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THE EFFECT OF INTERPERSONAL CONTENT ON CONCEPTUAL TASK PERFORMANCE OF SCHIZOPHRENICS

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THE EFFECT OF INTERPERSONAL CONTENT ON CONCEPTUAL TASK PERFORMANCE OF SCHIZOPHRENICS

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THE EFFECT OF INTERPERSONAL CONTENT ON CONCEPTUAL TASK PERFORMANCE OF SCHIZOPHRENICS

CHAPTER I

INTRODUCTION

Disturbances in conceptual thinking have been recognized as a major factor in schizophrenic disorders at least since the writings of Bleuler in 1911 (1950; 1951). The initial approach to these disturbances was largely restricted to observation, description of symptom patterns, and theoretical exploration. Systematic research directed toward examining the nature of schizophrenic thinking disturbances is of relatively recent origin. A number of rather extensive reviews of the literature in this area are available (Cameron, 1944b; Hanfmann & Kasanin, 1942; Hunt & Cofer, 1944; Lothrop, 1961; Rabin & King, 1958).

The hypothesis of general conceptual impairment. The tendency in the initial studies of thought disorders in schizophrenia was to attribute them to a general impairment or loss of the ability to conceptualize or to perform major conceptual operations. Thus Vigotsky concluded from his observations that " . . . in schizophrenia there is a

destruction of the psychologic systems which lie at the basis of concepts" (1934, p. 1068). He described the conceptual disturbance in schizophrenia as a regressive phenomenon and considered it a function of an underlying central nervous system disorder. Similarly, Bychowski (1935) compared schizophrenic conceptual performances to disturbances found in cerebral pathology and concluded that, at least in one group of schizophrenics, the underlying problem is an "agnosia and apraxia of thought," presumably associated with cerebral dysfunction. Hanfmann and Kasanin, in a series of studies of the conceptual task performance of schizophrenics, reported that although not all schizophrenics showed conceptual disturbance when compared with normals, those who did show such disturbance manifested a general deterioration of conceptual thinking and, in particular, in inability to generalize (Hanfmann & Kasanin, 1937; 1942; Kasanin & Hanfmann, 1938a; 1938b). Goldstein (1943; 1944; 1959) interpreted his findings regarding one group of schizophrenics as providing evidence for an impairment of the ability to maintain the "abstract attitude," an impairment resembling that which is found in certain types of brain pathology.

The hypothesis of selective impairment. Discussing the relationship between thinking disturbances and the general nature of schizophrenia, Angyal stated:

> We infer the presence of a thinking disturbance from the patient's verbal productions or from such nonverbal performances as imply thinking. A faulty end result in any performance may be due either to a defect in the tool or to a defect in using the tool. . . . If we apply this distinction to our problem, we may ask, Is the patient's thinking mechanism, as such, impaired, or is he using an otherwise intact tool in an incorrect way because of certain difficulties in the broader aspects of the personality organization? I have the impression that most authors tacitly assume that the schizophrenic thinking disturbance represents a defect in the tool. Delusions result in faulty intellectual productions and are still not included among the thinking disturbances. The implication of this is that the delusion is an incorrect way of using one's thinking processes, and that the thought disturbance proper represents an impairment in the thinking mechanism as such. This implication, however, can hardly be justified (1944, p. 122).

There has been a shift away from interpreting the thinking disturbances in schizophrenia as a function of a general impairment of, or defect in the "tool" of thinking. Instead, the tendency has been to interpret the observed disturbances as being manifestations of <u>selective</u> impairment, implying a defect in <u>using</u> the "tool" of thinking. According to this view, there are specific factors which interfere with specific aspects of schizophrenic conceptual functioning. Support for this hypothesis was initially obtained from a number of studies which were designed to investigate some of the older hypotheses of general impairment, deterioration and regression, and their implications. Cameron (1938a; 1938b; 1939), for instance, attempted to investigate the hypotheses that deterioration and regression are the bases of schizophrenic thought disorder. Finding that the conceptual performances of severely disorganized schizophrenics

were qualitatively different from those of either deteriorated senile patients or normal children, he concluded that schizophrenic conceptual functioning could not properly be considered as either a result of deterioration or of regression. He cautioned:

> The results of the present investigation made it seem evident that if we are to make use of the terms "regression" and "deterioration" to characterize schizophrenia generally, it will have to be with the clear realization that we are taking serious liberties with these concepts in the interest of convenience and brevity. The schizophrenic thinking we have found in our studies can be described neither as childish nor as that of ordinary organic deterioration (Cameron, 1939, p. 269).

Similarly Wegrocki (1940) found marked qualitative differences between the performances of schizophrenics and children on tests of proverb interpretation, analogies, and essential differences, and concluded that the data did not support the hypothesis that schizophrenia is the result of regression. The findings suggested that the thinking disorders of schizophrenics could be collectively designated as a disturbance in the ability to generalize. Wegrocki noted, however, that not all schizophrenics manifest this disturbance and that, of those who do, some can (with proper rapport) assume the "categorical attitude" for brief periods of time. This suggests that there is no deterioration of the capacity for generalization in these schizophrenics. Further evidence against the theory of deterioration of the conceptualizing capacity in schizophrenia was provided in a study by Rashkis (1947) in which he compared the performances

of schizophrenics, general paretics, and cerebral arteriosclerotics on both word sorting and number sorting tests. The results indicated that schizophrenics showed a disorder in conceptual organization; however, whereas the general paretics and cerebral arteriosclerotics manifested a deficit in performance potential, the schizophrenics did not show such a deficit.

Huston & Shakow (1949) approached the concept of deterioration in schizophrenia through an investigation of the learning capacity of schizophrenics. They found that, although schizophrenics achieved significantly poorer mean time scores than did normals on a pursuit learning task, both schizophrenics and normals improved on a later retest. In a 33-day "prod" experiment it was demonstrated that with extended practice the performance level of schizophrenics could be raised to the level of normals. There was no evidence of progressive deterioration of learning ability of schizophrenics. The investigators concluded:

> Thus it would appear that the deterioration seen clinically in chronic patients is not related to a permanent, progressive, or irreversible impairment in learning capacity. The capacity for forming new habits probably is present to the same degree as in the normal person. To develop this capacity proper motivation and more time must be given to overcome the interfering factors of the earlier stages of learning (Huston & Shakow, 1949, p. 887).

The results of this study are, again, suggestive of an intact "tool" for conceptualization in the schizophrenic. Also evident is the importance of experimental conditions

(time, motivational factors, etc.) in giving the schizophrenic the opportunity to demonstrate the use of his intact capacity. Yacorzynski (1950) emphasized the importance of experimental procedures in the study of conceptual processes of schizophrenics. In a study designed to determine what concepts psychotics are capable of using when no particular category or method is imposed upon them, he found that the psychotic group (compared with a normal control group) did not show an impairment in the variety of concepts which they can use. Yacorzynski concluded:

> If psychotics are allowed a freedom of choice in using various concepts, they are capable of using as many concepts as normal subjects. The often-reported inability of psychotics to use concepts is largely due to forcing the patient to use a particular category in solving a problem. Differences appear between the manic-depressives, schizophrenics, and controls in the use of concepts. All of these differences can be accounted for on the basis of emotional and personality factors, rather than a disintegration of the thought process (1950, p. 322).

A number of subsequent studies tended to confirm the finding that the peculiarities of schizophrenic conceptual functioning are due to factors other than the deterioration of thought processes <u>per se</u>. Thus, for example, McGaughran & Moran (1956), using an object sorting task, found no evidence of an impairment of abstractive ability in schizophrenics and suggested that the schizophrenic group manifested a loss of ability in social communication. Payne, Mattussek & George (1959), in a study dealing with various aspects of schizophrenic thought disorder, concluded

that Cameron's concept of "overinclusion" (the inability to maintain the boundaries of a conceptual problem and to restrict conceptual operations within their limits) accounts for unusual responses of all sorts and offers a more useful explanation of schizophrenics' difficulty on sorting tests than Goldstein's concept of "concreteness."

The effect of various specific factors on the conceptual performance of schizophrenics has been investigated in a number of studies. Among these are studies by Chapman (1956a; 1956b; 1958) regarding distractibility and the intrusion of associative responses as factors in schizophrenic thought disorders. The role of motivational factors in schizophrenic conceptual performance has been discussed by Rodnick & Garmezy (1957), and investigated by Garmezy (the effects of reward and punishment [1952]), Webb (the effect of the threat of failure [1955]), and Cavanaugh (the effect of motivational changes [1958]).

Interpersonal theory and conceptual performance of schizophrenics. An area of research, based on the theory of selective impairment of conceptual functioning in schizophrenia, which has received increasing attention in recent years involves the relationship between interpersonal factors and schizophrenic effectiveness in the use of concepts. Rabin & King, reviewing the psychological studies regarding schizophrenia have stated:

> It seems safe to say that the dominant orientation toward schizophrenia is a psychogenic one, the general view being that basically schizophrenia represents a disturbance in interpersonal relationships. The notion is especially congruent with the theoretical positions held by Cameron and Sullivan. One way to translate this theoretical orientation into research implications would be to consider variables referring to interpersonal processes as being central ones in psychopathology. The foregoing frame of reference does not preclude relationships between schizophrenic phenomena and variables which do not have direct interpersonal referents, but such relationships would be classified as "peripheral" in nature (1958, p. 237).

The theoretical position which holds that schizophrenia is a functional, psychogenic disorder with the primary focus upon disturbances in the area of interpersonal relationships has been formulated by Sullivan (1944) and Cameron (1939b; 1944a; 1944b), and elaborated by Arieti (1955). "For this view the functional psychoses are major disorders in which the direct effects of structural, physiological, and biochemical pathology are minimal or absent, while personal and social factors are maximal" (Cameron, 1944b, p. 868). Among the social and personal factors the effects of which are considered important are defective role-taking skills, social disarticulation, desocialization, impairment of affect, and failure of consensual validation. The psychogenic view implies that schizophrenic disorders are a function of factors in the experiential history of the individual and that the specific nature of disturbances of functioning may be related to specific types of events in the individual's life history. Similarly, schizophrenic impairment of conceptual functioning is not viewed as a general impairment

manifesting itself equally in all areas of conceptual functioning. As Cameron has stated, "To understand the etiology of a schizophrenic disorder in a given person, one must begin by mastering, as nearly as possible, his particular life history" (1944b, p. 892). Further, according to this theoretical orientation, the interpersonal difficulties of the schizophrenic are viewed as the outcome of unfortunate, more or less devastating interpersonal experiences in the development of the individual. Thought disorders or disturbances in conceptual functioning are interpreted as secondary in nature, as the outcome of the schizophrenic's interpersonal difficulties.

Briefly stated, the development of schizophrenic disturbances is formulated in the following way: Essentially as a function of interpersonal factors, the individual has experienced a severe threat to his security, leading to an overwhelming state of anxiety, and culminating in a shift in the mode of conceptual functioning. As Arieti has stated regarding the schizophrenic,

> Confronted with overpowering anxiety, he finally succombs, and the break with reality occurs. In other words when he cannot change himself any longer, not even in a neurotic way, he has to change reality. But reality cannot change, and he has to change himself again in order to see "reality" in a different way (1955, p. 183).

The shift in the conceptual process results, then, in the individual's experiencing the security-threatening reality in a different, unrealistic way, no longer adhering to the

principles of ordinary logic. Furthermore, since the "reality" which gave rise to this process is essentially an interpersonal "reality," the effects of the schizophrenic shift in conceptual functioning are likely to be manifested most intensely and seen most clearly in the individual's efforts to cope conceptually with problems involving interpersonal factors.

This line of reasoning has led to a general hypothesis which states that the presence of interpersonal factors in a conceptual task situation will have a detrimental effect on the schizophrenic's ability to perform the task. Interest in the effect of interpersonal factors on schizophrenic conceptual functioning has led to a number of studies designed to test this general hypothesis or specific problems which are based on this hypothesis (Affleck, 1954; Davis & Harrington, 1957; Dunn, 1954; Kreinik, 1959; Wexler, 1955; Whiteman, 1954). Of these studies, those by Whiteman, Wexler, and Affleck are similar in approach and serve as a basis for the present study. Whiteman (1954) compared a group of schizophrenics with a group of non-psychotics with respect to their performance on "formal concept" tests and a "social concept" test. His "formal concept" tests consisted of a verbal analogies test and a picture reasoning scale; his "social concept" test involved choosing one out of four, or one out of six pictures depicting social interaction scenes. On the latter test, the subject was asked to

select the one picture which "does not belong." The results indicated that all the tests discriminated between the groups in favor of the non-psychotic group, and that the "social concept" test showed the greatest disparity between groups. Thus the results tended to confirm the hypothesis that the deficit of schizophrenics relative to normals is greater on social than on formal conceptual problems. In a qualitative analysis of the data in this study, Whiteman made the following observations:

> The greater number of physicalistic responses among schizophrenics represents a definite tendency for the schizophrenic group to shift from the personal-social element of the cards to a more neutral (but not necessarily less abstract) dimension. . . . More generally, these findings support a position such as Cameron's . . . which views the thinking of the schizophrenic as a manifestation of his social disarticulation (1956, p. 203).

One possible shortcoming of this study is the fact that the compared tasks were different not only with respect to "formal" versus "social" content, but were different also with respect to the <u>type</u> of task and <u>type</u> of conceptual operation involved. Since our present knowledge regarding the variables in schizophrenic thought disorders is quite limited, such task differences (in addition to the independent variables being investigated) leave open the question whether differences in performance are due to the independent variable, to the other differences, or to a confounding of several factors.

Approaching the problem in a somewhat different

manner, Wexler (1955) compared a group of paranoid schizophrenics with a group of normals on "emotionally toned" and "neutrally toned" tasks. All tasks involved arranging in the proper sequence sets of thirteen cards which range from one end of a continuum to the other. The content of one "neutrally toned" task was a triangle changing to a circle (Zaslow [1950]); the content of the other task was color, ranging from red to orange. In the "emotionally toned" tasks, the content of one task was a picture of a man changing to a picture of a woman; the content of the other task was a series of pictures changing from a friendly interaction to a hostile interaction between two men. The results of this study tended to confirm the hypothesis that schizophrenics, compared with normals, tend to have more difficulty with "emotionally toned" tasks (involving personal or interpersonal content) than with "neutrally toned" tasks (involving non-human content). Although in this study the task operation of arranging material in logical sequential order was the same for all tasks, the complexity of the stimulus material was quite different for the types of tasks which were compared. Since the "emotionally toned" tasks are also the tasks in which the stimulus material is markedly more complex, the question remains as to the effect of differential stimulus complexity on the schizophrenic group's reported increased difficulty with the "emotionally toned" tasks.

Affleck (1956) extended the research in this area by

using a more refined method to investigate the degree to which interpersonal factors in a task situation interfere with the conceptual performance of schizophrenics. He used a set of twelve concept-formation tasks in which the subject was required to sort a series of pictures according to a principle indicated by an example presented. All tasks had the same formal structure, but they varied with respect to the degree of interaction portrayed in the context of the picture, ranging from "base level" tasks containing only geometric forms to tasks containing pictures of relatively intense interpersonal interaction. The concepts used as sorting principles always involved non-interpersonal aspects of the pictures, hence the actual sorting did not require the use of interpersonal concepts. The twelve tasks were equated for level of difficulty by empirical selection based on the performance of standardization groups of normal subjects. The tasks were presented to a group of "early chronic" schizophrenics. The results of this study indicated that, for both time and error scores, the performance of the schizophrenic group was poorer than that of the normal standardization group on all experimental tasks. In addition, it was found that the schizophrenics required more time to complete the tasks as the interpersonal intensity of the picture series increased, but that they were able to maintain a relatively consistent level of accuracy (error score). A secondary analysis of the data also revealed a significant interaction between behavioral

withdrawal and increasing performance time with increasing interpersonal content. The "high withdrawal" group tended to take more time than the "low withdrawal" group to complete the tasks as the interpersonal intensity of the content increased.

The fact that in Affleck's study the performance accuracy of schizophrenics was not affected by interpersonal content in the context of the task material left open to further inquiry the question of the possible effect of interpersonal content if the use of interpersonal concepts is required for the solution of the tasks. Hence, it would seem to be of value to conduct a study in which the effect on schizophrenics' performance of the necessity to use interpersonal concepts in the solution of tasks is investigated.

Reference has been made to Arieti's theory of the dynamics of schizophrenia. In discussing the longitudinal course of schizophrenia, Arieti (1955) described four successive stages of the disorder: the initial stage, the advanced stage, the preterminal stage, and the terminal stage. The initial stage is generally the period of onset and the early psychotic phase, characterized by conscious, observable anxiety, excitement or panic, a state of disequilibrium, and by the disturbing nature of symptoms such as delusions, hallucinations and ideas of reference. The advanced stage is characterized by the absence of easily observable anxiety, by the patient's acceptance of his illness, by the achievement of a state of equilibrium, by the acceptance of symptoms such

as delusions, hallucinations and ideas of reference without being particularly disturbed by them, by routine and stereotyped behavior, and by increasing desocialization. The preterminal stage is characterized by a severe disintegration of thought processes and by the development of peculiar habits. The terminal stage is characterized by the presence of "primitive oral habits," by the virtual absence of verbal expression, and by some apparent perceptual alterations. Arieti's concept of stages appears to offer a dimension of classification which has potential value in research with schizophrenics. Although at this point only the initial and advanced stages have been described and characterized in some detail, the investigation of these two stages would constitute a beginning in the exploration of this classificatory dimension. Since the reaction patterns for the initial and advanced stages differ considerably, it is possible that there are concurrent differences in conceptual functioning. Further, since one of the specific differences between these stages involves the degree of socialization (with more desocialization in the advanced stage) there may also be differences with respect to the effect of interpersonal content on the adequacy of functioning on conceptual tasks. It would seem, therefore, that a study would be of value in which schizophrenics in the initial and advanced stages (and normals) are compared with respect to the effect of interpersonal content on conceptual task performance.

CHAPTER II

PROBLEM

The primary purpose of this study is to investigate the effect of interpersonal content on the conceptual task performance of schizophrenics. A secondary purpose is to investigate the relationship between the stage of the schizophrenic disorder (according to Arieti's theory) and the degree to which interpersonal content affects conceptual task performance.

In order to investigate these effects, tasks of the following kinds will be considered: A set of concept formation tasks involving only inanimate objects and having as a principle of classification certain object characteristics; a set of tasks involving inanimate objects and a single human in which the principle of classification is (for some subjects) based upon object characteristics or (for others) based upon personal characteristics; a set of tasks involving objects and two people where the basis of classification is some aspect of interpersonal behavior. It is assumed that the range of tasks from those involving only inanimate objects, to those involving one person in

the context, to tasks requiring the use of a one-person concept, to tasks requiring the use of a two-person interpersonal concept represents a continuum from "least" to "most" interpersonal content. These tasks have been selected for the following reasons: It is assumed that having to deal with depicted people on the test cards symbolizes for the subject some aspect of interpersonal relationships and the threat which is implicit in these relationships. The cards with no people would offer minimal threat (not a complete absence of threat because the subject is in an interpersonal experimental situation). The cards with one person depicted, but where the person is not used to form the appropriate concept, poses a higher degree of threat. A still higher degree of threat is posed by the depiction of a person who must be used in the formation of the appropriate concept. The highest degree of threat is posed by the depiction of an interpersonal relationship where the interaction between two people serves as the basis for forming the appropriate concept.

The study is designed to investigate the performance of schizophrenics on tasks involving one or more people as compared with their performance on tasks involving only inanimate objects. Further, it is designed to investigate differences in performance between schizophrenics in the initial stage of the disorder (Schizophrenic-1) as compared with those in the advanced stage (Schizophrenic-2).

CHAPTER III

METHOD

Subjects

Three groups of subjects were used: Schizophrenic-1 (Stage-1), Schizophrenic-2 (Stage-2), and Normal. The criteria for selecting all subjects were: sex (male), age (18-46), educational status (must have completed the sixth grade), pre-test performance (must make fewer than two errors on the last three cards of the second practice set), degree of cooperativeness (must be willing to cooperate in the research in response to a request to do so), status of visual acuity (adequate, or adequately corrected vision). In addition the following conditions were used as criteria for excluding schizophrenic subjects: known or suspected brain pathology, chronic alcoholism, supplementary diagnosis of mental deficiency, 25 or more shock treatments, any shock treatments within three months prior to testing. Information regarding age and education for each subject, and regarding diagnosis, chronicity, and medication of patients is presented in Appendix A. Table 1 contains the means and ranges for each of the groups for age and educational status.

Table 1

Means and Ranges of Age and Educational Status for Normal, Schizophrenic-1, and Schizophrenic-2 Groups

		Normal	Schiz-1	Schiz-2
Age	Mean	29.4	29.4	35.0
	Range	18.6-41.0	19.6-43.7	23.1-45.3
Education[a]	Mean	11.5	10.6	10.9
	Range	8-15	6-16	7-16

[a]Highest grade completed.

Schizophrenics. The schizophrenic subjects were selected from the patient population of Central State Griffin Memorial Hospital at Norman, Oklahoma. All patients had an official diagnosis of "schizophrenic reaction," any sub-type, and the patient's current ward psychiatrist concurred with the appropriateness of this diagnosis. All schizophrenic subjects who met the criteria for inclusion in the research (with the exception of pre-test performance) were interviewed independently by each of two judges who were familiar with Arieti's theory and classification system. (The instructions given to the judges are presented in Appendix B.) Each judge independently applied a classificatory statement to each patient: Stage-1, Stage-2, Undecided. For 82 per cent of the patients the classificatory statements by the judges were in agreement. In cases of agreement on an "Undecided"

classification, the patient was excluded from the research. When the judges disagreed about the classification for a patient, the statement of a third judge (E) was used. Where two out of three judges were in agreement, the agreed upon classification is the one which was used. If that classification happened to be "Undecided," or if there was no classification which was used by two judges, the patient was excluded. Therefore, all patients included in the research had a classification applied to them which was agreed upon by two judges. (All judges were clinical psychologists with a minimum of six years of clinical experience, and a minimum of four years of experience in diagnostic work with schizophrenic patients in a psychiatric hospital.)

The Schizophrenic-1 group. N = 30. The schizophrenics in this group were classified as being in the first (or initial) stage of the disorder. Characteristics of this stage are: Anxiety is conscious and observable. The patient may be in a state of excitement, restlessness, or panic. In Arieti's terms, the patient has not yet reached a state of equilibrium. Symptoms such as hallucinations, delusions, and ideas of reference are disturbing to him.

The Schizophrenic-2 group. N = 30. The schizophrenics in this group were classified as being in the second (or advanced) stage of the disorder. Characteristics of this stage are: Anxiety is not easily observed; the patient seems to have accepted his illness and has reached a state of

equilibrium. Delusions and hallucinations have lost many of their unpleasant qualities and the patient does not seem to be disturbed by them. Behavior tends to be routine and stereotyped. Spontaneous response is avoided, and there is a trend toward increasing desocialization.

Normals. N = 30. The subjects in this group were employees at Central State Griffin Memorial Hospital. In addition to meeting the general selection criteria, subjects in this group had to have had no history of emotional disturbance or of psychiatric disorder.

Experimental Materials

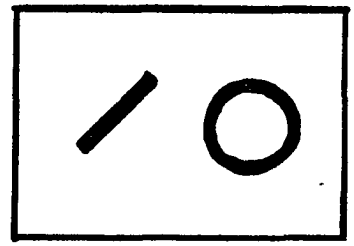
The formal structure of the task situation used in this study is based on the test devised by Affleck (1954). The material developed for the present investigation consists of nine sets of pictures. Although the specific picture content varies from set to set, all sets have the same formal structure. That is, each set consists of nine pictures containing two concepts on the basis of which the cards may be sorted. In each set there are three different instances of each of the two concepts. Each instance of one concept occurs in combination with each instance of the other concept.

Fig. 1 is presented for the purpose of illustrating the formal structure of the picture sets. The two concepts in this illustration are (1) the slope of the line and (2) the size of the circle. There are three different instances of the slope of the line and three different instances of the

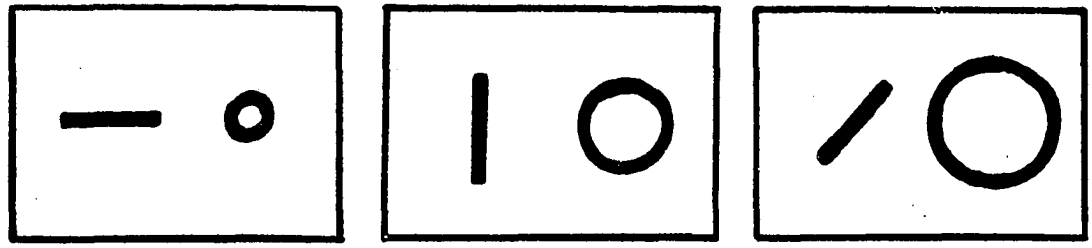
size of the circle. Each instance of the slope of the line is combined with each instance of the size of the circle, resulting in nine different combinations. Three cards are selected so that they contain all three instances of both concepts. These three cards are called standard cards. A fourth card is selected from the remaining six cards so that it will match the center standard card with respect to the relevant concept. This card is called the guide card. The relevant concept is defined as the concept selected on the basis of which the remaining five cards are to be matched with the standard cards. In Fig. 1, the relevant concept is the size of the circle (indicated by the guide card matching the center standard card, both containing a medium sized circle); the irrelevant concept is the slope of the line (differing on the guide card and center standard card).

The nine sets of pictures are divided into three series, each series consisting of three sets of pictures. One series is composed of three sets of pictures with only non-human content and is called the Object Series. In this series both sorting concepts involve non-human content. The second series, called the Person Series, is composed of three sets of pictures with both non-human content and one person in each picture. In this series one sorting concept involves non-human content, the other sorting principle involves the person portrayed. The third series, called the Interpersonal Series, is composed of three sets of pictures, each picture

Guide Card



Standard Cards



Test Cards

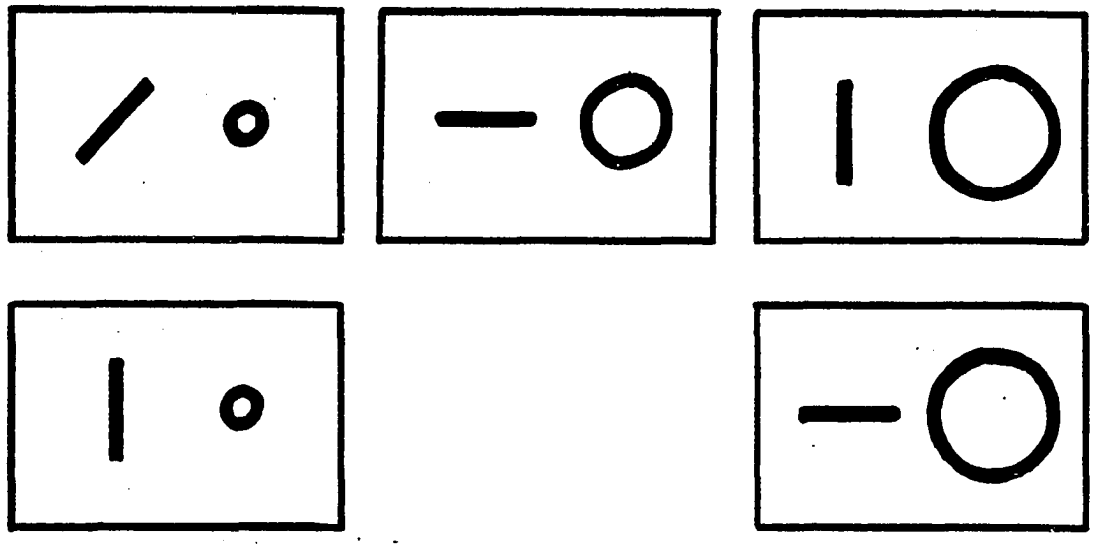


Fig. 1. Illustration of formal structure of picture sets.

with both non-human content and two persons. In this series one sorting concept involves non-human content, the other sorting concept involves the interaction between the two persons portrayed. For the purpose of illustration, the standard cards of all nine sets are presented in Appendix C.

All pictures were drawn in India ink on white 5" by 8" index cards, covered with transparent acetate. An effort was made to have each set of pictures in one series comparable to a set of pictures in the other two series with respect to stimulus qualities such as space occupied by the picture, "shadedness," "line-ness," number of items portrayed, etc. In a pilot study using normal subjects, an effort was made to match the sets of the three series with respect to task difficulty, or at least to make sure that the Object Series is no less difficult than the other two series.

Apparatus

In order to clarify the nature of the task situation and to facilitate the presentation of the tasks, a task board was constructed. This task board is illustrated in Appendix D. There were two rows of three card holders, the top row for the standard cards and the bottom row to be used by the subject for sorting the cards presented to him. Above the standard card holder was an inclined holder for the guide card. All holders were $5\frac{1}{4}$" by $8\frac{1}{4}$" and were constructed with wood strips. The top was left open so that the cards could be slid in and out of the holders with ease. A board 12" in height was

attached at right angles to the top of the task board. A 10 watt clear bulb was mounted in the center of this back board and was operated by the experimenter by a floor switch. This light was clearly visible to the subject.

Research Design

The basic research design was a 3 x 3 factorial design. Within each 3 x 3 cell there was a replication over two scores. The number of subjects per 3 x 3 cell was 10. Subjects were assigned to the cells in the following manner: As each of the 30 subjects in a group became available, he was assigned randomly to one of three conditions. Each condition demanded that he perform on two tasks. The major classification variables, therefore, were Groups (Schizophrenic-1, Schizophrenic-2, Normal) and Conditions (I, II, III).

Procedure

The picture series were presented in three different combinations, constituting three different experimental conditions.

Condition I. This condition consisted of the Object Series and the Person Series. In the Person Series, the non-human sorting concept was the relevant concept.

Condition II. This condition consisted of the Object Series and the Person Series. In the Person Series, the human sorting concept was the relevant concept.

Condition III. This condition consisted of the

Object Series and the Interpersonal Series. In the Interpersonal Series, the interpersonal sorting concept was the relevant concept.

It will be noted that each experimental condition consisted of the Object Series plus one of the other series. Since there were three sets of pictures in each series, each subject was presented with a total of six sets of experimental pictures.

Task Procedure and Instructions

Before the presentation of the experimental picture sets, two practice sets were given in order to clarify the task operations and to familiarize the subject with the procedure. The practice sets contained only simple forms and objects, the content being different from that of any of the experimental picture sets. After the experimenter (E) introduced himself to the subject (S), S was seated in front of the task board, with E at S's right. S was then given the following instructions:

> I have a series of tasks that I would like you to do. These tasks will be done on the board which you see in front of you. Notice that there are six card holders here. Now I am going to place three cards in these three card holders like this (E places the three standard cards of the first practice set in the top row of card holders). Notice that these three cards are different from each other. Now I am going to take this card and match it with this one because it is like it in some way (E places the guide card in the holder above the center standard card). I want you to look at all the cards and figure out what makes this card (E points to the guide card and then to the center standard card) belong with this card. Figure out what makes them match, what they have in common.

Now I am going to give you five cards, one at a time. I want you to place the card I give you under one of these three cards (E points to the three standard cards) so that it matches one of these three cards according to the same rule which makes this card go with this card (E points to the guide card and then to the center standard card). If you think it belongs with this card (E points to the left standard card), you will put it in this holder (E points to left test card holder). If you think it belongs with this card (E points to center standard card), you will put it in this holder (E points to center test card holder). And if you think it belongs with this card (E points to right standard card), you will put it in this holder (E points to right test card holder).

If you place it in the holder under the correct card, this light will go on as a signal that you are correct (E turns on light). If, after you have placed a card in a holder the light does not go on, it means that you have placed it in the wrong holder under the wrong card. If that happens--if the light does not go on--I want you to move the card and put it in one of the other holders, under one of the other cards. Do this until the light goes on indicating that you have placed the card correctly. Now let me repeat, I want you to match each card I give you with the one card of these three (E points to the standard cards) you think it belongs with, using the rule that makes this card go with that one (E points to the guide card and then to the center standard card). Do this as quickly and accurately as you can.

The test cards of the first practice set were then presented one at a time. After each card was placed in the correct holder, it was removed from the task board. For the second practice set and for the subsequent experimental sets, the following instructions were repeated:

Here are three cards, all of which are different. I am going to match this card with this card (E places guide card in holder above center standard card) because it is like it in some way, because they have something in common. Look at the two cards I have matched (E points to the guide card and center standard card) and figure out what makes this card (E points to guide card) belong with this card (E points to center standard card). Decide what the rule is that makes them belong together, what they have in common. Then, using that rule, match

> the cards I give you with the cards you think they belong with. Do this as quickly and accurately as you can until the light goes on, indicating that you are correct.

During both practice sets S was reminded to keep moving the card until the light goes on, if such instruction was necessary. If the subject was unable to grasp the nature of the task during the second practice set, making more than two errors on the last three cards of this set, he was excluded from the study and testing was discontinued at this point.

All placements of test cards by each subject were recorded. The total time between the presentation of each test card and the correct placement was recorded to the nearest fifth of a second.

Response Measures

Two measures, a time score and an error score, were used in the analysis of the data. The time score was the total time from the presentation of the test card to the correct placement of the card. The error score was determined as follows: If the first placement was correct, a score of 1 was assigned; if S required two placements, a score of 2 was assigned; if S required three or more placements, a score of 3 was assigned. Thus a perfect error score for a set was 5; the poorest score possible for a set was 15.

CHAPTER IV

RESULTS

In order to clarify the terms used in the presentation and discussion of the results, it will be noted that each subject performed two tasks. The task which was always presented first (Task-1) was the Object Series and was the same for all three conditions; the second task (Task-2) varied from condition to condition. Thus each subject obtained two scores for each of the measures (time, error), one score on Task-1 and one score on Task-2. The results for the time and error measures will be presented separately. Except where specifically noted, all results will be evaluated against a significance level of .05.

Time

The means and standard deviations of time scores for the three groups of subjects on each task are presented in Table 2; the means are depicted in Fig. 2.

The time scores were subjected to an analysis of covariance in which the effect of Task-1 (Object Series) scores was removed from Task-2 performance. In order to

Table 2

Means and Standard Deviations Over Groups, Conditions, and Tasks
Time Scores (Seconds)

Cond.	Series[a]	Normal		Schiz-1		Schiz-2		All Groups	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.[b]
I	(1) Obj-*Obj*	145.8	141.0	178.3	71.0	163.4	121.7	162.8	112.5
	(2) *Obj*-Per	60.4	71.9	118.8	74.6	134.8	70.8	104.7	77.1
II	(1) Obj-*Obj*	149.5	142.3	145.1	99.3	165.2	50.9	152.9	101.2
	(2) Obj-*Per*	128.4	156.0	128.2	70.0	139.5	41.4	132.0	98.2
III	(1) Obj-*Obj*	128.0	91.6	86.4	34.4	176.8	107.0	130.4	89.1
	(2) Obj-*Int*	102.6	70.0	155.6	126.0	209.6	118.3	155.9	113.0
All Cond.	(1) Obj-*Obj*	140.8	123.1[b]	136.6	80.8[b]	168.5	95.3[b]	148.6	101.1
	(2) - - - -	97.1	107.2[b]	130.9	91.8[b]	161.3	87.4[b]	130.9	98.4

[a]The relevant sorting concept for each series is indicated by italics. *Obj*, *Per*, and *Int* refer to non-human, one-person, and interpersonal concepts, respectively.

[b]These values are the standard deviations for the total Group or Condition. They are not means of the standard deviations subsumed under them.

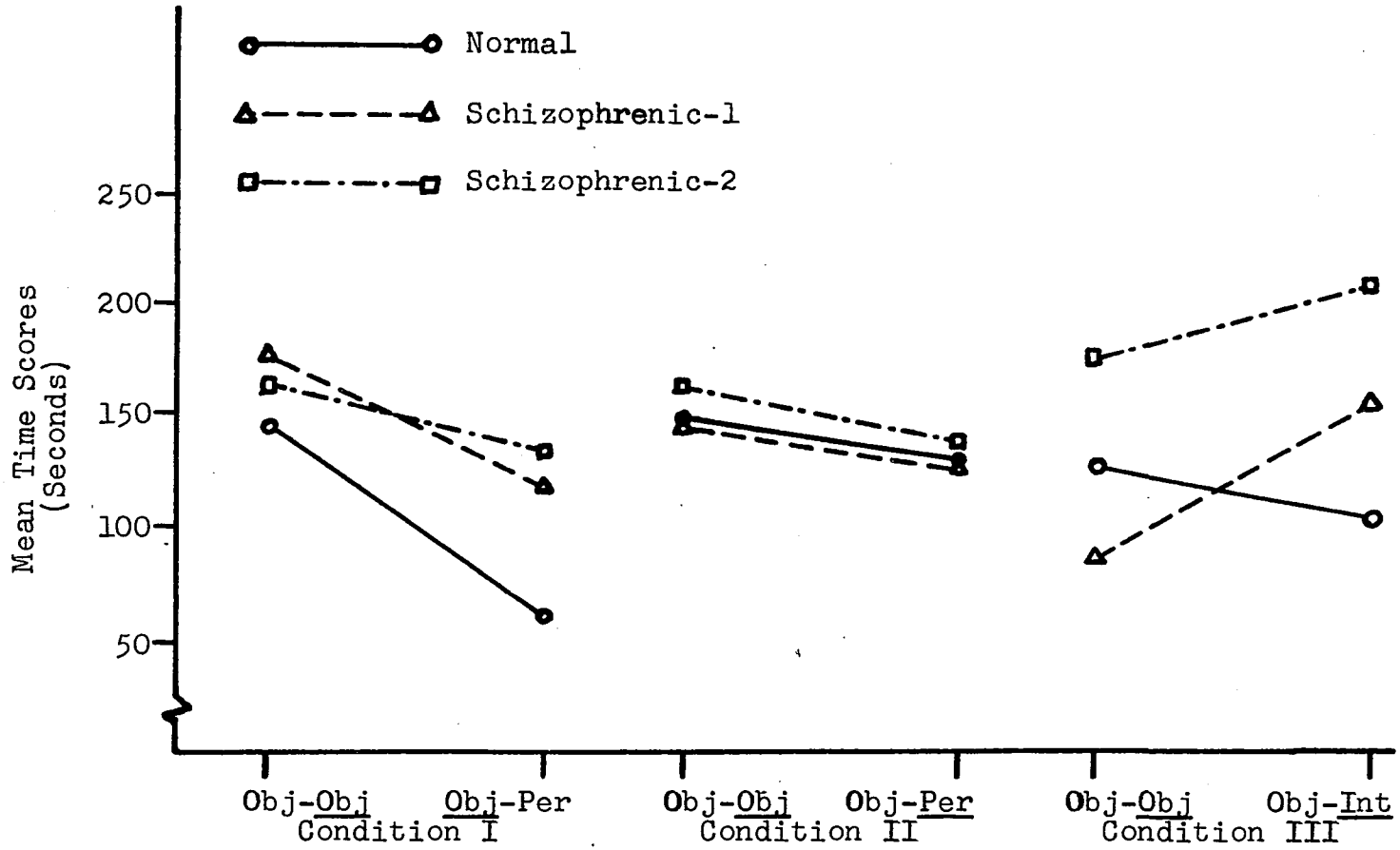


Fig. 2. Mean time scores over Groups, Conditions, and Tasks.

interpret such an analysis properly, a number of assumptions must be met (Lindquist, pp. 328-331). Two of these assumptions were violated: homogeneity of variance of adjusted scores and (more seriously) homogeneity of regression within cells. In order to satisfy these assumptions, the scores were subjected to a logarithmic transformation and an analysis of covariance was performed on the transformed scores. Tests performed on the transformed scores satisfied the assumption of homogeneity of reduced variances (Bartlett's test: $X^2 = 13.70$; $df = 8$; $P > .05$) and the assumption of homogeneity of regression within cells (the appropriate $F = .61$ [Lindquist, p. 330]). It will be noted that statistical tests performed upon transformed data are, in general, not identical with tests performed upon non-transformed data (Lindquist, pp. 149-151). Thus there is an obvious advantage to an interpretation of results based upon non-transformed data. However, when untransformed data do not meet the assumptions for a statistical test, the use of a transformation which satisfies these assumptions makes the interpretation of the results somewhat more secure. The results presented are based upon the (log) transformed data. (In order to enable the reader to compare these results with the results obtained using the original data, the summary of the analysis of covariance of untransformed time scores is presented in Appendix E.)

The summary of the analysis of covariance of log

time scores is presented in Table 3.

The adjusted mean log time scores for the three groups are presented in Table 4; the adjusted mean log time scores for the three conditions are presented in Table 5.

In the analysis of variance of the reduced Task-2 log time scores, the effect of Group (G) is significant. This indicates that with the effect of Task-1 scores partialled out, Task-2 scores (on the average over all conditions combined) for the three groups are not identical. The t tests performed to evaluate the differences between pairs of groups indicate that the adjusted mean log time score for the Normal group is significantly lower than the adjusted mean log time scores for both the Schizophrenic-1 group (t = 11.90; df = 80) and the Schizophrenic-2 group (t = 12.41; df = 80). The adjusted mean log time score for the Schizophrenic-2 group is significantly higher than the adjusted mean log time score for the Schizophrenic-1 group (t = 2.89; df = 80).

In addition, there is a significant Condition (C) effect, indicating that with the effect of Task-1 scores partialled out, Task-2 scores (on the average over all groups combined) for the three conditions are not identical. The t tests performed to evaluate the differences between pairs of conditions indicate that the adjusted mean log time score for Condition I is significantly lower than the

Table 3

Analysis of Covariance of Log Time Scores, Partialling Out Effect of Task-1 Scores

Source	df	Task-1		Task-2	Reduced			
		SS	SP	SS	SS	df	MS	F
Total	89	7.10313	4.89404	9.87035	6.49837	88		
Group (G)	2	.36209	.78446	2.03095	1.09350	2	.54675	11.46*
Condition (C)	2	.09845	-.27238	.89010	1.28382	2	.64191	13.46*
G x C	4	.43409	.19720	.37511	.30512	4	.07656	1.61
Error	81	6.20850	4.18476	6.57419	3.81593	80	.04770	

*Significant.

Table 4

Adjusted Mean Log Time Scores: Groups

	Group		
	Normal	Schiz-1	Schiz-2
Adjusted Mean	18.48210	20.63702	21.23196

Table 5

Adjusted Mean Log Time Scores: Conditions

	Condition		
	I	II	III
Adjusted Mean	18.65169	20.23956	21.59164

adjusted mean log time scores for both Condition II (t = 8.87; df = 80) and Condition III (t = 15.40; df = 80). The adjusted mean log time score for Condition III is significantly higher than the adjusted mean log time score for Condition II (t = 7.55; df = 80).

Errors

The means and standard deviations of error scores for the three groups of subjects on each task are presented in Table 6; the means are depicted in Fig. 3.

Table 6

Means and Standard Deviations Over Groups, Conditions, and Tasks: Error Scores

Cond.	Series[a]	Normal		Schiz-1		Schiz-2		All Groups	
		Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.[b]
I	(1) Obj-*Obj*	20.4	5.4	23.3	3.9	20.4	3.4	21.4	4.4
	(2) *Obj*-Per	15.7	1.0	20.2	3.4	21.4	5.1	19.1	4.6
II	(1) Obj-*Obj*	21.3	5.6	20.5	3.8	20.8	4.0	20.9	4.4
	(2) Obj-*Per*	21.4	7.1	20.0	4.0	21.8	2.3	21.1	4.6
III	(1) Obj-*Obj*	20.3	2.6	19.1	2.7	20.5	3.3	20.0	2.8
	(2) Obj-*Int*	19.6	3.1	21.3	3.3	20.9	4.2	20.6	3.9
All Cond.	(1) Obj-*Obj*	20.7	4.6[b]	21.0	3.8[b]	20.6	3.5[b]	20.7	3.8
	(2) - - - -	18.9	5.0[b]	20.5	4.0[b]	21.4	3.8[b]	20.3	4.4

[a]The relevant sorting concept for each series is indicated by italics. *Obj*, *Per*, and *Int* refer to non-human, one-person, and interpersonal concepts, respectively.

[b]These values are the standard deviations for the total Group or Condition. They are not means of the standard deviations subsumed under them.

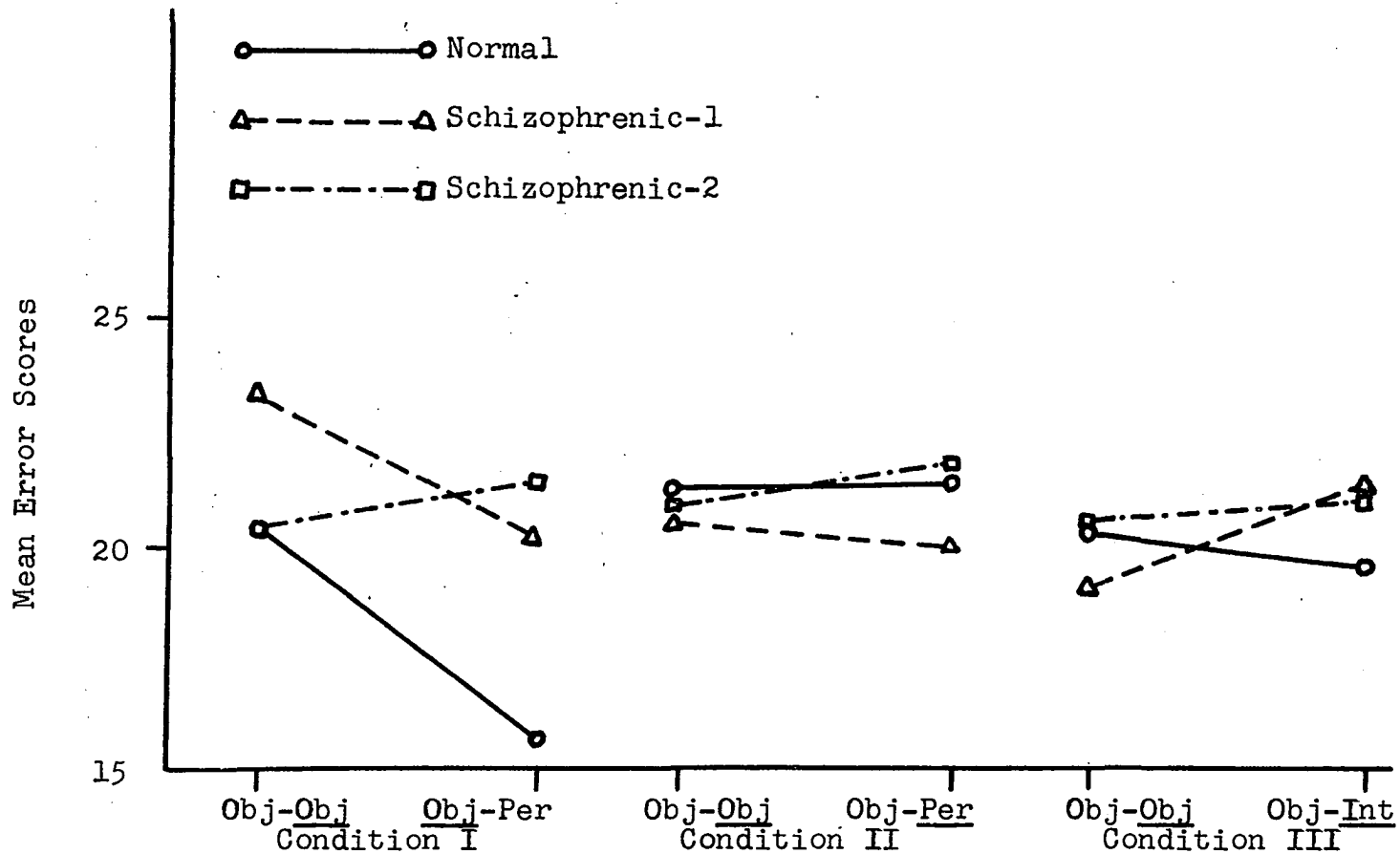


Fig. 3. Mean error scores over Groups, Conditions, and Tasks.

The error scores were subjected to an analysis of covariance in which the effect of Task-1 (Object Series) scores was removed from Task-2 performance. It was found that the assumption of homogeneity of variance of adjusted scores and the assumption of homogeneity of regression within cells were violated. In an effort to meet these assumptions, the scores were subjected to a logarithmic transformation and an analysis of covariance was performed on the transformed scores. In this analysis, the more important assumption of homogeneity of regression within cells was satisfied (the appropriate $\underline{F} = .43$). The assumption of homogeneity of reduced variances was not met (Bartlett's test: $X^2 = 18.09$; $\underline{df} = 8$; $\underline{p} < .05$). Since the departure from homogeneity does not seem to be very great, its effect can be compensated for by changing the level of significance to .025 (Lindquist, p. 86). The results presented are based upon the (log) transformed data. (In order to enable the reader to compare these results with the results obtained using the original data, the summary of the analysis of covariance of untransformed error scores is presented in Appendix E.) The summary of the analysis of covariance of log error scores is presented in Table 7.

The adjusted mean log error scores for the three groups are presented in Table 8; the adjusted mean log error scores for the three conditions are presented in Table 9.

Table 7

Analysis of Covariance of Log Error Scores, Partialling Out Effect of Task-1 Scores

Source	df	Task-1 SS	Task-1 SP	Task-2 SS	Reduced SS	df	MS	F
Total	89	.59681	.16222	.68976	.64567	88		
Group (G)	2	.00147	.00340	.05237	.05055	2	.02528	4.08*
Condition (C)	2	.00937	-.01264	.03374	.05511	2	.02756	4.45*
G x C	4	.02956	.01405	.04958	.04394	4	.01099	1.71
Error	81	.55641	.15741	.55407	.49607	80	.00620	

*$p < .025$

Table 8

Adjusted Mean Log Error Scores: Groups

	Group		
	Normal	Schiz-1	Schiz-2
Adjusted Mean	12.65953	13.00606	13.22191

Table 9

Adjusted Mean Log Error Scores: Conditions

	Condition		
	I	II	III
Adjusted Mean	12.67058	13.14653	13.10332

In the analysis of variance of the reduced Task-2 log error scores, the effect of Group (G) is significant. This indicates that with the effect of Task-1 scores partialled out, Task-2 scores (on the average over all conditions combined) for the three groups are not identical. The *t* tests performed to evaluate the differences between pairs of groups indicate that the adjusted mean log error score for the Normal group is significantly lower than the adjusted mean log error scores for both the Schizophrenic-1 group ($t = 5.33$; $df = 80$) and the Schizophrenic-2 group ($t = 8.74$; $df = 80$). The adjusted mean log error score for

the Schizophrenic-2 group is significantly higher than the adjusted mean log error score for the Schizophrenic-1 group (t = 3.33; df = 80).

In addition, there is a significant Condition (C) effect, indicating that with the effect of Task-1 scores partialled out, Task-2 scores (on the average over all groups combined) for the three conditions are not identical. The t tests performed to evaluate the differences between pairs of conditions indicate that the adjusted mean log error score for Condition I is significantly lower than the adjusted mean log error scores for both Condition II (t = 7.29; df = 80) and Condition III (t = 6.23; df = 80). The adjusted mean log error scores for Condition II and Condition III do not differ significantly (t = .65; df = 80).

CHAPTER V

DISCUSSION

The present study is an exploratory one with the primary purpose that of determining the effect of interpersonal content on the conceptual task performance of schizophrenics. In the analysis of the data, the only effects which are relevant to this purpose are those involving groups. (Scores referred to throughout this discussion are the logarithms of the original scores.) For both time and errors, there were significant Group effects for adjusted Task-2 scores, with the effect of Task-1 scores partialled out. Both groups of schizophrenics performed at a poorer level than did the normal group; the Schizophrenic-2 group performed at a poorer level than the Schizophrenic-1 group. It will be noted that if there were a differential effect among groups with respect to ability or with respect to interaction with the experimental conditions, it would presumably be evident in the performance on Task-1 (no persons portrayed). From Tables 3 and 7 it can be seen that there are no significant Group effects for Task-1 scores for either time or errors; i.e., if Group or

Group-by-Condition mean squares are formed and tested against Error mean squares, none of these effects is significant. Further, in the analyses of covariance, the linear component of any effect which might be carried over from Task-1 to Task-2 is removed. Thus, the significant Group effects indicate that on the tasks involving series of pictures in which one or two persons are portrayed, schizophrenics performed more poorly than did normals, and the Schizophrenic-2 group performed more poorly than did the Schizophrenic-1 group. This means that, independent of performance on tasks involving only non-human content, the introduction of human content resulted in a poorer performance for both groups of schizophrenics than for the normal group, and in a poorer performance for the Schizophrenic-2 group than for the Schizophrenic-1 group. This may be interpreted to mean that the introduction of human content in the task material had a disruptive effect on the performance of schizophrenics (compared with normals), and that it had a relatively greater disruptive effect on the performance of the Schizophrenic-2 group than on the performance of the Schizophrenic-1 group.

In the analysis of both time and error scores, there was no significant Group-by-Condition interaction when mean scores are considered. This indicates that the role and kind of personal or interpersonal content in the different conditions did not differentially affect the groups tested.

Since an inspection of the data suggested that groups did respond differentially to different conditions, a supplementary analysis was performed dealing with the number of subjects within each group whose performance on Task-2 was better than on Task-1 (Increment), compared with the number of subjects whose performance on Task-2 was poorer than on Task-1 (Decrement). The distribution of subjects with respect to this dichotomy for the time measure is presented in Table 10; the summary of a multiple contingency analysis (Sutcliffe, 1957) performed on these data is presented in Table 11.

Table 10

Distribution of Subjects Over Groups, Conditions, and Change: Time

Condition	Change	Normal	Schiz-1	Schiz-2	All Groups
I	Increment	9	8	6	23
	Decrement	1	2	4	7
II	Increment	6	7	8	21
	Decrement	4	3	2	9
III	Increment	8	1	5	15
	Decrement	2	9	5	16
All Conditions	Increment	23	16	19	58
	Decrement	7	14	11	42

Table 11

Summary of Multiple Contingency Analysis: Time

Interaction	df	X^2
Group x Response	2	3.59
Condition x Response	2	6.50*
Group x Condition x Response	4	10.07*

*Significant.

It will be noted that in this analysis, the relevant Group-by-Condition-by-Response effect is significant. An inspection of Table 10 indicates that a large portion of the chi-square value is attributable to the performance of the Schizophrenic-1 group on Condition III. Nearly all the chi-square value is attributable to the performance of the Normal and Schizophrenic-1 groups on Conditions I and III. Although this finding is not obviously interpretable, the trend suggests that (for the time measure) of the tasks involving human content, the series requiring the use of interpersonal concepts (Condition III) had the most disruptive effect on the Schizophrenic-1 group and differentiated most between the Schizophrenic-1 and Normal groups.

The performance Increment-Decrement data for the error measure is presented in Table 12; the summary of the multiple contingency analysis performed on these data is presented in Table 13.

Table 12

Distribution of Subjects Over Groups, Conditions, and Change: Errors

Condition	Change	Normal	Schiz-1	Schiz-2	All Groups
I	Increment	9	8	5	22
	Decrement	1	2	5	8
II	Increment	5	5	4	14
	Decrement	5	5	6	16
III	Increment	7	3	3	13
	Decrement	3	7	7	17
All Conditions	Increment	21	16	12	49
	Decrement	9	14	18	41

Table 13

Summary of Multiple Contingency Analysis: Errors

Interaction	df	X^2
Group x Response	2	5.46
Condition x Response	2	6.54*
Group x Condition x Response	4	2.60

*Significant.

For the error measure, the effects involving groups are not significant. Inspection of Table 12 does indicate, however, an increase in the proportion of subjects showing a Task-2 decrement from the Normal to the Schizophrenic-1,

to the Schizophrenic-2 groups. There is no significant Group-by-Condition interaction with respect to the error measure. The fact that such an interaction was found with respect to the time measure suggests that the question regarding differential group response to different kinds of interpersonal task content is still an open one which might profitably be explored further in future research.

A number of questions may be raised regarding the characteristics of the groups used in this study, particularly with respect to fact that most of the schizophrenic subjects were on medication (whereas the normals were not), the fact that on the average the Schizophrenic-2 group subjects were 5.6 years older than the subjects in the other groups, and the fact the educational level of the Normal group was slightly (less than one year) higher than the educational level of the schizophrenic groups. In general, it seems reasonable to assume that whatever effects these factors might have on a subject's task performance, these effects would be manifest on Task-1 as well as on Task-2. Since the interpretation of the findings is based upon an analysis of covariance in which the effect of Task-1 performance is partialled out, it seems likely that any effect of medication, age, or educational level is also partialled out.

The findings of the present study are generally in agreement with those of Whiteman (1954) and Wexler (1955).

It will be noted that in Whiteman's study, task content was confounded with the nature of the task operations; in Wexler's study, task content was confounded with the type and complexity of task materials (see pp. 10-13). In the present study, stimulus content varied independently of the nature of the task operation and independently of stimulus type and complexity. Therefore, the present findings strengthen the position that interpersonal content has a selective detrimental effect on the conceptual task performance of schizophrenics. The findings of the present study are in agreement with those of Affleck (1956) only with respect to the time measure. Whereas Affleck did not find any significant effect of interpersonal content on the error scores of schizophrenics, the present study did show such an effect. Because of a number of differences between these two studies, the reason for the different findings with respect to the error measure is difficult to evaluate. A number of possibilities might be considered: The tasks used in the present study were more difficult than those used by Affleck (as estimated by the performance levels of the normal groups). This might mean that the tasks used in the present study were more discriminating than those used by Affleck. In addition, in Affleck's study the interpersonal content was always <u>in the context</u> of the task material and the use of interpersonal concepts was not necessary for correct performance; in two out of

three conditions of the present study the use of concepts regarding one person or two persons interacting was necessary for the successful completion of the tasks. It is possible that the use of such concepts implies a more direct (hence more threatening) experiencing of "interpersonal" themes than does the mere depiction within the context of the stimulus material of two people interacting. However, since the relevant Group-by-Condition effects were not significant, this difference between the two studies can be interpreted only as one possible factor contributing to the emergence of significant Group effects for the error measure in the present study. It may also be that time is a more "sensitive" measure of performance disruption than accuracy (errors) since it is more readily affected by withdrawal, preoccupation, anxiety, "blocking," etc. Perhaps accuracy is impaired only after the disruptive effect of particular task content exceeds a certain range. The possible effect of these and other factors can be determined only by further research in these areas.

It should be pointed out that there are numerous methodological problems which make comparison of the results of different studies difficult. (Rodnick & Garmezy [1957] and Lothrop 1961 have discussed these problems extensively.) One difficulty encountered in attempts to compare the results of studies is the heterogeneity of "schizophrenic" groups. Thus, for example, Whiteman used "relatively

undeteriorated" schizophrenics with various diagnoses, Wexler used only paranoid schizophrenics, Affleck used "early chronic" schizophrenics with various diagnoses, and the present study used "first stage" and "second stage" schizophrenics (with various diagnoses) based upon Arieti's concepts. It must also be recognized that the experimental criteria for the inclusion of subjects in any particular study determines to some extent the nature of the group selected. Thus, for example, in the present study subjects had to be sufficiently in contact, sufficiently cooperative, and had to be able to perform adequately on the second practice set in order to be included in the research. Criteria such as this rule out a large segment of the schizophrenic population and leave a relatively select group. (This is probably one reason for the paucity of research data regarding schizophrenics in the preterminal and terminal stages). Thus great caution must be exercised in attempts to generalize from the findings of research with such groups and to make interpretations with respect to the nature of "schizophrenia."

In order to put the present findings in proper perspective, it is necessary to evaluate them with reference to the theoretical framework from which the study emerged. In general, the findings support the theory of <u>selective</u> impairment of schizophrenic conceptual functioning. The "selective" factor of major interest in the present study

was interpersonal content. The results indicate that when groups were equated statistically for their performance on tasks without human content the performance on tasks involving human content was poorer for both groups of schizophrenics than for the Normal group, and the performance of the Schizophrenic-2 group was poorer than that of the Schizophrenic-1 group. This means that the impairment of the performance of schizophrenics on the tasks used was a function of the presence of human content and a function of the stage of the disorder. These findings support the position which considers the area of interpersonal functioning a particularly troublesome one for schizophrenics. The fact that on tasks involving only non-human content schizophrenics performed as well as did the Normal group certainly does not support the idea of a general impairment or deterioration of conceptual functioning in schizophrenia.

The judges who participated in this study were able to achieve a high level of agreement with respect to the classification of prospective subjects as belonging in either the Schizophrenic-1 or Schizophrenic-2 groups according to the criteria outlined in their instructions (based on Arieti's formulation). This, together with the fact that the results effectively differentiated the Schizophrenic-1 and Schizophrenic-2 groups with respect to the effect of interpersonal content on conceptual task performance, suggests that such a system of classification

can be meaningfully applied to schizophrenic populations. The findings suggest that schizophrenics in the advanced stage of the disorder are affected more severely by interpersonal content (in a conceptual task) than are schizophrenics in the initial stage. This may be related to the "increasing desocialization" of the advanced stage schizophrenics, and to the implied greater threatening nature of interpersonal relationships which (when symbolically represented in a conceptual task) have a disruptive effect on task performance. It would seem to be of value for future studies to delineate further the characteristics of schizophrenics classified according to Arieti's concept of stages.

CHAPTER VI

SUMMARY

Systematic research in the area of schizophrenic thought disorders is of relatively recent origin. Initially, these thought disorders were viewed as a function of a general impairment of the ability to conceptualize, and as regressive and deteriorative in nature. Impairment of specific conceptual functions such as the ability to maintain the "abstract attitude" or the ability to generalize was postulated. More recent studies have suggested that schizophrenic conceptual disturbances are not a function of an impairment of conceptual processes per se; rather, these studies indicated that the impairment is selective in nature, specific factors interfering with the effectiveness of schizophrenics in specific areas.

Congruent with the theories of Arieti, Cameron, and Sullivan, schizophrenia is considered to be a psychogenic disorder representing, basically, a disturbance in interpersonal relationships. It has been postulated that the area of interpersonal functioning is a particularly threatening one for schizophrenics and that, in general

terms, schizophrenia represents a defensive reaction to interpersonal threat. From this it would follow that the presence of interpersonal factors in a conceptual task would interfere with the effectiveness of the performance of schizophrenics.

The primary purpose of the present study was to investigate the effect of interpersonal content on the conceptual task performance of schizophrenics. A secondary purpose was to investigate the relationship between the stage of the schizophrenic disorder (according to Arieti's formulation) and the degree to which interpersonal content affects conceptual task performance.

Three groups of subjects were used: Schizophrenic-1 (initial stage), Schizophrenic-2 (advanced stage), and Normal. All subjects had the following characteristics: Male, between ages 18 and 46, completed the sixth grade, willing to cooperate in the research, adequate or adequately corrected vision, fewer than two errors on the last three cards of the second practice set (pre-test criterion). In addition, schizophrenic subjects had to have an official diagnosis of "schizophrenic reaction," any sub-type (the current ward psychiatrist concurring). Criteria for exclusion of schizophrenic subjects were: known or suspected brain pathology, chronic alcoholism, supplementary diagnosis of mental deficiency, 25 or more shock treatments, any shock treatment within three months prior to testing.

Normal subjects must have had no history of emotional or psychiatric disorder. Each patient was placed in the Schizophrenic-1 or Schizophrenic-2 group by agreement between two independent judges. (The level of agreement between the two judges was 82 per cent.) If the judges disagreed, the "tie" was broken by a third judge and the classification agreed upon by two out of three judges was used.

Each subject performed two sets of sorting tasks. The first task involved pictures having only non-human content. The second task depended upon the condition (I, II, or III) to which the subject was assigned. In Condition I, the second task necessitated the use of concepts involving objects in a pictorial context in which one person was portrayed. In Condition II, the second task required the use of concepts involving a single person portrayed. In Condition III, the second task required the use of interpersonal concepts in picture series portraying two persons. Each subject was assigned randomly to one of these conditions, subject to the restriction that one-third of each group was assigned to each condition. The basic research design was a 3 x 3 (Group x Condition) factorial design, with 10 subjects in each 3 x 3 cell. Both time and error measures were used.

For both measures, effects involving groups are the ones which are most relevant to the research purposes.

Analyses of covariance (using log transformed scores) in which the effect of the first task (non-human content) on the second task (human content) was partialled out revealed a significant Group effect for both time and errors. The performances of both schizophrenic groups were poorer than that of the Normal group; the performance of the Schizophrenic-2 group was poorer than that of the Schizophrenic-1 group. (A supplementary multiple contingency analysis of the proportion of subjects in each group showing a performance decrement on tasks involving human content did reveal a significant Group-by-Condition effect for time.) It was noted that there were no significant Group effects for Task-1 scores (involving only non-human content) with respect to either time or errors.

The results indicate that introducing human content into the task material had a disruptive effect on the performance of schizophrenics (compared with normals), and that it had a more disruptive effect on the performance of the Schizophrenic-2 group than on that of the Schizophrenic-1 group. This means that the impairment of the performance of schizophrenics on the tasks used was a function of the presence of human content and a function of the stage of the disorder. These findings were interpreted as strengthening the position that interpersonal content does have a selective detrimental effect on the conceptual task performance of schizophrenics. The relatively greater

detrimental effect of human content on the Schizophrenic-2 group (compared with the Schizophrenic-1 group) may be related to the "increasing desocialization" of the advanced stage schizophrenics, and to the implied greater threatening nature of interpersonal relationships. It would seem to be of value for future studies to delineate further the characteristics of schizophrenics classified according to Arieti's concept of stages.

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APPENDIX A. SUBJECT INFORMATION

Table 14

Individual Age and Education Data

Normal			Schizophrenic-1			Schizophrenic-2		
S no.	Age	Educ.	S no.	Age	Educ.	S no.	Age	Educ.
1	27.8	8	31	30.8	8	61	31.8	12
2	36.8	10	32	25.0	12	62	26.7	11
3	18.6	12	33	28.7	9	63	35.1	12
4	19.3	13	34	20.7	9	64	35.4	9
5	20.3	10	35	33.0	6	65	39.3	14
6	25.7	10	36	27.5	15	66	41.5	8
7	28.3	15	37	22.0	6	67	45.3	8
8	41.0	8	38	19.6	11	68	40.4	9
9	34.3	15	39	33.7	13	69	24.9	12
10	34.4	12	40	32.9	14	70	25.6	11
11	24.3	12	41	32.1	8	71	23.5	13
12	28.5	8	42	21.1	12	72	34.8	12
13	19.5	12	43	31.2	9	73	40.3	9
14	19.6	12	44	20.4	8	74	43.2	15
15	20.2	12	45	27.0	12	75	37.5	8
16	38.1	12	46	23.9	12	76	23.8	12
17	34.1	12	47	37.8	13	77	40.4	9
18	40.3	12	48	33.6	8	78	29.8	11
19	40.5	14	49	20.2	11	79	29.8	12
20	25.5	8	50	37.4	13	80	37.3	8
21	21.2	15	51	26.2	13	81	38.9	8
22	31.7	11	52	33.5	15	82	28.6	12
23	36.0	8	53	32.7	6	83	42.3	16
24	26.0	13	54	34.7	15	84	41.5	7
25	26.9	12	55	38.3	9	85	23.1	13
26	31.8	15	56	31.1	10	86	29.5	13
27	32.0	12	57	24.1	9	87	32.3	9
28	39.4	8	58	23.4	12	88	40.6	10
29	40.6	12	59	37.5	11	89	42.4	10
30	20.8	12	60	43.7	8	90	43.7	14

Table 15

Diagnosis, Chronicity, and Medication Data for the Schizophrenic-1 Group

S no.	Diagnosis[a]	Chron (1)[b]	Chron (2)[c]	Medication[d]
31	Ac. Und.	8-0	1-4	Th 50t
32	Paranoid	9-2	1-0	Th 100
33	Chr. Und.	3-4	1-3	Th 50b; St 5t
34	Paranoid	4-3	4-3	Th 100b; P 5b
35	Paranoid	0-6	0-2	St 5t
36	Paranoid	5-6	5-4	P 10b
37	Paranoid	2-4	1-10	Th 100
38	Ac. Und.	0-1	0-1	None
39	Chr. Und.	1-1	0-11	Th 100t
40	Paranoid	0-7	0-7	P 2.5b
41	Chr. Und.	6-0	2-7	Th 200t
42	Paranoid	1-7	1-1	St 2b; S 3
43	Paranoid	0-9	0-9	St 10b
44	Catatonic	5-2	0-4	Th 200t
45	Paranoid	0-5	0-5	St 2b
46	Chr. Und.	0-10	0-9	St 5b
47	Chr. Und.	5-0	2-5	M 100q; St 5b
48	Ac. Und.	1-8	0-4	St 5b
49	Catatonic	1-5	1-0	St 5b
50	Paranoid	15-0	2-5	Tr 8
51	Catatonic	7-10	3-8	St 10b
52	Paranoid	5-2	0-4	None
53	Simple	9-0	1-8	None
54	Chr. Und.	5-5	2-9	Th 200b
55	Chr. Und.	23-0	4-9	Th 100t
56	Chr. Und.	9-0	1-1	Th 100b; St 10b
57	Catatonic	3-11	1-9	P 5t
58	Chr. Und.	5-4	3-8	P 5b
59	Chr. Und.	3-0	0-7	Th 100t
60	Paranoid	19-3	2-2	Th 200q

[a]Primary diagnosis. Chr. Und. = Chronic Undifferentiated; Ac. Und. = Acute Undifferentiated.

[b]Time (yrs-mos) since first psychiatric hospitalization.

[c]Total time (yrs-mos) spent in psychiatric hospital(s).

[d]Th = Thorazine; St = Stelazine; P = Prolyxin; M = Mellaril; Tr = Trilafon. Dosages in mg. No suffix = once a day; b = bid; t = tid; q = qid.

Table 16

Diagnosis, Chronicity, and Medication Data for the Schizophrenic-2 Group

S no.	Diagnosis[a]	Chron (1)[b]	Chron (2)[c]	Medication[d]
61	Catatonic	0-8	0-6	Th 200b
62	Chr. Und.	1-0	1-0	Th 100b; S 1b
63	Paranoid	3-8	3-4	Th 50b; P 2.5b
64	Catatonic	4-3	4-3	None
65	Chr. Und.	1-7	0-7	St 5b
66	Paranoid	3-5	1-10	Ter 50b
67	Chr. Und.	6-0	1-3	Ter 50b
68	Chr. Und.	5-0	2-8	M 100
69	Catatonic	4-0	4-0	Th 100t
70	Chr. Und.	5-9	5-9	S 3
71	Chr. Und.	1-5	0-8	St 10b
72	Paranoid	10-0	8-8	Th 100q
73	Chr. Und.	20-10	18-1	S 2
74	Chr. Und.	6-5	1-10	R 2
75	Paranoid	1-4	0-7	Th 100b
76	Paranoid	3-9	3-4	Th 100b
77	Chr. Und.	7-8	2-3	St 2
78	Chr. Und.	0-8	0-8	Th 100b
79	Chr. Und.	11-7	2-2	St 2b
80	Paranoid	11-6	10-8	S 2
81	Paranoid	9-2	8-1	S 1; S 2
82	Chr. Und.	5-3	3-7	Th 100
83	Chr. Und.	6-5	4-5	Th 100b
84	Paranoid	0-5	0-5	Th 100b
85	Chr. Und.	4-5	1-9	None
86	Paranoid	6-5	2-0	Tr 8b
87	Chr. Und.	2-7	2-2	Th 50t; P 2.5b
88	Paranoid	7-6	4-11	Th 100b
89	Chr. Und.	10-4	7-2	None
90	Chr. Und.	20-10	20-10	None

[a]Primary diagnosis. Chr. Und. = Chronic Undifferentiated. Ac. Und. = Acute Undifferentiated.

[b]Time (yrs-mos) since first psychiatric hospitalization.

[c]Total time (yrs-mos) spent in psychiatric hospital(s).

[d]Th = Thorazine; St = Stelazine; Ter = Teractin; M = Mellaril; P = Prolyxin; S = Serpasil; Tr = Trilafon. Dosages in mg. No suffix = once a day; b = bid; t = tid; q = qid.

APPENDIX B. INSTRUCTIONS TO JUDGES FOR CLASSIFICATION OF SCHIZOPHRENIC SUBJECTS

Instructions to Judges for Classification of Schizophrenic Subjects

The same two judges were used for the classification of all schizophrenic subjects in the research. Both judges had some familiarity with Arieti's formulation regarding "stages" of schizophrenia; they were, however, asked to thoroughly familiarize themselves with the section of Arieti's book which deals with the stages of schizophrenic disorders (1955, Pp. 321-384).

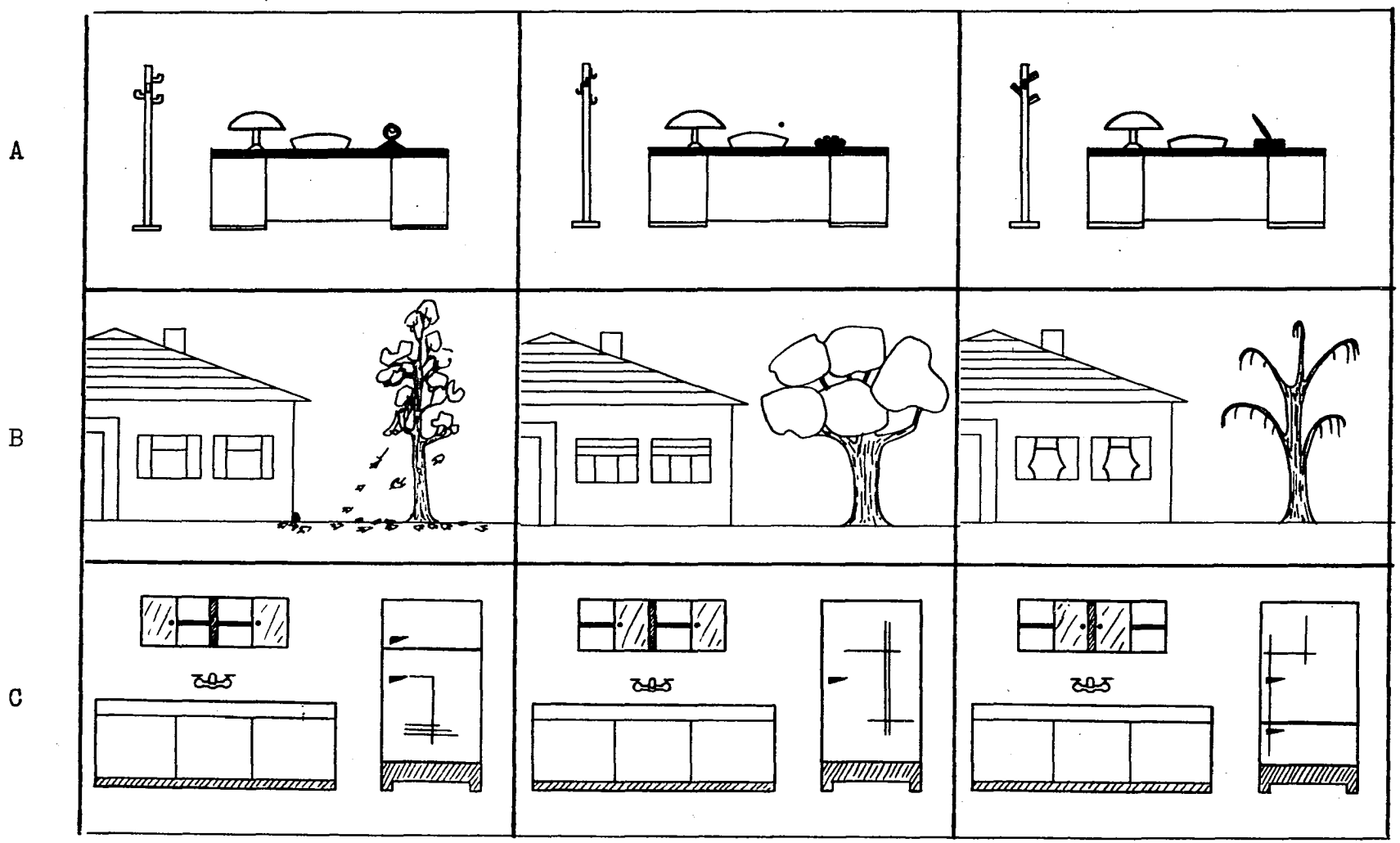
In addition, the judges were given the following instructions:

> The names of prospective subjects will be given to you as they become available. You will be asked to interview each patient and to classify him as belonging in either the "Stage-1" or the "Stage-2" category. If you think that a patient does not properly belong in either the "Stage-1" or "Stage-2" category, or if you are in doubt regarding the proper classification, you may indicate the classification "Undecided." The following description of both stages may be used as a reference or "guide-line" for making the classification.
>
> Stage-1. This is the initial stage of the disorder. Anxiety is conscious and observable. The patient may be in a state of excitement, restlessness or panic. In Arieti's terms, the patient has not yet reached a state of equilibrium. Symptoms such as hallucinations, delusions, and ideas of reference are disturbing to him.
>
> Stage-2. This is the advanced stage of the disorder. Anxiety is not easily observed. The patient seems to have accepted his illness and to have reached a state of equilibrium. Delusions and hallucinations have lost many of their unpleasant qualities and the patient does not seem to be disturbed by them. Behavior tends to be routine and stereotyped. Spontaneous response is avoided, and there tends to be a trend toward increasing desocialization.
>
> Please note that these descriptions of Stage-1 and Stage-2 include the typical characteristics of these two stages. Not all patients within these stages of the

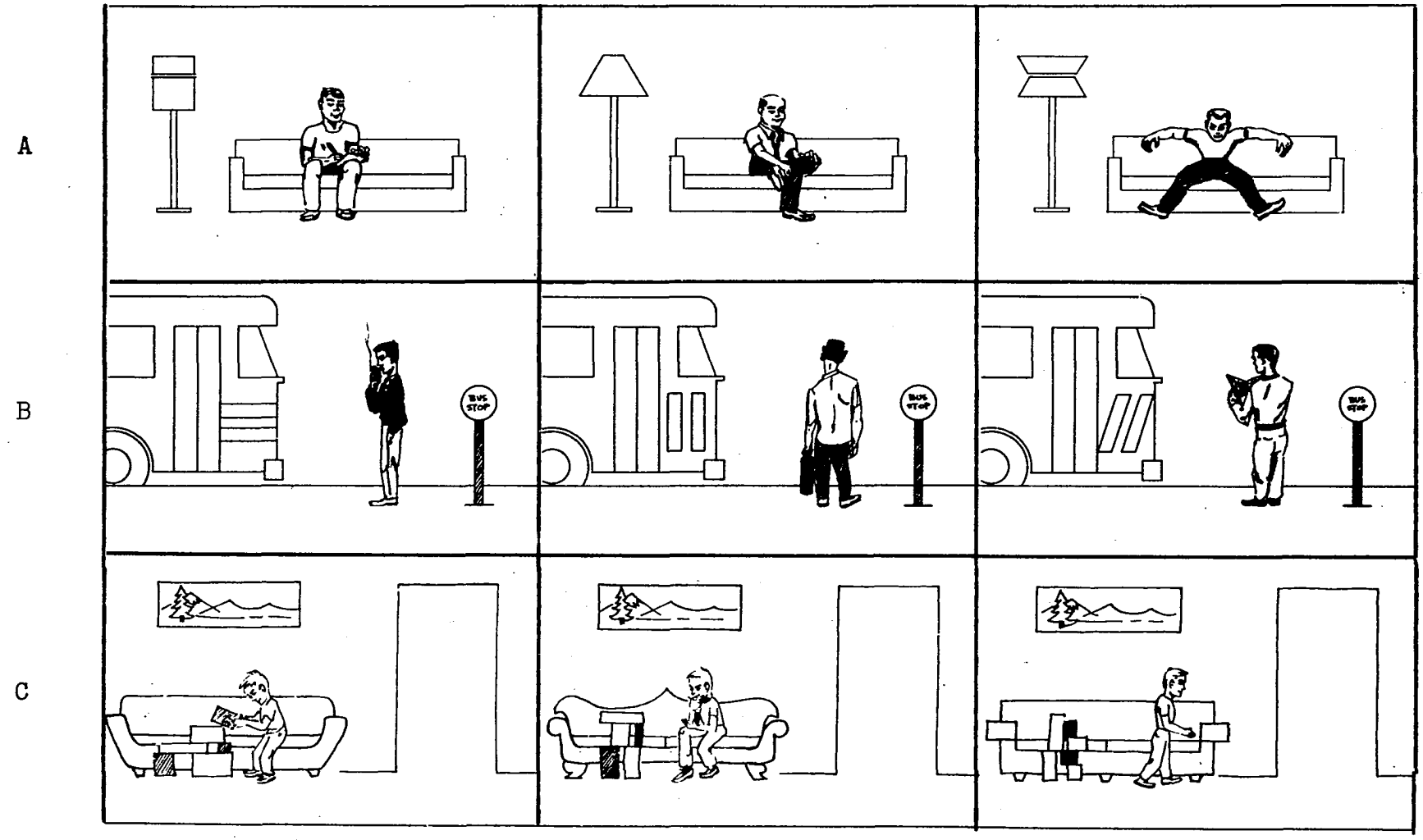
disorder will have every characteristic described for the particular stage. Therefore, a patient may be classified on the basis of the category which is considered appropriate for his general reaction pattern. Patients who might be classified within the later stages of schizophrenia must be excluded. Thus severely "deteriorated" or "regressed" patients, or patients who have developed peculiar habits such as hoarding or self-decoration should be classified as "Undecided."

To repeat: If you can classify the patient as belonging in either Stage-1 or Stage-2, indicate the appropriate classification next to his name. If for any reason you can not classify the patient as belonging in either Stage-1 or Stage-2, mark "Undecided" next to his name.

APPENDIX C. STANDARD CARDS OF PICTURE SERIES



Object Series: Standard Cards

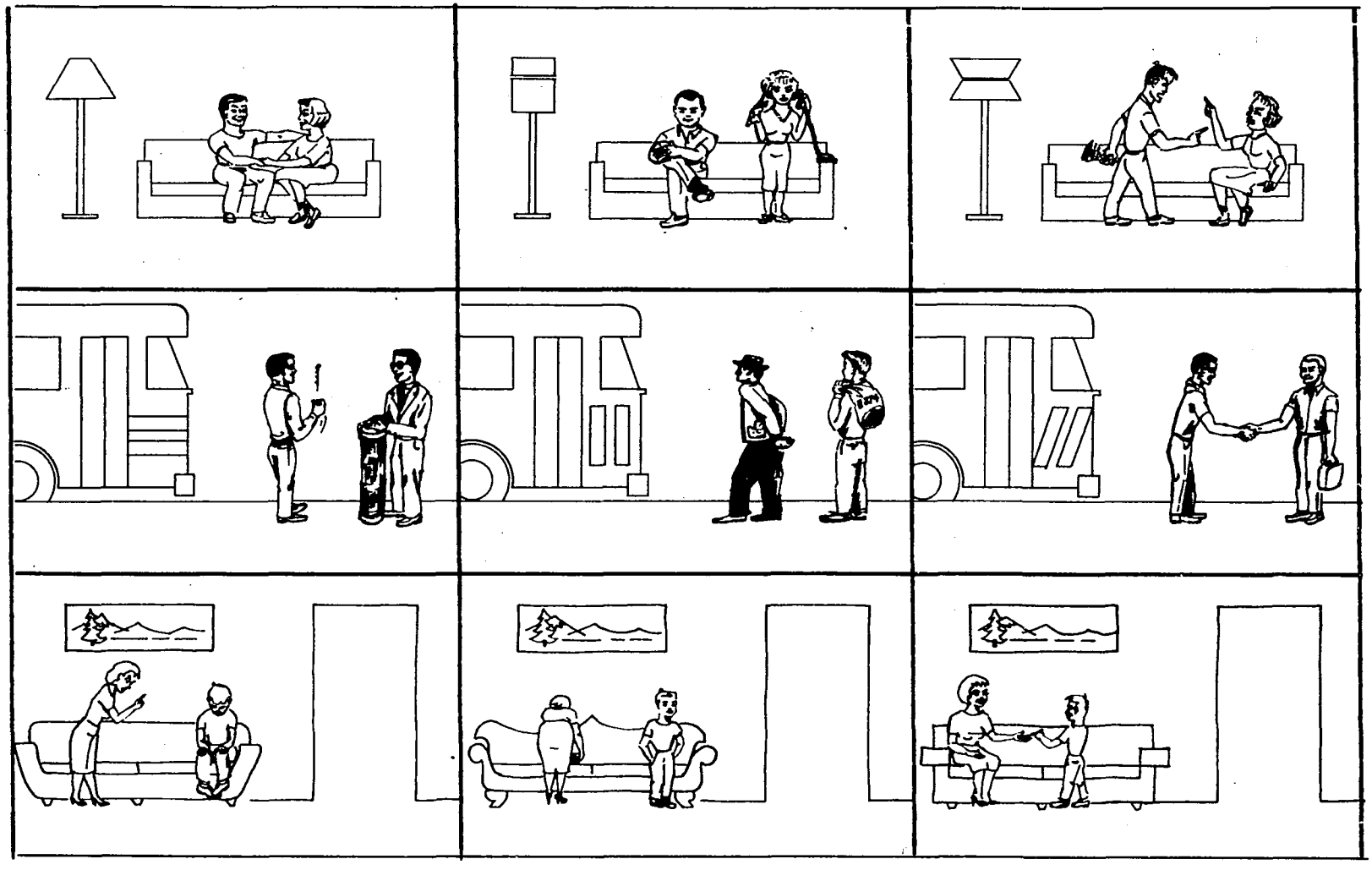


Person Series: Standard Cards

A

B

C



Interpersonal Series: Standard Cards

Description of Standard Cards

Object Series

	Relevant Concept	Irrelevant Concept
Set A:	Shape of hat rack "hooks."	Object on desk (clock, ash tray, desk pen).
Set B:	Season of year, as indicated by the tree (leaves falling, autumn; full foliage, summer; bare branches, winter).	Shape of curtains in the window of the house.
Set C:	Placement of cabinet doors over the sink.	Door arrangement on the refrigerator (freezer, top; no freezer; freezer door bottom).

Person Series

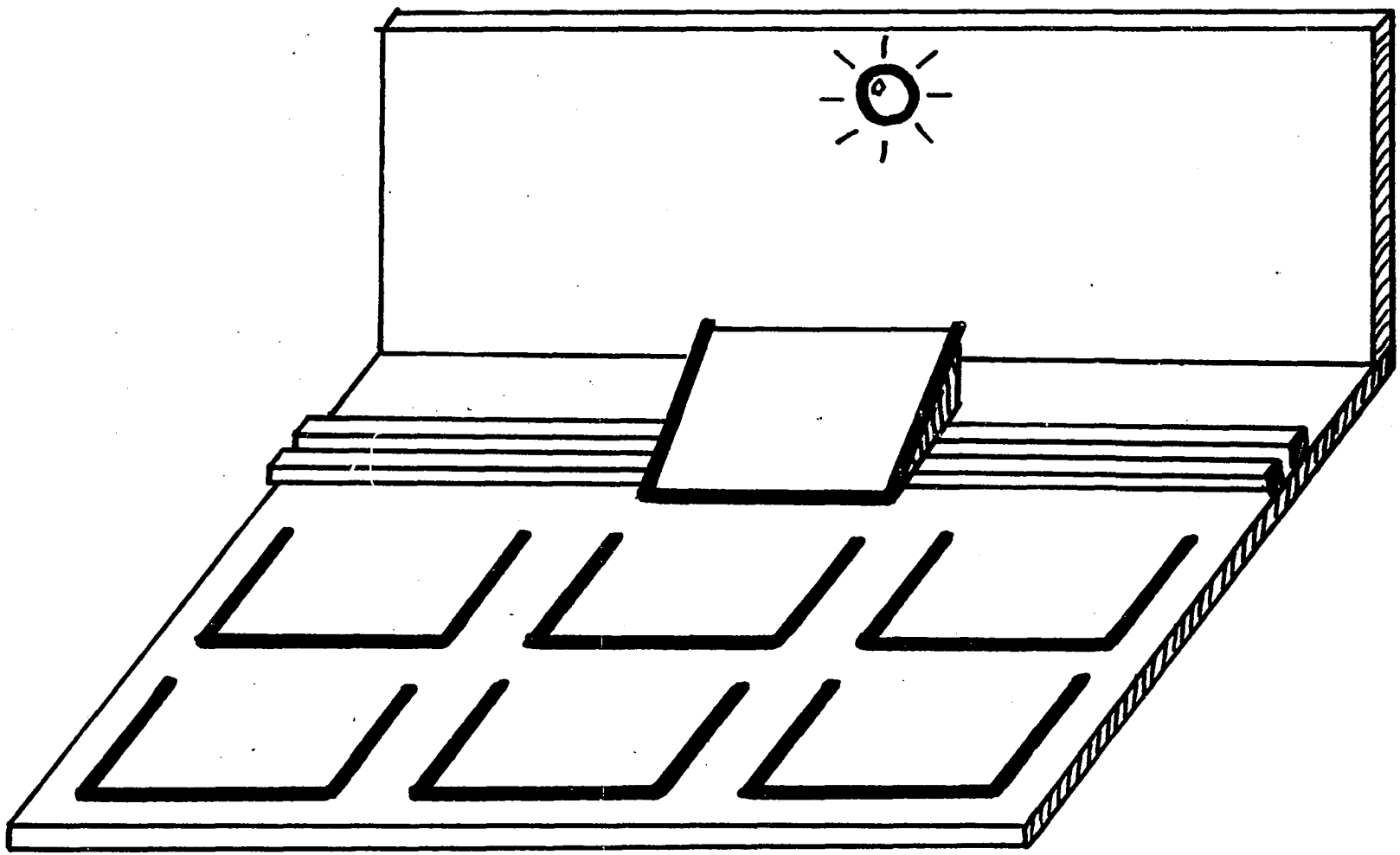
	Relevant Concept--Cond. I (Irrelevant Concept--Cond. II)	Irrelevant Concept--Cond. I (Relevant Concept--Cond. II)
Set A:	Shape of lamp shade.	Level of activity of man (doing something actively, just sitting, relaxing).
Set B:	Shape of design of bus emblem.	Activity of man (smoking, holding brief case, reading).
Set C:	Shape of couch.	Boy's involvement with the blocks (active, observing, none).

Description of Standard Cards--Continued

Interpersonal Series

	Relevant Concept	Irrelevant Concept
Set A:	Interaction between man and woman (friendly, neutral, hostile).	Shape of lamp shade.
Set B:	Relationship between men (none, verbal, physical contact).	Shape of design of bus emblem.
Set C:	Relationship of mother to boy (angry, neutral, friendly).	Shape of couch.

APPENDIX D. TASK BOARD



Task Board

APPENDIX E: ANALYSES OF COVARIANCE OF ORIGINAL (UNTRANSFORMED) TIME AND ERROR SCORES

Table 17

Analysis of Covariance of Time Scores, Partialling Out Effect of Task-1 Scores

Source	df	Task-1 SS	Task-1 SP	Task-2 SS	Reduced SS	df	MS	F
Total	89	910,257.74	554,393.40	861,650.78	523,996.92	88		
Group (G)	2	17,977.54	24,842.63	62,216.60	37,568.31	2	18,784.19	3.88*
Condition (C)	2	16,299.33	-24,471.78	39,484.16	76,089.53	2	38,044.77	7.85*
G x C	4	30,531.84	12,700.92	26,533.12	22,732.04	4	5,683.01	1.17
Error	81	845,449.03	541,321.63	733,416.90	387,606.97	80	4,845.09	

*Significant.

Table 18

Analysis of Covariance of Error Scores, Partialling Out Effect of Task-1 Scores

Source	df	Task-1 SS	Task-1 SP	Task-2 SS	Reduced SS	df	MS	F
Total	89	1377.60	319.12	1725.30	1651.38	88		
Group (G)	2	2.60	-1.15	93.96	94.90	2	47.45	2.78
Condition (C)	2	30.20	-26.65	63.36	81.41	2	40.71	2.38
G x C	4	68.20	30.12	120.31	108.22	4	27.06	1.58
Error	81	1276.60	388.80	1447.67	1366.85	80	17.09	

APPENDIX F. INDIVIDUAL SCORES (RAW DATA)

Table 19

Individual Time and Error Scores of the Normal Group Over Conditions and Tasks

S no.	Time[a]		Errors[b]	
	Task-1	Task-2	Task-1	Task-2
		Condition I		
1	90.2	16.0	17	15
2	234.8	35.4	29	15
3	47.4	18.6	17	15
4	38.8	18.2	18	15
5	26.4	29.0	15	16
6	107.8	56.2	17	16
7	61.8	23.4	17	15
8	139.4	130.6	19	17
9	222.2	36.2	28	15
10	489.6	240.6	27	18
		Condition II		
11	48.0	47.8	15	16
12	127.6	114.6	23	21
13	33.0	29.2	15	15
14	216.4	75.2	23	16
15	158.2	56.0	29	18
16	112.4	56.0	27	18
17	39.0	75.2	16	21
18	509.6	546.4	23	36
19	55.0	67.2	15	21
20	185.4	216.8	27	32
		Condition III		
21	81.0	56.2	18	18
22	68.2	100.0	19	22
23	359.4	254.6	24	21
24	195.4	189.8	24	23
25	75.0	64.6	19	18
26	151.8	89.0	21	16
27	122.0	111.0	21	23
28	76.0	92.0	19	23
29	81.6	40.4	22	16
30	70.0	28.2	16	16

[a]Seconds. [b]Equivalent to 15 + number of errors.

Table 20

Individual Time and Error Scores of the Schizophrenic-1 Group Over Conditions and Tasks

S no.	Time[a]		Errors[b]	
	Task-1	Task-2	Task-1	Task-2
		Condition I		
31	235.4	135.8	22	21
32	222.4	96.0	23	19
33	237.2	144.0	28	18
34	197.6	219.4	22	23
35	122.6	73.2	22	19
36	87.2	55.8	21	18
37	94.6	51.0	25	20
38	85.2	42.2	16	15
39	258.2	266.6	30	32
40	242.8	103.8	24	17
		Condition II		
41	230.4	217.8	23	26
42	108.6	135.4	22	24
43	51.0	44.6	17	17
44	91.6	83.4	20	22
45	265.2	115.6	25	16
46	337.0	214.6	27	20
47	58.4	153.8	15	19
48	148.8	66.4	21	19
49	104.8	211.6	17	20
50	55.2	38.6	18	17
		Condition III		
51	118.0	122.4	22	22
52	36.4	62.0	15	17
53	29.8	145.0	16	20
54	70.0	124.2	19	29
55	143.6	502.2	18	24
56	88.8	137.8	18	17
57	101.4	116.0	20	21
58	93.2	158.8	18	20
59	96.8	128.6	23	27
60	86.2	59.2	22	16

[a]Seconds. [b]Equivalent to 15 + number of errors.

Table 21

Individual Time and Error Scores of the Schizophrenic-2 Group Over Conditions and Tasks

S no.	Time[a]		Errors[b]	
	Task-1	Task-2	Task-1	Task-2
		Condition I		
61	83.6	214.6	15	26
62	83.4	36.0	19	17
63	169.2	81.0	20	18
64	168.2	154.8	23	31
65	63.8	87.4	15	18
66	183.2	128.2	25	20
67	479.6	180.8	23	15
68	91.8	74.8	19	19
69	93.2	123.2	22	23
70	218.2	267.2	23	27
		Condition II		
71	209.4	148.4	22	21
72	80.2	86.0	17	18
73	170.4	106.4	26	25
74	129.6	128.4	18	24
75	103.0	92.6	17	19
76	136.0	132.8	19	24
77	230.0	211.6	18	23
78	215.0	185.8	24	21
79	177.2	178.2	19	22
80	201.0	124.6	28	21
		Condition III		
81	165.4	259.6	22	24
82	133.8	102.0	17	18
83	243.8	321.2	26	29
84	163.6	136.4	23	20
85	125.2	121.6	20	23
86	79.6	55.8	20	16
87	72.2	115.2	15	19
88	83.2	256.0	18	24
89	304.6	408.4	20	21
90	396.4	319.8	24	15

[a]Seconds. [b]Equivalent to 15 + number of errors.