality using a 5 point rating scale, considering each rating variable singly. The ratings were averaged between the raters, resulting in one score for each dimension of S. This was the normative rating. For the ipsative measure, the same 100 males were rated by the same 8 psychologists, each psychologist rating each subject on an 8 point continuum using the Q sort items. Each item was summed across

the ratings to give each subject one score for each Q sort item. The correlation between the two methods of measurement was .95, corrected for attentuation. Block concluded that both methods are almost equivalent as measures of personality.

E. Factor-analysis of Q sorts

Stephenson's conception of the use of Q methodology varies from other theorists, particularly when the Q sorts are factor-analyzed. Stephenson believes that the Q technique of factor-analysis differs from the R technique and the P technique (Stephenson, 1953). The R technique is defined as the application of tests to subjects, intercorrelating the tests, and factor-analyzing the test matrix. The P technique applies the tests to a number of subjects, the persons are intercorrelated, and the person matrix is factor-analyzed. Q methodology is designed in terms of people, and the quality of performance is assessed with respect to each person in turn. Stephenson believes that the R technique is a technological rather than a psychological problem while the Q technique is primarily a psychological problem in which prior propositions are tested out through factor-analysis.

When Stephenson initially outlined his Q methodology and the place of factor-analysis, there was some dispute between him and Burt (Burt 1937; Burt and Stephenson, 1939). Stephenson argued that the Q technique was different from the conventional R and P factor analytic techniques. Burt, on the other hand, agreed with Stephenson that the correlation of persons was valid and offered a mathematical proof that correlation of tests and correlation of persons result in similar structures. However, Burt insisted that there were very few differences between Stephenson's Q technique and the traditional

factor-analytic techniques and that Q methodology was but one application of factor-analysis of persons. The factor-analysis of persons proposed in this dissertation will be based on the arguments of Burt.

F. Factor-analytic studies of schizophrenia

Some of the major factor-analytic studies of schizophrenia have been done by Lorr and Guertin. Their theoretical viewpoint of schizophrenia has been influenced by the work of Jenkins (1952). Jenkins bases his viewpoint of schizophrenia on the theory of Adolph Meyer, which considers schizophrenia to be progressive maladaptation with habit disorganization. Jenkins considers Norman Maier's experimental work with rats to be a link in understanding the schizophrenic process. Maier demonstrated experimentally that rats, subjected to continued frustration, show a replacement of adaptive behavior by frozen, stereotyped behavior. Jenkin's hypothesizes schizophrenia to be a breakdown of the adaptive process. He hypothesized three sequences in the schizophrenic process: 1) Schizoid Withdrawal - this is a withdrawal of attention and interest from the outer enviornment, and empathic withdrawal from humans. It is not considered to be a phase of the schizophrenic process, but is developed early in childhood. 2) Personality Disorganization - this is a regressive process and a reversal of the developmental process. This considers behavior as representing a limited range of responses that are relatively invariable, automatic and rigid. 3) Psychotic Reorganization - e.g. the suspiciousness of the paranoid which develops after psychotic breakdown to the delusions of the paranoid. The psychotic reorganization stabilizes the psychosis so that the progression is less rapid and recovery is less likely. Jenkins considers that, in this sequence, delusions reduce the inner tensions

of the personality at the expense of reality distortion. It is a psychotic reorganization in an effort to maintain the integration of a disintegrating personality.

Lorr and his colleagues have analyzed the factors which describe the 20 scales of the Elgin Prognostic Scale through factor-analysis (1951). Two hundred admissions at Elgin State Hospital were rated on the Elgin Prognostic Scale by one author and one psychiatrist. Tetrachroric correlation between 17 of the 20 scales were computed. The matrix was factored by the Centroid method and the three obtained factors were rotated to oblique simple structure. Lorr identified the 3 factors as: 1) a factor of schizoid withdrawal, 2) a factor of schizophrenic reality distortion, and 3) a less well defined factor of personality rigidity, or inadaptability. He compares these findings to the three schizophrenic sequences as described by Jenkins. One of the criticisms of this study is that there are no reliability estimates given, as well as having only two judges rate the patients.

Lorr, et. al. (1954) have attempted to study factors descriptive of chronic schizophrenics who were selected for the operation of prefrontal lobotomy. Again, the authors purpose is to strive at a simpler and conceptually more satisfactory differentiation of major schizophrenic processes. One hundred and fifty-three patients were administered the Northport Record, a scale containing 81 brief items of characteristic behavior and symptoms of psychotic patients. Psychiatrists and psychologists were raters. The ratings were obtained prior to lobotomizing the patients, who were all chronic schizophrenics. Eleven scores based on previous factors were intercorrelated, and a factor-analysis, using the centroid method, was

done. The results indicated three factors: 1) An apathetic withdrawal with motor disturbances; 2) perceptual and thinking distortion, which Lorr considered to represent a phase of schizophrenic disorganization, and 3) a fighting reaction.

Lorr, et. al. (1955) conducted another study on the change in lobotomized chronic schizophrenic patients. Two hundred and fifty chronic male schizophrenic patients, all ill four years or more, were the subjects. One hundred and twenty-five were lobotomized and a control group of 125 were rated by psychologists and psychiatrists with the Northport Record. Initial ratings were done prior to the lobotomies. The ratings were also made on all patients three months later. A factor-analysis was done, and the factors were rotated to simple structure. Four similar factors of change were identified: 1) reduced social withdrawal with motor disturbances, 2) reduced schizophrenic excitement, 3) reduced grandiose belligerences, 4) reduced distortion of thinking. Lorr concluded that the lobotomies resulted in improvement of behavior of chronic schizophrenic patients, but the nature of the process following the lobotomy did not appear to differ greatly from that which may occur without lobotomy.

Lorr et. al. (1955) attempted to identify some principal parameters descriptive of psychopathology and psychotic patients. The Northport Scale was administered. The subjects were 423 male veteran psychotic patients. Twenty-five psychiatrists, psychologists and trainees rated the patients after interviews, and on their ward behavior during the preceding week. The first order factors obtained were: 1) affective disorders, 2) schizophrenic process, 3) disturbances of temperament. The second order factors were: 1)

resistive withdrawal with motor disturbances, 2) projective distortion of perception and thought, and 3) bipolar apathetic withdrawal versus agitated hyperactivity. It is unfortunate that with this number of judges, Lorr did not report any indices of agreement between the psychiatrists, psychologists and trainees.

Guertin (1952a) proposed to form a more reliable classification system for schizophrenia. One hundred diagnosed schizophrenics, 61 females and 39 males, ages 16 to 60, were rated on the basis of symptoms abstracted from two psychiatric textbooks. Seventy-seven symptoms were initially administered and 52 were retained. These symptoms were rated for presence or absence in the patients. The items were intercorrelated and the resulting matrix was factor-analyzed by the Centroid method and rotated to simple structure. Six factors were obtained: 1) excitement-hostility, 2) psychomotor retardation and withdrawal, 3) guilt-conflict, 4) persecuted-suspicious, 5) personality-disorganization, 6) confused-withdrawal. Guertin did not consider these results to be diagnostic categories per se, but response variables which would lead to a topographical map of the schizophrenic domain. He stressed the need for an inverted factor-analysis to describe the patients used in the study.

The same individuals tested in the previous study were factor-analyzed. Using 20 of the patients, 12 females and 8 males, the subjects were rated by the author using the 52 item scale for the presence or absence of symptoms. The matrix of persons was factor-analyzed and rotated to oblique simple structures. Three factors were obtained. The persons were described as 1) paranoid, 2) simple, 3) hebephrenic schizophrenics. Guertin concluded that

there is no group factor of schizophrenia and that his results corresponded to the categories of Kraepelin. He also concluded that the present method of subtyping schizophrenia was supported. One criticism of this study is the use of only himself as the judge. His conclusions seem to be rather broad on the basis of only his own judgements of the patients.

Guertin and Ziliatis (1953) studied 24 male paranoid schizophrenic patients and one hypothetical normal, through a transposed factor-analysis, in an attempt to further subtype paranoid schizophrenia. One hundred items of the Minnesota Multiphasic Personality Inventory, which were thought to discriminate between paranoid schizophrenics, were administered to these patients. The matrix of persons was intercorrelated and factor-analyzed using the centroid method. The factors were rotated to simple structure. Three factors were obtained: group A were described as socially normal paranoids; group B as grandiose and delusional paranoids; and group C were evasive and well-integrated paranoids.

In an attempt to further understand the classification of schizophrenia and the diagnostic features of the Bender-Gestalt Test, Guertin (1954) administered the Bender-Gestalt and the Malamud Sands rating scale to 32 male schizophrenic patients as well. The matrix of intercorrelations of persons were obtained, factor-analyzed and rotated. Four factors of persons were obtained. Group A were chronic undifferentiated schizophrenics; group B were disorganized; group C were conforming and non-defensive; and group D were actively defensive. He concluded that these factors were similar to his earlier findings as well as similar to the descriptions by Jenkins and Lorr.

In another study, Guertin and Jenkins (1956a) examined the resemblances

among a group of schizophrenics, again to study the nature and classification of schizophrenia. Twenty-nine veterans with schizophrenic psychoses were rated by the author (Guertin) on the Multidimensional Scale for Rating Psychiatric Patients, Hospital Form. Tetrachroric correlations between patients were then computed. The factors were extracted by the multiple group method and rotated to oblique simple structure. The factor-analysis of persons resulted in 4 factors. Factor I was a bipolar factor where the persons ranged from normality at the negative end to the extreme of schizophrenic disorganization at the other end. This factor was interpreted as related to the degree of pathology. Factor II was named "schizophrenic withdrawal." The patients appeared to be catatonic schizophrenics or the resistive withdrawal with motor disturbance type of schizophrenic as described by Lorr. Factor III represented "schizophrenic disorganization" without force or heat and dependent on poor personality disorganization or the late stage in a process which had burned itself out. Factor IV was interpreted as "schizophrenic agitation and anxiety." Again, only one judge rated the patients, rather than having a group of psychiatrists and psychologists rate them.

Guertin (1956b) investigated the schizophrenic type factors that would be obtained by administering the Activity Rating Scale. Twenty-nine males with varied schizophrenic subtype diagnoses and one hypothetically normal person (based on scores in the expected direction) were administered the Activity Rating scale, which contains 99 items related to patients adjustment in activities. One nurse, one music therapist, one corrective therapist, one occupational therapist, one chaplain, and one sports worker, administered the

scales. Tetrachroric correlations were computed and the matrix was factor-analyzed by the multiple group method and the factors rotated to simple structure. The factor-analysis of persons resulted in 5 types. The first was the "psychotic reorganization type," which was characterized by interest, animation, hostility, gross paranoid diagnoses, some disorganized features, and presence of thought disturbances with bizarre distortion of reality. Type II was the "apathetic type." They were characterized by low loadings on affectomotor pressure, interest, and animation, assaultiveness and regressive activity. They were characterized by a motivational deficiency. They were characterized by some personal care and attention, no emotional instability and would not become disturbed when intruded upon. Factor III was named the "disorganized type." They were characterized by regressive activity (hebephrenics). They were heedless of personal needs, disregarded conventional restrictions of behavior, and were disorganized. Their disorganization stemmed from disorganized behavior rather than delusions. Factor IV was the "chronic reintegrated type." They were highly loaded in interest and animation, sociability and communication. There was low verbal hostility (the hypothetical normal was highly loaded on this factor). These individuals had gone through an acute stage but had reintegrated. They appeared passive but maintained an interest in their surroundings. Their remission was not complete. They were not under any particular emotional pressure. Factor V were the "resistive isolation type." They were characterized by assaultiveness, verbal hostility, affectomotor pressure. They had low loadings on sociability and communicability. They emphasized resistiveness and assaultiveness. This was a bipolar factor with the very socially withdrawn at the lower

end. But these very passive and inhibited persons were unlike the disorganized type who showed an unconcern. These patients showed an active disconcern. Guertin concluded that these types resembled Jenkins' psychotic reorganization type, particularly factor number one. The disorganized type of Jenkins, was factor III and the resistive isolation type was factor V.

An over all criticism of Guertin's studies in his lack of reliability estimates. In some of the studies described above, only one rater and sometimes only two, were used to rate the behavior of the patients. When more raters were used, no coefficients of rater agreement were reported. On the other hand, Guertin's studies are characterized by careful factor-analytic procedures and thoughtful interpretations.

Gorham and Betz (1963) measured psychiatric behavior on the basis of a nurses behavior chart. Forty-four items of behavior were administered by the nurses on the ward to 100 patients. The items were averaged for 7 day periods during their first and last week of hospitalization. The items were factor-analyzed and 10 factors were extracted. The first was "asocial acting out," the second was "motor retardation," the third was "psychotic deterioration," the fourth was "agitation," the fifth was "mental health," the sixth was "unusual motor behavior," the seventh was "thought disturbances," the eighth was "depression," the ninth was not definable as meaningful, and the tenth was "lack of motivation." There is some question regarding the accuracy of the factor-analysis in this study, as contrasted with the careful rotations in this study did not appear to be invariant, which would question the interpretation of the factors as reported in this study.

Factor-analytic studies appear to have isolated at least three different

types of schizophrenic subtypes, and possibly more. The studies of Lorr and Guertin agree on certain types. They have consistently arrived at one factor of "withdrawal." This type of patient appears to withdraw at a motor level and to be apathetic and disinterested in his surroundings. He is most like the catatonic type of personality. Another type might be termed the "chronic undifferentiated type." And there is also a type with "mental" or "cognitive," or "distortion of reality" as the basic disorder. A fourth type which is often isolated and may be a combination of type three, is characterized by "assaultiveness and extreme activity" on one pole and "socially withdrawn and disorganized" on the other pole.

Beck, in his monograph "The Six Schizophrenias" (1954), attempted to classify schizophrenia on the basis of responses to the Rorschach test, and psychiatric interviews. Patients who were diagnosed as schizophrenic on the basis of psychiatric diagnoses were given the Rorschach Test. Psychiatrists also rated these patients with 120 items of schizophrenic behavior. These items were matched with their Rorschach correlates. Psychiatrists and psychologists rated the same patients. On the basis of Stephenson's Q methodology, the patients for whom a high degree of agreement between psychiatrists and psychologists was obtained, were correlated and this matrix was factor-analyzed. Beck obtained six factors characteristic of schizophrenic behavior, both manifest and latent. However, there is some criticism regarding the methodology employed in this study. Conger, Sawrey and Krause (1956) criticize Stephenson's Q methodology as employed in this study. Since each factor-analysis consisted of a correlation matrix composed of X individuals rating Y patients, each correlation represented a combination of rater and

patient characteristics, so that the variance is distributed between raters and patients in indeterminate amounts. Therefore, claim the authors, when the correlation matrix is analyzed, it is impossible to determine to what extent the factors represent raters as opposed to patients. Conger, Sawrey and Krause believe that the effects of the raters on the patients could be separated by extracting individual correlation matrices for each patient and factoring each separately. If the three agree, then the patients are described and not the raters. In other words, the basis of Beck's results are uncertain because of inter-rater unreliability.

Stephenson (1956) responded to this criticism by stating that the analysis is concerned with the raters' specificities rather than the more general range. Therefore, he did not believe that Beck required high inter-rater reliability. Conger, Sawrey and Krause replied to Dr. Stephenson (1956), "If you use 20 raters to judge one patient, you are not evolving a picture of schizophrenia when the factors are analyzed but you are evolving a picture of raters of schizophrenia. Therefore, you cannot derive factors of schizophrenia. Therefore, you cannot derive factors of schizophrenia where raters who disagree substantially with one another are confounded with the patients." This appears to be a valid criticism, and is a difficulty inherent in Stephenson's methodology in regard to certain types of designs in which raters and patients are factor-analyzed without any prior control of the degree of reliability of raters. This is another reason why it is important to have some estimate of the degree of agreement among raters, or if not, to be certain that in the design of the experiment the rater variance has been separated from the patient variance.

CHAPTER III

PROCEDURE

Three variables were used in this study; patients, raters, and items.

The patients in this study were acutely disturbed schizophrenics, 18 to 35 years of age, from the Loyola ward of the Illinois State Psychiatric Institute. Eighteen patients were used in the study; 10 females and 8 males. None of the patients were medicated during the period of rating. All of the patients were selected from the Cook County Mental Health Center, where they each were legally committed and diagnosed as schizophrenic by 2 court psychiatrists. The court diagnosis of schizophrenia was re-examined by the assistant chief of service and the second year resident psychiatrist from the Loyola ward, through a series of diagnostic interviews. The final diagnosis of schizophrenia was based on the judgements of the Loyola psychiatrists. The patients were all involved in milieu therapy treatment (Artiss, 1962; Jones, 1956) which consisted of daily group therapy meetings, group relative meetings, occupational therapy, recreational therapy, and intensive contact with the psychiatrists, nurses, aides, social worker, occupational therapist, and the psychologist. There was no scheduled individual psychotherapy.

The rating scales were constructed during a series of meetings where the staff (psychiatrists, head nurses, nursing educator, pharmacologist, social worker, and psychologist) selected the items to be used in the scales. The items were selected from daily reports of patient behavior which were

compiled by the nursing and aide staff, and from related literature in the field (Beck, 1954; Jung, 1924; Grinker, 1961; Bleuler, 1950).

The "behavior" scale was defined as those items of schizophrenic behavior which are observable, fairly objective, and concrete. The "inferential" scale was defined as those statements of schizophrenic behavior on a more speculative level of behavior than those of the behavior scale. Considerable discussion was held in selecting the items. The boundaries of each item were discussed in order that the items would not contain a "behavior" that was so specific or so general that it would not be useful. Table I lists the 101 behavioral items that were selected and Table II lists the final inferential items that were selected.

The Q sort technique of scaling, developed by Stephenson (1953) was used. This technique is particularly applicable to small sample studies because it allows a single patient to be rated by a large sample of items, the items being judged according to the patient's own mean. The distribution is a fixed, normal, forced choice distribution. (Figure I, Figure II) The rater is instructed to rate each patient on a 13 point scale, ranging from 0 to 12 on the basis of items of behavior (or inferential behavior) that are most characteristic of the patient's behavior. The items of behavior that are rated "most characteristic" are placed at the upper end of the distribution and items which are most uncharacteristic of the patient are placed at the opposite end of the distribution. Those items which are neither characteristic nor uncharacteristic of the patient are placed in the center of the distribution. The raters used either the lists of items (Tables I and II) or Q sort decks of 3 by 5 index cards, each card containing one item of behavior. Use of the

cards allowed a rater to form a preliminary sorting, before deciding on the final arrangements of cards.

The raters were instructed to rate each patient on both the behavioral and inferential scales. The raters in this study included 3 psychiatrists, 11 nurses, 8 psychiatric aides, 1 social worker, and 1 psychologist, from the Loyola Ward of the Illinois State Psychiatric Institute. The raters represent three levels of training: psychiatric, psychiatric nursing, and psychiatric aide. For the purposes of testing out the hypothesis regarding inter-rater agreement, the social worker and psychologist were not placed in either of these three categories. However, for the factor-analysis of the persons, the psychologist and social worker's ratings were included in the average score for each item.

The raters were familiarized with the items on the scales through a series of training sessions to provide agreement on the meanings of the individual items and to acquaint themselves with the techniques of Q sorting. Each rater received four hours of training, during which time, each item was discussed, its boundaries were delimited, and each member of the group participated in attempting to understand the meaning of the item.

The main part of the study consisted in each rater rating each patient with both the inferential and behavioral scales. In an attempt to control for wide variations in behavior over long periods of time in these acutely disturbed patients, the raters were instructed to rate a patient on his behavior during the previous week. Since various raters worked on different hospital shifts, they may not have had equal opportunity to observe certain aspects of patient behavior. The daily patients reports, which covered the

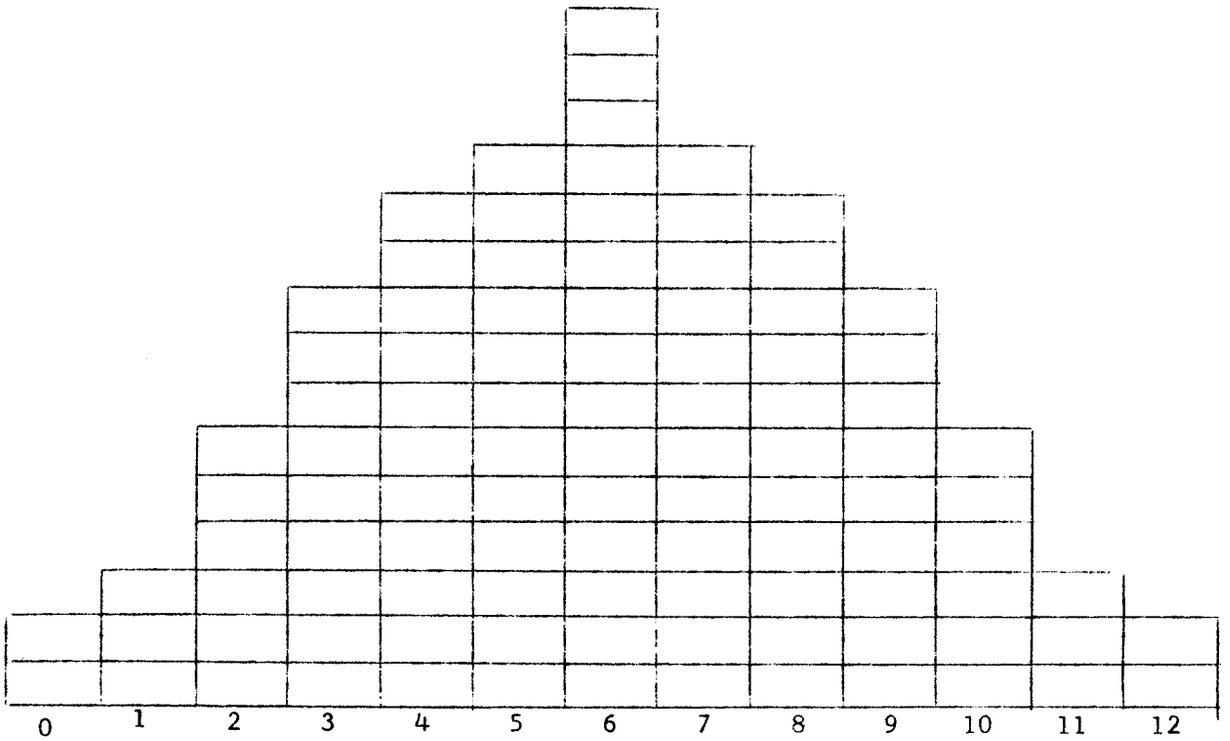
FIGURE I

BEHAVIOR SCALE

Patient _____

Rater _____

Date _____



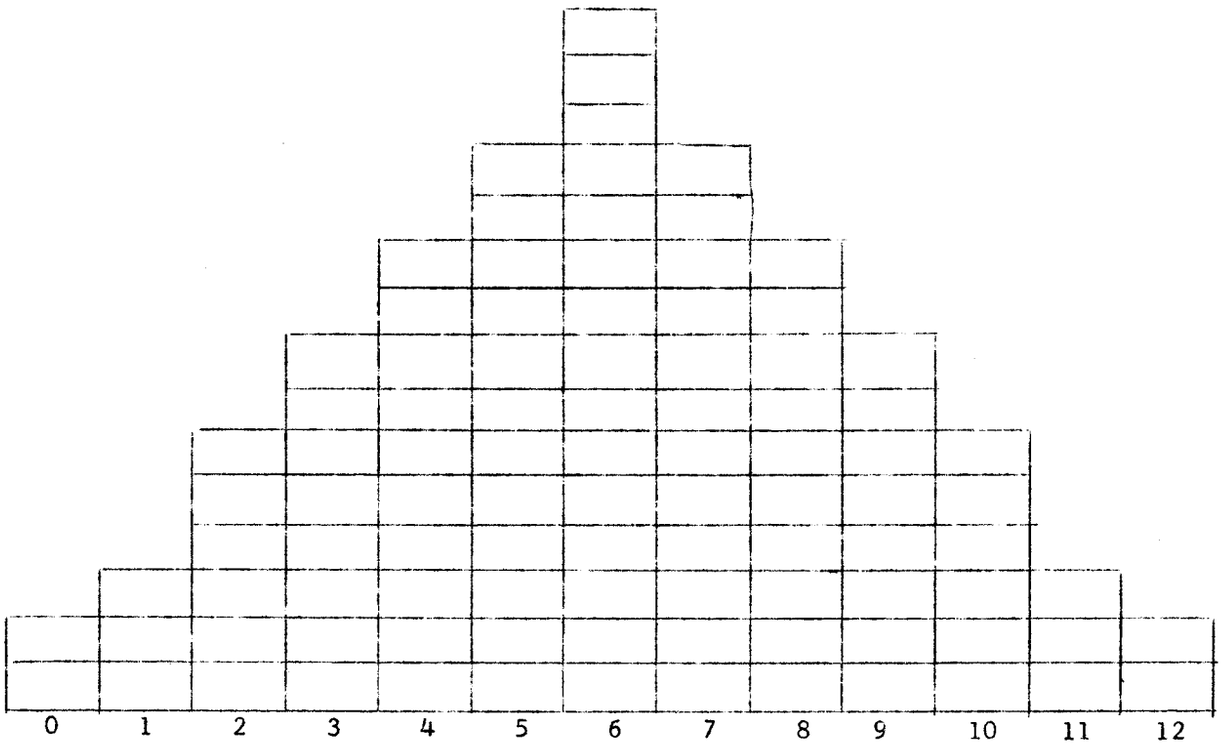
Rate the patient according to Behavior items which are most characteristic of the patient (at the right extreme of the scale) and most uncharacteristic of the patient (at the left extreme of the scale). Items which are not particularly characteristic nor uncharacteristic of the patient are placed in the center of the scale. Write the number of the item in the box. Place only one number in each box.

1-21-63

FIGURE II

INFERENTIAL SCALE

Patient _____
Rater _____
Date _____



Most Uncharacteristic

Most Characteristic

Rate the patient according to Inferential items which are most characteristic of the patient (at the right extreme of the scale) and most uncharateristic of the patient (at the left extreme of the scale). Items which are not particularly characteristic nor uncharacteristic are placed in the center of the scale. Write the number of the item in the box. Place only one number in each box.

1-21-63

TABLE I

LIST OF BEHAVIORAL ITEMS

1. does not talk to patients
2. does not talk to staff
3. does not respond when spoken to
4. does not attend ward meetings
5. annoys others
6. talks to patients on one to one relationship
7. eats alone
8. urinates at inappropriate places
9. soils (not himself)
10. refuses meals
11. soils own self (urine,feces,etc)
12. smearing of food, feces, saliva
13. tears clothes
14. paces
15. speaks to himself
16. shouts, swears
17. hits staff members
18. hits patients
19. breaks or throws furniture
20. attacks self
21. leaves ward without permission
22. stares
23. moves slowly (hesitantly)
24. joins (groups, activities)
25. participates (groups, activities)
26. picks at self or clothing
27. assumes odd postures
28. touches objects
29. whispers
30. wakefulness during night
31. sleeps during day
32. excessive sleeping
33. difficulty in getting to sleep
34. initiates ward activities
35. does not talk during ward meetings
36. talks during ward meetings
37. dines inappropriately
38. somatic complaints
39. complains about hospital care
40. attends ward meetings only upon special request
41. does not ear for long periods
42. gain in weight
43. loss in weight
44. eats from others trays
45. eats non-foods
46. does not follow through on activities
47. masturbates
48. sleeps in clothes
49. does not wash (shave, change clothes)
50. wears others' clothes
51. loses own possessions
52. borrows from others
53. cries
54. crawls on floor
55. rocks, tics, tremors, convulsions
56. rigid posture
57. constantly active
58. mask-like facial expression
59. collects things
60. asks same question over and over
61. dresses and undresses often
62. stuffs objects in orifices of body
63. attempts to hurt self
64. touches people
65. weeps
66. screams
67. whimpers
68. dramatic and theatrical
69. talks about his feelings easily
70. never smiles
71. destroys objects
72. complains about other patients
73. complains of being suspicious of staff or patients
74. complains of being anxious
75. flirtatious
76. shows off body or possessions
77. misidentifies people
78. shows marked interest in opposite sex
79. shows little interest in opposite sex
80. has excessive dry skin
81. blushes easily
82. recent change in skin color
83. recent change in hair color
84. has specific skin lesions or eruptions
85. wrings hands
86. sits alone very quietly
87. slurred and mumbled speech
88. rapid and accelerated speech
89. sighs
90. has headaches
91. clean and neat
92. dines appropriately
93. pays attention to grooming
94. requests center around medication
95. prefers to remain by self
96. goes along with others' suggestions
97. avoids looking at others
98. repetitive actions
99. repeats words of others
100. repeats gestures of others
101. seeks physical contact

TABLE II

INFERENTIAL ITEMS

1. laughing inappropriately
2. sarcastic
3. poor memory
4. seems withdrawn
5. hallucinates (auditory, visual or tactile)
6. delusional
7. provokes anger in other patients
8. provokes anger in staff
9. becomes angry easily
10. does not show anger
11. ritualistic movements
12. looks suspicious
13. looks angry
14. flat affect
15. affect generally inappropriate
16. wide and rapid mood changes
17. euphoric affect
18. jealous
19. poor judgement
20. inappropriate washing
21. self-destructive tendencies
22. looks confused
23. apathetic
24. looks dazed
25. looks drowsy
26. emotes, play acts
27. imitates other patients
28. imitates staff
29. mimics staff (hostile purpose)
30. mimics patients (hostile purpose)
31. seems anxious
32. attempts to monopolize meetings
33. makes irrelevant comments
34. denies own identity
35. misidentifies
36. denies identity of others
37. seeks physical contact
38. grandiose feelings
39. feelings of worthlessness
40. seeks verbal contact
41. looks sad
42. poor concentration
43. seems happy
44. seems composed
45. seductive
46. charming
47. seems out of contact with environment
48. recent memory impaired
49. total memory impaired
50. partial memory impaired
51. acts as though understands what is said to him
52. thought processes are slow
53. limited and repetitive verbalizations
54. communicates clearly to patients
55. communicates clearly to staff
56. makes excessive demands
57. disruptive of group activities
58. disruptive of staff attention to other patients
59. overtly negativistic
60. diverts attention from self to others
61. diverts attention from others to self
62. competes with other patients for attention
63. competes with staff for attention
64. ignores other's needs
65. ignores own needs
66. misunderstands or misinterprets purposes or intentions of others
67. concerned others will be hurt
68. blames self
69. sees own pathology in others
70. attributes own unacceptable ideas to others
71. rude, impolite
72. sensitive to others feelings
73. difficulty in making decisions
74. uncomfortable in talking
75. provokes anxiety in others
76. provokes boredom in others
77. simultaneous reaching for and repelling people
78. constricted affect
79. feels omnipotent
80. poor attention span
81. conflicting tendencies
82. difficulty in carrying out decisions
83. ingratiating (sickening) with others
84. expresses concern over family and friends
85. acts like parent to other patients or staff
86. acts like child to other patients or staff
87. blames relatives for hospitalization
88. denies illness
89. rejects relatives
90. cannot judge response (effect) on others
91. sets up conflict between others
92. sets up disorganization in others
93. stimulates inconsistencies in others
94. feelings of helplessness
95. feelings of hopelessness
96. wishes to hurt others
97. seems overcontrolled or brittle

behavior of each patient during the preceding 24 hour period, were available to each staff member and read each day. In addition, the patients' behavior was discussed during daily staff meetings. Therefore, the raters were instructed to augment their own observations with information available to all staff members.

The data were analyzed in the following manner. The degree of agreement between all the raters was computed for each patient on both the behavior and inferential scales. The Pearson Product Moment Correlation Coefficient was the measure of agreement between raters. This resulted in two matrices of correlation coefficients for each patient, (one behavior, one inferential) each matrix representing correlations between the 26 raters. This resulted in 35 matrices (The inferential matrix for patient 11 was not available), each matrix containing 325 correlation coefficients.

Since each matrix was comprised of intercorrelations between raters, the average correlation within a rater group (psychiatrists, nurses, aides) could be computed. This was done for each patient and each scale separately. The average correlation within a group was computed by converting each "r" to a "z" score, then taking a weighted average of the "z" scores, and transforming the average "z" score to an "r" which represented the average correlation of that group of raters on a particular patient for a particular scale. (McNemar, 1962) That is, for the three psychiatrists, 3 correlation coefficients would be averaged to obtain a single average "r" for psychiatrists. For the 8 psychiatric aides, there would be 28 intercorrelations of aides which would be converted to z scores and averaged.

Differences in agreement between the three groups (psychiatrists, nurses,

aides) and differences between the two scales, could then be determined by means of the "sign test" (Siegel, 1956).

The psychometric properties of the individual items were also analyzed in order to separate those items in which there was agreement among the raters from those items in which there was little agreement among the raters. The reliability of the items was measured by the dispersion of the items (standard deviation). That is, an item with narrow dispersion was defined as being a "useful" item, while an item with wide dispersion was considered to be a less "useful" item. This means that if an item of behavior was rated as characteristic of one patient but uncharacteristic of another patient, which would place that item at opposite extremes of the scale, it could still be a useful item if all the raters agreed that it was a useful item. (The item had a narrow dispersion throughout all the patients). This item analysis would determine which items were more reliable and stable in terms of characterizing the behavior of schizophrenics.

On the basis of those items selected as stable (with narrow dispersions), all possible intercorrelations between patients were computed. This resulted in two matrices of intercorrelations of persons; a behavioral matrix and an inferential matrix. These two matrices were factor-analyzed to determine if specific subgroupings of schizophrenia could be isolated. The Principal Axis method of factor-analysis (Thurstone, 1947) was employed, with Thurstone's Formula 15 (1947) as the estimate of the communalities. The extracted factors were then rotated to oblique simple structure.

CHAPTER IV

RESULTS

A. Rater Agreement

The average intercorrelations within a rater group (psychiatrists, nurses, aides) on the Behavior scale and Inferential scale are shown in Tables III and IV. Since all the raters were unable to rate all the patients (for administrative reasons) as had been originally designed, the number of raters in each group who were used to compute the average correlation per group is shown in the tables.

The coefficients of agreement of the psychiatrists on the Behavior scale ranged from r equals .05 to .60, and on the Inferential scale, ranged from r equals .12 to .55. The nurses' coefficients of agreement on the Behavior scale ranged from .28 to .55, and on the Inferential scale, from .26 to .54. The aides' coefficients of agreement on the Behavior scale ranged from .20 to .50, and on the Inferential scale, from .08 to .46.

The hypothesis that psychiatrists would agree more highly among themselves on the Inferential scale than on the Behavioral scale was tested by the "sign test." No significant difference was found, and the hypothesis was rejected.

No significant difference in nurses' agreement was found between the Behavior and Inferential scales.

The hypothesis that aides would agree more highly on the Behavior scale than on the Inferential scale was tested by the sign test. A significant

TABLE III

AVERAGE CORRELATIONS OF RATER GROUPS

ON THE BEHAVIOR SCALE

Pat.	No. of Raters	Av. r Psych	No. of Raters	Av. r Nurses	No. of Raters	Av. r Aides
1	3	.41	11	.55	8	.41
2	3	.35	11	.53	7	.42
3	3	.60	11	.46	6	.41
4	3	.45	11	.47	5	.22
5	3	.34	11	.48	8	.45
6	3	.38	11	.40	4	.48
7	3	.06	9	.28	5	.35
8	3	.45	10	.54	7	.48
9	3	.38	10	.48	5	.42
10	3	.35	10	.39	6	.24
11	2	.31	10	.44	4	.50
12	2	.47	9	.30	5	.24
13	3	.28	9	.36	6	.23
14	2	.47	10	.43	5	.20
15	2	.07	8	.40	5	.31
16	3	.38	9	.39	6	.25
17	2	.05	11	.42	8	.22
18	2	.25	11	.35	8	.26

TABLE IV

AVERAGE CORRELATIONS OF RATER GROUPS

ON THE INFERENTIAL SCALE

Pat	No. of Raters	Av. r Psych.	No. of Raters	Av. r Nurses	No. of Raters	Av. r Aides
1	3	.39	11	.54	8	.40
2	3	.35	11	.48	7	.38
3	3	.20	11	.35	6	.24
4	3	.35	11	.45	5	.26
5	3	.34	11	.41	8	.33
6	3	.36	10	.45	5	.46
7	3	.35	10	.32	4	.35
8	2	.50	10	.41	7	.33
9	3	.20	10	.33	5	.32
10	3	.41	10	.49	6	.18
12	2	.12	9	.39	5	.08
13	3	.47.	9	.38	6	.18
14	2	.55	10	.49	5	.33
15	3	.17	9	.26	5	.27
16	3	.34	9	.28	6	.16
17	2	.14	11	.42	7	.23
18	2	.39	11	.51	8	.26

difference of p equals .018 (significant at the .05 level) was found, supporting the hypothesis.

The hypothesis that aides would show greater agreement than psychiatrists and nurses, and nurses would show greater agreement than psychiatrists on the Behavior scale, was tested by the "sign test." a) Differences between aides and psychiatrists were not significant. b) Nurses showed significantly higher agreement than aides in rating behavior (p equals .004, significant at the .01 level), which was a reversal of the expected direction. c) Nurses also showed significantly higher agreement than psychiatrists in rating behavior (p equals .004, significant at the .01 level).

The hypothesis that psychiatrists would show greater agreement than nurses and aides, and that nurses would show greater agreement than aides on the Inferential scale, was tested by the "sign test." a) No significant difference was found between psychiatrists and nurses. b) There was no significant difference between psychiatrists and aides. c) Nurses showed significantly higher agreement than aides (p equals .006, significant at the .01 level).

B. Item analysis

The psychometric properties of the individual items were analyzed to separate items with narrow dispersions (high agreement) from items with wide dispersions (low agreement). The 101 items of the Behavior scale and the 97 items of the Inferential scale were analyzed. Each rater's score on a particular item was averaged, and standard deviation of the item was computed, one patient at a time. The distributions of these standard deviations of each item were then analyzed. A cutting point of plus 2.05 sigmas was selected.

Those items with at least 10 of 18 patients with sigmas greater than 2.05 sigma were defined as items with wide dispersions (low agreement items). Those items having at least 10 of 18 patients with sigmas less than plus 2.05 were defined as items with narrow dispersions (high agreement items).

Sixty-four out of 101 Behavioral items were selected as "useful" (high agreement items), and 51 out of 97 Inferential items were selected as "useful" (high agreement items). The selected items are shown in Tables V and VI.

C. Factor-analysis of persons

The 64 Behavioral items and the 51 Inferential items were the raw scores in intercorrelating the 18 patients on the Behavioral scale, and the 17 patients on the Inferential scale. The selected items were used rather than the original items because the selection of more reliable items would increase the clarity of the factorial structure.

The Principal-Axis method of factor-analysis extracted five factors from the Behavior matrix, of 18 persons and four factors from the Inferential matrix of 17 persons. However the fifth factor of the Behavior matrix proved to be a residual factor. The Behavior Factor matrix and the Inferential Factor matrix are shown in Tables VII and VIII. The factors were rotated to oblique simple structure. The rotated matrices are shown in Tables IX and X.

Behavioral scale correlations greater than r= .256 are significant at the .05 level. Inferential scale correlations greater than r= .288 are significant at the .05 level. On the Behavior scale, factor loadings of .30 or greater were interpreted. A cutting point of .36 or greater was used on the Inferential scale.

The rotated factors of the Behavioral Scale are interpreted as follows: (The psychiatric diagnoses of schizophrenic subtypes at admission are also presented).

Factor A. Well Integrated and in Remission

Patient	Loading	Diagnosis
2	.54	Acute Undifferentiated
6	.52	Acute Undifferentiated
15	.30	Acute Undifferentiated

These patients' behavior is characterized by "talking to patients on a one to one relationship," "attention to grooming and personal care," and expression of affect. Uncharacteristic behavior is "inappropriate eating habits," and very destructive behavior.

Factor B. Withdrawn and Regressed

Patient	Loading	Diagnosis
1	.73	Catatonic
16	.56	Paranoid
8	.48	Acute Undifferentiated
12	.38	Acute Undifferentiated
10	.32	Paranoid

These patients' behavior is characterized by sitting alone quietly, smearing of food, feces, etc., staring, and generally self-involved behavior. Uncharacteristic behavior is: attention to grooming, and acting out behavior.

Factor C. Undifferentiated

Patient	Loading	Diagnosis
5	.54	Affective
11	.53	Paranoid
10	.43	Paranoid
12	.37	Undifferentiated
17	.35	Simple
3	.34	Undifferentiated

These patients' behavior is difficult to classify. Their behavior varies

TABLE V

BEHAVIORAL ITEMS
SELECTED ON BASIS OF
ITEM ANALYSIS

64 ITEMS

6. talks to patients on one to one relationship
8. urinates at inappropriate places
9. soils (not himself)
10. refuses meals
11. soils own self
12. smearing of food, feces, saliva
13. tears clothes
15. speaks to himself
16. shouts swears
17. hits staff members
18. hits patients
19. breaks or throws furniture
20. attacks self
21. leaves ward without permission
22. stares
26. picks at self or clothing
27. assumes odd postures
28. touches objects
29. whispers
32. excessive sleeping
33. difficulty in getting to sleep
37. dines inappropriately
39. complains about hospital care
41. does not eat for long periods
42. gain in weight
43. loss in weight
44. eats from others trays
45. eats non-foods
47. masturbates
48. sleeps in clothes
50. wears others' clothes
51. loses own possessions
53. cries
54. crawls on floor
55. rocks, tics, tremors, convulsions
56. rigid posture
59. collects things
60. asks same question over and over
61. dresses and undresses often
62. stuffs objects in orifices of body
63. attempts to hurt self
64. touches people
65. weeps
66. screams
67. whimpers
71. destroys objects
75. flirtatious
76. shows off body or possessions
77. misidentifies people
80. has excessive dry skin
81. bluses easily
82. recent change in skin color
83. recent change in hair color
84. has specific kin lesions or eruptions
85. wrings hands
86. sits alone very quietly
89. sighs
90. has headaches
92. dines appropriately
93. pays attention to grooming
94. requests center around medication
98. repetitive actions
99. repeats words or others
100. repeats gestures of others

TABLE VI

INFERENTIAL ITEMS
SELECTED ON BASIS OF
ITEM ANALYSIS

51 ITEMS

3. poor memory
11. ritualistic movements
12. looks suspicious
18. jealous
20. inappropriate washing
22. looks confused
23. apathetic
24. looks dazed
25. looks drowsy
26. emotes, play acts
27. imitates other patients
28. imitates staff
29. mimics staff (hostile purpose)
30. mimics patients (hostile purpose)
31. seems anxious
33. makes irrelevant comments
34. denies own identity
35. misidentifies
36. denies identity of others
39. feelings of worthlessness
41. looks sad
42. poor concentration
48. recent memory impaired
49. total memory impaired
50. partial memory impaired
53. limited and repetitive verbalizations
56. makes excessive demands
57. disruptive of group activities
58. disruptive of staff atention to other patients
62. competes with other patients for attention
63. competes with staff for attention
67. concerned others will be hurt
68. blames self
69. sees own pathology in others
70. attributes own unacceptable ideas to others
71. rude impolite
72. sensitive to others feelings
73. difficulty in making decisions
76. provokes boredom in others
77. simultaneous reaching for and repelling people
79. feels omnipotent
80. poor attention span
81. conflicting tendencies
82. difficulty in carrying out decisions
85. acts like parent to other patients
87. blames relatives for hospitalization
91. sets up conflict between others
92. sets up disorganization in others
93. stimulates inconsistensies in others
95. feelings of hopelessness
96. wishes to hurt others

TABLE VII

THE PRINCIPAL AXES
FACTOR MATRIX[a]

BEHAVIOR SCALE
64 ITEMS

Patients	I	II	III	IV	V	hj^2
1	-05	79	10	04	09	65
2	72	-37	-12	34	-09	78
3	83	-37	12	00	-06	84
4	-33	-27	35	21	23	40
5	60	-21	32	-27	21	62
6	72	-11	-09	36	-13	69
7	83	05	01	-13	11	72
8	-56	46	17	17	07	59
9	86	-07	-04	06	24	81
10	82	19	28	00	-06	79
11	66	-26	41	07	-24	73
12	76	33	20	-13	04	75
13	75	35	-13	-11	10	72
14	84	24	-28	04	-19	88
15	89	01	-17	11	09	84
16	51	48	06	28	17	60
17	65	-02	15	-17	-24	53
18	88	05	-24	-15	11	87

[a]Decimal points have been omitted for all entries.

TABLE VIII

THE PRINCIPAL AXES
FACTOR MATRIX[a]

INFERENTIAL SCALE
51 ITEMS

Patients	I	II	III	IV	hj^2
1	46	-69	-15	14	72
2	46	74	19	-02	80
3	-08	40	63	-06	57
4	-07	-21	64	28	54
5	10	-55	40	-02	47
6	58	65	06	10	77
7	66	-14	23	-24	57
8	40	-65	-08	03	59
9	89	07	-07	-08	81
10	75	-25	16	-34	77
12	77	-24	15	-17	70
13	90	20	-19	00	89
14	93	10	-14	05	90
15	83	33	04	10	81
16	70	-04	-03	-24	55
17	71	-15	15	30	64
18	86	-04	-14	40	92

[a]Decimal points have been omitted for all entries.

TABLE IX

OBLIQUE FACTOR MATRIX
BEHAVIOR SCALE

Patients	A	B	C	D	E
1	-14	73	-01	06	09
2	54	-24	00	-02	-09
3	26	-22	34	02	-06
4	18	00	20	-52	23
5	-08	-05	54	01	21
6	52	-01	-01	00	-13
7	05	08	25	27	11
8	-06	48	-08	-25	07
9	26	03	16	18	24
10	14	32	43	02	-06
11	27	-02	53	-25	-24
12	-03	38	37	18	04
13	-01	27	06	41	10
14	17	11	-09	43	-19
15	30	03	02	27	09
16	28	56	04	01	17
17	-01	00	35	13	-24
18	04	-03	04	48	11

TABLE X

TRANSFORMATION MATRIX

	A	B	C	D	E
I	22	06	24	23	00
II	-21	84	-10	22	00
III	00	43	91	-74	00
IV	95	28	-32	-59	00
V	00	15	01	00	1.00

TABLE XI

REFERENCE VECTOR COSINES

	A	B	C	D	E
A	1.00				
B	10	1.00			
C	-23	23	1.00		
D	-56	-28	-45	1.00	
E	00	15	01	00	1.00

TABLE XII

CORRELATIONS BETWEEN PRIMARIES

	A	B	C	D	E
A	1.00				
B	-02	1.00			
C	65	-10	1.00		
D	75	12	69	1.00	
E	-01	-15	-01	-03	1.00

TABLE XIII

OBLIQUE FACTOR MATRIX

INFERENTIAL SCALE

Patients	A	B	C	D
1	23	-66	03	05
2	31	74	06	19
3	-10	66	52	-01
4	08	08	71	-33
5	-12	-25	48	03
6	47	58	-01	14
7	05	09	22	46
8	11	-57	06	13
9	37	09	-06	43
10	00	-01	15	59
12	15	-05	18	45
13	48	12	-18	36
14	52	05	-10	33
15	53	31	03	23
16	12	04	-04	50
17	54	-08	27	-01
18	76	-15	00	-04

TABLE XIV

TRANSFORMATION MATRIX

	A	B	C	D
I	47	05	04	39
II	18	83	-18	01
III	-13	50	96	-06
IV	85	-23	22	-92

TABLE XV

REFERENCE VECTOR COSINES

	A	B	C	D
A	99			
B	-09	99		
C	05	28	1.00	
D	-59	21	-25	1.00

TABLE XVI

CORRELATIONS BETWEEN PRIMARIES

	A	B	C	D
A	1.00			
B	-09	1.00		
C	15	-36	1.00	
D	60	-29	36	1.00

from talking to patients, shouting and swearing, sitting alone quietly, headaches. This factor represents a mixture of behavior, and is probably similar to the psychiatric diagnosis of acute undifferentiated schizophrenia.

Factor D. Conforming to Disorganized

Patient	Loading	Diagnosis
18	.48	Undifferentiated
14	.43	Undifferentiated
13	.41	Undifferentiated
4	-.52	Affective

This is a bi-polar factor. The behavior of the positively loaded patients is characterized by sitting alone quietly, conforming, attention to grooming, dining appropriately. Uncharacteristic behavior is urinating at inappropriate places, overtly destructive behavior hyperactivity, leaving ward without permission, tearing clothes. The negatively loaded patients are characterized by urinating at inappropriate places, soiling self, destroying objects, masturbating, misidentifying. Uncharacteristic behavior includes dining appropriately, attention to grooming. The characteristic behavior of the positively loaded patients is uncharacteristic of the negatively loaded patients and vice-versa.

The rotated factors of the Inferential Scale are interpreted as follows. The schizophrenic subtype diagnoses at admission are also presented.

Factor A. Disorganized, Anxious, but Conforming

Patient	Loading	Diagnosis
18	.76	Undifferentiated
17	.54	Simple
15	.53	Undifferentiated
14	.52	Undifferentiated
13	.48	Undifferentiated
6	.47	Undifferentiated
9	.37	Undifferentiated

These patients are characterized by confusion, anxiety, difficulty in making decisions and carrying out decision, sad, feelings of hopelessness, poor concentration. Uncharacteristic behavior is excessive demands on others, gross thought disturbances, rudeness or impoliteness, and disruptive behavior.

Factor B. Integrated and Regressive

Patient	Loading	Diagnosis
2	.74	Undifferentiated
3	.66	Undifferentiated
6	.58	Catatonic-Undifferentiated
8	-.57	Undifferentiated
1	-.66	Catatonic

This is a bi-polar factor. The positive pole contains patients who are integrated, act as leaders, and are able to express affect appropriately while the negative pole contains patients who are withdrawn, regressed and disintegrated. The positive pole contains patients whose characteristic behavior is acting like parents to other patients, sensitive to others feelings, concern that others will be hurt, imitating staff. Their uncharacteristic behavior is disruption of group activities, rude and impolite. The negative pole contains patients whose characteristic behavior is rude, impolite behavior, irrelevant comments, sadness, hopelessness, reaching for and repelling people. Uncharacteristic behavior is sensitivity to others feelings, acting like parents to other patients.

Factor C. Affective Expression

Patients	Loading	Diagnosis
4	.71	Affective
3	.52	Undifferentiated
5	.48	Affective

This appears to be a factor of strong expression of affect, together with

some disorganization. The characteristic behavior is emoting, play acting, excessive demands, difficulty in self identification or of identifying others, competing for attention, and activity. Uncharacteristic behavior is apathy, provoking boredom in others, concern others will be hurt.

Factor D. Paranoid and Anxious

Patients	Loading	Diagnosis
10	.59	Paranoid
16	.50	Paranoid
7	.46	Undifferentiated
12	.45	Undifferentiated
9	.43	Undifferentiated
13	.36	Undifferentiated

These patients are characterized by looking suspicious, looking confused, looking anxious, poor concentration, blaming relatives for hospitalization. Their uncharacteristic behavior is excessive demands, or rude or impolite behavior.

CHAPTER V

DISCUSSION

The rater coefficients of agreement were relatively low for all three groups. This is partially due to departure of the actual rating procedure from the original experimental design. The judges were originally scheduled to rate each patient on his behavior during the previous week. However, some of the raters were not able to keep up with the rating schedule, and rated the patient after the scheduled date, on some occasions, weeks after the scheduled date. This probably contributed to low coefficients of agreement. The raters probably rated on the basis of primacy, rather than recency, as described by Hunt (1962).

In general, the coefficients of agreement are similar to those found by Grinker (1961). This indicates that there is low agreement in rating the behavior of schizophrenic patients. Behavioral and inferential ratings of some patients were at a random level, suggesting that behavioral descriptions of acutely disturbed psychotic patients may be very unreliable.

The significantly higher coefficients of agreement on the Behavioral Scale as compared to the Inferential Scale was expected when the aides rated the patients. Aides probably rate behavioral data more accurately because of their lack of theoretical knowledge, and their emphasis on more concrete aspects of relating to patients rather than interpretation of behavior.

The lack of differentiation between behavioral and inferential data by

the nurses and psychiatrists was surprising. It was expected particularly that psychiatrists would show higher agreement on inferential data than on behavioral data. Grinker's study (1961) as well as other studies have indicated consistently that highly trained raters agree more on theoretical or inferential data, than on behavioral data. The negative result may have been due to the low number of psychiatrists (three) in this study. The fact that only two psychiatrists rated 6 out of 18 patients also probably contributed to the negative findings.

The factor-analysis of the Behavioral and Inferential Scales resulted in four factors of patients on each scale. The factorial structure of the Inferential Scale appears to be clearer than the structure of the Behavioral Scale. This might be due to the wider range of rater agreement coefficients on the Behavioral Scale as compared to those on the Inferential Scale.

An important lesson learned from the factor analysis in this study is that even with fairly low coefficients of rater agreement, a simple structure can be obtained. In the Lorr and Guertin studies, no coefficients of rater agreement were reported. However, it is important to remember that rater agreement and test reliability are not necessarily the same concept. It appears that Lorr and Guertin were more interested in describing the structure of items and patients, rather than in describing the characteristics of raters. Hunt was more interested in describing characteristics of raters rather than characteristics of patients or items. But, although Guertin and Lorr did not report inter-rater reliability, and sometimes obtained factorial structures based on only a few raters, they consistently obtained similar factorial structures. Therefore, it is important to note that, even with

fairly low coefficients of rater agreement in this study, it is possible to obtain a simple factorial structure.

The psychiatric diagnoses determined on admission to the ward do not correspond exactly to the groupings based on the factor-analysis. This may be due to the psychiatric diagnoses taking into account other data, or that the factor analysis determined groupings on the basis of more specific data. Or it may reflect the inadequacy of present psychiatric classificatory systems.

The Behavior Factor A Group were characterized by well integrated behavior. They each had gone through an acutely disturbed stage, and each exhibited extremely disorganized behavior, but at the time of testing, appeared to be in remission. This factor is characterized by integrated behavior, and by reaching out toward other people, and acting as leaders on the ward. This factor is similar to the positive pole of Inferential Factor B, which is also characterized by integrated behavior, leadership qualities, and empathic relationships.

These two factors are similar to Guertin's Chronic Reintegrated Type (Guertin, 156b) except that the patients in this study exhibit more positive and integrated behavior. It is possible that Guertin's patient sample was not comprised of acutely disturbed schizophrenics, but were more chronic.

On the other hand, Behavior Factor D and Inferential Factor A are similar to Guertin's Chronic Reintegrated Type, and Apathetic Type (Guertin, 1956b), and to his lack of General Interest Type (Guertin, 1955). The patients in Behavior Factor D are characterized by conforming behavior, but are somewhat withdrawn. On a more inferential level, they appear confused,

with difficulty in making or carrying out decisions.

Behavior Factor B and the negative pole or Inferential Factor B contain patients who exhibit regressed behavior, are very socially withdrawn, destructive, and disorganized. Similar factors were found in the Guertin and Lorr studies (Guertin, 1956b; 1952a, 1955, 1956a) and Lorr (1951).

Behavior Factor C was not clear and interpreted as representing a mixture of behavior, similar to the psychiatric diagnosis "acute undifferentiated type." Inferential Factor C represented strong expression of affect with some disorganized features.

It was implicitly anticipated that the factor analysis of the Behavior and Inferential Scales would result in similar factorial structures. This expected finding was substantiated to a certain degree. As was discussed above, the Behavioral and Inferential factors contain similarities. For example, Behavior Factor A appears to be similar to Inferential Factor B in terms of describing similar behaviors.

However, it was also anticipated that the same patients who comprised a particular Behavior factor would also comprise a similar Inferential factor. That is, patients 2, 6 and 15 are highly loaded in Behavior Factor A, which appears to contain similar characteristics as Inferential Factor B. But patients 2, 3 and 6 have high loadings on Inferential Factor B. Analysis of the other factors produces similar results. What is the reason for this inconsistency?

There is no one answer to this question, but rather a number of possible questions are raised.

It is possible that the low rater agreement has resulted in a poor

factorial structure. Although the final factorial structures are "loose," in that minor rotations can be made, these rotations are adjustments rather than major rotations. The factorial structures of both scales appear to be relatively invariant, indicating that a simple structure was achieved. This denies the possibility of low rater agreement producing a poor factorial structure.

Another speculation is that the patients do not comprise similar groupings on each scale because the structure of the behavioral scale and the structure of the inferential scale are different. That is, patients may be loaded on one factor of the Behavior Scale because they exhibit similar behavioral characteristics, but the same patients belong to different factors on the Inferential Scale because their characteristics are different at a more inferential level.

For example, patients 2 and 15 are highly loaded in the same Behavior Factor, and exhibit similar manifest behavior. They both talk to other patients on a one to one relationship, pay attention to grooming, and blush. But their inferential behavior is different (They belong to different factors on the Inferential Scale). Here, patient 2 is characterized by acting like a parent, sensitive to other feelings, and imitates staff members, while patient 15 is characterized by confusion, anxiety, difficulty in making decisions, and feelings of hopelessness. In other words, although they appear to be similar at a behavioral level, they are quite different at a more inferential level.

Sargent (1956) has suggested a scheme of studying psychopathology, based on the analogy of a pyramid. At the base of the pyramid are the behavioral manifestations, and as one rises higher on the pyramid, the manifestations

become progressively more inferential.

The results of the factor analysis demonstrate Sargent's schema, and the descriptions of many clinicians, that similar behavioral symptoms do not necessarily reflect the same underlying causes of these symptoms. In this study, patients of a particular Behavioral Scale group manifested similar behavioral characteristics, but the same patients manifested different inferential characteristics.

The reverse also holds. Patients of a particular inferential group manifested similar inferential characteristics, but the same patients manifested different behavioral characteristics.

Certain implications of these findings are interesting. Let us imagine a design with a large sample of items ranging from very concrete observations of behavior to theoretical propositions of psychopathology. If we form a single rating scale, intercorrelate the persons or items, and factor analyze the matrices, the obtained factorial structure combines speculative with concrete items, resulting in a loss of some information. But if we separate the items into a series of scales, each scale composed of items at progressively more inferential levels, the result is a hierarchical description of psychopathology. If each scale is factor-analyzed (person and item factor analysis) we can trace a person through various levels of inference, or we can observe the groupings of items through increasing levels of inference.

This procedure, although exhaustive, permits a more comprehensive picture of the structure of psychopathology. In constructing a classificatory system of schizophrenia, this procedure clarifies the structure of the system through increasing levels of inference, and in this manner, can provide a more valid

basis of interpolating between inferential theories and behavioral observations.

CHAPTER VI

SUMMARY

This dissertation investigated differences in agreement between psychiatrists, psychiatric nurses, and psychiatric aides in rating acutely disturbed schizophrenic patients with Behavioral and Inferential Scales.

Eighteen acutely disturbed schizophrenic patients, 10 females and 8 males, were rated by 26 raters, using the Behavior Scale and the Inferential Scale. The Behavior Scale contained concrete, fairly objective items of manifest behavior, and the Inferential scale contained items of behavior on a more inferential level.

It was hypothesized that psychiatrists should show greater agreement than nurses and aides, and nurses should show greater agreement than aides on the Inferential Scale; that aides should have greater agreement than nurses and psychiatrists, and nurses should have greater agreement than psychiatrists on the Behavior Scale; that psychiatrists should have greater agreement on the Inferential than on the Behavior Scale; and that aides should have greater agreement on the Behavior scale than on the Inferential Scale.

The results indicated that:

1) Psychiatrists did not agree more highly on the Inferential Scale than on the Behavior Scale.

2) Nurses did not agree more highly on the Inferential Scale than on the Behavior Scale.

3) Aides agreed more highly on behavioral data than on inferential data.

4) Nurses showed higher agreement than aides in rating behavior.

5) Nurses showed higher agreement than psychiatrists in rating behavior.

6) Nurses showed higher agreement than aides in rating inferential behavior.

An item analysis which separated the items with high rater agreement from the items with low rater agreement reduced the number of behavioral items from 101 to 64, and the number of inferential items from 97 to 51.

A Principal Axis method of factor analysis of the two scales, using the selected items, resulted in the following factors: Behavioral Scale; A) Well Integrated and in Remission, B) Withdrawn and Regressed, C) Undifferentiated, D) Conforming - Disorganized. Inferential Scale: A) Disorganized, Anxious, but Conforming, B) Integrated and Regressive C) Affective Expression, D) Paranoid and Anxious.

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APPENDIX

TABLE XVII

PRODUCT MOMENT CORRELATIONS
BETWEEN THE PATIENTS
BEHAVIOR SCALE[a]
64 ITEMS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1																		
2	-32																	
3	-34	78																
4	-20	-14	-17															
5	-15	41	63	-04														
6	-12	72	63	-13	26													
7	-02	52	68	-28	54	58												
8	53	-54	-57	13	-48	-43	-40											
9	-14	68	74	-21	60	62	67	-50										
10	17	45	65	-22	55	59	65	-35	64									
11	-19	53	74	-02	51	54	57	-35	51	65								
12	28	35	56	-28	55	39	60	-34	65	79	45							
13	23	33	50	-38	33	55	79	-31	62	62	29	65						
14	16	58	58	-53	29	62	65	-45	69	69	43	69	68					
15	-06	67	70	-33	49	67	72	-52	81	73	52	65	63	84				
16	38	30	21	-16	17	40	40	01	49	50	18	58	54	53	49			
17	-06	42	54	-28	43	43	58	-39	49	57	58	51	50	50	42	30		
18	-01	58	70	-38	50	59	79	-52	82	66	42	64	74	81	82	38	53	

[a]Decimal points have been omitted for all entries.

TABLE XVIII

PRODUCT MOMENT CORRELATIONS
BETWEEN THE PATIENTS
INFERENTIAL SCALE
51 ITEMS[a]

	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
1																	
2	-32																
3	-46	42															
4	07	-03	39														
5	30	-40	12	40													
6	-13	81	30	-10	-40												
7	37	30	06	00	24	28											
8	68	-30	-40	15	33	-16	31										
9	26	45	-09	-18	12	51	57	37									
10	46	21	-01	-05	31	27	70	47	64								
12	57	26	-10	15	14	33	61	45	58	85							
13	28	49	-12	-18	-13	64	47	26	87	61	63						
14	38	50	-17	-13	-04	59	62	32	83	64	65	89					
15	16	62	08	-10	-04	65	48	03	77	48	53	78	82				
16	29	26	-02	-21	19	33	41	31	71	61	55	63	58	63			
17	45	21	-02	08	30	35	48	35	60	46	51	57	57	62	45		
18	51	33	-23	-04	07	54	43	40	76	47	57	79	85	76	50	75	

[a]Decimal points have been omitted for all entries.

TABLE XIX

BEHAVIOR SCALE - RESIDUAL MATRIX

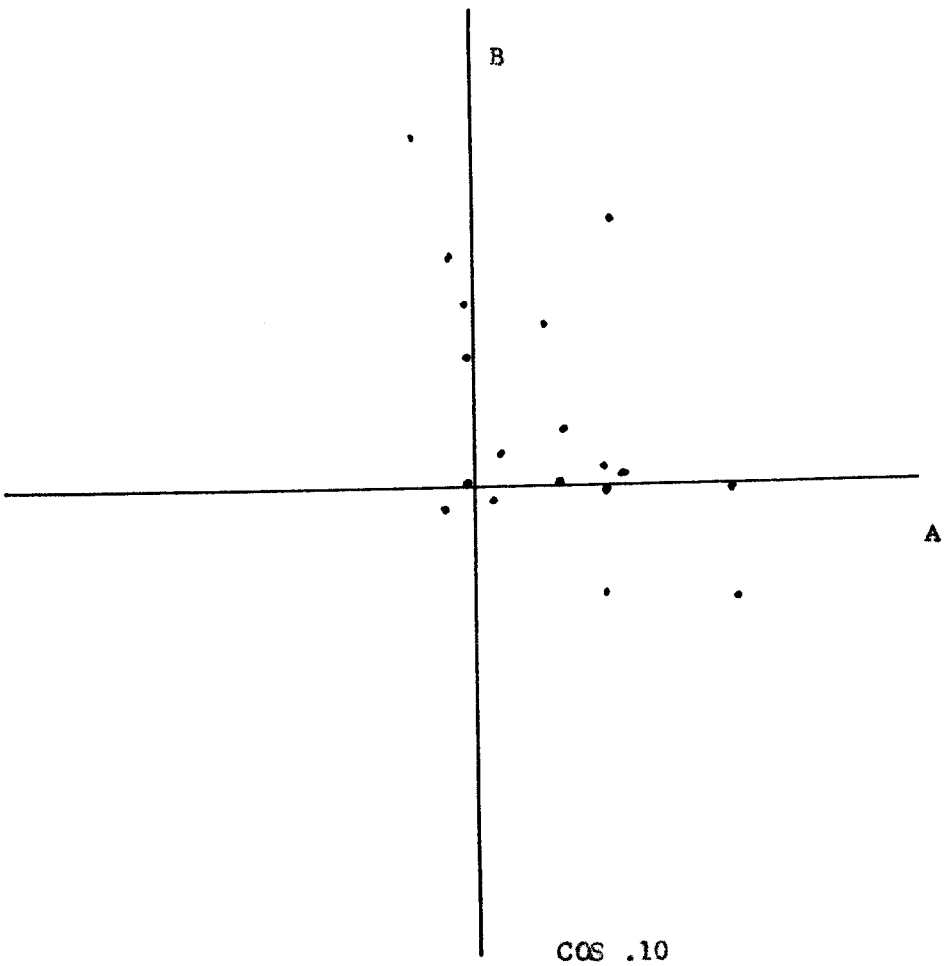
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	-11																	
2	01	-05																
3	-02	05	-05															
4	-06	-01	-02	-16														
5	00	04	02	00	-06													
6	01	03	-02	06	-05	-07												
7	-02	00	01	00	-02	04	03											
8	11	01	04	-04	-06	00	05	-06										
9	-07	03	01	-01	04	-01	-06	00	-04									
10	04	-05	00	01	01	03	-04	-02	-03	-05								
11	02	-04	04	02	00	01	07	08	00	03	-05							
12	05	-01	02	00	04	-05	-08	-08	01	05	-03	-06						
13	-01	-05	03	01	-06	09	12	-02	-02	-01	-02	-02	01					
14	06	00	-01	-06	-03	-02	-03	-04	02	03	00	05	-05	-11				
15	-02	-01	-01	-02	-01	-01	00	-03	01	05	02	01	-06	07	-01			
16	-01	06	-04	02	-02	01	-03	01	04	-01	-03	05	01	03	-01	-07		
17	00	00	-04	-03	-01	00	05	01	00	-01	04	-02	03	-04	-09	06	01	
18	01	00	04	00	00	00	03	01	03	01	-01	-02	00	02	01	-06	00	-04

TABLE XX

INFERENTIAL SCALE - RESIDUAL MATRIX

	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17	18
1	-06																
2	00	-13															
3	-05	04	-19														
4	02	04	08	-07													
5	-06	-11	09	04	-14												
6	-05	06	06	01	-12	-09											
7	03	04	01	-05	01	-03	01										
8	03	02	-05	08	-03	-02	-09										
9	00	00	00	03	10	-04	-02	06	-01								
10	01	01	03	-05	03	03	05	03	-03	-16							
12	09	05	-05	11	-13	05	-02	00	-10	13	-02						
13	03	-03	-01	05	-03	01	-05	01	04	02	01	-02					
14	00	02	-04	04	-01	-02	06	00	-01	01	-01	01	-01				
15	-00	-01	00	-02	05	-05	-01	-09	02	-03	-02	-02	02	-05			
16	-03	-03	05	-08	11	-03	-11	01	07	-01	-04	01	-06	08	03		
17	00	-02	-01	-08	09	00	03	-03	01	-03	-05	-01	-07	04	02	-01	
18	01	00	-08	00	03	04	-02	01	02	-03	-02	-01	01	02	-01	04	-10

BEHAVIOR SCALE



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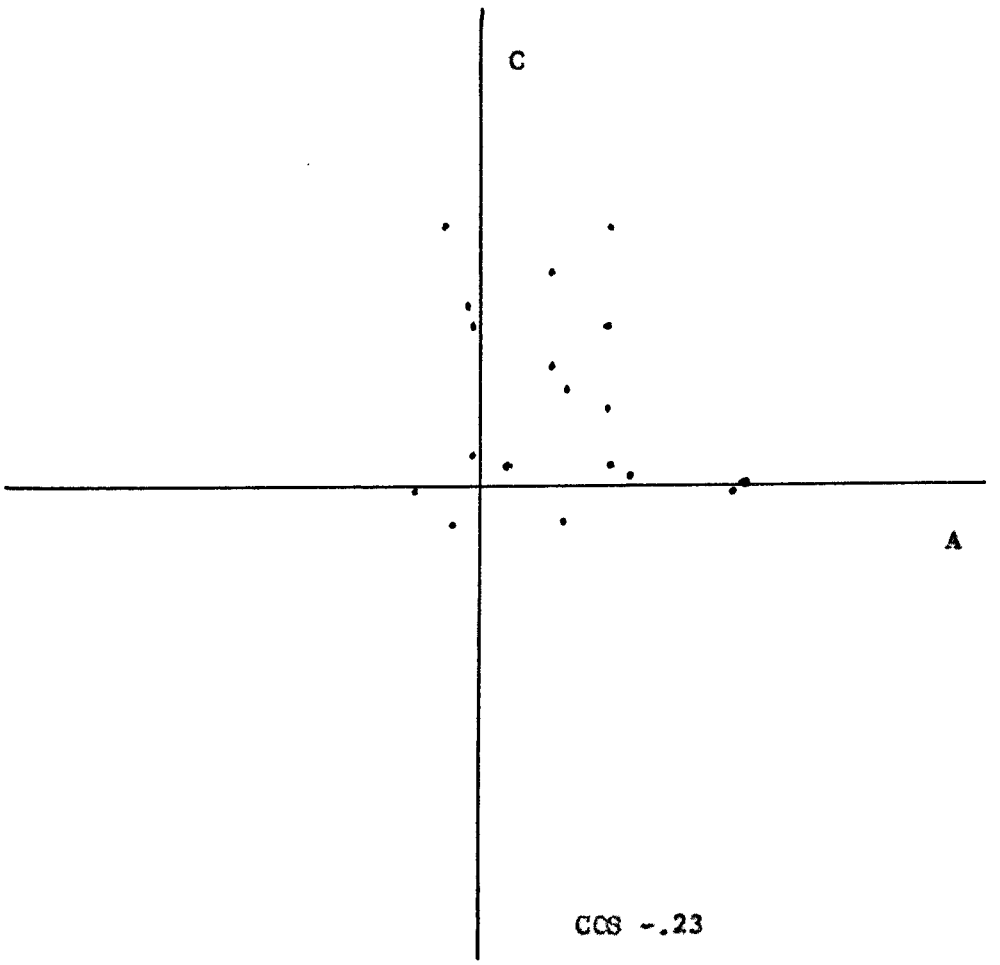

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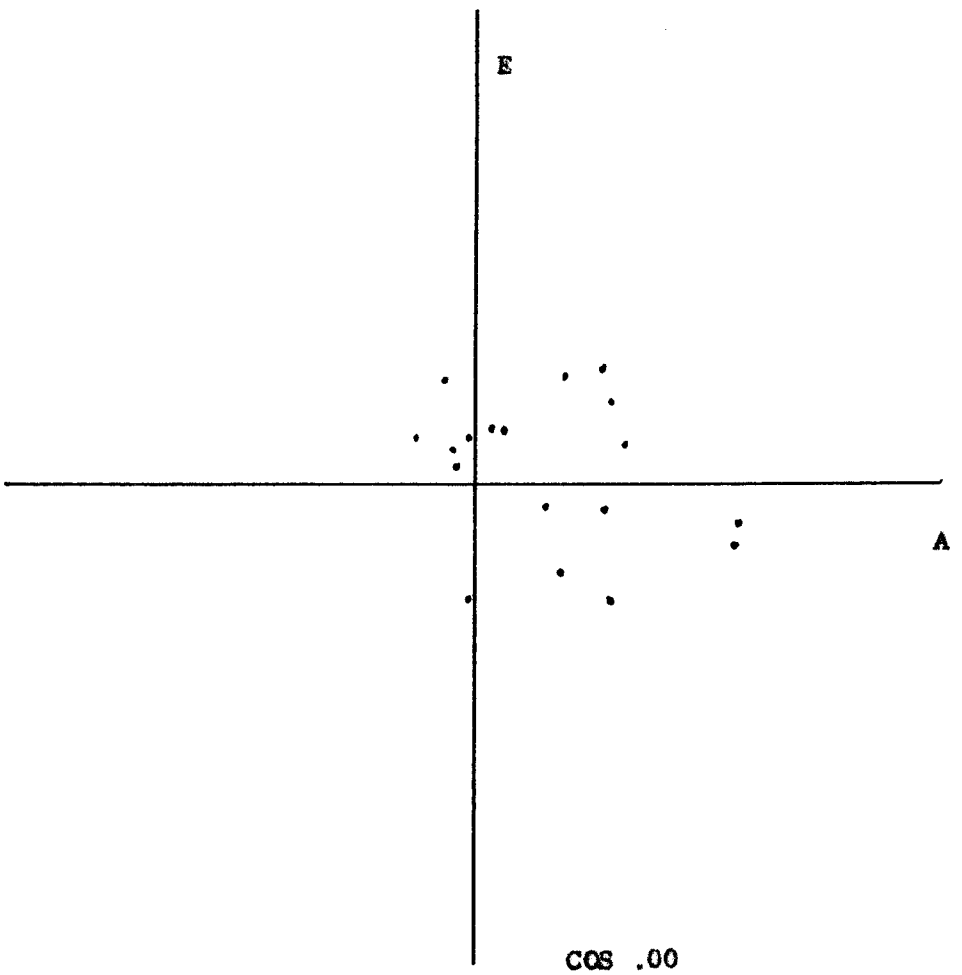
BEHAVIOR SCALE

BEHAVIOR SCALE



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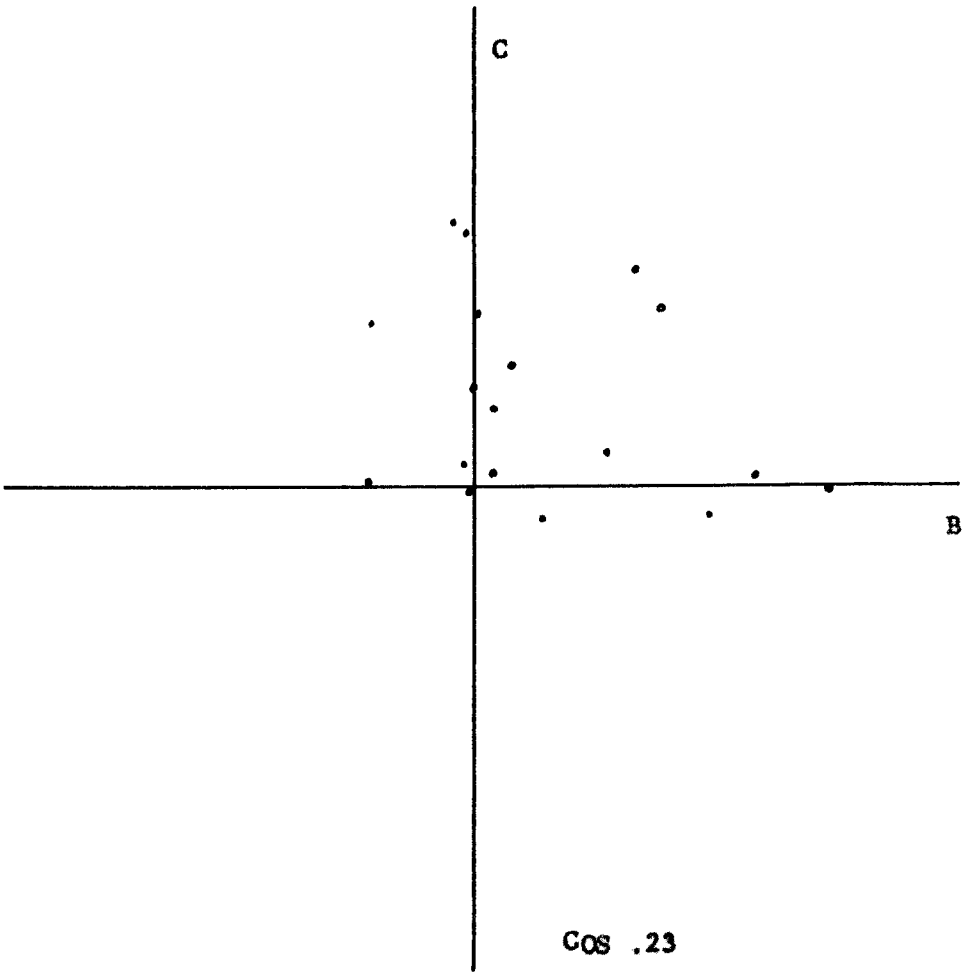

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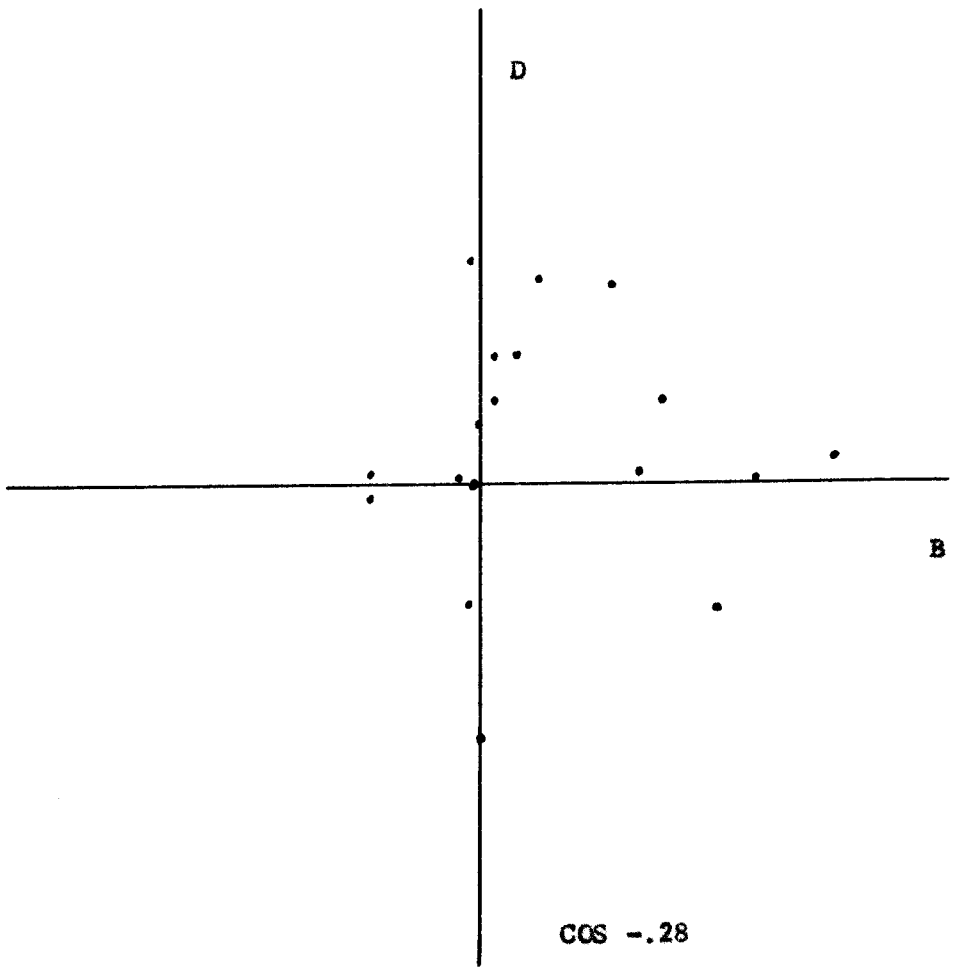

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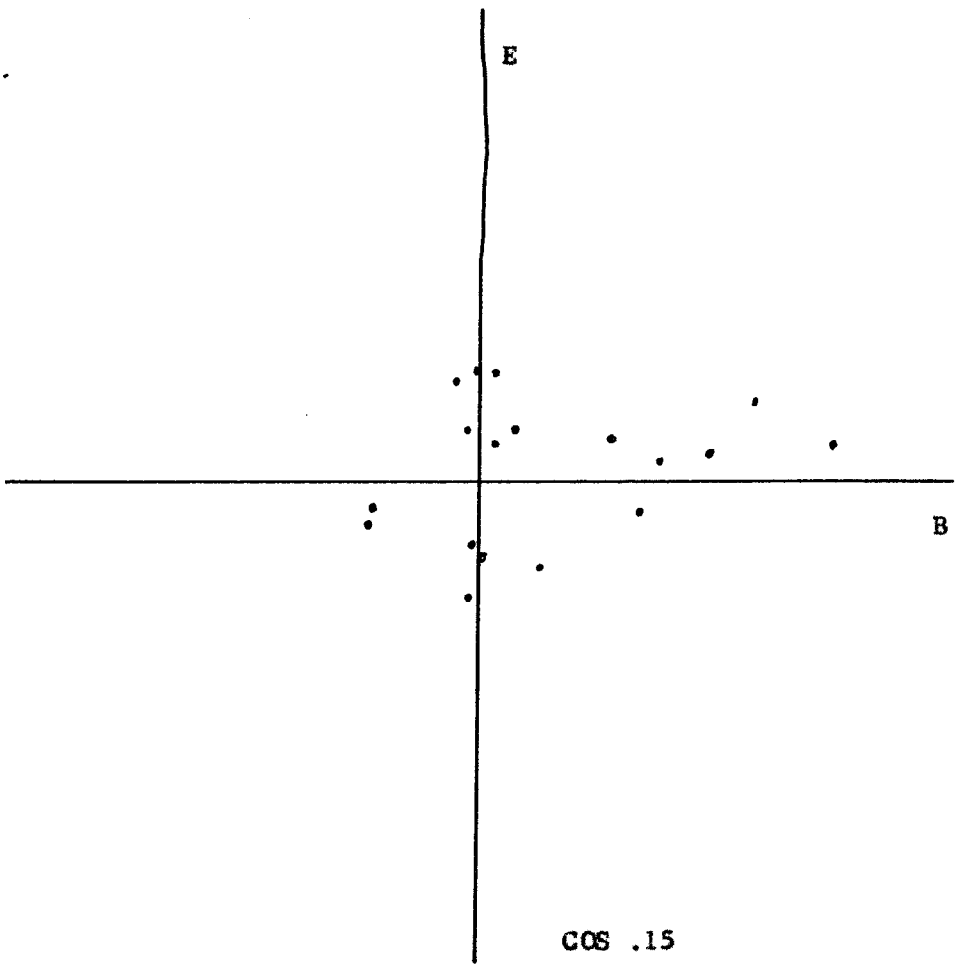

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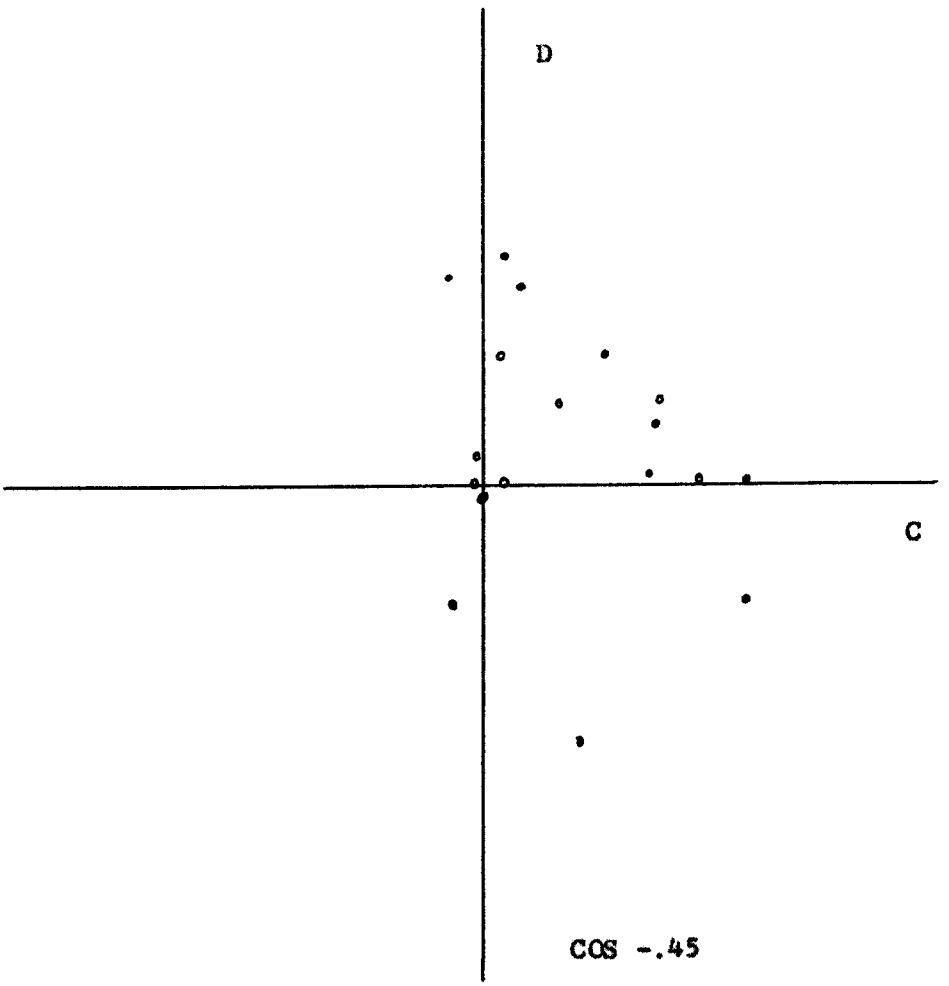

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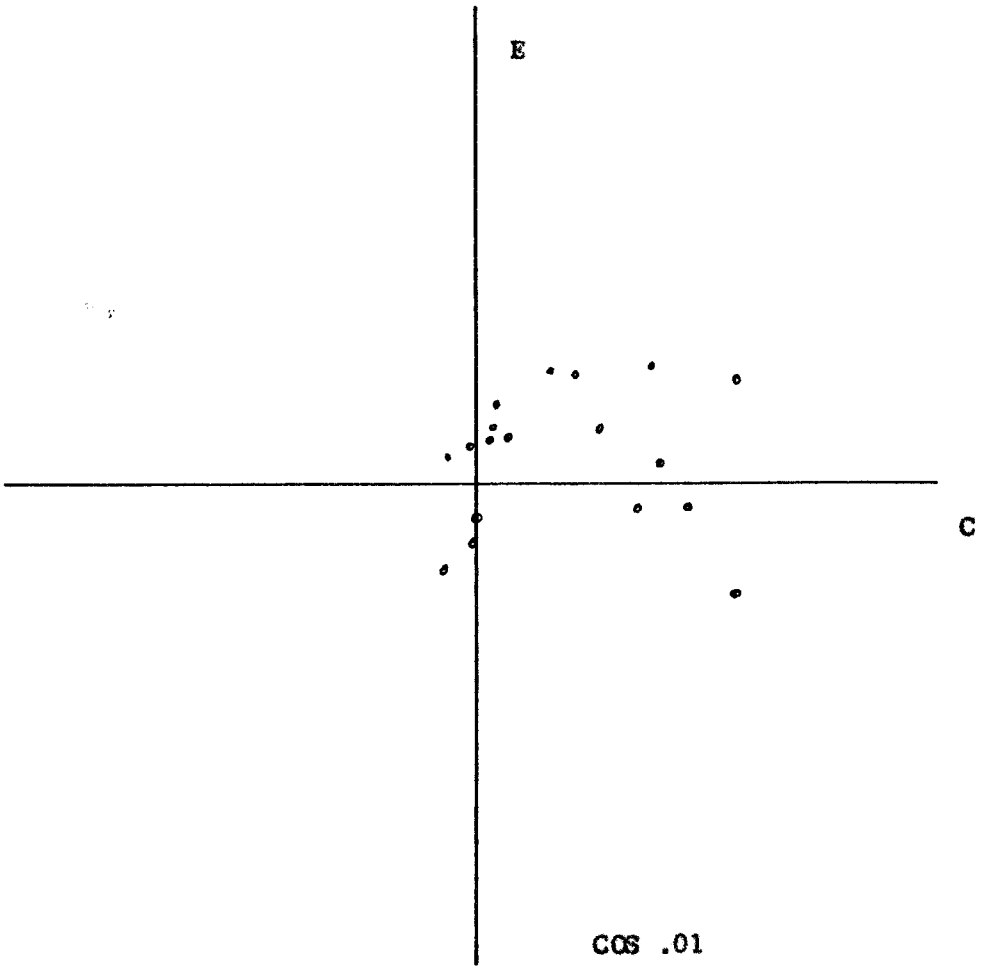

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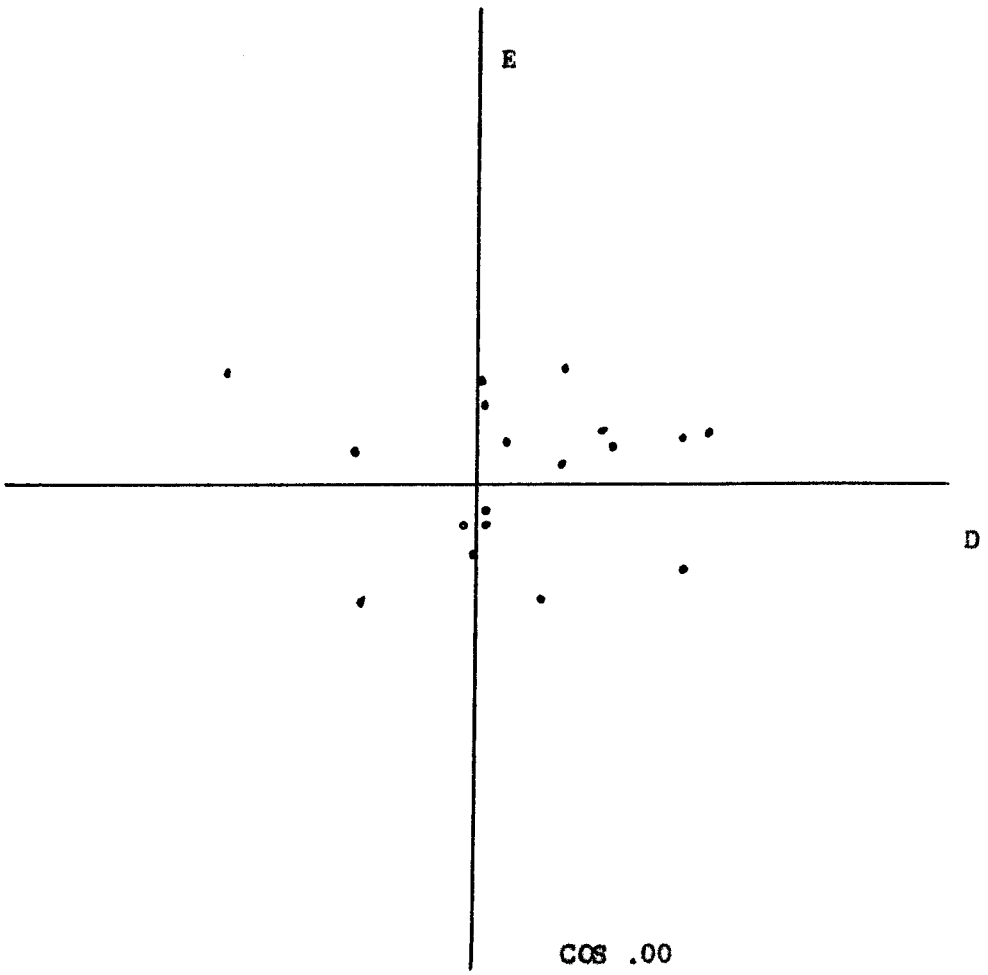

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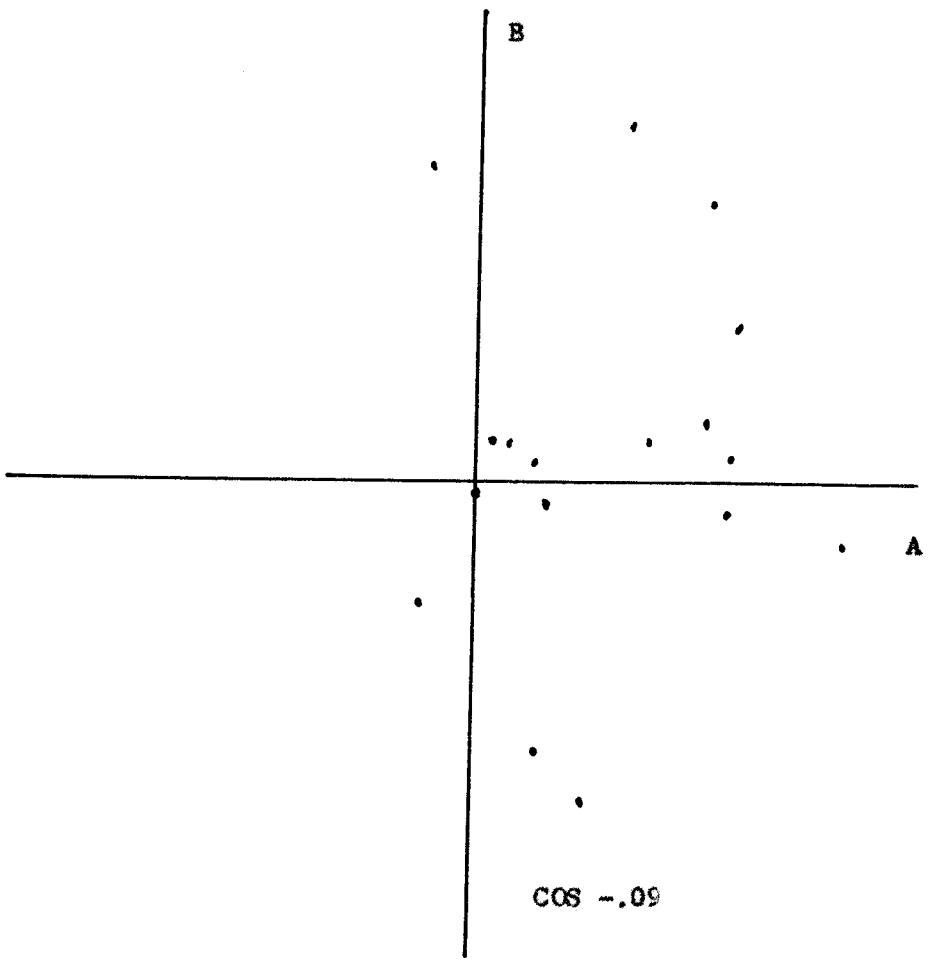

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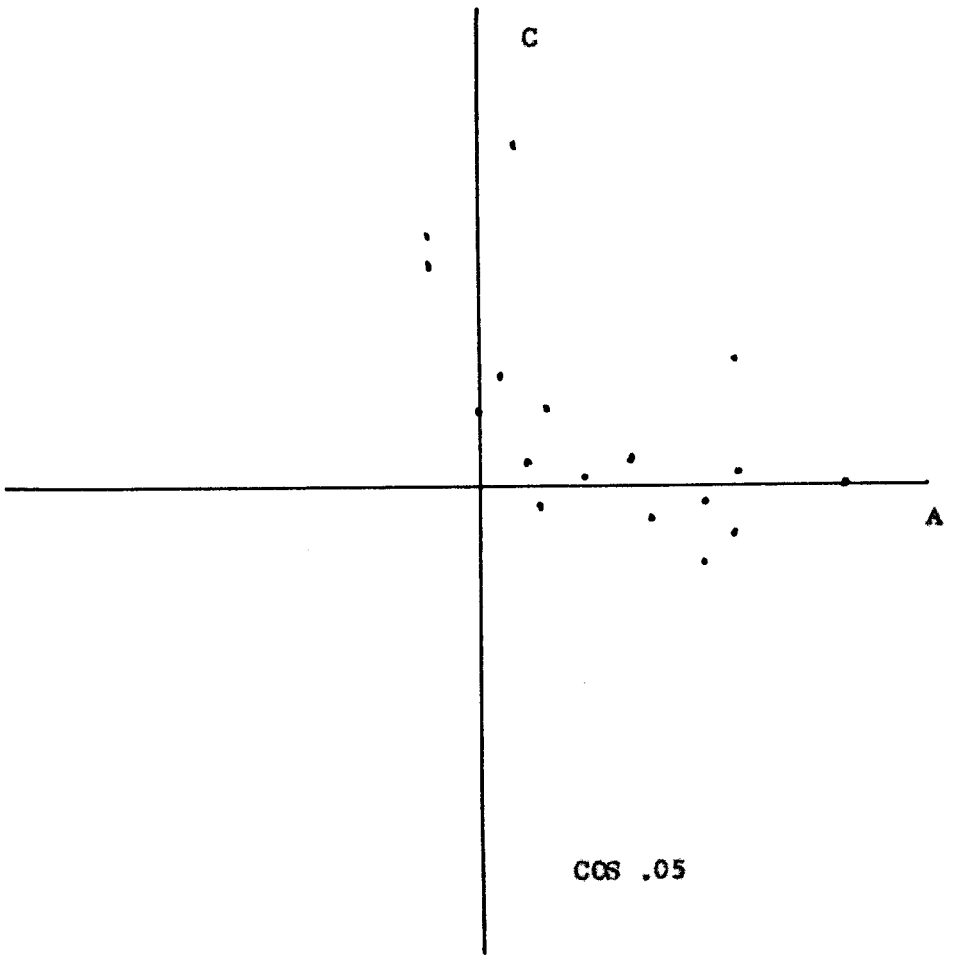

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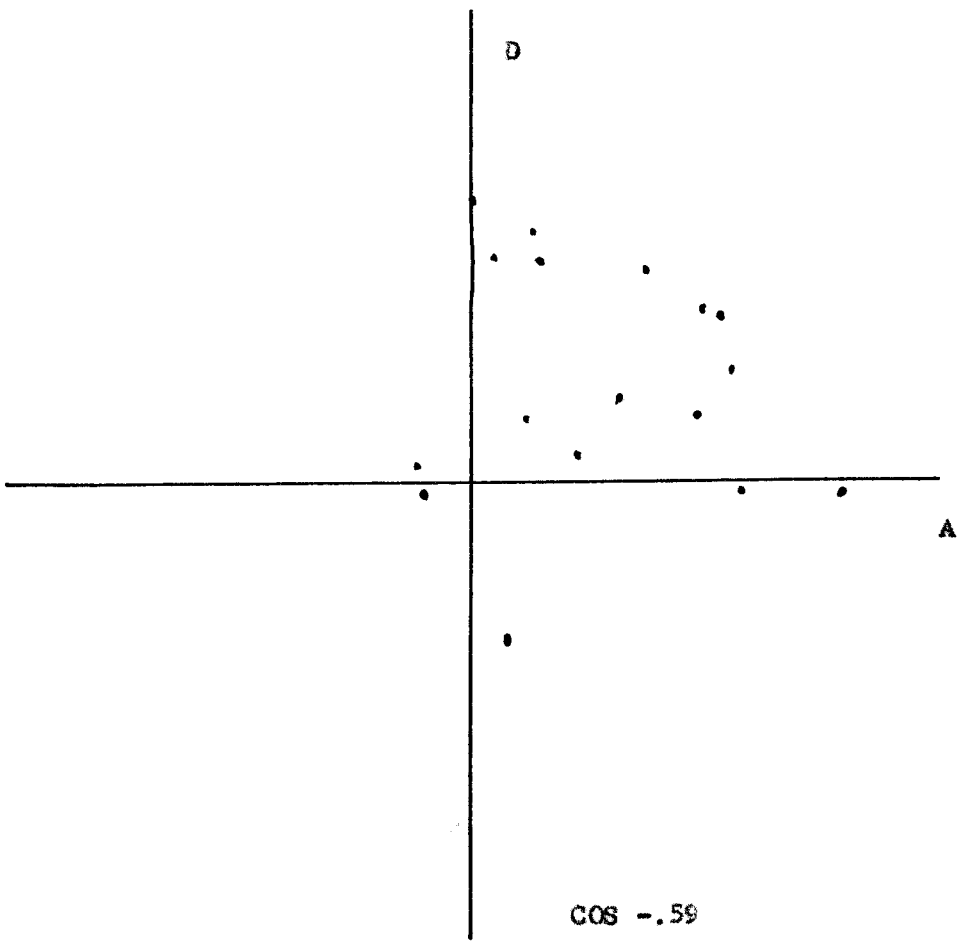

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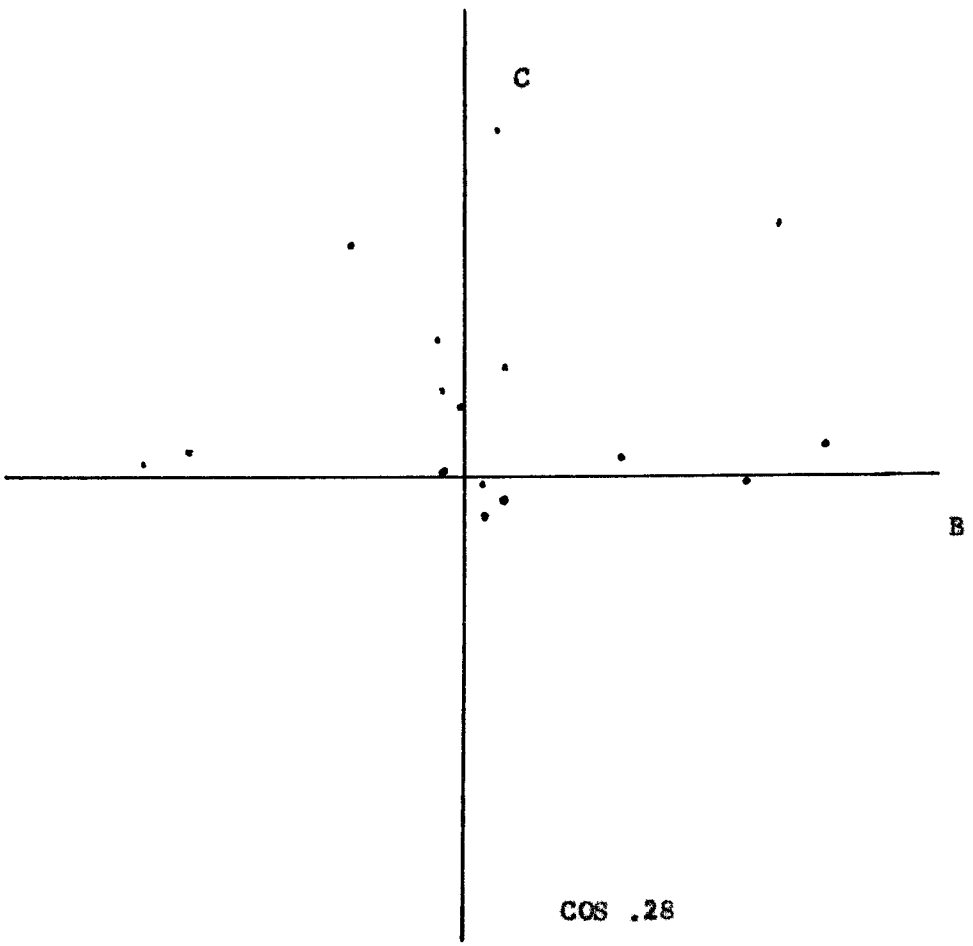

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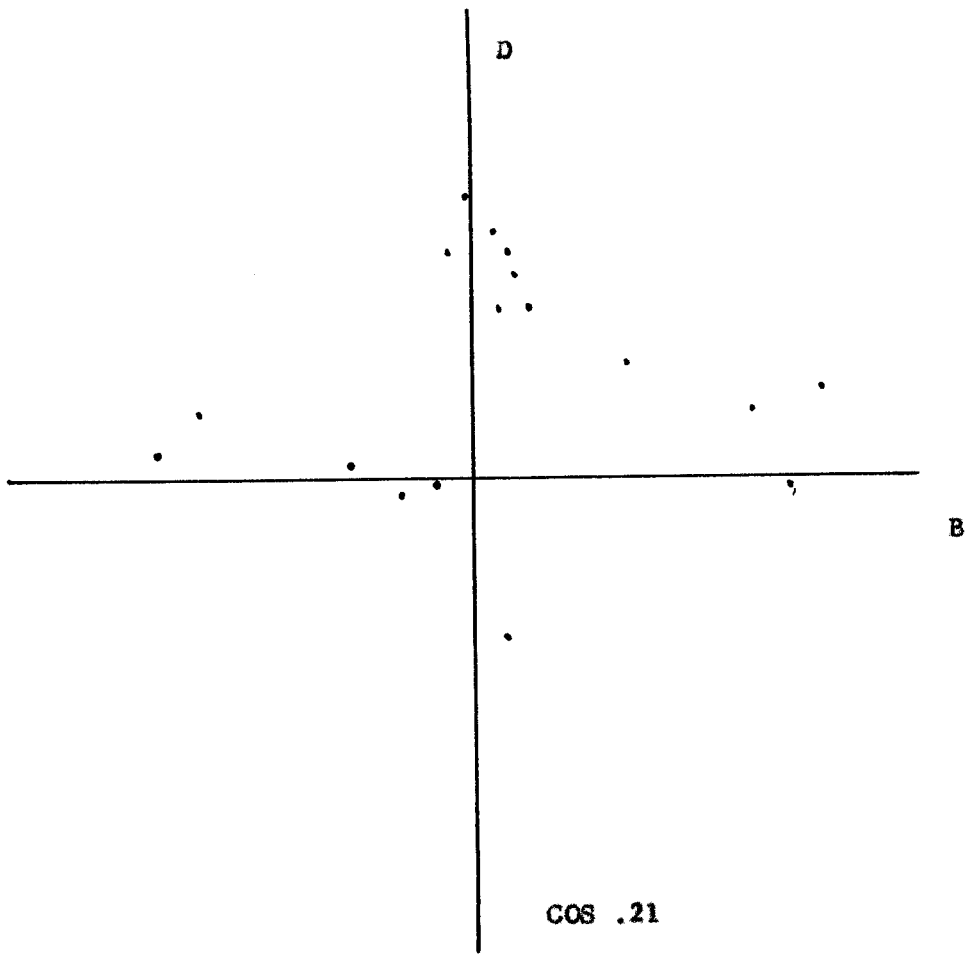

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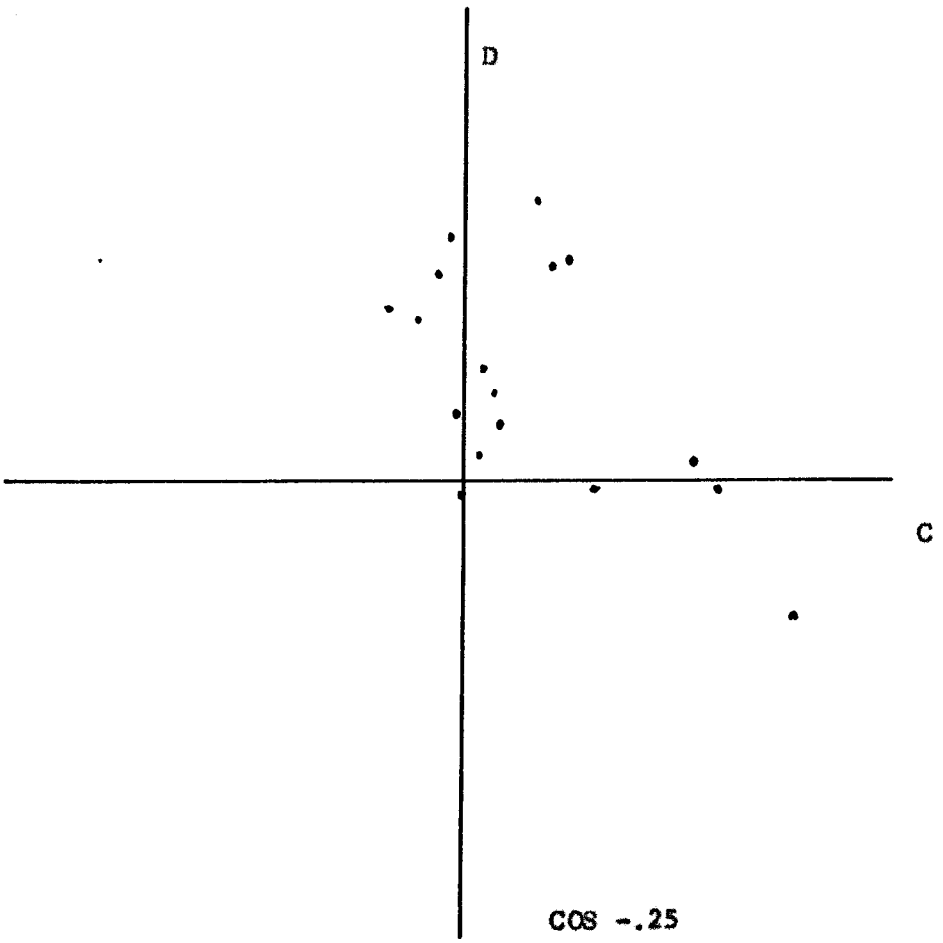


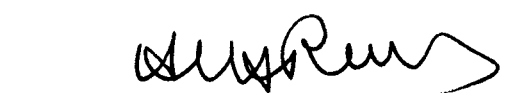
APPROVAL SHEET

The dissertation submitted by James G. Georgas has been read and approved by five members of the Department of Psychology.

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

The dissertation is therefore accepted in partial fulfillment of the requirements for the Degree of Doctor of Philosophy.

January 29, 1964
Date


Signature of Adviser