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Social conceptual sorting and communication in schizophrenics and normals.

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SOCIAL CONCEPTUAL SORTING AND COMMUNICATION IN SCHIZOPHRENICS AND NORMALS

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Introduction

Previous studies on the conceptual ability of schizophrenic patients have indicated impairment in their performance. Whereas most studies have been concerned with non-social concepts, the present study evaluated the schizophrenic's ability to form and attain social concepts. Schizophrenics and matched normals were asked to sort words related to socially evaluative concepts and to indicate their reason for their sorting. This study was undertaken to study the following:

1) Schizophrenic performance in the acquisition of concepts having both social evaluative and interpersonal dimensions. The social evaluative dimension refers to whether the conceptual task has socially desirable content or socially undesirable content. The interpersonal dimension concerns itself with the object of the concept to be acquired. In this case the subject was parents or people in general.

2) The schizophrenic's ability to communicate what the concept is.

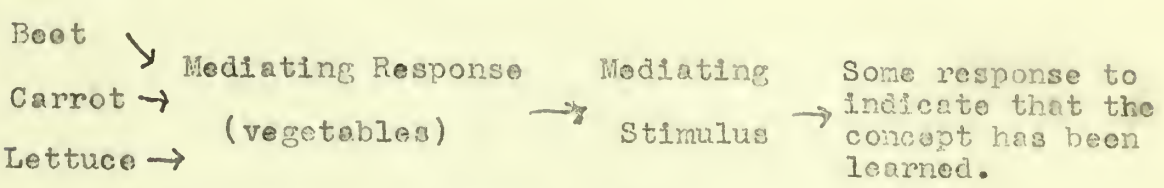
Since this experiment deals with concept formation, a discussion of some of the various meanings and underlying processes of concept formation seems pertinent. Vinacke (1951) in his review of the literature on concept formation supplies the following definition of a concept.

"Concepts must be regarded as selective mechanisms in the mental organization of the individual, tying together sensory impressions, thus, aiding in the identification and classification of objects". He also indicates that a concept is linked with a symbolic response which may be activated without the physical presence of an external object. The symbolic response stands for whatever it has been linked with in the previous experience of the organism and depends upon how that experience is organized.

As to the processes involved in concept formation, Vinacke (1951) cites two major processes; 1) abstraction 2) generalization. Abstraction refers to "the features common to a class of objects which summate their impressions on the observer, who acquires a picture in which common features stand out strongly while the variable characteristics are washed out". Generalization refers to the process whereby the concept is supposed to originate as an hypothesis which S proceeds to test by trying it on fresh specimens of the class. The latter view makes concept formation a more active process.

According to Osgood (1953), a concept is a common response (usually) made to a class of phenomena, the members of which display common characteristics. Thus, formation of a concept is based upon common cues resulting from S's symbolic processes. He says that concept formation is

the learning of a common mediating response for a group of objects, words or situations. Schematically, concept formation can be described as follows:



The importance of conceptualization is brought out by Bruner, Goodnow and Austin (1956). They hold the view that categorical learning is one of the principal ways by which a member of society is socialized. They state further that the concepts of a particular society are constructions or inventions, and do not exist in the environment.

Johnson (1955) in his discussion of concept formation points out that concepts are widely used in communication of information and principles that are instrumental in solving real-life problems. He indicates that socially acceptable concepts are always designated by a communicable symbol and are learned for the purposes of communication.

The latter two views which have been cited stress the importance of the attainment of concepts as having a direct effect on the individual's social behavior and communication. Thus, concept formation serves an important function in determining an individual's adjustment to his particular society. If he has attained the basic concepts of his society, his behavior and communication may in effect, be in line with societal norms. Whereas, if these basic

concepts are not developed, the individual will not behave in the manner appropriate for his particular culture. With this basic formulation one can then look at some aspects of the problem of schizophrenic behavior in terms of the failure to utilize the basic social concepts of a particular society. This view serves as the basis for this experiment.

Background of the Problem

1. Theory

Many theories attempting to explain the schizophrenic process have been expounded, but this section will concern itself only with those pertinent to the present experiment.

A. The "Organismic" View of Goldstein

Goldstein's (1951) approach is derived from an "Organismic" view. According to this view, changes found in schizophrenics are symptomatic of the change in the personality's relation to the environment. Goldstein and Gelb cited by Goldstein and Scheerer (1941) have analyzed the the behavior changes in psychopathological individuals and have made a distinction between two modes of behavior, 1) abstract, and 2) concrete. The normal individual is capable of assuming both, whereas the abnormal is more restricted to one, the concrete. These two types of behavior are considered by Goldstein and Scheerer (1941) to be capacity levels of the total personality in a specific plane of activity.

According to Goldstein (1951) the concrete attitude is "realistic". In this attitude we are bound to the immediate experience of a given situation in its particular uniqueness. The individual's behavior is governed by the immediate claims made by one particular aspect of the situation in the environment. In the abstract attitude we are oriented in our behavior by a more conceptual viewpoint. Here we think of a situation as representative of a category. Goldstein includes the following abilities as part of the abstract attitude.

1) To assume a mental set voluntarily,
2) To shift voluntarily from one aspect of a situation to another,
3) To grasp the essential of a given whole, to break up a whole into parts and to voluntarily isolate them,
4) To keep in mind various aspects of a situation,
5) To generalize and plan ahead ideationally, and,
6) To maintain a discrimination for a length of time.

Goldstein feels that in schizophrenia there is a basic change in total behavior and that the impairment in thinking is a special expression of the change. The basic change is the reduction of the abstract attitude, which leads to an impairment of categorical thinking. This is not purely an intellectual disturbance, but a basic disturbance of the total organism. The intellectual and emotional disturbances

are two manifestations of this one basic change. Goldstein interprets this change as a "coming to terms with the environment".

In one of his articles Goldstein (1943) says the following about schizophrenia:

> "The world of the schizophrenic is determined to a pathological extent by his own feelings, and thinking, and by his capacity to react. The demarcation between the outer world and his ego is more or less suspended or modified in comparison with the normal. The objects which impress the patient are not the same as those which would impress the normal in a given situation. He experiences objects only to which he can react in the only way in which he is capable, i.e., in the concrete way".

It seems pertinent here to mention a recent study by McGaughran and Moran (1956) who discard Goldstein's hypothesis and utilize their interpretation of Sullivan's and Cameron's theories to explain the basic loss in schizophrenia. They purport to supply evidence that Goldstein's hypothesis does not hold true. Using Rapaport's modification of the Goldstein-Gelb-Weigl Object Sorting test, they found that a schizophrenic group did not differ from a non-psychiatric group in the conceptual level of performance. They rated the Ss response as to why certain objects belonged together on five conceptual levels, 1) Abstract 2) Functional 3) Concrete 4) Failure 5) Pathological indicators. They found no significant difference between the groups on any of these levels. They did find that the groups differed in what they refer to as conceptual area.

That is, the schizophrenic group employed more "private" reasons for their sorting behavior than did the non-psychiatric group. An example of this would be of the following sort. In response to why one has sorted the objects in a particular manner, one may say "Because they are all red", or he may say "They are all red like my sister's dress". Both responses are scored as being of the same conceptual level because they imply redness, but they are considered to represent two different conceptual areas. The former pertains to a "public" area whereas the latter refers to a "private" area. The latter is scored "private" because the term "sister's dress" is included. On the basis of their results the authors conclude that the basic loss in schizophrenia is that of social skills and communication. They claim that this supports the views of both Sullivan and Cameron who see the basic loss as a disturbance in social communication. The authors further conclude that loss in communication does not necessitate loss of the abstract attitude.

Several problems arise from this experiment. One is that the authors do not give any data pertaining to the actual sorting of the objects. It is not made clear as to how the groups compared with each other on this part of the task. The experimenters only dealt with verbal responses. Since they utilized the communicative aspects of the performance only, they found the basic loss to be in the area

of social communication. Secondly, the above type of communication would be considered by Goldstein to be of a concrete variety. The subject does not relate the concept to a category but to some specific object like his "sister's dress". To quote from Goldstein (1951 p.26) "according to the specific way in which the patient experiences a certain object or situation, a definite property or aspect of the object or situation becomes the basis for the choice of words. A word when used by a schizophrenic appears as part of an object or situation, not as representative of it".

Also, the question of interpretation of theory arises from this experiment. It becomes a question of whether Sullivan and Cameron claim that the basic loss in schizophrenia is the factor of communication or whether McGaughran and Moran have interpreted it in this manner.

B. The Interpersonal Theory of Sullivan

Sullivan (1956) views schizophrenia as involving a loss of control of early referential processes, which then dominate consciousness. This can be seen in a clearer light when viewed through the developmental aspects of personality.

The individual in the early part of his life employs modes of thinking which are primarily uncommunicative. That is, they are not "consensually validated" (Do not conform to the common societal modes of thinking) or

logical. They are of a personal nature and have meaning only to the person who is using them. Sullivan calls this mode of thinking, the "early referential processes". Through the process of socialization some aspects of these processes drop out or are dissociated from consciousness. With the formation of the self system a more consensually validated and logical mode of thinking arises. In this latter mode which is a product of the social process, the individual is able to communicate with others of his particular culture. He has grasped and is able to utilize the concepts of his culture and therefore, can communicate with other people.

In schizophrenia, consciousness is dominated by the earlier illogical referential (thought) processes. Thus, the basic loss is the socialized mode of thinking, the mode of thinking essential for adequate behavior on tasks and situations calling for underlying conceptual processes. One can infer from this theoretical approach that it is possible for the schizophrenic to conceptualize, but in an egocentric or non-communicable manner. And since effective communication is normally dependent upon conceptualization, it will necessarily be private and "personal" in schizophrenics. Communication, while impaired, is nevertheless not the basic loss as McGaughran and Moran (1956) indicate but rather the ability to conceptualize in a non-egocentric,

or effective manner, is lost. Because this ability to conceptualize in a reality-adequate manner is impaired, the capacity for social communication is affected.

Sullivan (1954) also points out that the schizophrenic does not constantly employ the early referential processes. These processes can be found to arise in situations where interpersonal security is at stake and anxiety is aroused. The situation which provokes the referential processes can be traced back to a past relationship with particular significant people in the course of which one has experienced anxiety. When the anxiety is intense, the self system of the schizophrenic which normally excludes the early referential processes loses control of awareness with the result that these early referential processes invade consciousness. As Sullivan states there is a failure in "...the restriction of awareness of one's mental processes to those which are more or less clearly valid in communication." (1956, p.25). On the other hand when the schizophrenic is under no great pressure, he "...is in much the same mental state as we, and the implicit processes that he notices are those more or less capable of communication" (1956, p. 25). Finally, fundamental to the schizophrenic process are those referential processes. These include the following characteristics: "There is not the most rudimentary discrimination between what is relevant and what is irrelevant in a vast total situation that is impinging upon

one's end organs. Correspondingly, there is an extreme lack of clarity as to the action which reaches the goal, if it is reached at all, and nothing like the cause and effect thinking as to why the goal is or is not reached" (1956, p.13). Essentially, the basic process of schizophrenic adjustment is the lack of capacity for adequate social conceptualization.

C. The Biosocial View of Cameron

For Cameron (1947) schizophrenia is a result of the individual's reaction to his inability to play the various roles required of him, a conclusion that is strongly reminiscent of one of Goldstein's criteria of concrete behavior. The reaction is to include or over-include one's uncommunicable fantasy productions into the field of shared social operations. The basic loss then appears to be the inability to exclude one's fantasy from reality. The patient becomes unable to discriminate between his fantasy and the world of reality. Thus, we get what Cameron calls "overinclusion". Here again it appears that the basic loss is not communication, but the inability to differentiate between fantasy and reality, which affects communication. It would appear that conceptualization (the discrimination of relevant criterial attributes of a situation or object) is affected by the intrusion of one's fantasy in a behavioral situation. These inadequate categorizations of the schizophrenic probably then lead

to behavior responses that are improper and inept socially. The inept behavior results in conflict and anxiety. When there is inept behavior on the part of the more adjusted person, he probably continues to test out his conceptualizations of social roles until they match to some extent those demanded by the community. But the schizophrenic is the individual who has stopped testing his conceptualizations because of strong anxiety and the lack of emotional support by significant people. He then resorts to fantasy in which his conceptualizations of social roles appear adequate. As soon as he behaves on this basis, he experiences difficulties. Modes of behaving which previously seemed to be convincing lose their potency and positive conclusions are shaken by doubt. Without benefit of a supportive environment, the individual retires; his egocentric conceptualizations remain inadequately tested in the social community and lead to further anxiety when he has to come to terms again with his environment. Finally, Cameron (1939b) agrees with Goldstein by stating that "the schizophrenic's tendency to maintain the concrete attitude is strong".

Another matter of theoretical importance which concerns this experiment and also corresponds to Sullivan's view is the point that Cameron (1947) makes concerning the effects of personal material on the schizophrenic's behavior. He says "Almost everyone who studies schizophrenic persons,

seems to be struck by the same thing; the patient's behavior, especially in matters of personal importance tends to become unintelligible and unpredictable in terms of the organized social perspectives dominant in his culture."

2. Conceptual Performance in Schizophrenics

In a test of the Goldstein hypothesis, Bolles and Goldstein (1938) studied the performance of schizophrenics on the Color Form Sorting test, the Object Sorting test and Pintner Paterson Feature Profile test among other tests. They found that the patients were unable to assume the "abstract attitude". No statistics are presented in this article, but the authors state that the protocols of the individual patients indicate an inability to perform the tasks correctly. The protocols indicated that the patients did think of grouping objects in terms of categories, but more in terms of the manner in which the objects affected them personally. That is, they categorized in terms of the special meaning it had to them. The behavior was determined by some individual appearance of the situation which impressed the patient.

Following the same line of thinking that Goldstein has put forth, Feldman and Drasgow (1951) and Rapaport (1946) have designed experiments to study loss of conceptual mode in the schizophrenic process. In the Feldman and Drasgow study a group of normals and schizophrenics were given cards with four pictures on each. Two concepts

could be formed about the pictures, either concrete or abstract. Concrete referred to actual identification of the pictures whereas abstract referred to describing the pictures as representative of a category. Rapaport's study compared a schizophrenic group to a normal group on the Object Sorting test. The scoring procedure was that developed by Rapaport. The results of both studies support a deficit in conceptualization for schizophrenics.

That conceptual deficit is not confined to adult schizophrenics as the foregoing experiments indicate, has been pointed out by Schulman (1953) in a study with schizophrenic children. Using the Object Sorting test and a scoring technique for different levels of abstraction, he compared his results to already established norms for normal children. He confirmed the Goldstein hypothesis concerning the schizophrenic's need to adhere to the reality aspects of a situation. From this study Schulman concluded that concept formation is an ego function, and that the defective ego in schizophrenia does not permit adequate conceptualization. This is an attempt to provide some basis for understanding the conceptual processes in schizophrenia, but a view of this sort would necessitate a much more elaborate description than just a labeling of ego function defect.

Kasanin and Hanfmann (1938) attempt to explain schizophrenic deficit in conceptualization as a regression to a

pre-conceptual level of thinking. Comparing 62 schizophrenics to 95 normals, they conclude, "The schizophrenic is not able to grasp certain general principles or the idea of classification according to certain principles, and frequently develops other principles and other classifications than those which the average person adopts". This statement does not seem to indicate a regression to a pre-conceptual level of thinking, but rather a different frame of reference with regard to classification of objects. Furthermore, evidence from a study by Wegrocki (1940) seems to contraindicate regression to a pre-conceptual level. In his experiment investigating both generalizing ability in schizophrenia and the view of regression to a pre-conceptual level of thinking, he concluded that schizophrenics exhibited an impairment of the former, but did not exhibit a regression phenomenon. The study employed as subjects, children of ages 10-14, adult normals, and adult schizophrenics. The specific tasks were Van Wagnan Analogies test, a proverb interpretation test and an essential similarities test (in which S must designate which item of a series of four does not belong with the other three). He found that the schizophrenics showed the most impairment in generalization and also that their performance was quite different from the performance of the children.

Another characteristic of schizophrenic performance on conceptual tasks has been pointed out by several other

studies. The findings were reported by Cameron (1939a), Epstein (1953) and Chapman and Taylor (1957), and are designated as overinclusion. Cameron reports that the most striking characteristic of conceptual sorting is the schizophrenic's tendency to overinclude. That is, his schizophrenic Ss included in their concepts objects which did not belong. Cameron indicates that they wished also to include objects which were not even a part of the test. Accordingly, Cameron's concept of overinclusion of one's fantasy into reality may serve as an explanation of this phenomenon. Epstein's study was aimed at testing Cameron's hypothesis of overinclusion. In comparing a group of schizophrenics to a group of normals, he found that the schizophrenics overincluded significantly more than the normals. The test consisted of a series of items of the following nature. S is given a cue word such as "house". This word is followed by "curtains", "telephone", "bricks", "roof", "none". S must select those words which describe items included as an integral part of the concept of house.

Whereas Cameron might attribute overinclusion phenomena to the inclusion of one's fantasy into reality, or an overgeneralization because of anxiety provoking uncertainty (1951) Chapman and Taylor propose a "Distractor" variable to explain it. They conclude that there is no loss of conceptual ability, but that there is an overresponsiveness to distracting stimuli which the schizo-

phrenic includes in his concept. In their experiment, they found that the schizophrenics would include in their concepts items that were similar to those which belonged in the concept. By "similar" it is meant that if the category is fruit, S would sort vegetables with them also. Epstein's (1953) conclusions although stated four years before the Chapman and Taylor (1957) study, advanced the above two views. He suggests that overinclusion in schizophrenia can be a function of an attention defect (distraction) or an over-responsiveness to material related to subjective hypotheses. However, Epstein's study only supports a defect in attention which is brought out by the fact that the schizophrenic group overincluded stimuli which were associationistically or concretely related to the task at hand.

3. Relationship Between Conceptualization and Degree of Deterioration

That schizophrenics as a group show a deficit on conceptual tasks is quite evident from the literature. A further consideration in this matter has been brought out by other investigators. This is the variability within the schizophrenic group itself. By dividing their schizophrenic groups into different sub-groups they have found differences in conceptual performance. Rapaport (1946) and Wegrocki (1940) find that least impairment occurs in paranoids. However, Epstein's (1953) study suggests that

conceptual performance is not a function of sub-type, but rather a function of personality disorganization. Meadow, Greenblatt and Solomon (1953) have correlated concept formation with looseness of association. They find that the more dissociated S's free associations are, the more impaired is abstraction.

Another type of sub-division was employed by Flavell (1956). He has shown that impairment of abstract thinking is related to the patient's social adequacy as rated by judges. Flavell presented words to his Ss, giving two meanings for each word. S was to select one of the two meanings as being the correct definition of the stimulus words. One meaning was concrete, whereas another was considered to be abstract. He found that the schizophrenic group selected the concrete meaning more than the normal group did. He also found that his measure of social adequacy of the schizophrenic patients correlated with their ability to select abstract definitions. Social adequacy was rated on sociability, emotionality, awareness of goings on and coherence. Finally, similar results were obtained by Chodorkoff and Mussen (1952) employing a vocabulary test with four possible meanings, 1) class 2) description 3) example 4) function. Their normal group gave more class definitions and less example and function definitions, than the schizophrenic group. Also, a correlation between conceptual quotient (a measure of deficit on the Shipley

Hartford Retreat scale), and performance, on the vocabulary test indicated for the schizophrenic group, that greater conceptual deficit was positively related to poor vocabulary performance.

4. Effects of Content of Task

A number of investigators have not only become concerned with the conceptual performance of schizophrenics, but have also turned to studying the effects of the content of a task on the performance. This line of thought appears to originate from the frames of reference of Sullivan and Cameron. With the hypothesis that schizophrenia results from a defective process of socialization and that the disturbance is a result of social problems, these investigators have designed studies to test this hypothesis. The rationale has been that greater deficit should appear on tasks which are most relevant to the disturbance. Such proposals were supported by the data of Davis and Harrington (1957) and Heath (1956).

The Davis and Harrington study found that a normal group did equally as well with human and non-human content tasks and significantly better than the schizophrenic group on the task involving human content. There was no difference between the groups on the tasks involving non-human content.

Further support was given to this view by Heath (1956) who used a different set of stimuli. He gave a group of

schizophrenics various dissected sentences of the Stanford Binet type. One group of sentences had as its content, themes dealing with "threat". The specific content of these sentences was 1) rejection by mother 2) rejection by father 3) heterosexual relations 4) homosexual relations 5) mother-son aggression 6) father-son aggression. A second group of sentences contained "neutral" themes, and dealt with 1) receiving acceptance 2) work activities 3) construction activities. The Ss did significantly better on the tasks concerned with neutral themes. Unfortunately a normal control group was not used. Finally, Dunn (1954) studying visual discrimination in schizophrenia as a function of thematic content contributes more clarity to the problem of the effects of task content on performance. Utilizing six variations of each of four scenes, 1) mother whipping child 2) mother scolding child 3) mother feeding child 4) two objects, schizophrenics and normals were to make judgments as to whether the variations were the same or not the same as the standard. The schizophrenic group was significantly less effective than the normals in discriminating between the pictures of the scolding scene, tended to be less effective on the whipping scene, but were equally as effective as the normals on the feeding and object scenes.

The above studies did not deal with conceptual tasks but the results would indicate a similar finding with a

conceptual task as the stimulus. Thus, Whiteman (1954) studying conceptualization in schizophrenia, found that schizophrenics perform significantly better on formal concept formation tasks than on social concept formation tasks. Although, he finds that normals do better than schizophrenics on both types of tasks, he states that Goldstein's hypothesis is insufficient and indicates that one must consider the content of the concept formation task.

On the other hand a more recent experiment by Cavanaugh (1958) suggests that the role of motivation must be considered in studying conceptual performance of schizophrenics. Using the Whiteman stimuli and comparing normals and schizophrenics under two different environmental conditions (white noise vs no noise) Cavanaugh found that the schizophrenic group is inferior to the normal group in conceptualization where there is no noise. Employing white noise as an aversive stimulus, he finds that schizophrenic performance improves to approximate the normal group performance, whereas there is no change in performance of the normal group from the no noise to white noise condition. With the white noise condition Ss were told that the noise would continue until a correct solution was made or until the time limit was up. Cavanaugh interprets his findings as a temporary increase in motivation and a relinquishing

of schizophrenic defenses. The author concludes that potential conceptual ability is present and requires the necessary motivating conditions to bring it forth. This explanation has its merits, but it does not explain Whiteman's results under conditions of "normal" motivation, that is the inferior conceptual performance on social conceptual tasks as opposed to formal conceptual tasks. Whiteman's study still reflects the importance of the interpersonal component. The present experimenter is in agreement with Whiteman that the Goldstein hypothesis is insufficient. Therefore the present experimental design has been set up in an attempt to study the interpersonal component in a more detailed manner.

5. Communication

It is fairly common knowledge among people working in a clinical setting that the language of schizophrenics can at times be uncommunicative. One phase of the present study attempts to discover if the schizophrenic can communicate on an abstract or concrete level the basis for his sorting words referring to the social-personal dimensions of parents and unknown people.

Studies by Webb (1955) and Hirschman (1953) have investigated the affects of failure-stress on a schizophrenic's verbal communication. Webb (1955) administered a similarities test, a measure of conceptual ability similar to the one on the Wechsler-Bellevue, to a group of schizophrenics.

He gave both a pre and post test, stressing one group between the tests and not stressing the other group between tests. He found that the control groups performance increased on the post test, whereas the experimental group showed a decrement in performance. He did not find any difference in communication. That is, neither group differed in manisfestations of schizophrenic language.

Hirschman (1953) gave 3 spoken passages of neutral information to a group of schizophrenics and non-psychotics. After one minute he asked each subject to write as much about the passage as he could. This was done for the first two passages. Before the S had to write about the third passage, the experimenter briefly perused the papers already completed, and verbalized dissatisfaction. The major findings were 1) stress increased the gross productivity of both groups, 2) stress increased the amount of irrelevant material given by the schizophrenic group.

6. Parental Relationships in schizophrenia

For Cameron (1947), the disorganization in schizophrenic thinking is a symptom of the patient's "social disarticulation", initially occasioned by defective categorization of roles. Isolation from common social influence leads to maintenance of social fantasies instead of realistic viewpoints, which result in impairment of organized socially acceptable thinking.

Despite the above considerations only two systematic studies (Cavanaugh, 1958, Whiteman, 1954) have attempted to test the performance of schizophrenics on problems involving social concepts. A view such as Cameron's would imply a selective impairment of cognitive functioning dependent upon whether the content of the concept refers to a social or non-social situation. In view of this, it seems advisable to carry Whiteman's study one step further. That is, one should compare schizophrenic conceptual performance on tasks having specific interpersonal content to tasks having no specific interpersonal content. Because there is evidence that schizophrenia is associated with certain factors in the patient's relationships with his parents, "parents" have been selected as the specific interpersonal content of the conceptual task in this experiment. The logical basis for the selection of "parents" finds its support in the studies cited below.

Prout and White (1950) designed a study to see if there are many existing differences between attitudes of mothers of male schizophrenics and attitudes of mothers of male normals. They found some significant differences between the groups in their relationships with their sons. The mothers of the schizophrenics were less sociable, exhibited more physical complaints, were less critical of their husbands and were less willing to admit that they did not want a

child. Freeman and Grayson (1955) studying attitudes of schizophrenic mothers, found that they were characterized by attitudes of sacrificing martyrdom, by subtle (rather than frank) domination, and by overprotectiveness. In return for this, they expected unquestioning conformity with parental wishes through inner conviction rather than through coercion. Using interviewing techniques, Tietze (1949) purports that mothers of schizophrenics are over-anxious, obsessive and domineering. She also adds that rejection of the child was quite obvious in most mothers.

Reichard and Tillman (1950) have studied both parents of the schizophrenic. Using interviewing techniques they found that parents of schizophrenic patients fall into three categories. 1) Schizophrenogenic mother- These mothers are domineering and aggressive women married to a quiet withdrawn husband whom they dominate and nag. This is the overtly rejecting mother. She is sadistically critical of the child. The withdrawn father lends no support to the child. 2) Schizophrenogenic mother- This mother is covertly rejecting. She subtley is dominating and sadistically hostile. Due to reaction formation, she becomes overprotective. 3) Schizophrenogenic father- This is less frequent than the other two. His behavior falls into the same category as the first type of schizophrenogenic mother.

This study also indicated that in most cases interviews

with the patients showed that they definitely felt rejected by the parents.

In summary then, three theories have been discussed concerning the basic loss in schizophrenia. A common element has been abstracted from them, this being conceptualization. Goldstein's theory attributes a general loss in abstract ability to schizophrenia. Cameron and Sullivan imply a selective loss in conceptualization, that being in the social sphere. The experimental literature, with some exceptions, reveals that schizophrenics show less conceptual ability than normals on formal concepts and exhibit further deficit on concepts having social content.

Several questions emerge from the foregoing discussion. They concern themselves with 1) the problem of whether in a schizophrenic group, there is a differential performance between non-social and social conceptual tasks and 2) the relationship of specific social content to conceptual performance. That is, the latter explores performance in terms of whether the content is desirable or undesirable or interpersonally familiar or unfamiliar.

Statement of the Problem

This study was undertaken to investigate the acquisition and communication of a concept when:

1) Social concepts have parents as their content as opposed to social concepts which have an unspecified group of people as their content.

2) The concepts involved contain desirable and undesirable social traits.

In doing this, a group of schizophrenics, and a group of normal controls were given a concept formation task having two socially evaluative dimensions (socially desirable traits and socially undesirable traits), and either one of two interpersonal dimensions (familiar people or unknown people). The analysis includes inter and intra group comparisons under the various treatments.

Hypotheses

Goldstein (1951) purports that the schizophrenic process entails a loss in the ability to assume the abstract attitude. He states that the basic loss is the inability to think categorically. Sullivan (1956) and Cameron (1947) suggest that the schizophrenic process reflects a social disorganization and the implication is that one would be most likely to see disorganization in social areas pertinent to the patient's personal problems. Whiteman (1954) combining Goldstein's view and Sullivan's and Cameron's views found that the schizophrenics show a greater loss in conceptualization when the concepts refer to social situations rather than being of a non-social nature. Finally a series of studies on parents indicate that some of the social phenomena that contribute to the schizophrenic process is the patient's relationship with his parents. With

the above in mind, two major hypotheses were investigated. The first was that

1. the schizophrenic group will show more conceptual impairment relative to the normal group in classifying specially selected words when these words pertain to parents than when the words refer to people in general. This is based upon the consideration that the concept of "parents" has more emotional significance for schizophrenics than the concept of "people".

a) The schizophrenic group will give less correct responses than the normal group on a social conceptual sorting task refering to "parents" relative to one refering to "people".

b) The schizophrenic group will include more incorrect responses than the normal group on the same conceptual sorting task referring to "parents" relative to one referring to "people".

In accordance with the views of Goldstein (1951), the findings of Cameron (1947), and McGaughran and Moran (1956), the second hypothesis was that

2. the schizophrenic group will differ from the normal group in their reasons for a particular sorting when the words refer to parents than when they refer to people in general.

a) The schizophrenic group will give less abstract or formal reasons than the normal group.

b) The schizophrenic group will give more idiosyncratic (affective) reasons than the normal group.

Procedure

Subjects

a) A group of 36 male patients selected from the records of Northampton and Worcester State Hospitals in Massachusetts were randomly (using a table of random numbers) assigned to four groups of nine Ss each. Through information obtained from the record and the ward physician's report, these patients showed no evidence of brain damage and were off Electro Convulsive therapy for at least one month. Furthermore, as reported in the record or by the ward attendant, these patients displayed at least one of the following behavioral criteria of schizophrenia as described by Lewis and Piotroski (1952):

1. Physical sensations with dissociation

This involves delusions of perception. It involves a misstatement of obvious facts. For example, "There is a steel plate sticking in my head." "My tongue is too large for my mouth." Delusions regarding obviously false statements about the body are the main symptoms here.

2. Delusions regarding others

This sign includes physical sensations with dissociation regarding others. Misidentification and misrecognition of people are involved in this sign. Thoughts about other people that are obviously not true are also included. "My father came back from the dead and is alive now."

3. Delusions regarding physical objects

This includes the feeling that objects are not real. Other indications are feelings that objects behave as if they are animate.

4. Speech disturbances and intellectual blocking

Unintelligible mumbling, interruptions of speech, and complaints that thoughts are not right because the patient wanted to say something else.

5. Uncontrolled repeated interrupting and anxious thought

This sign includes auditory or visual hallucinations or thoughts prompting the patient to do something which makes him very anxious and guilty.

6. Ideas of reference and or feelings of being controlled by inimical outside forces (paranoid ideas)

This sign deals with clearly accusing other persons or some external force (magical or real) of definite attempts at harming or controlling the patient.

Their findings are that the clinical manifestation of any one of these signs is indicative of schizophrenia. Thus, in this experiment if S manifested any one of the above signs (according to reports from aides or physicians), within a few days prior to the experimental testing, it was considered that he sufficiently met the criteria for a diagnosis of schizophrenia.

The signs were distributed among the 36 Ss as follows. Twenty two showed a predominance of paranoid ideas, ten manifested auditory and visual hallucinations and the remaining four displayed several signs, these being delusions regarding others, speech disturbances and intellectual blocking, and auditory and visual hallucinations. The above list of signs are only six of ten which Lewis and Piotrowski offer. The remaining four were too difficult to detect and therefore were excluded from use in this experiment.

In addition to the above criteria for selection of the schizophrenic population, the mental status of the patient at the time of testing was also considered. This was evaluated subjectively by the experimenter during testing. If the patient appeared to be in good contact, manifested no apparent distracting hallucinations or delusions and agreed to take part in the experiment, he was selected as a subject for the schizophrenic group. Naturally, this procedure made only a select group of schizophrenics available for the experiment, but it was felt that the inclusion of patients in a severely disturbed or deteriorated state would offer no substantial information to the study as their behavior would most likely be random and lack motivation. Secondly, Ss who were disturbed at the time of testing were not able to perform at a sufficiently competent level on the formal concept formation task (to be described below) so as

to match the level achieved by the normal group. Thus, a total of 64 Ss seen in a disturbed state had to be excluded from the experiment, because they exhibited extremely low or almost no formal conceptual ability at the time of testing.

b. Normals

A group of 36 male patients at Springfield General Hospital, Springfield, Mass., who were being treated for respiratory disorders and a variety of other mild physical disorders not related to mental disorder were randomly assigned to four groups of nine Ss each in the same manner as the schizophrenic group. Only those Ss who did not show any overt manifestations of disturbance were selected.

c. Matching of the Groups

In order to control for formal conceptual ability, the groups were matched on the concept formation test of the Shipley Hartford Retreat scale. Furthermore, attempts were made to match the groups on age and education.

Stimulus and Materials

The stimuli for the social concept formation test were 18 socially desirable trait names, 18 socially undesirable trait names, and six words which were unrelated to each other and were not trait names. The words were printed on 5 x 8 index cards, and one word appeared on each card. The trait names referred to three qualities of people,

1) Intellect, (I), 2) Physical Appearance (A), 3) Interpersonal Relations (P). The three qualities have been selected because of their availability for describing people. They were obtained in the following manner:

A group of 59 college students from two introductory psychology courses were asked to categorize a list of 112 words which are descriptive of people. They were told to classify the words as to whether they referred to socially desirable or socially undesirable qualities of people, and also as to whether they referred to any of the three qualities mentioned above. The Ss were told that if any doubt existed in their mind about rating a specific word, they were to place it in a category called "other". If 90% or more of the group rated a word in the same category, that word was selected for this experiment.

The words were as follows:

Socially Desirable	Trait Name Words Intellect (I)	Socially Undesirable
Intelligent		Stupid
Smart		Feebleminded
Well-read		Moron
Scholarly		Retarded
Wise		Idiot
Genius		Numbskull

Appearance (A)

Handsome	Messy
Attractive	Dirty
Clean	Fat
Spotless	Stoop-shouldered
Neat	Tattered
Good-looking	Cross-eyed

Interpersonal (P)

Helpful	Merciless
Considerate	Irritating
Dependable	Spiteful
Comforting	Cold-hearted
Gentle	Gossiping
Faithful	Nasty

Non-Trait Name Words

Jamgloo
Table
Apple
Bell
Watch
Money

Method

As previously mentioned the 36 Ss in each of the two groups were sub-divided into four sub-groups of nine Ss each. Thus, there were eight sub-groups in all. Each of the four normal and schizophrenic sub-groups, were tested under the following four conditions, each sub-group receiving only one of the conditions:

Sub-group 1- Received socially desirable cue words and were given the information that the cue words describe parents and then asked to sort words which belong with the cue words.

Sub-group 2- Received socially undesirable cue words and were given the same information and instructions as sub-group 1.

Sub-group 3- Received socially desirable cue words and were given the information that the cue words describe people, and then asked to sort words which belong with the cue words.

Sub-group 4- Received socially undesirable cue words and were given the same information and instructions as sub-group 3.

Six of the 42 words served as cue words. The cue words were one word from each trait name category. They were as follows: Intelligent, Stupid, Handsome, Messy, Helpful, Merciless. The remaining 36 words were given to Ss so that he could perform the sorting task to be described below.

A cue word was placed in a slot at the back of a box so that it was perpendicular to the desk in front of S and visible at all times. S was given the 36 cards for sorting and then given the instructions to put words that belong with the cue word in that particular box and to put words that do not belong with it in another box which was placed to the left of the former box. Each S performed three sortings under the conditions to be described below. With each sorting S used the same 36 words. After each sorting S was asked why he thought the words belonged with the cue word.

a. Method in General.

Group 1- Sorted to cue cards referring to I, A, and P, qualities which were of a socially desirable nature. Briefly, the instructions were that the cue word described

parents and that S was to put with it words that could describe parents in the same way. The specific instructions are given below in the instruction section.

Group 2- Sorted to cue words referring to I, A, and P qualities which were of a socially undesirable nature and which described parents. Instructions were the same as for Group 1.

Group 3- Sorted to cue cards referring to I, and A, and P qualities which were of a socially desirable nature. S was told that the cue card could describe people and that he was to put with it words that could describe people in the same manner.

Group 4- Sorted to cue words referring to I, A, and P qualities of a socially undesirable nature and describing people. The instructions were the same as for group 3.

Counter balancing of the order of presentation of cue words

Since the order in which the cue cards are presented may affect sorting behavior, the orders of presentation were varied as is indicated in the experimental design below.

Parents as object of the concept		No. of Ss	People as Object of Concept
Socially Desirable cue words	IAP	3	IAP
	API	3	API
	PIA	3	PIA
Socially undesirable cue words	IAP	3	IAP
	API	3	API
	PIA	3	PIA

I----------Intellect cue word

A----------Appearance cue word

P----------Interpersonal cue word

There were a total of 9 S's in each major group and 3 S's for each particular sequence variation.

a. Where "parents" are the object

A card with the word_____ (the particular cue word for the concept to be formed) was inserted on the back of a box as described above, and S was told the following: "We are interested in how people sort words. Here is the word (cue word). This word can describe parents. There are other words than can describe parents in the same way. Here are 36 cards with different words on them. I want you to go through them and put in this box (cue card box), all the words that you think describe parents in the same way as (cue word). Put in this box all those words that you think do not describe parents in the same way."

After each sorting S was asked, "Why do you think all of these words belong together?" (in reference to the words in the cue word box).

b. Where "People" are the subject

"We are interested in how people sort words. Here is the word (cue word). This word can describe people. There are other words that can describe people in the same way. Here are 36 cards with different words on them. I want you to go through them and put in this box (cue card box) all the words that you think describe people in the same way as (cue word). Put in this box all those words that you think do not descirbe people in the same way".

After each S was given the instructions he was asked to repeat them in order to make certain he had comprehended his task. If the instructions were not understood, the experimenter repeated them. Any S showing great difficulty in comprehending the instructions was dropped from the experiment.

Criteria for Measurement

1. Trait Name Concepts

Each cue card for the trait names has two conceptual or classificatory dimensions: 1) Desirability which refers to whether it is a desirable trait or an undesirable trait. 2) Quality (Q) which refers to the specific attribute of a person. It can be a P, I or A Quality.

Each word that is sorted in the cue word box can be placed into one of 5 possible scoring categories which refers to the precision of the sorting.

These Categories are:

a. Correct Closed (CC)- The word conforms to both the D and Q dimensions of the cue word. The term "closed" designates a category in which all of the attributes are accounted for.

b. Correct open Q (COQ)- The word conforms only to the Q dimension of the cue word. The term "open" designates a category in which all of the attributes are not accounted for.

c. Correct Open D (COD)- The word conforms only to the D dimension of the cue word.

d. Incorrect O (IO)- The word does not conform to either the Q or D dimension of the cue word, but is a trait name word.

e. Incorrect (I)- All non-trait name words.

Thus, the scores for the sorting behavior were the number of words in each of the scoring categories.

For purposes of clarity an example is given. If in sorting to the cue word "Helpful" an S uses words such as "considerate", "merciless", "smart", "fat", "apple", and "dependable", the scores would be as follows.

1. Two CC scores for "considerate" and "dependable" as they fit both the D and Q dimensions of socially desirable and interpersonal respectively.

2. One COQ score for "merciless" which conforms to the Q dimension of interpersonal.

3. One COD score for "smart" which conforms to the D dimension of socially desirable.

4. One IO score for "fat" which neither conforms to the Q or D dimension of the cue word, but is a trait name word.

5. One I score for "apple" which is a non-trait name word.

2. Communication

The manner in which S verbalized his reason for his particular sorting was also scored. Criteria were derived

for scoring the communication on one of three levels of an abstract-concrete continuum. The levels and their criteria which are discussed by Bruner, Goodnow, and Austin (1956) were as follows:

a. Formal- A reason was scored formal if S indicated that the words have been grouped together because they represent abilities, traits or appearance of people. This must be done without specific reference to a specific individual or situation.

Examples of this are:

1. "They are mental abilities of people". (for intellect)

2. "They represent certain characteristics or traits of people". (for interpersonal)

3. "They refer to how a person looks". (for appearance)

Another type of response that was scored as formal was one which abstracted some quality that tied all the words together and was not the same as any of the stimulus words.

An example of this is:

"They all refer to cruelty in people". (for socially undesirable-interpersonal)

b. Functional- The criteria for this category was that the words were tied to a specific behavioral situation or that the words were synonyms for the cue word.

Examples of this are:

1. "all of these words mean the same as intelligent". (this refers to the synonym criterion)

2. "A person who is helpful would also be considerate and gentle". (this refers to a specific behavioral situation)

c. Affective- In this instance the words belong together for some idiosyncratic reason. The reason does not make use of the objective criteria of the stimulus words.

Examples are:

1. "I feel they belong together".

2. "Things I look for first in a person".

The following table contains the experimental design and the relevant symbols which are frequently referred to in this study. The design is represented for one group as both groups are treated in the same manner.

Table A

Experimental Design

Instructions

		"People"		"Parents"
		Sequences	No. of Ss	Sequences
Desirability	Desirable	IAP	3	IAP
		API	3	API
		PIA	3	PIA
	Undesirable	IAP	3	IAP
		API	3	API
		PIA	3	PIA

N-----Instructions (People" vs "Parents")

D-----Desirability (socially, desirable vs socially undesirable)

Seq---Sequences (IAP vs API vs PIA)

Q-----Qualities (I, A or P)

I-----Intellect quality

A-----Appearance Quality

P-----Interpersonal Quality

OPS---Ordinal Position in Sequence (1st sorting vs 2nd sorting vs 3rd sorting)

Results

1. Control measures

As mentioned previously, the groups were matched on age, education, and formal concept formation ability from scores on the Shipley Hartford Retreat scale.

Table 1 contains the means, standard deviations, and *t* values for differences between the means for each of the above three variables. The *t* values indicate that there are no significant differences between the groups on any of these variables ($p=.05$).

2. Sorting behavior

The raw score data (Appendix A) for the sorting responses indicated a substantial number of zero scores in all five scoring categories and therefore, suggesting skewed distributions. To deal with these data in such a manner that the assumptions of analysis of variance were more closely approximated, transformations were performed on all scores (Appendix B). A transformation of $\sqrt{X + .5}$ was employed as suggested by Edwards (1954). Appendix C contains the frequency distributions for transformed data and indicates that they are J distributions. Thus, the assumption of normality was not met. However, the Norton study as reported by Lindquist (1953) indicates that the F test is relatively insensitive to deviations from normality.

Table 1

Means, Standard Deviations and t Scores for Age, Education and Concept Formation Scores on the Shipley Hartford Scale

	Age		Education		Concept Score	
	M	SD	M	SD	M	SD
Normal	36.80	7.81	11.44	2.10	6.39	2.54
Schizophrenic	34.94	8.39	10.88	2.03	6.83	2.96
t	.96		1.17		.67	

Table 2

Analysis of Variance for CC, COQ, COD, IO, and I Scores

		CC		COQ		COD		IO		I	
Source	df	ms	F	ms	F	ms	F	ms	F	ms	F
N	1	.01	.03	.03	.05	.92	.57	.007	.006	.31	
P	1	.12	.40	2.56	4.57	21.69	13.39*	9.88	8.74*	3.74	9.84*
D	1	3.87	12.90*	2.45	4.37	22.67	13.99*	2.92	2.58	6.16	16.21*
Seq.	2	.13	.43	.84	1.50	4.26	2.63	.62	.55	.22	.58
NxP	1	.009	.03	.005	.009	.68	.42	1.18	1.04	1.29	3.39
DxP	1	.13	.43	2.31	4.12	.88	.54	3.46	3.06	.90	2.36
NxD	1	.0001	.0003	.63	1.12	.88	.54	1.48	1.31	.29	.76
NxDxP	1	.001	.003	2.54	4.53	.02	.01	1.68	1.49	1.24	3.26
PxSeq	2	.06	.20	.32	.57	7.32	4.51	2.00	1.77	.09	.24
NxSeq	2	.08	.26	.07	.12	.14	.09	2.01	1.78	1.24	3.29
DxSeq	2	.02	.06	.30	.53	1.41	.87	.39	.34	.20	.53
NxPxSeq	2	.38	1.27	.21	.38	2.19	1.35	1.32	1.17	.70	.18
DxPxSeq	2	.16	.53	.30	.53	.26	.16	.11	.016	.14	.38

Continued on next page

Table 2 (Con't)

		CC		COQ		COD		IO		I	
Source	df	ms	F	ms	F	ms	F	ms	F	ms	F
DxNxSeq	2	.28	.93	.08	.14	1.09	.67	.41	.37	.65	1.71
DxNxPxSeq	2	.12	.40	.47	.84	2.22	1.37	.37	.33	.11	.30
Between Error	48	.30		.56		1.62		1.13		.38	
Between	71	.29		.59		2.29		1.27		.55	
Q	2	1.98	.18	.12	1.00	.66	3.30	.005	.02	.14	2.29
OPS	2	.02	.18	.54	4.54	1.14	5.70*	1.27	5.54*	.11	1.88
PxQ	2	.04	.36	.07	.58	1.01	5.05*	.42	1.85	.07	1.14
PxOPS	2	.05	.45	.035	.29	.84	4.20	.03	.13	.01	.16
NxOPS	2	.13	1.18	.385	3.21	.28	1.40	.21	.91	.10	1.64
NxQ	2	.07	.64	.17	1.42	.01	.05	.42	1.85	.09	1.47
DxQ	2	.44	4.00	.345	2.87	.96	4.80*	.80	.35	.52	8.61*
DxOPS	2	.09	.81	.21	1.75	.44	2.20	.30	1.30	.01	.24
NxPxQ	2	.006	.05	.09	.75	.01	.05	.01	.05	.01	.24
NxPxOPS	2	.66	6.00*	.07	.58	.38	1.90	.33	1.46	.08	1.31
DxPxQ	2	.01	.09	.09	.75	1.01	5.05*	.20	.89	.06	.98

Continued on next page

Table 2 (Con't)

		CC		COQ		COD		IO		I	
Source	df	ms	F	ms	F	ms	F	ms	F	ms	F
DxPxOPS	2	.06	.54	.015	.125	.80	4.00	.05	.22	.23	3.77
DxNxQ	2	.11	1.00	.11	.92	.14	.70	.21	.91	.09	1.47
DxNxOPS	2	.31	2.81	.19	1.58	.75	3.75	.72	3.13	.11	1.88
DxNxPxOPS	2	.33	3.00	.002	.02	.26	1.30	.18	.78	.04	.65
DxPxNxQ	2	.07	.67	.10	.83	.15	.75	.13	.59	.05	.90
Within Error	112	.11		.12		.20		.23		.06	
Within	144	.14		.13		.38		.25		.07	

N---------- Instructions (Parents vs People)

P---------- Personalities (Schizophrenic vs Normal)

D---------- Desirability (Socially Desirable vs Socially Undesirable)

Seq.------- Sequences (IAP vs API vs PIA)

Q---------- Qualities (I vs A vs P)

OPS-------- Ordinal Position in Sequence (1st Sorting vs 2nd Sorting vs 3rd Sorting)

* Significant at P = .01

Nevertheless, the distributions in this study were highly skewed so that the results must be treated with caution.

The statistical design utilized to study the sorting behavior was a randomized factorial analysis of variance. The analysis is shown in Table 2. Included in this table are the sources of variance, the degrees of freedom, the mean squares, and the F scores for each of the scoring categories (CC, COQ, COD, IO, and I). This table contains five analyses of variance, one for each of the scoring categories. The sums of squares have been omitted for the purposes of conserving space. Degrees of freedom are only presented once in this table (alongside of the sources of variance) because the statistical design for each scoring category is exactly the same.

The level of significance selected, was p=.01. This level, rather than p=.05 was selected because of the skewed distributions, and therefore, it was felt that a more stringent level of acceptance was desirable.

a. Correct Closed scores

Analysis of the frequency of CC responses indicates significant main effects in the desirability and quality dimensions. Furthermore, a significant Instructions x Personalities x Ordinal Position in Sequence interaction in also indicated. Tables 3,4,5, and Figure 1 explain these results more explicitly.

Table 3 shows that both groups made significantly (p=.01) more CC responses to cue words of a socially

Table 3

Means and Standard Deviations of the Number of CC Responses Made to Socially Desirable and Socially Undesirable Cue Words

	Socially Desirable	Socially Undesirable
M	2.11	1.84
SD	.36	.50

Table 4

Means and Standard Deviations of the Number of CC Responses to I, A, and P Cue Words

	I	A	P
M	2.11	1.79	2.01
SD	.36	.47	.52

I---------- Intellect

A---------- Appearance

P---------- Interpersonal

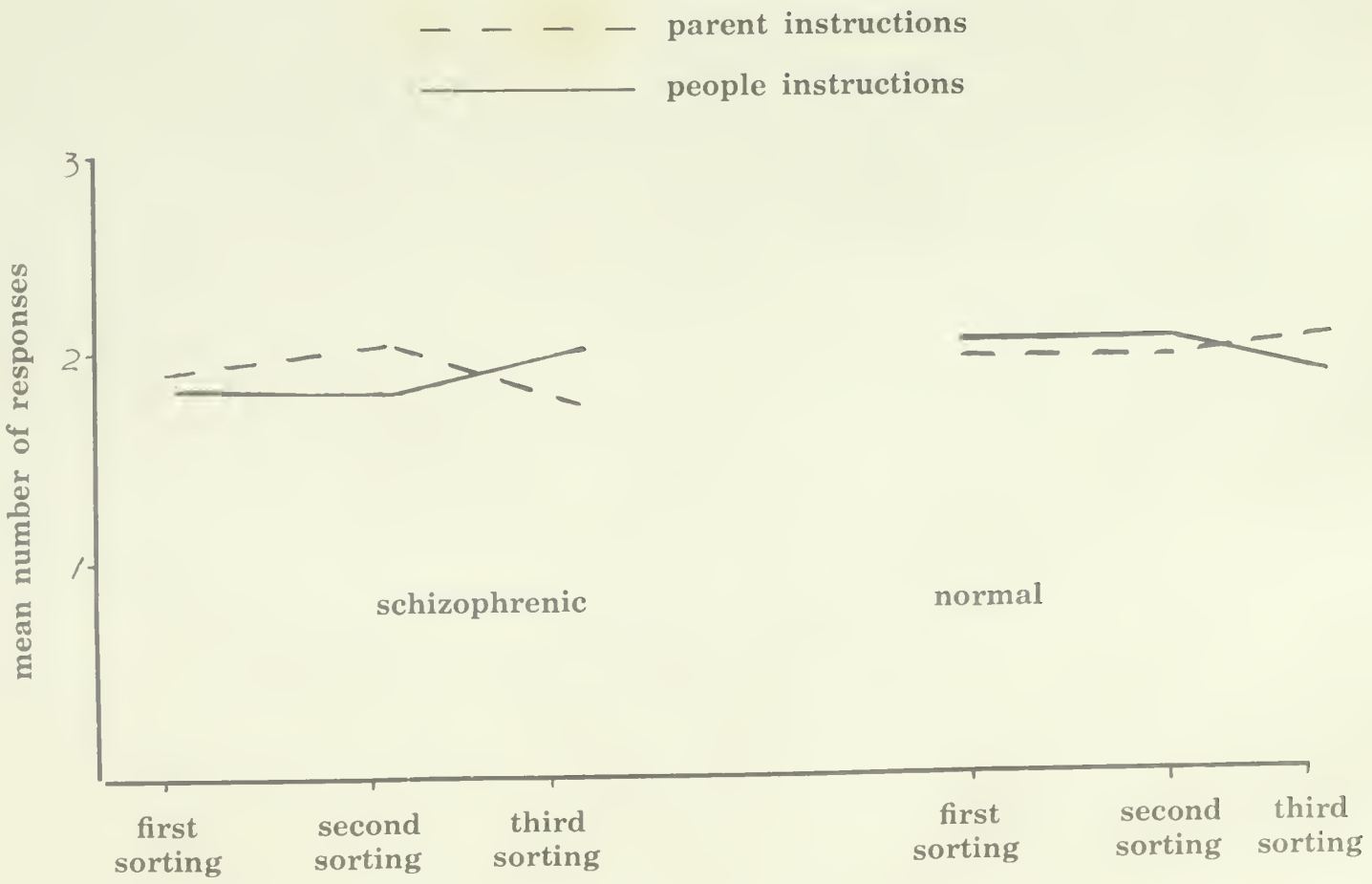
Table 5

Means, Standard Deviations, and t Scores for Number of CC Responses in Each Group as a Function of Ordinal Position in Sequence and Instructions (NxPxOPS interaction)

	Schizophrenic					Normal				
	Parents		People			Parents		People		
	M	SD	M	SD	t	M	SD	M	SD	t
1st sorting	1.95	.51	1.88	.61	.56	1.99	.32	2.04	.35	.40
2nd sorting	2.11	.34	1.88	.51	1.85	1.99	.52	2.02	.39	.24
3rd sorting	1.79	.55	2.09	.38	2.41	2.05	.38	1.89	.47	1.29

FIGURE 1

Mean Number of CC Responses for Each Group as a Function of Ordinal Position in Sequence and Instructions



desirable nature as opposed to cue words of a socially undesirable nature.

Table 4 contains the means and standard deviations for the number of CC responses to intellect, appearance, and interpersonal cue words. A difference of .16 or more between the means indicates a significant difference at p=.01. Thus, significantly more CC responses were made to intellect and interpersonal cue words than to appearance cue words. There is no significant difference in number of CC responses to intellect cue words as opposed to interpersonal cue words.

Table 5 and Figure 1 illustrate the significant NxPxOPS interaction. The results can most readily be seen in Figure 1 which contains two graphs, each showing the double interaction of NxOPS for each group. The following was obtained utilizing the method of critical differences as suggested by Lindquist (1953). There are no significant simple effects within each group, nor between each group. A difference of .319 was necessary for significance. One significant interaction is present, in the schizophrenic group.

From the first to third sorting the difference in accuracy reverses itself and becomes greater in favor of "people" sortings as against "parents" sortings. A critical difference of .23 was necessary for significance. Thus, the "parent" variable seems to have the more significant

effect on change of accuracy than does the "people" instruction.

b. Correct Open Q scores

Table 2 indicates no significant F's, and therefore, no significant differences in number of CCQ responses as a function of any of the variables.

c. COD scores

Returning to the F scores in table 2, it can be seen that the main effects of personality, desirability, and ordinal position in sequence are significant. The significant interactions are PxQ, DxQ, and DxPxQ.

Tables 6,7, and 8 show the means and standard deviations for the above mentioned significant main effects. Table 6 indicates the means and standard deviations of the number of COD responses for the schizophrenic and normal groups. The schizophrenic group have significantly ($p=.01$) more COD responses than the normal group.

Table 7 compares the number of COD responses to socially desirable and socially undesirable cue words. Significantly more COD responses were made to socially desirable cue words.

Table 8 contains the means and standard deviations of the number of COD responses for each of the three sortings. A critical difference of .258 between the means indicates a significant difference at $p=.01$. Only the mean of the

Table 6

Means and Standard Deviations of the Number of COD Responses Made by Each Group

	Schizophrenic	Normal
M	2.17	1.53
SD	.92	.91

Table 7

Means and Standard Deviations of the Number of COD Responses Made to the Socially Desirable and Socially Undesirable Cue Words

	Socially Desirable	Socially Undesirable
M	2.18	1.53
SD	1.01	.84

Table 8

Means and Standard Deviations of the Number of COD Responses Made to 1st, 2nd and 3rd Sortings

	1st	2nd	3rd
M	1.98	1.86	1.72
SD	.96	1.45	.96

Table 9

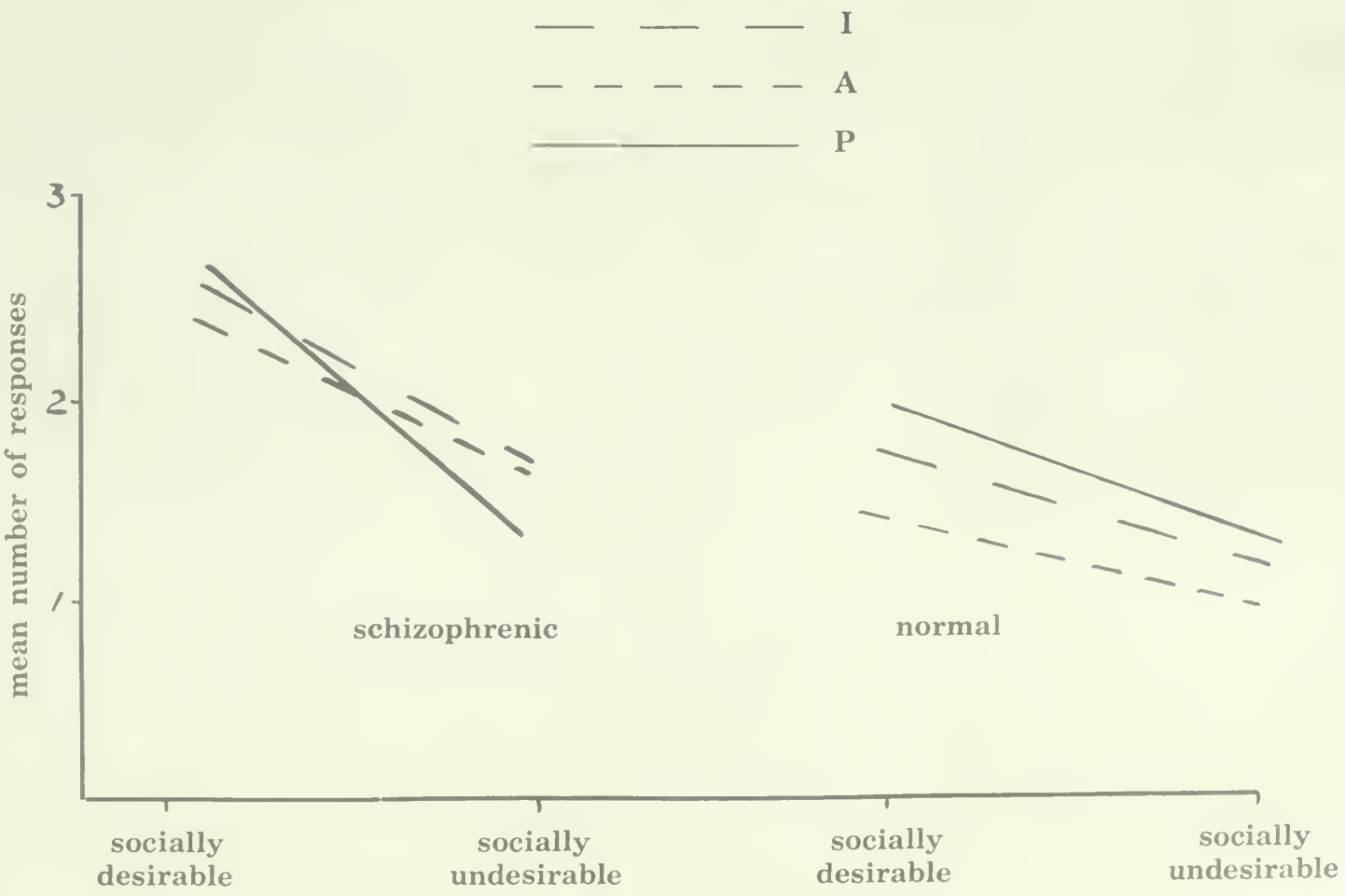
Means, Standard Deviations and t Scores for Number of COD Responses in Each Group as a Function of Desirability of the Cue Word and Quality of the Cue Word (DxPxQ)

	Schizophrenic					Normal				
	Socially Desirable		Socially Undesirable			Socially Desirable		Socially Undesirable		
	M	SD	M	SD	t	M	SD	M	SD	t
I	2.64	.73	1.88	.73	3.8*	1.80	.99	1.39	.68	2.05
A	2.47	.82	1.87	.94	3.0*	1.47	1.0	1.16	.66	1.05
P	2.69	.52	1.46	.96	6.15*	1.98	.95	1.40	.81	2.90*

*Significant at p = .01

FIGURE 2

Mean Number of COD Responses for Each Group as a Function of Desirability and Qualities



first sorting is significantly different from the mean of the third sorting. This indicates that less COD responses were made to the third sorting than to the first sorting. A comparison of first sorting to second sorting, and second sorting to third sorting shows no significant differences.

Due to the fact that the DxPxQ interaction includes the significant PxQ, and DxQ interactions, the latter two results have not been presented in table form. Table 9 and Figure 2 show the results obtained for the DxPxQ interaction. A discussion of this interaction will include the DxQ and PxQ interactions. Table 9 contains the means, standard deviations, and t scores for number of COD responses for each group in response to socially desirable and socially undesirable I, A, and P cue words. The results of this table can most easily be seen in Figure 2 which shows the triple interaction in graphic form.

With reference to within groups simple effects, the schizophrenic group made significantly more COD responses to I, A, and P cue words when they were of a socially desirable nature as opposed to I, A, and P cue words of a socially undesirable nature. A critical difference of .52 was necessary for significance. The normal group presents dissimilar results. They indicate no differences in mean number of COD responses to I and A cue words as a function of the desirability of the cue word. The significant

(p=.01) result for the normal group lies in the sorting to P cue words. In this instance the normal group made significantly more COD responses to P cue cards of a socially desirable nature than to P cue cards of a s ocially undesirable nature. Similarly, a critical difference of .52 was necessary for significance.

Thus it appears that the schizophrenic group, makes more COD responses to socially desirable cue words than to socially undesirable cue words regardless of their quality. On the other hand, the normal group, makes more COD responses to socially desirable cue words than to socially undesirable cue words only in regard to the P quality.

Analyzing cross groups, the results indicate that the schizophrenic group made significantly more COD responses than the normal group to I, A, and P cue words of a socially desirable nature, whereas there are no significant differences between the groups on number of responses to I, and P cue words of a socially undesirable nature. Only on A cue words of a socially undesirable nature does the schizophrenic group give more COD responses than the normal group. A critical difference of .52 was necessary for significance.

With reference to specific interactions, the PxQ (as a function of the undesirable dimension), DxQ (as a function fo the schizophrenic group), and PxD (as a function of qualities) interactions indicate significance at p=.01. This latter interaction is not the same as the overall PxD

interaction which is not significant, but refers to a comparison of both groups as a function of each quality. The findings of the first interaction indicate that when considering responses to undesirable cue words, the difference in number of COD responses to A and P cue cards is significantly ($p=.01$) greater in the schizophrenic group than in the normal group. No significant differences of this sort are found with desirable cue words. A critical difference of .51 was necessary for significance.

The second significant interaction lies in the schizophrenic group. The finding here is that the difference between number of COD responses to socially desirable and socially undesirable P cue words is significantly ($p=.01$) greater than the difference between number of COD responses to socially desirable and socially undesirable A cue words. A critical difference of .37 was necessary for significance.

The third interaction comparing both the normal and schizophrenic groups indicates that the difference in number of COD responses between socially desirable and socially undesirable P cue words is significantly greater in the schizophrenic group than in the normal group. This is illustrated clearly in Figure 2. The graph for the schizophrenic group shows that most responses were made to P cue words of a socially desirable nature, whereas the least responses were made to P cue words of a socially undesirable nature. In the normal groups this is not the case as all three lines

Table 10

Means and Standard Deviations of the Number of IO Responses for Each Group

	Schizophrenic	Normal
M	1.36	.93
SD	.86	.57

Table 11

Means and Standard Deviations of the Number of IO Responses for the 1st, 2nd and 3rd Sortings

	1st	2nd	3rd
M	1.29	1.03	1.11
SD	.64	.62	.73

are essentially parallel.

d. Incorrect Open scores

Re-examination of Table 2 shows that only main effects are present in the IO scoring category. These being personalities and ordinal position in sequence. Table 10 contains the means and standard deviations of number of IO responses made by each group. The schizophrenic group made significantly (p=.01) more IO responses than the normal group, indicating a greater amount of inaccuracy.

With respect to the ordinal position in sequence, means and standard deviations are shown in Table 11. This table shows the mean number of IO responses made on the first, second and third sortings. Utilizing the critical difference method, a difference of .21 is significant at p=.01. Thus, the mean for the first sorting is greater than the mean for the second but not significantly larger than the mean for the third sorting. Also, there is no significant difference between the mean for the second and the mean for the third sorting.

Incorrect scores

The F scores in Table 2 show three significant effects, two main (personalities and desirability), and a DxQ interaction. Tables 12, 13 and 14 contain the means and standard deviations pertinent to these effects. Table 12 shows the means and standard deviations of the number of I responses made by each group. The schizophrenic group made significantly (p=.01) more I responses than did the normal group.

Table 12

Means and Standard Deviations of the Number of I Responses for Each Group

	Schizophrenic	Normal
M	1.10	.84
SD	.58	.33

Table 13

Means and Standard Deviations of the Number of I Responses to Socially Desirable and Socially Undesirable Cue Words

	Socially Desirable	Socially Undesirable
M	1.14	.81
SD	.58	.22

Table 14

Means, Standard Deviations and t Scores for Number of I Responses to A, I and P Cue Words as a Function of Social Desirability of the Cue Word

	Socially Desirable			Socially Undesirable	
	M	SD	t	M	SD
I	1.15	.58	5.87*	.78	.29
A	1.01	.56	2.54	.85	.33
P	1.27	.57	7.94*	.77	.20

I---------- Intellect

A---------- Appearance

P---------- Interpersonal

* Significant at p = .01

FIGURE 3

Mean Number of I Responses to I, A and P Cue Cards as a Function of Desirability of the Cue Word

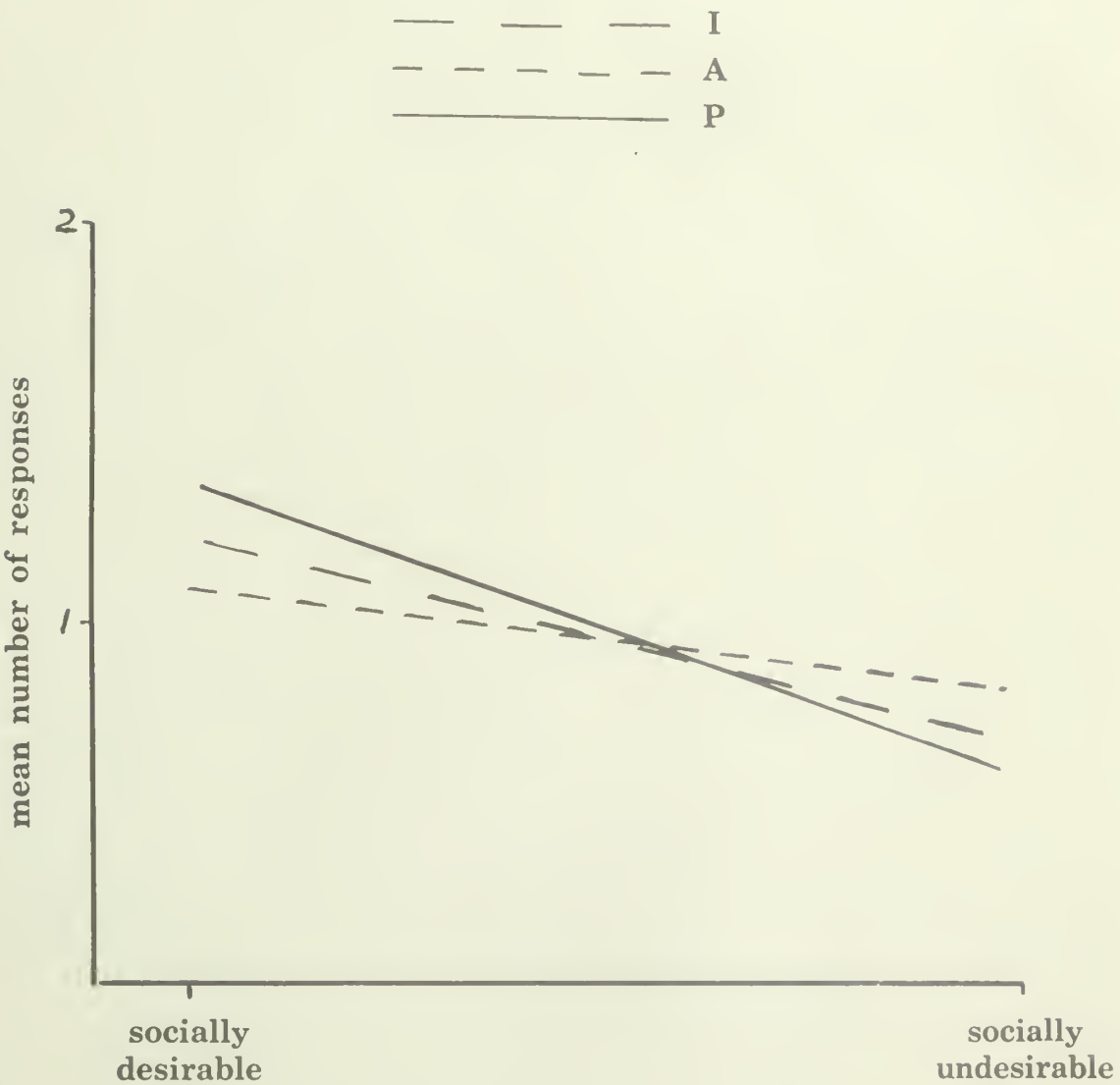


Table 13 which contains the means and standard deviations of the number of I responses made to socially desirable and socially undesirable cue words, indicates that significantly more I responses were made to socially desirable cue words. Thus, there is a greater degree of inaccuracy in sortings to socially desirable cue words.

The DxQ interaction is illustrated in Table 14 and Figure 3. Analysis of simple effects by the critical difference method indicates that for the I and P cue words significantly more responses were made to socially desirable cue cards of these particular qualities than to socially undesirable cue cards of these qualities. No significant differences of this sort is indicated in A cue words. A critical difference of .17 was necessary for significance.

Concerning the interaction, it is found to predominate the complete table. That is, the difference in number of I responses between socially desirable cue words of the P quality and socially undesirable P cue words is significantly greater than that same difference for either I or A cue words. Furthermore, the difference in number of I responses between socially desirable and socially undesirable I cue words is significantly greater than the difference between socially desirable and socially undesirable A cue words. A critical difference of .12 or more between the differences is significant.

3. Communication

As was indicated in the procedure section, Ss were asked to verbalize the basis for their particular sorting, and the verbalizations were scored on one of three levels (Formal, Functional and Affective). Due to the fact that the frequency of occurrence of Formal scores were quite small in both groups, the frequencies of Formal and Functional scores were combined. Tables 15, 16 and 17 contain the results of these scorings for each group. They indicate the frequency of combined Formal-Functional, and Affective communications for each cue word as a function of desirability of the cue word and instructions. The results have been analyzed by the Chi Square statiotic, however where the expected frequency in a cell was less than five, Fisher's exact test was utilized as suggested by Walker and Lev (1953).

Table 18 contains the sources, degrees of freedom, Chi Squares and Fisher p's (used whenever necessary) for the interactions involving both the schizophrenic and normal groups combined. There are no significant results for the responses to I cue words. However the P x C and D x C interactions for A cue words are significant at $p = .04$ (using Fisher's method) likewise the same interactions (P x C and D x C) are also significant for responses to P cue words. The levels of significance are $p = .01$ and $p = .05$ respectively.

Table 15

Frequency of Combined Formal-Functional and Affective Classifications of Communication to I Cue Words as a Function of Instructions, Personalities, and Social Desirability of the Cue Word

			Combined Formal - Functional	Affective
Schizophrenic	Socially Desirable	Parents Instructions	5	4
		People Instructions	5	4
	Socially Undesirable	Parents Instructions	8	1
		People Instructions	9	0
Normal	Socially Desirable	Parents Instructions	9	0
		People Instructions	9	0
	Socially Undesirable	Parents Instructions	9	0
		People Instructions	9	0

Table 16

Frequency of Combined Formal-Functional and Affective Classifications of Communication to A Cue Words as a Function of Instructions, Personalities and Social Desirability of the Cue Word

			Combined Formal - Functional	Affective
Schizophrenic	Socially Desirable	Parents Instructions	5	4
		People Instructions	6	3
	Socially Undesirable	Parents Instructions	9	0
		People Instructions	9	0
Normal	Socially Desirable	Parents Instructions	9	0
		People Instructions	9	0
	Socially Undesirable	Parents Instructions	9	0
		People Instructions	9	0

Table 17

Frequency of Combined Formal-Functional and Affective Classifications of Communication to P Cue Words as a Function of Instructions, Personalities and Social Desirability of the Cue Word

			Combined Formal-Functional	Affective
Schizophrenic	Socially Desirable	Parents Instructions	4	5
		People Instructions	5	4
	Socially Undesirable	Parents Instructions	9	0
		People Instructions	7	2
Normal	Socially Desirable	Parents Instructions	9	0
		People Instructions	9	0
	Socially Undesirable	Parents Instructions	9	0
		People Instructions	9	0

Table 18

Table of Chi Squares and Fisher p's for Communication Scores for Both Groups Combined

		I Cue Words		A Cue Words		P Cue Words	
Source	df	Chi Square	Fisher p	Chi Square	Fisher p	Chi Square	Fisher p
N x C	1	.12		.16		.11	
P x C	1		.18		.04	12.98**	
D x C	1		.30		.04	5.26*	

N - - - - - Instructions

C - - - - - Levels of Communication (combined Formal-Functional, Affective)

P - - - - - Personalities

D - - - - - Desirability

* Significant at p = .05

** Significant at p = .01

Table of Chi Squares and Fisher p's for Communication Scores for each Group

Source	df	I Cue Words Chi Square	I Cue Words Fisher p	A Cue Words Chi Square	A Cue Words Fisher p	P Cue Words Chi Square	P Cue Words Fisher p
NxC (Schizophrenic)	1	.16		.18		.14	
NxC (Normal)	1	0		0		0	
DxC (Schizophrenic)	1		.02		.05	10.36**	
DxC (Normal)	1	0		0		0	

N - - - - - Instructions

C - - - - - Levels of Communication (Combined Formal-Functional, Affective)

D - - - - - Desirability

** Significant at p = .01

Table 19 shows the analyses of the N x C and D x C interactions for each group separately. It indicates that the normal group shows zero interaction as they never used the Affective classification on any of the levels of the independent variables. However the schizophrenic group shows a significant D x C interaction on the I, A and P cue words. The levels of significance on .02, .05 and .01 respectively. These interactions appear to be a result of the schizophrenic group's tendency to make more use of the Affective category in response to socially desirable cue words as opposed to socially undesirable cue words.

In conclusion then, differences in communication between the normal group and schizophrenic group are attributable to the schizophrenic group's tendency to make more Affective responses to socially desirable cue words than to socially undesirable cue words.

General Summary of Results

Whereas the previous section was specific in content, this section is designed as an attempt to compare both groups in general by tying together and summarizing what the author considers the more pertinent findings of this experiment.

Firstly, it has been noted that both the schizophrenic and normal groups have been matched on formal concept formation ability as borne out by the results of the performance on the Shipley Hartford Concept Formation scale.

1. Sorting behavior

While both groups did not differ significantly in number of CC responses, the results indicate that the schizophrenic group made more responses of a less precise nature. This is indicated by the significantly greater amount of IO and I responses made by the schizophrenic group. Concerning the desirability dimension, more responses are made by both groups to the socially desirable cue words. This is evidenced by the greater number of responses made to socially desirable cue words in the CC, COD, and I scoring categories. Another consistent result is seen in the OPS effects. There is evidence of a tendency to give less COD and IO responses as one progresses from one sorting to the next.

In terms of the interactions, the schizophrenic group appears to be affected by the instructions variable in the CC scoring categories only. Evidence of this effect in the normal group. This seen in the NxPxOPS interaction in which a time factor may be involved in determining the schizophrenic's conceptualizations in response to "parents" and "people" sortings.

In the interactions involving Desirability and Qualities, the sortings to interpersonal cue words appear to have the most outstanding and significant effects in the COD and I scoring category. The DxPxQ interaction illustrates this in that the greatest difference in number of COD

responses between socially desirable and socially undesirable cue words occurs in the P quality with the schizophrenic group. Although a similar effect does not occur in the normal group, the significance of the P quality is seen in the simple effects of this group. The P quality is the only one of the three qualities to show a significant simple effect. In the DxQ interaction (I responses), the significance of the P quality also stands out. Although the interaction pervades the complete table, the greatest difference occurs in the P quality.

2. Communication

Significant interactions comparing both groups in response to A and P cue words, were found. These indicated that the schizophrenic group relative to the normal group tended to make more use of the Affective classification of communication. When analyzed further, it was found that these differences were attributable to the schizophrenic group's tendency to give more Affective responses to socially desirable cue words than to socially undesirable cue words. The normal group did not show any differences of this sort as they did not give any Affective responses at all.

Discussion

The purpose of this study was to investigate schizophrenic conceptual performance and communication relative to that of normals. Examination of the results indicates that the hypotheses were not substantiated. Predictions of Instructions X Personalities interactions in the CC and I scoring categories were made, and none were significant. However, a triple interaction of Instructions X Personalities X Ordinal Position in Sequence was significant in the CC scoring category. Essentially, this appears to be a measure of responses over time, whereas the Instructions X Personalities interaction excludes the time variable. Since this was not an a priori prediction, this triple interaction and the non-predicted results are to be viewed with caution and considered as hypotheses for further research. Returning to the Instructions X Personalities X Ordinal Position in Sequence interaction, it was observed to occur in the schizophrenic group only, and was not entirely clear as to what had occurred. However the interaction did indicate that a significantly greater change in accuracy of sortings occurred in response to "parents" as opposed to "people". Several explanations are possible. Firstly, it should be considered that people refers to a general classification in relation to which the sorting items are appropriate whereas parents refers to a subcategory of people for which the sorting items are

appropriate only to the extent that parents are people. Thus, it may not be the actual content which is of importance, but rather the specific versus general classification. Secondly, it might be supposed that "parents" as the subject of the concept serves as a stress variable and shows its effects in the accuracy of schizophrenic conceptualization over a period of time. That is, on the initial sorting there is little or no stress at all brought on by the fact that certain manipulations must be made regarding parents. By the time the third sorting is reached, the stress has built up in such a way as to affect "parent" sortings in a more significant manner than "people" sortings.

In general the results do not support Cameron or Sullivan. This does not necessarily contraindicate the correctness of their theories, but may merely be a function of the methodology which may not have been sufficiently sensitive to detect a direct instructions effect in the CC and I scoring categories.

Considering the precision of the sortings, the data indicates that the schizophrenic group is less precise than the normal group. This is evidenced by the schizophrenic group's tendency to make more IO and I responses than the normal group. Data of this sort would support the findings of Cameron (1939), Epstein (1954) and Chapman and Taylor (1957). The results indicate a tendency for the schizophrenic to overgeneralize.

Finally to be considered in this section are the effects of desirability and quality on performance. Both groups exhibit a tendency to give more responses to a socially desirable cue words than to socially undesirable cue words. This phenomena occurs in the most precise scoring category as well as in two of the lesser precise scoring categories. Apparently there appears to be a tendency to broaden one's conceptual boundaries when dealing with socially desirable material. There appears to be a finer discrimination and less freedom in allowing negative affect to spread. This seems to suggest a lower level of conceptualization as regards desirable attributes of people. Discrimination is less acute in sortings to socially desirable cue words as opposed to sortings to socially undesirable cue words.

Utilizing the communication data to explore this result further, it can be seen that a significant role is played by the socially desirable cue words. Analysis reveals that the effects of socially desirable cue words are present only in the schizophrenic group. The schizophrenic group gave more Affective and less combined Formal-Functional responses to socially desirable cue words than to socially undesirable cue words. Since the normal group does not show similar effects as a function of desirability, this result seems to indicate the importance of the positive affective component in schizophrenic conceptual communication.

The above results are extremely surprising and exactly the opposite of what one would predict from a Sullivanian point of view. They might be explained in terms of an increase in control as a result of heightened defensiveness in response to stimuli having a negative affective component, and a relaxation of defenses in response to stimuli exhibiting a positive affective component. Thus, positive affect does not become integrated into higher order thought processes or expressed in the same communicable fashion as negative affect.

Considering the combined effects of desirability and quality (interactions involving D and Q), these occur in the Correct Open D and Incorrect scoring categories. The tendency to make more Correct Open D and Incorrect responses to interpersonal cue words is clearly indicated. Closer analysis reveals that sortings to interpersonal cue words are most affected in this way. In the Incorrect scoring category, the most significant effect occurs to interpersonal cue words. A similar and more complicated effect is obtained from the Desirability X Personalities X Qualities interaction in the Correct Open D scoring category. While both the schizophrenic and normal groups are affected most by the interpersonal quality, the effect is most pronounced in the schizophrenic group by way of the interaction occurring only in that group. These results suggest that it may

be important to categorize interpersonal data in terms of desirable and undesirable manifestations. Furthermore, it would appear that undesirable interpersonal traits are more finely discriminated than desirable interpersonal traits. The fact that the schizophrenic group shows more of this than the normal group would imply that these patients have become selectively aware of negative interpersonal characteristics.

All in all, it may be concluded that in general the hypotheses developed from Sullivan's and Cameron's theories, were not substantiated. This could suggest that the theoretical positions are incorrect, or that the measures were not appropriate, or that the hypotheses were not related to the theories. It is difficult to evaluate which it is. However, some other interesting empirical findings to be investigated further, were found.

Summary

Summary

The purpose of this investigation was to study social conceptual performance and communication in male schizophrenics as a function of desirability and subject of the concept. To study this in a controlled manner a group of 36 male normals was compared to the same number of schizophrenics on a social conceptual sorting task. Both groups were matched on general conceptual ability by the Shipley Hartford Retreat scale.

Ss were presented with guide words referring to three qualities of people 1) Intellect, 2) Physical Appearance, 3) Interpersonal Relations. They were then given 36 words from which to select words that belonged with the guide word. A further characteristic of the guide words was that they were either of a socially desirable or socially undesirable nature. Along with the guide words Ss were given one of two sets of instructions. One set described the guide words as referring to people, whereas another set described the guide words as pertaining to parents. After S completed his sorting, he was asked the reason for his particular sorting.

Sorting behavior was scored on the basis of precision. Thus, a word which has been sorted could fall into one of five possible scoring categories depending on how closely it fitted the desirability and quality characteristics of the guide word. The sorting categories ranged from correct

to incorrect. S's reasons (communication) for his sortings were given one of three scores which were on an Abstract-Concrete continuum.

A randomized factorial analysis of variance design was employed to study sorting behavior. This entailed five analyses, one for each of the five scoring categories. A Chi Square or exact probability test was utilized to deal with the communication data.

The sorting data was lacking in normality (one of the assumptions of analysis of variance) and transformations were made in order to approximate this assumption more closely. However, the transformations resulted in highly skewed J shaped curves which necessitated raising the level of statistical significance as suggested by Lindquist (1953), also viewing the results with caution.

The hypotheses that the "parent" instructions would affect the precision of the schizophrenic group's sorting and level of communication differently than the "people" instructions, were not supported. However, this instructions variable showed some significant effect in the schizophrenic group. The findings, although not entirely clear, suggested that the "parent" instructions most affected the preciseness of sortings over time. This was interpreted firstly, as a differential response made to a specific classification (parents) as opposed to a more general classification (people). Thus, what one might be comparing is

a specific group to a more general group and the content of the groups may not be of importance. Secondly, this was also interpreted as a result of stress brought about by having to sort to "parent" instructions; the stress having its effect over time.

That schizophrenics tend to overinclude in their sortings was found in support of Cameron (1939) Epstein (1953) and Chapman and Taylor (1957). The schizophrenic group sorted as many correct words as the normal group did, but they also sorted more words of a less precise nature. This was interpreted as a tendency for the schizophrenic to overgeneralize.

With reference to the desirability dimension, it was found that both groups responded in a less precise fashion to socially desirable cue words as opposed to socially undesirable cue words. This suggested a need for finer discrimination and less freedom in allowing negative affect to spread and furthermore, a lower level of conceptualization as regards desirable attributes of people. Utilizing the communication data, significant effects were obtained in sortings to socially desirable cue words and only in the schizophrenic group. Under the socially desirable condition, the schizophrenic group gave more concrete responses and less responses of a more abstract nature than they did for the socially undesirable condition. Since the normal group did not show similar effects, the result seemed to indicate an

affective component which is important to schizophrenic conceptual communication. That is, concepts having positive affect associated with them are not expressed in the logical fashion in which concepts having a negative affectual component are expressed. Finally, the desirability dimension had its most pronounced effect on sortings to interpersonal cue words. This occurred in both groups, but was greatly emphasized in the schizophrenic group.

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Appendix A

Number of CC, COQ, COD, IO and I Responses

Made by each Subject

Schizophrenic (Socially Desirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	3	2	5	0	0	0	11	9	10	0	2	2	4	2	5
2	5	5	5	1	3	0	5	9	8	1	7	0	0	0	0
3	1	5	5	0	0	0	0	10	5	1	0	0	0	0	4
4	5	5	5	4	3	5	10	10	5	11	9	5	6	6	6
5	5	3	5	5	2	2	0	0	1	0	0	1	0	0	0
6	2	5	5	1	0	0	8	4	7	10	0	0	0	0	1
7	5	4	5	5	2	2	9	7	6	3	5	7	4	5	5
8	5	5	5	5	4	5	10	10	9	10	10	7	4	3	3
9	1	2	2	2	2	2	5	4	6	3	5	6	3	4	2

continued on next page

Normals (Socially Desirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	5	5	5	0	0	0	10	8	10	0	1	2	0	2	2
2	2	5	5	0	0	0	0	2	10	0	0	0	0	0	1
3	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0
4	5	5	5	0	2	1	6	12	9	0	1	3	0	1	2
5	2	5	2	0	0	0	0	0	0	0	0	0	0	0	0
6	2	4	5	0	0	0	0	0	0	0	0	0	0	0	0
7	2	5	4	0	5	0	0	0	0	0	0	0	0	0	0
8	4	4	4	0	0	0	0	0	0	1	0	0	0	0	0
9	5	5	5	0	0	0	5	5	7	0	0	0	0	0	2

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Schizophrenic (Socially Undesirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	4	5	4	0	0	0	9	5	4	1	0	4	4	2	2
2	1	5	1	0	0	0	1	0	0	0	0	0	0	0	0
3	2	4	2	0	0	0	1	5	1	0	0	0	0	1	0
4	1	3	0	0	0	0	0	3	0	0	1	2	0	0	0
5	5	4	5	1	0	1	9	8	8	3	6	7	0	0	0
6	5	5	5	0	0	0	0	4	6	0	0	0	0	0	1
7	1	1	3	0	0	0	1	2	0	0	0	0	0	0	0
8	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
9	3	3	5	0	0	0	8	4	6	0	0	0	0	1	0

continued on next page

Normal (Socially Undesirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0
2	1	3	4	0	0	0	0	3	6	0	0	0	1	0	1
3	2	5	5	5	5	5	1	0	10	0	0	10	0	0	0
4	2	4	1	0	0	0	3	3	1	0	0	0	0	0	0
5	1	4	1	0	0	0	1	3	1	1	0	0	0	0	0
6	4	5	5	0	0	0	0	0	0	0	0	0	0	0	0
7	2	5	1	0	0	2	1	4	0	0	0	2	0	0	0
8	4	5	3	0	0	0	2	0	1	1	0	0	0	0	0
9	3	4	5	0	0	0	0	4	0	0	0	0	0	0	0

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Schizophrenic (Parents-Socially Desirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	5	5	5	0	3	0	10	7	8	0	3	0	1	0	0
2	1	5	5	5	1	2	5	10	10	8	0	0	0	1	1
3	4	4	5	4	0	0	10	9	9	5	0	0	0	0	2
4	5	4	5	1	0	1	8	10	6	1	3	1	0	4	2
5	2	5	5	0	0	0	0	1	4	0	0	0	0	1	0
6	5	5	5	0	0	0	10	9	10	1	1	0	1	1	1
7	4	3	5	3	2	5	8	6	9	6	6	3	0	0	0
8	4	4	4	1	0	0	7	9	8	6	3	5	4	3	5
9	2	3	1	0	0	0	1	3	4	0	0	0	0	0	0

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Normal (Parents-Socially Desirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	5	3	5	1	2	0	0	5	6	0	5	0	0	0	1
2	3	4	5	0	0	0	6	8	4	1	2	0	0	2	2
3	5	5	5	0	0	2	9	8	10	3	1	0	2	3	3
4	0	3	3	0	0	0	1	5	2	0	0	4	0	3	0
5	4	4	5	5	0	0	0	8	7	0	0	0	0	0	1
6	3	5	5	0	0	0	1	0	3	0	0	0	0	0	0
7	3	5	3	5	0	0	10	4	5	7	0	0	1	1	1
8	5	4	5	0	0	0	0	0	2	0	0	0	0	0	0
9	4	5	5	0	0	0	0	2	3	0	0	0	0	0	0

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Schizophrenic (Parents-Socially Undesirable)

Subjects	CC			COQ			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	1	5	4	3	4	0	0	0	0	0	0	0	0	0	0
2	4	5	5	0	2	0	9	10	6	0	4	0	0	1	0
3	0	0	5	5	1	4	0	1	9	7	10	9	1	0	0
4	5	2	4	0	0	0	1	1	2	0	0	0	2	0	0
5	1	5	2	0	0	4	7	6	3	4	6	4	0	0	0
6	3	5	4	0	0	0	6	4	0	0	0	0	1	1	0
7	1	3	0	0	2	0	6	5	1	0	2	0	0	0	0
8	2	3	4	0	0	0	1	3	0	0	0	0	1	0	0
9	2	3	3	0	0	0	2	3	0	0	0	0	1	1	0

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Normal (Parents-Socially Undesirable)

Subjects	CC			COC			COD			IO			I		
	A	I	P	A	I	P	A	I	P	A	I	P	A	I	P
1	2	5	4	0	0	0	5	3	5	0	0	0	0	0	0
2	1	5	3	0	0	0	0	0	0	0	0	0	0	0	0
3	2	5	5	0	0	0	6	5	5	0	0	0	0	0	0
4	2	4	4	0	0	4	1	1	2	0	0	7	0	0	0
5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0
6	4	4	4	1	0	1	3	5	5	9	6	8	1	0	1
7	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0
8	3	5	4	0	0	0	0	3	2	0	0	0	0	0	0
9	2	5	3	0	0	0	0	0	0	0	0	0	0	0	0

Appendix B

Transformed Sorting Scores of Appendix A in their Respective Sequences

CC Scores (Normal)

Socially Desirable									Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
2.35	2.35	2.35	1.58	2.12	1.58	2.35	2.35	1.58	2.12	1.58	1.23	2.12	1.23	1.58	2.12	1.87	1.23
2.35	2.35	2.35	1.58	2.12	2.35	1.58	2.35	1.58	2.12	1.23	1.23	2.12	2.35	2.35	2.35	2.35	1.58
2.12	1.58	2.35	2.12	2.12	2.12	2.35	2.35	2.35	2.12	1.87	2.35	2.12	1.87	2.35	1.23	2.35	1.58

Parents (Socially Desirable)									Parents (Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
1.87	2.35	2.35	1.87	2.35	2.12	2.35	2.35	2.35	2.35	1.58	2.12	1.58	2.35	2.35	1.87	2.35	1.23
1.87	.7	1.87	1.87	2.35	2.35	2.35	2.12	2.12	2.12	2.12	2.12	1.58	.7	1.58	2.12	2.12	1.58
2.35	2.12	2.35	1.87	1.87	2.35	2.35	2.12	2.35	1.87	1.87	1.87	1.87	2.12	2.35	1.87	2.35	1.58

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CC Scores (Schizophrenic)

Socially Desirable									Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
1.58	1.87	2.35	2.35	2.35	2.35	2.35	2.35	1.58	2.12	1.58	1.58	1.23	1.23	2.35	2.12	2.35	2.12
2.35	1.23	2.35	2.35	2.35	1.87	2.35	2.12	2.35	1.23	1.23	1.87	2.35	2.35	2.35	.7	1.87	1.23
2.35	2.35	2.35	1.23	1.58	1.58	2.35	2.35	2.35	1.87	1.87	2.35	.7	.7	2.35	2.35	2.12	2.35

Parents (Socially Desirable)									Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
2.35	2.35	2.35	1.23	2.35	2.35	2.35	2.35	1.58	2.35	2.12	2.35	.7	2.35	.7	2.12	2.35	1.23
2.12	2.35	2.35	2.12	2.35	2.12	2.35	1.87	2.12	2.35	1.87	2.12	2.35	2.12	1.58	1.58	2.35	1.23
2.35	2.35	2.35	2.12	2.12	2.12	1.23	1.87	1.58	1.87	1.23	.7	1.58	1.87	1.87	2.12	1.87	1.58

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COQ Scores (Normal)

Socially Desirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	.7	.7	.7	.7	.7	.7
1.58	.7	1.23	.7	.7	2.35	.7	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

Socially Undesirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	2.35	2.35	2.35
.7	.7	.7	.7	.7	.7	1.58	.7	.7

Parents (Socially Desirable)								
I	A	P	A	P	I	P	I	A
1.58	1.23	.7	.7	.7	.7	1.58	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	2.35
.7	.7	.7	2.35	.7	.7	.7	.7	.7

Parents (Socially Undesirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	1.23	1.23	.7	.7	.7	2.12	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

continued on next page

COQ Scores (Schizophrenic)

Socially Desirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	1.23	.7	1.87	.7	.7	1.23
.7	.7	.7	2.35	1.58	1.58	1.58	1.58	2.35
1.87	2.12	2.35	1.58	1.58	1.58	2.35	2.12	2.35

Socially Undesirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	1.23	.7	1.23

Parents (Socially Desirable)								
I	A	P	A	P	I	P	I	A
1.87	.7	.7	2.35	1.58	1.23	.7	.7	.7
.7	1.23	1.23	2.12	.7	.7	2.35	1.58	1.87
.7	.7	.7	1.23	.7	.7	.7	.7	.7

Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A
1.58	.7	.7	2.35	2.12	1.23	.7	2.12	1.87
.7	.7	.7	.7	.7	.7	2.12	.7	.7
1.58	.7	.7	.7	.7	.7	.7	.7	.7

continued on next page

COD Scores (Normal)

Socially Desirable									Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
2.92	3.24	3.24	.7	.7	.7	3.24	1.58	.7	1.87	1.87	1.23	.7	.7	.7	2.55	1.87	.7
3.54	2.55	3.08	.7	.7	.7	.7	.7	.7	1.87	1.23	1.23	.7	.7	.7	3.24	.7	1.23
.7	.7	.7	.7	.7	.7	2.74	2.35	2.35	2.12	.7	.7	1.58	1.23	.7	.7	2.12	1.23

Parents (Socially Desirable)									Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
2.35	.7	2.55	2.55	2.12	2.92	3.24	2.92	3.08	1.87	2.35	2.35	2.55	2.35	2.35	.7	.7	.7
2.35	1.23	1.58	1.23	1.87	.7	2.74	2.92	.7	2.35	1.87	2.35	.7	.7	.7	1.58	1.23	1.23
1.58	.7	1.87	3.24	2.35	2.12	1.58	.7	.7	.7	.7	.7	.7	1.58	1.87	.7	.7	.7

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COD Scores (Schizophrenic)

Socially Desirable								
I	A	P	A	P	I	P	I	A
3.08	3.39	3.24	2.35	3.08	2.92	2.74	2.12	2.92
3.24	.7	2.35	.7	1.23	.7	2.55	2.74	3.08
3.24	3.24	2.35	2.35	2.55	2.12	3.08	3.24	3.24

Socially Undesirable								
I	A	P	A	P	I	P	I	A
2.35	1.23	1.23	1.23	.7	.7	2.12	2.35	3.08
1.58	1.23	.7	3.08	2.55	2.12	.7	1.87	.7
2.12	2.92	2.55	.7	.7	.7	2.92	2.92	3.08

Parents (Socially Desirable)								
I	A	P	A	P	I	P	I	A
2.74	3.24	2.92	2.35	3.24	3.24	2.12	1.23	.7
3.24	2.92	2.55	3.24	3.08	3.08	3.08	2.55	2.92
3.08	3.24	3.24	2.74	2.92	3.08	2.12	1.87	1.23

Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A
3.24	3.08	2.55	.7	3.08	2.55	.7	.7	.7
2.12	2.55	.7	1.23	1.58	1.23	1.87	2.55	2.74
2.35	2.55	1.23	1.58	.7	1.87	.7	1.87	1.23

continued on next page

IO Scores (Normal)

Socially Desirable									Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
1.23	.7	1.58	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
1.23	.7	1.87	.7	.7	.7	.7	.7	.7	.7	1.23	.7	.7	.7	.7	3.24	.7	.7
.7	.7	.7	1.23	.7	.7	.7	.7	.7	.7	.7	.7	1.23	.7	.7	1.58	.7	.7

Parents (Socially Desirable)									Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
2.35	.7	.7	1.23	.7	1.58	.7	1.23	1.87	2.55	3.08	2.92	.7	.7	.7	2.74	.7	.7
.7	.7	2.12	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	2.35	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7	.7

continued on next page

IO Scores (Schizophrenic)

Socially Desirable									Socially Undesirable								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
1.58	.7	1.58	1.23	.7	2.74	.7	.7	3.24	.7	.7	.7	.7	.7	.7	2.12	.7	1.23
.7	.7	.7	.7	1.23	.7	2.74	2.35	1.87	.7	.7	.7	.7	.7	.7	1.58	1.23	.7
3.08	3.39	2.35	1.87	2.55	2.35	2.74	3.24	3.24	.7	.7	.7	.7	.7	.7	2.74	2.59	1.87

Parents (Socially Desirable)									Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A	I	A	P	A	P	I	P	I	A
1.87	.7	.7	2.92	.7	.7	.7	.7	.7	2.12	.7	.7	2.74	3.08	3.24	.7	.7	.7
1.87	1.23	1.23	2.35	.7	.7	1.87	2.55	2.55	.7	.7	.7	.7	.7	.7	2.12	2.55	2.12
1.23	1.23	.7	2.55	2.35	1.87	.7	.7	.7	1.58	.7	.7	.7	.7	.7	.7	.7	.7

continued on next page

I Scores (Normal)

Socially Desirable								
I	A	P	A	P	I	P	I	A
1.58	.7	1.58	.7	.7	.7	1.23	.7	.7
1.23	.7	1.58	.7	.7	.7	1.58	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

Socially Undesirable								
I	A	P	A	P	I	P	I	A
.7	.7	.7	.7	.7	.7	1.23	.7	1.23
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

Parents (Socially Desirable)								
I	A	P	A	P	I	P	I	A
.7	.7	1.23	.7	1.58	1.58	1.87	1.87	1.58
1.87	.7	.7	1.23	1.23	1.23	1.23	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A
.7	1.23	1.23	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7
.7	.7	.7	.7	.7	.7	.7	.7	.7

continued on next page

I Scores (Schizophrenic)

Socially Desirable								
I	A	P	A	P	I	P	I	A
1.58	2.12	2.35	.7	.7	.7	1.23	.7	.7
.7	.7	2.12	.7	.7	.7	2.35	2.35	2.12
2.55	2.55	2.55	1.87	1.58	2.12	1.87	1.87	2.12

Socially Undesirable								
I	A	P	A	P	I	P	I	A
1.23	.7	.7	.7	.7	.7	1.58	1.58	2.12
.7	.7	.7	.7	1.23	.7	.7	.7	.7
1.23	.7	.7	.7	.7	.7	.7	.7	.7

Parents (Socially Desirable)								
I	A	P	A	P	I	P	I	A
.7	1.23	.7	.7	1.23	1.23	.7	1.23	.7
2.12	.7	1.58	.7	1.58	.7	.7	.7	.7
1.23	1.23	1.23	2.12	2.35	1.87	.7	.7	.7

Parents (Socially Undesirable)								
I	A	P	A	P	I	P	I	A
1.23	.7	.7	1.23	.7	.7	.7	.7	.7
1.23	1.23	.7	1.58	.7	.7	.7	.7	.7
.7	.7	.7	1.23	.7	1.23	.7	.7	1.23

Appendix C

Raw Scores, Transformed Scores and their Frequency in each Quality

CC Scores

Raw Score	Transformed Score	Frequency I	A	P
0	.7	1	3	4
1	1.23	2	12	6
2	1.58	6	19	4
3	1.87	12	9	8
4	2.12	16	12	14
5	2.35	36	17	36

COQ Scores

Raw Score	Transformed Score	Frequency I	A	P
0	.7	57	52	54
1	1.23	2	7	4
2	1.58	6	1	6
3	1.87	3	2	0
4	2.12	2	2	3
5	2.35	2	8	5

COD Scores

Raw Score	Transformed Score	Frequency I	A	P
0	.7	18	22	21
1	1.23	3	12	6
2	1.58	3	2	5
3	1.87	9	2	3
4	2.12	7	0	4
5	2.35	7	5	6
6	2.55	3	5	8
7	2.74	2	2	3
8	2.92	6	4	3
9	3.08	4	6	6
10	3.24	6	6	7
11	3.39	0	1	0
12	3.54	1	0	0

IO Scores

Raw Score	Transformed Score	Frequency I	A	P
0	.7	49	49	51
1	1.23	5	4	2
2	1.58	3	0	4
3	1.87	3	4	2
4	2.12	1	2	3
5	2.35	3	2	2
6	2.55	4	2	1
7	2.74	1	1	4
8	2.92	0	2	1
9	3.08	1	1	1
10	3.24	2	2	1
11	3.39	0	1	0
12	3.54	0	0	0

I Scores

Raw Score	Transformed Score	Frequency I	A	P
0	.7	49	54	47
1	1.23	10	9	10
2	1.58	4	2	8
3	1.87	4	1	2
4	2.12	2	4	1
5	2.35	2	1	3
6	2.55	1	1	1

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Approved by;

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