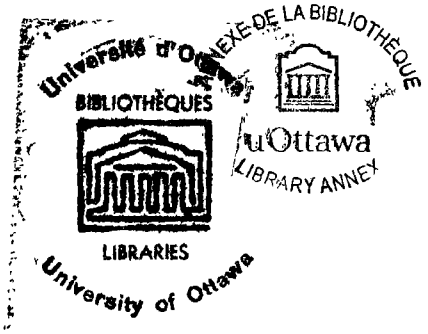
A STUDY OF THE RELATIONSHIPS BETWEEN LEVELS OF CONCEPTUALIZATION AND SOCIALIZED ACTION-TENDENCIES IN HOSPITALIZED MALE SCHIZOPHRENICS

by Sister Thomas Francis Lynch (Gladys Marie) Sr.

Thesis presented to the School of Psychology and Education of the University of Ottawa as partial fulfillment of the requirements for the degree of Doctor of Philosophy



Ottawa, Canada, 1964

ACKNOWLEDGMENTS

This dissertation was prepared under the supervision of Professor Maurice Chagnon, Ph.D., Assistant Director of the School of Psychology and Education of the University of Ottawa. His expert guidance and encouragement are deeply appreciated.

The writer is indebted to Professor Lawrence T. Dayhaw, Ph.D., for his profitable assistance with the statistical analysis and to Mr. Gilles Chagnon, M.Ps., for his help in selecting the statistical method. The writer is grateful to Dr. F. Snedden, Superintendent of the Ontario Mental Hospital, Brockville, for permission to use the facilities of the hospital, and to Dr. J. O'Connell and Mr. N. Derrick for their assistance in selecting the population.

The writer is also grateful to Commanding Officer C.N.K. Kirk of the Royal Canadian Mounted Police, Division A, and his men who participated in this experimental research.

CURRICULUM STUDIORUM

Sister Thomas Francis Lynch was born December 28, 1915, in Noroton Point, Connecticut, U.S.A. She received the Bachelor of Arts degree from Saint Joseph College, Hartford, Connecticut, in 1951, and the Master of Arts degree in Psychology from the Catholic University of America in Washington, D.C. in 1958. The title of her thesis was A Study of the Personality Status of Retarded Readers.

TABLE OF CONTENTS

Chapter — page

INTRODUCTION vii

I.- REVIEW OF THE LITERATURE 1
1. The Nature of the Conceptual Deficit in Schizophrenia as Indicated by Studies Using Performance Tasks 2
2. Evaluation of Schizophrenic Conceptualization on Verbal Tasks 9
3. The Logic Underlying Schizophrenic Conceptualization 12
4. Overinclusiveness as a Factor of Conceptual Deficit 14
5. The Relations of Conceptualization and Socialization 17
6. Summary and Basic Hypothesis 27

II.- EXPERIMENTAL DESIGN. 31
1. Tools of the Experiment 31
2. Method of Administration 41
3. Sample Population 42
4. Statistical Procedure 49

III.- PRESENTATION AND DISCUSSION OF THE RESULTS 52
1. Inter-Group Differences in Conceptualization and Socialization 52
2. The Influences of the Sub-Categories of the Social Dimension on the Total Chi Square Results 56
3. The Implications of the Present Findings to Past and Future Research 60

SUMMARY AND CONCLUSIONS 68

BIBLIOGRAPHY 69

Appendix

1. SAMPLE OF MILGRAM'S WORD MEANING TEST AND SCORING SHEET. 72

2. PRESENTATION OF RAW DATA. 75

3. FREQUENCY DISTRIBUTION OF AGE FOR THE EXPERIMENTAL AND CONTROL GROUPS. 79a

4. ABSTRACT OF A Study of the Relationships Between Levels of Conceptualization and Socialized Action-Tendencies in Hospitalized Male Schizophrenics. . . 80

LIST OF TABLES

Table — page

I.- Test-Retest Reliability Coefficients on the Word Meaning Test and the Hand Test for the Experimental and Control Groups. 40

II.- Means, Standard Deviations, Standard Error of Means and t Value for Ages of the Experimental and Control Groups 45

III.- Frequencies and Means for the Educational Level of Experimental and Control Groups 46

IV.- Frequencies of the Sub-Categories of the Schizophrenic Group. (N:50). 47

V.- Frequency of the Schizophrenic Group (N:50) in the Types of Wards 48

VI.- Partition of Chi Square When Probabilities are Estimated from Marginal Totals 50

VII.- The Chi Square Values for the Total Three-Way Analysis and the Three Two-Way Analyses for the Experimental and Control Groups. 54

VIIa.- Frequency Table for the Multi-Dimensional Chi Square. 61

VIII.- Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups 75

IX.- Frequency Distribution of Age for the Experimental and Control Groups 79a

LIST OF FIGURES

Figure page

1.- Means of the Total Scores for the Subdivisions of the Experience Ratio for the Experimental and Control Groups. 58

INTRODUCTION

Some experimental studies as well as clinical experience with schizophrenics seem to indicate that there is a tendency for concrete conceptualization to occur concomitantly with non-social action tendencies. However, very few objective studies relating the two variables have been reported in the literature.

Most of the studies done to date have been concerned primarily with the type of deficit in conceptualization and only incidently with relating it to the social variable in schizophrenia. Since one of the main characteristics of schizophrenia is withdrawal from social interaction, it was thought feasible to attempt to evaluate the socialized action-tendencies and to relate them to a specific level of conceptualization. Cameron's hypothesis of concrete preference as a corollary to social disarticulation provided the theoretical framework in which to interpret the results and to statistically reject or support his position.

With the advent of a modification of the chi square analysis to fit a multi-dimension model, the variables of conceptualization, socialization and normalcy could be more accurately and meaningfully assessed.

This report is concerned with the nature of the conceptual deficit, abstract or concrete, and its relation to socialization in schizophrenics and normals.

The first section of the dissertation presents a review of the literature on the various approaches used in studying conceptualization and socialization. Emphasizing quantitative studies, this summary reveals the controversy that exists regarding the nature of the conceptual deficit and the comparatively few studies which correlate it with the social variable.

A description of the experimental design of the project is presented, delineating the nature of the tests utilized and the criteria for selecting the sample population. The method of administration of the tests is given and the section concludes with a detailed description of the statistical operations employed.

The results obtained in this analysis of the relationships between conceptualization and socialization are then presented and discussed. This discussion evaluates the inter-group differences in the two variables. Then the implication of the results to past and future research is discussed.

Finally, the summary and conclusions of the investigation are presented along with suggestions for further research.

CHAPTER I

REVIEW OF THE LITERATURE

A survey of the literature on schizophrenia revealed recurrent stress on two factors of personality, namely: that of conceptualization along an abstract-concrete continuum, and the inadequacy of socialization. Few studies have been done relating the two facets. Therefore, it seemed feasible to study the differences between schizophrenics and normals on measures of levels of conceptualization and socialized action-tendencies. The present chapter will review and evaluate the research on the nature of the conceptual deficit in schizophrenia as indicated by results on performance and verbal tasks. Then the theoretical considerations underlying the logic of schizophrenic conceptualization will be considered. Other studies within the framework of the two alternate hypotheses to impaired thinking, that of overinclusiveness and of social incommunicability, will be presented. Cameron's[1] concept of social disarticulation will be delineated, because this study will be interpreted in terms of this theoretical position. Finally, a summary of the findings of research and the formulation of the hypothesis of the present study will conclude the chapter.

---

1 N. Cameron, The Psychology of Behavior Disorders, New York, 1947, 1-598 p.

1. The Nature of the Conceptual Deficit in Schizophrenia as Indicated by Studies Using Performance Tasks.

A great variety of conceptual tasks were developed to measure conceptualization in general, and concreteness in particular. The subjects were asked either to build concepts from a set of stimuli or to learn the concept represented by a predetermined set of stimuli. Responses to these tests have been classified in many different ways and thereby add to the confusion in the field of conceptual research.

Sorting tests yielded evidence that some schizophrenics tended to give more concrete responses than normals. According to Goldstein[2] the disorder of schizophrenia was to be assessed in terms of a loss of abstract attitude. By using certain sorting tests, Goldstein and Scheerer[3] distinguished between two kinds of human behavior, the abstract and the concrete. However, though they devised a standard administration method for the tests, they failed to develop a standard scoring procedure. Consequently the concept of concreteness represented a composite of wide deviations subjectively

---

2 K. Goldstein, "Methodological Approach to the Study of Schizophrenic Thought Disorder", in J.S. Kasanin (ed.), Language and Thought in Schizophrenia, California, 1944, p.18.

3 -------- and M. Scheerer, "Abstract and Concrete Behavior, an Experimental Study with Special Test", in Psychological Monographs, Vol. 53, No. 2, 1951, vi-151 p.

rated by the examiners; a distinct disadvantage in any research instrument. Originally the conceptual levels were used to distinguish brain-damaged patients from normals. Then they were transferred to describe schizophrenic thinking, thereby extending the concepts with consequent imprecision. Theoretically, the concrete attitude was realistic and bound to the immediate experience of a given thing or situation in its particular uniqueness. Thinking and acting were directed by the immediate claims made by one particular aspect of the object or situation in the environment.

The abstract attitude transcended the immediately given and abstracted from particulars. Action was directed by a more conceptual point of view. However, there were gradients in both concrete and abstract behavior. The normal individual combined both attitudes and was capable of shifting from one to the other as circumstances required. However, in schizophrenia, behavior was disintegrated and the abstractive capacity was impaired. It was important to emphasize that:

> The process of disintegration in the direction of concrete behavior does not prevent the arousal of ideas and thoughts; what it actually affects and modifies is the way of manipulating and operating them. Thoughts do arise, but they can only become effective in a concrete way: just as the patient cannot deal with outer-world objects in a conceptual frame of reference, so he deals with ideas simply as things which belong to an object or situation. Concepts, meanings, categories--other than situational means-end relations--are not within his scope.[4]

---

4 Goldstein, Op. Cit., p. 20-21.

Thus concreteness inhered within schizophrenic language. Frequently there was a lack of generic words which signified categories or classes. In addition to the extreme concreteness of schizophrenic thinking, there was a projection of irrelevant ideas into speech and action. Consequently, the language seemed embellished and animated at times. Practically and theoretically the work of Goldstein furthered research even though it was poorly adapted experimentally for validation.

A theory of schizophrenic thinking was devised by Vigotsky[5] based on the results of sorting tests. He decided that normal thinking developed ontogenetically from an associative complex stage to the final stage of true conceptual thinking. In the associative complex stage, psuedo-concepts formed on the basis of similar concrete and mechanical elements. Things were associated on the basis of non-essential similarities and many divergent ideas were fused in a chain-like arrangement under one conceptual heading. In the mature stage, true concepts based upon essential, abstract similarities form the basis of thought. The immature process was not eradicated from adult conceptualization, but appeared in psychic deterioration, or even in normals in

---

5 L.S. Vigotsky, "Thought in Schizophrenia", in The Archives of Neurology and Psychiatry, Chicago, Vol. 31, 1934, p. 1065.

states of excessive fatigue or severe illness. Vigotsky was a regression theorist and believed that schizophrenic thinking was a return to an earlier immature stage. The sorting test which was used had no quantitative scoring except a "time-help" score devised by Hanfmann and Kasanin.[6] The "time-help" score represented the number of times the examiner had to correct the schizophrenic patient multiplied by five and added to the number of minutes taken. The results could be attributed to the slowness of the schizophrenics rather than to conceptual disability.

Schizophrenic thinking was designated by Werner[7] as syncretic, because separate ideas tended to become fused into one another without differentiation and separate aspects of the self, such as thought, perception, feeling also seemed to coalesce. Such may be observed in the numerous language distortions of the schizophrenic. The patient seemed bound to the phenomenal attributes of the immediately apparent. Words were considered as sense data rather than as symbols, so that the word was considered to be a quality of its denoted object, or else apprehended as an independent object with distinctive characteristics, as in clang associations.

---

6 E. Hanfmann and J. Kasanin, "A Method for the Study of Concept Formation", in The Journal of Psychology, Vol. 3, 1937, p. 521-540.

7 H. Werner, Comparative Psychology of Mental Development, Chicago, 1948, p. 106.

The developmental stages in conceptualization were categorized by Kasanin.[8] The first was that of physiognomic thinking, in which the child animated objects and projected his ego into them. As the child developed, a type of concrete thinking emerged which was realistic and literal. The capacity to use language to form abstractions and generalizations was the final stage, and was called abstract thinking or categorical thinking. It was the prerogative of the adult. According to Kasanin, schizophrenic thinking was concrete and lacked the discriminative power of classifying ideas according to established principles. Even when such principles were explained to a schizophrenic, he rejected them in favor of unacceptable categorizations. Another important factor was the vacillation between parts of presented data due to an inability to abstract one principle while neglecting others.

Angyal[9] pointed out that the schizophrenic suffered not so much from difficulty in understanding relationships, as from the fact that it was impossible to see connections in a unitary system in terms of which normal people think.

---

8 J.S. Kasanin, "The Disturbance of Conceptual Thinking in Schizophrenia", in Language and Thought in Schizophrenia, California, 1944, p. 41-42.

9 A. Angyal, "Disturbances of Thinking in Schizophrenia", in Kasanin (ed.), Language and Thought in Schizophrenia, California, 1944, p. 117.

He believed that the concept of relationship was inadequate to describe the organization of wholes, since a Gestalt was neither a collection of parts nor a collection of relationships between parts. The whole had a definite organization according to a unitary plan. He hypothesized that:

> The thinking of the schizophrenic patient is not impaired so far as apprehending of relationships is concerned; the schizophrenic, when he fails in the solution of an intellectual task, fails in the apprehension of system connections.[10]

The disturbance was described as difficulty in abstraction, in generalizing, or in categorical thinking.

Comparing young schizophrenics to young normals, Fey[11] studied the performance on the Wisconsin Card Sorting Test. The technique had the advantage of objective scoring which provided quantitative measures. She found that the schizophrenics experienced greater difficulty in solving a problem which involved the effective utilization of generalizations or concepts than did the normals. Although she matched the groups for age, intelligence and education, the sample size was relatively small, only ten men and twelve women.

---

10 Angyal, Op. Cit., p. 117.

11 E. Fey, "The Performance of Young Schizophrenics on the Wisconsin Card Sorting Test", in The Journal of Consulting Psychology, Vol. 15, No. 4, 1951, p. 311-319.

A series of studies using the Goldstein-Gelb-Weigl Sorting Test was conducted by McGaughran and Moran[12,13] in which a conceptual level was opposed to a conceptual area. In the first analysis, the purpose was a quantitative investigation of differences in conceptualization in matched pairs of schizophrenics and nonpsychiatric patients when age, educational level, intelligence and length of hospitalization were controlled. The conclusion was that schizophrenics showed a loss of social communication without impaired abstractive ability. The selection of a homogeneous sample might have influenced the results. Only paranoids were used and, therefore, it would have been more exact to apply the results to that group rather than generalizing to schizophrenics in general. In a second analysis, performance was measured in terms of "publicness-privateness" and "openness-closedness" of the concept behavior. The schizophrenics were significantly different without apparent deficit in abstract ability.

---

12 L.S. McGaughran and L.J. Moran, "Conceptual Level Versus Conceptual Area Analysis of Object-Sorting Behavior of Schizophrenic and Nonpsychiatric Groups", in The Journal of Abnormal and Social Psychology, Vol. 52, No. 1, 1956, p. 43-50.

13 L.S. McGaughran, "Differences Between Schizophrenic and Brain Damaged Groups in Conceptual Aspects of Object Sorting", in The Journal of Abnormal and Social Psychology, Vol. 54, No. 1, 1957, p. 44-49.

Later, Wechowicz and Blewett[14] attempted to replicate McGaughran and Moran's study using a more heterogeneous sample and obtained the opposite effect. There was a deficit in conceptual level, but not in social communicability. In view of these contradictory findings, the problem of the schizophrenic pattern in conceptual performance and social communication seemed unresolved.

At the present time there seems to be no general agreement on the exact nature of the task presented by the sorting test situations, nor the factors inherent in the mental disorder which might militate against success.

2. Evaluation of Schizophrenic Conceptualization on Verbal Tasks.

A further method of assessing concreteness was the use of verbal material, such as proverbs and vocabulary tests. In defining proverbs, either verbally or by selecting alternatives from a multiple choice form, schizophrenics gave fewer abstract and more concrete responses than normals. Benjamin[15] studied language disturbance by means of proverbs. He found that literal interpretations were typical of the

---

14 T.E. Wechowicz and D.B.Blewett, "Size Constancy and Abstract Thinking in Schizophrenic Patients", in The Journal of Mental Science, Vol. 105, 1959, p. 909-934.

15 J.B. Benjamin, "A Method for Distinguishing and Evaluating Formal Thinking Disorders in Schizophrenia", in Kasanin (ed.), Language and Thought in Schizophrenia, California, 1944, p. 65.

schizophrenic, and that more marked disorders in conceptualization were found in hebephrenics and paranoids and less in paranoics and acute catatonics. However, the evaluation of the responses was based on descriptive classifications assigned by different examiners which allowed for greater subjectivity.

A greater degree of experimental control was exercised by Gorham[16] in the study of schizophrenic thinking with a multiple-choice proverb test. He conducted a pilot study on one hundred and eighteen chronic schizophrenics and seventy-eight normals. For each of the twelve proverbs the subjects were to choose one of four interpretations, some of which were concrete and others abstract. Gorham found a significant correlation between concreteness and a test of verbal comprehension. In an extension of this study, Gorham tested one hundred chronic schizophrenics and one hundred normals matched for education, age and vocabulary. The abstract and concrete scores derived from the multiple-choice proverb test differentiated the groups at the $p < .001$ level. In a later cross-validation study, the results were reconfirmed. From the results of this carefully controlled

---

16 D.R. Gorham, "The Use of Proverbs Test for Differentiating Schizophrenics from Normals", in The Journal of Consulting Psychology, Vol. 20, No. 6, 1956, p. 435-440.

study it would seem that schizophrenics tend to be concrete in the interpretation of proverbs.

The evaluation of schizophrenic conceptualization by means of vocabulary tests, rendered contradictory results. Two studies, one by Feifel[17] and another by Harrington and Ehrmann[18] showed that in defining words verbally, schizophrenics gave significantly fewer abstract responses than normals. However, an investigation of the conceptual level of schizophrenic definitions by Moran, Moran and Blake[19] resulted in non-significance. In testing a group of forty schizophrenics and forty normals on word meaning, the schizophrenics were not more concrete than normals. The same patients were later asked to give as many synonyms as possible for each of the defined words, and in this case the schizophrenics gave more imprecise ones. The subjects were then given stimulus words followed by eight words more or less associated. Again the schizophrenics selected more

---

17 H. Feifel, "Qualitative Differences in the Vocabulary Responses of Normals and Abnormals", in Genetic Psychology Monograph, No. 39, 1949, p. 151-204.

18 R. Harrington and J.C. Ehrmann, "Complexity of Response as a Factor in the Vocabulary Performance of Schizophrenics", in The Journal of Abnormal and Social Psychology, Vol. 49, No. 3, 1954, p. 362-364.

19 L.J. Moran, F.A. Moran, and R.R. Blake, "An Investigation of the Vocabulary Performance of Schizophrenics II. Conceptual Level of Definitions", in The Journal of Genetic Psychology, Vol. 80, 1952, p. 107-132.

distantly related words. Perhaps in a semi-structured task precision breaks down.

A study by Rabin, King and Ehrmann[20] evaluated three aspects of vocabulary performance on a picture vocabulary test, verbal vocabulary achievement, and level of verbal definition. Significant differences were found between long-termed schizophrenics and normals on all three measures, but not between short termed schizophrenics and normals. Thus the importance of stage of the mental disorder as a variable was demonstrated experimentally.

3. The Logic Underlying Schizophrenic Conceptualization.

Essentially involved in selective abstraction was logical functioning. Von Domarus[21] stated that the distinguishing mark of schizophrenic thought was "predictive" logic; the logical identities were made on the basis of identical predicates instead of on identical subjects. The schizophrenic thinker, a paralogician in Domarus' terms, concluded from the statement "Indians are swift" and "stags

---

20 A.I. Rabin, C.F. King and J.C. Ehrmann, "Vocabulary Performances of Short-term and Long-term Schizophrenics", in The Journal of Abnormal and Social Psychology, Vol. 50, No. 2, 1955, p. 258-258.

21 E. von Domarus, "The Specific Laws of Logic in Schizophrenia", in Kasanin (ed.), The Language and Thought in Schizophrenia, California, 1944, p. 65.

are swift" that "Indians are stags" because swift is common to both. Likewise a schizophrenic might equate a man and a house because both were described as surrounded. Neither the nature of the surroundings nor that of the surrounded made any difference in the conclusion reached. The difference between logical and paralogical thinking was that the former was based on Aristotelian logic and the latter concluded identity from the similar nature of adjectives.

Perhaps the concepts of von Domarus would not have received the deserved attention if Arieti[22] had not developed similar ideas in more detail. Arieti termed the predicative logic of schizophrenics "Paleological" thinking and believed it to be characteristic of autistic thinking in general. Thus material found in dreams of normal people would fall into the same category. The mediating predicates used in schizophrenic reasoning may be that of similarity, contiguity, time, space, finality, causality or any characteristic which two events can share in common. The schizophrenic tended to disregard the connotation of words while attention was diverted to the denotation. The physical aspects of the word itself was concentrated on and from that concreteness emerged. In the paranoid a different pattern occurred:

---

22 S. Arieti, Interpretation of Schizophrenia, New York, 1955, p. 65.

> Aristotelian thought is preserved to a considerable extent (...) but it is often strangely used to support conclusions reached by paleologic thought. This situation is, to a certain degree, reminiscent of those defences of the ego which in many neuroses protect or reinforce, unconscious complexes.[23]

4. Overinclusiveness as a Factor of Conceptual Deficit.

Recent research has linked conceptual deficit with overinclusiveness. Cameron[24] believed that schizophrenics were not overly concrete, but rather abstract because of the inability to preserve conceptual boundaries, which resulted in the incorporation of irrelevant ideas.

> It is the result of unstable ego organization which fails to limit the number and kind of simultaneously effective excitants to a relatively few coherent ones.[25]

Chapman and Taylor[26] offered a direct test of the overinclusion hypothesis. Using a card-sorting task in which there were incorrect elements similar to the correct elements, they demonstrated that the schizophrenics used the incorrect distracter communalities as a basis for sorting more often

---

23 Arieti, Op. Cit., p. 187.

24 N. Cameron, "Deterioration and Regression in Schizophrenic Thinking", in The Journal of Abnormal and Social Psychology, Vol. 34, No. 2, 1939, p. 265-270.

25 --------, Personality Development and Psychopathology, Boston, 1963, p. 613.

26 L.J. Chapman and J.A. Taylor, "Breadth of Deviate Concepts Used by Schizophrenics", in The Journal of Abnormal and Social Psychology, Vol. 54, No. 1, 1957, p. 118-123.

than the normals did. The findings were interpreted as indicating that the schizophrenic deficit on conceptual tasks is in part the result of being overly responsive to distractions. Actually, Chapman was testing whether schizophrenics could form concepts at all, rather than the level of conceptualization. In a later study, Chapman[27] remedied this defect by varying the difficulty of the conceptual tasks on two levels, in order to simultaneously test responsiveness to associative distractions and level of conceptual ability. It was found that both the level of concept difficulty and the presence of associative distractions interacted to influence conceptual performance adversely and thus supported both the hypotheses of impaired ability and of overinclusion.

The controversy over the relationships between these two variables was studied by Payne, Mattusek and George.[28] In order to test the overinclusive hypothesis, a large battery of tests was employed. Of the five measures of concreteness used, only one, the Object Sorting Test, significantly differentiated between the schizophrenics and normals.

---

27 L.J. Chapman, "Intrusion of Associative Responses into Schizophrenic Conceptual Performance", in The Journal of Abnormal and Social Psychology, Vol. 56, No. 3, 1958, p. 374-379.

28 R.W. Payne, P. Mattusek and E.I. George, "An Experimental Study of Schizophrenic Thought Disorder", in The Journal of Mental Science, Vol. 105, p. 627-652.

The latter result was explained away as being,

> (...) due to the heterogeneous nature of the material, which favored the production of unusual overinclusive responses some of which are labelled concrete when Goldstein's criteria are applied.[29]

The authors reported that the other four measures of concreteness failed to reach significance. There were limitations in the sampling of the study. For example, neurotics were used as the control group. There was some evidence that such a control group would diminish the magnitude of the differences on the tests of concreteness, since some neurotics approach some schizophrenic types in conceptual performance. There were no chronic schizophrenics in the study which could diminish the concrete score, because concreteness has been demonstrated to be more pronounced in the chronic population.

Recent research on overinclusive thinking by Payne[30] suggested that schizophrenics were heterogeneous with respect to overinclusive thinking, and only about half the patients diagnosed as schizophrenic were abnormally overinclusive. The implications of overinclusive thinking have not been exhaustively investigated. It may be that such

---

29 Payne, et. al., Op. Cit., p. 650.

30 R.W. Payne, "An Object Classification Test as a Measure of Overinclusive Thinking in Schizophrenic Patients", in The British Journal of Clinical Psychology, Vol. 1, 1962, p. 213-221.

thinking may be a relatively specific disorder, virtually independent of general intelligence and the retardation which commonly characterized many psychotic patients. More research is needed to substantiate the nature and prevalence of the overinclusive hypothesis relative to schizophrenia.

5. The Relations of Conceptualization and Socialization.

In the course of individual development, according to Rapaport,[31] ideation changed into thought and the change was marked not only by a shift from the pleasure principle to the reality principle, but by a crucial reorientation from the idiosyncratic character to the socially shared character of thinking. Socialization was syntonic with the individual's personality organization. The motivations of ordered thought were, in varying degrees, socially shared.

Piaget's[32] detailed stage-analytic theory of intellectual development provided an historical frame and perspective within which to view adult behavior. Piaget referred to the first, primitive concepts used by a child as preconcepts. In keeping with the general character of preoperational thought, these preconcepts tended to be action-ridden,

---

31 D. Rapaport, Organization and Pathology of Thought, New York, 1951, 1-730 p.

32 J. Piaget, Language and Thought, London, 1932, v-234 p.

imagistic, and concrete. Piaget pointed out that the transition from egocentric thinking to a higher level of thinking which recognized the relativity of qualities, was dependent upon the discovery of the relativity of the "me". Though Piaget's conclusions linked the socialization of thinking to reflective awareness, the findings concerning the process were limited and the understanding of them in terms of a cathectic theory was confused.

According to Sullivan,[33] schizophrenic thinking paralleled ordinary thinking in its less censored symbolism, as in reverie and dreams. He believed that the occurence was explicable in terms of a peculiarly inadequate adaptation of the cognitive processes to the necessities of adult life. The characteristic pattern was one of reversive change within the dissociative systems.

Cameron emphasized the intimate relation between thought and socialization in child development. He stated:

> As the child gradually acquires speech the organization of his language is determined by his social environment, his thinking tends to become progressively more socialized. The continual interchange between a given person and those around him not only develops the social character of his language and thought but also maintains it afterward at an adequate social level.[34]

---

33 H. Sullivan, Schizophrenia as a Human Process, New York, 1962, vii-351 p.

34 Cameron, 1947, Op. Cit., p. 82.

Cameron maintained that the developing individual adopts the general attitude of the social group such that he eventually comes to respond to his own behavior with the same attitudes that others do. In the schizophrenic, autistic fantasy tends to crowd out social communication and the patient's continuing social isolation becomes less and less influenced by social interaction. Thus thought disorganization should be regarded in the complex matrix of causal factors which include an increasing isolation and a consequent loss of ability to take the role of a listener, an increasing utilization of thinking modes which are private, rather than socially-shared in character. He stated that:

> Language and thought, which together are called symbolic behavior, must never be looked upon as something apart from the rest of human living. Language behavior is learned by each of us in action, and social thinking is derived directly from it.[35]

When language becomes disorganized, social disarticulation is inevitable, because language is the most effective instrument of interpersonal communication, and enriches potentialities for role-taking. Schizophrenia develops in anxiety-ridden, lonely individuals, who are socially inept and immature. The individual has never acquired sufficient social skill for shifting perspectives by assuming successive role when under stress. The individual with defective

---

35 Cameron, 1947, Op. Cit., p. 82.

role-taking habits can see things from a limited point of view and fails to see alternate choices. As Cameron noted:

> It is our view that disorganized schizophrenics are persons who never have developed very adequate role-taking skills and have, therefore, not been able to establish themselves firmly in their cultural pattern.[36]

As a result of Cameron's[37] investigation of thought disorder, he delineated descriptive categories. In one category "asyndesis", there was a conglomerate of relevant, but loosely related verbal elements which shared in a vague sense the same meaning sphere. The elements were felt by the subject to be related, but were actually a fragmentation. Another category was called "metonymic distortion", by which Cameron described an unprecise approximation in which some substitute term was given instead of one a normal person would give; for example, a patient stated that he had his menu three times a day. Related to this was "scatter by amplification", by which the schizophrenic attempted to clarify meanings by reverbalizing even less relevant material. Cameron posited the phenomenon of "interpenetration of themes", by which was meant the constant intrusion of autistic, non-relevant material into the stream of thought. The

---

36 N. Cameron, "Experimental Analysis of Schizophrenic Thinking", in J.S. Kasanin (ed.), Language and Thought in Schizophrenia, California, 1944, p. 51.

37 Ibid., p. 52-54.

severely disorganized individual reached a point where all external influences were blocked out in favor of his own preoccupations. When a patient's asocial fantasy themes were able to subordinate all external events his view of the environment became so distorted that it was impossible to function socially in an organized way.

Research has shown that the conceptual deficit of schizophrenics was increased when social, interpersonal content was involved in the task. Whiteman[38] derived a hypothesis involving Cameron's view of schizophrenic thinking as a product of social disarticulation as opposed to Goldstein's interpretation that the defect was the result of a concrete attitude. The prediction was that schizophrenics would exhibit a greater deficit on a test of social concepts than on a test of formal concepts. Two formal concept tests and a pictorial social concept test were administered to thirty-one schizophrenics and thirty-one nonpsychiatric subjects matched for vocabulary, sex, education and age. The impairment on the social concept test was found to be significantly greater than decrement on tests of non-socially toned concepts. The evidence supported the theoretical position of social withdrawal as a determinant of cognitive functioning. In a

---

38 M. Whiteman, "The Performance of Schizophrenics on Social Concepts", in The Journal of Abnormal and Social Psychology, Vol. 49, No. 2, 1954, p. 226-271.

subsequent study, Whiteman[39] delineated the qualitative aspects of schizophrenic thought in forming social concepts. The social concept test differentiated the schizophrenic with respect to the incidence of individualistic responses, rejections, explicitly formulated concepts, physicalistic responses and inappropriate responses. The schizophrenic sample tended to show a greater frequency of responses that evidenced the intrusion of emotional factors. The results of the study emphasized the importance of the schizophrenic asocial tendencies impinging upon the cognitive processes. The findings supported Cameron's position that the thinking of schizophrenics is a manifestation of asociability.

The relation of level of conceptualization and socialization was studied by Flavell.[40] He found significant differences between schizophrenics and normals on a test of word meanings. Normals selected more essential abstract words and the schizophrenics more non-essential concrete words to describe the relationships. Within the schizophrenic group, ability to abstract was positively related to

---

39 M. Whiteman, "Qualitative Features of Schizophrenic Thought in the Formulation of Social Concepts", in The Journal of Nervous and Mental Diseases, Vol. 124, No. 1, 1956, p. 199-204.

40 J. Flavell, Thought, Communication and Social Integration in Schizophrenia: an Experimental and Theoretical Study, unpublished doctoral thesis presented to the School of Psychology of Clark University, 1955, 1-208 p.

ratings on adequacy of everyday social behavior. The word meaning test constituted an experimental measure of abstract verbal thinking. The subjects were presented with common words and asked to choose between two other words, the one which had the closer meaning. The tendency to make choices on the basis of abstract essential meaning relationships between the matched words was presumed to reflect genetically mature, abstract conceptualization, and conversely, choices on the basis of concrete, non-essential meaning relationships was supposed to reveal concrete, genetically immature thinking.

As the experimental measure of social interaction, Flavell devised a special behavior rating scale measuring four traits believed to underlie social integration, namely: emotionality; sociability, or the tendency to show affective involvement in interpersonal situations; coherence, or the ability to make oneself understood by others; and awareness, or the tendency to be cognizant of people and events in the environment. Within the schizophrenic group, concreteness was significantly related to inadequacy of social behavior, as measured by the rating scale. Flavell found that the schizophrenics with the most unusual concepts tended to be the least sociable, perhaps because they found communication with others so difficult. There were two significant limitations in the study. The social rating scale was marked by

different nurses on the psychiatric wards and thereby greater subjectivity was introduced. Secondly, the responses on the word meaning test were so paired that only two concrete and two abstract responses occurred over forty per cent of the items.

Milgram[41] attempted to correct the latter limitation by modifying Flavell's word meaning test so that a subject chose between one concrete and one abstract word on each of forty-eight test cards. He compared the preferences of schizophrenics, brain-damaged, and normals for abstract or concrete word meaning relationships. He found that both schizophrenic and brain-damaged patients chose fewer abstractly related words. The statistical analysis of data showed significant differences between all sub-categories of relationships except part-whole and concrete-context. The relation of abstract and concrete preferences to degree of social interaction was incidental since the latter was established on the basis of the examiner's observation. In the conclusion of the study, Milgram interpreted the deficiencies as indicating that lowered role-taking performance in schizophrenia was related to deficits in cognition.

---

41 N.A. Milgram, Cognitive and Empathetic Factors in the Role Attitudes of Schizophrenics and Brain-damaged Patients, unpublished doctoral dissertation presented to the School of Psychology of Boston University, Boston, 1958, 86 p.

The present study is a further investigation of Milgram's abstract-concrete dimension in schizophrenia and the consequent relationships to socialized action-tendencies as measured by Wagner's Hand Test.[42] In terms of rationale, Wagner expected that a projective personality test which employed hands as visual stimuli would throw light on the action tendencies of subjects projecting onto the cards. Research showed that the Hand Test differentiated between clinical groups at highly significant levels. In an exploratory study, Wagner[43] was concerned with differentiating a known group of schizophrenics from normals. A statistical analysis with the results of a median test showed that the distribution of responses for the groups for each category were significant at the $p < .001$ level of significance with the exception of the inactive category which reached $p < .05$. The maximum differentiation was obtained from the withdrawal category which produced a correlation of .81 between the presence of withdrawal responses and schizophrenia. In a later study, Wagner[44] differentiated neurotics from schizophrenics by means of the test. Again the withdrawal score

---

42 E.E. Wagner, The Hand Test, Ohio, 1962, p. 1-60.

43 ---------, "The Use of Drawings of Hands as a Projective Medium for Differentiating Normals and Schizophrenics", in The Journal of Clinical Psychology, Vol. 27, No. 3, 1961, p. 279-280.

44 ---------, "The Use of the Hands as a Projective Medium for Differentiating Neurotics and Schizophrenics", in The Journal of Clinical Psychology, Vol. 28, No. 2, 1962, p. 208-209.

provided the maximum discrimination. The interpersonal category was significant beyond the $p < .01$ level and the withdrawal category beyond the $p < .001$ level of significance. It was hypothesized that when an individual produced withdrawal responses, he projected his inability to formulate meaningful action-tendencies and to interact appropriately with his interpersonal and impersonal surroundings.

In an extensive and controlled study, Bricklin[45] used the test to assess overt aggression by means of an acting-out score. The principle of the score was that the probability of overt aggressive behavior increased as dominant and aggressive attitudes outweighed attitudes of social cooperation. In an analysis of the acting-out scores, significant differences of greater than $p < .02$ were found for all groups except Inmates when opposed to Hospital Act-out Cases. The Hand Test acting-out score successfully predicted tendencies of an aggressive nature.

The test has been used for other purposes: to differentiate satisfactory and unsatisfactory employees in industry;[46] to assess overt psychosexual maladjustment in

---

45 B. Bricklin, Z.A. Piotrowski and E.E. Wagner, The Hand Test, Illinois, 1962, v-95 p.

46 E.E. Wagner and J. Copper, "Differentiation of Satisfactory and Unsatisfactory Employees at Goodwill Industries with the Hand Test", in The Journal of Projective Techniques and Personality Assessment, Vol. 27, No. 3, 1963, p. 354-356.

neurotics;[47] and for the differentiation of aggressive behavior of schizophrenics.[48] In the last study, a withdrawal score of one or over was considered to counter-indicate aggression since description, bizarre percepts and failures were postulated to represent a withdrawal from reality and a relinquishment of meaningful life roles.

6. Summary and Basic Hypothesis.

In summation, research demonstrated that the conceptual performance of schizophrenics deviated from the performance of normals. Great controversy still exists regarding the nature of the deficit. Early research tended to stress that the schizophrenic was abnormally concrete and inferred from it that conceptual ability was impaired. Later research showed that the deficit was selective and that other factors than conceptual ability were being measured. One of the main reasons for the confusion in the area was the variety and the nature of the assigned tasks. Consequently it was difficult to state with positive assurance that the ability to formulate abstract concepts was impaired in schizophrenia.

---

47 E.E. Wagner, "Hand Test Content Indicators of Overt Psychosexual Maladjustment in Neurotic Males", in The Journal of Projective Techniques and Personality Assessment, Vol. 27, No. 3, 1963, p. 357-358.

48 -------- and E. Medvedeff, "Differentiation of Aggressive Behavior of Institutionalized Schizophrenics with the Hand Test", in The Journal of Projective Techniques, Vol. 27, No. 1, 1963, p. 111-113.

At the present time there are two major hypotheses which have been proposed as alternatives to that of impaired ability. One hypothesis involves the factors of overinclusiveness. Supporters of this hypothesis have argued that conceptual ability merely seems impaired, because adequate conceptual performance is prevented by over-responsiveness to extraneous stimuli. There is some evidence that over-inclusiveness and impaired conceptualization occur together.

The second major alternative involves the factor of social communicability. Cameron has long hypothesized that what appears as a conceptual deficit is primarily a reflection of the schizophrenics' social disarticulation. Presently, it remains to be proved whether over-inclusiveness and/or disturbances in social communication are sufficient to account for the deficit in the conceptualization of schizophrenics.

It was in terms of the experimental evidence of the deficit in conceptualization, over-inclusiveness, and social disarticulation in schizophrenia that the present investigation was designed. The preferences of schizophrenics along an abstract-concrete dimension would be expected to reveal the type of conceptualization, since the concept is the manipulandum of thought. Therefore, the Milgram Word Meaning Test was selected, which insured a definite task with a minimum of over-inclusion. The test is based upon concept

attainment or the present utilization of concepts previously acquired. The selection of the Hand Test for estimating socialized action-tendencies was based upon the premise that it is a discriminating instrument with the interpersonal and withdrawal categories acting as powerful indicators of a social or non-social adjustment pattern. The Hand Test is unique in that it seems to show action-tendencies which play a natural and major role in daily social living. It was anticipated that a preferance for concrete word meaning relationships would occur concurrently with asocial patterns of behavior in schizophrenics and conversely in normals, and would further elucidate Cameron's theory of social disarticulation. Therefore, it was to further investigate the preferences of schizophrenics along a dimension of abstract-concrete word relationships and to link the results to socialized and non-socialized action-tendencies that this study was undertaken.

The null hypothesis is that there are no significant differences in the relationships of abstract-concrete conceptualization and social-nonsocial action-tendencies between normals and schizophrenics. Consequently, the research hypothesis may be stated that there are significant differences in the relationships of conceptualization and socialization between normals and schizophrenics and it is anticipated that the null hypothesis will be rejected

because schizophrenics will exhibit more concrete conceptualization and nonsocial tendencies and that normals will show abstract conceptualization and social action-tendencies.

The following chapter presents the experimental design employed to test the hypothesis.

CHAPTER II

EXPERIMENTAL DESIGN

The experimental design begins with a description of the instruments used in the research, along with a description of the factors which they represent. This is followed by a description of the method of administration. The sample population is then described and the criteria for selection of the groups. Finally, the statistical procedure for analyzing the data is presented.

1. Tools of the Experiment.

The test used to assess the level of conceptualization was Milgram's Word Meaning Test. The test material consists of forty-eight, three by five inch cards. On each card three words are printed in capital letters; one at the top called the stimulus word, and two side by side at the lower section of the card, called choice words. All the stimulus words are nouns; the choice words are nouns, adjectives, or verbs. On a given card, the stimulus word is related to one of the choice words in any one of seven ways, while it is related to the other choice word in a different one of these seven ways. The seven types of word relationships used in this study are the following:

1. Synonyms: the choice word is a synonym or a substitute term for the stimulus word, e.g., "king-monarch".

2. Supraordinate: the choice word refers to a class or genus of events of which the object referred to by the stimulus word is a member or species, e.g., "winter-season".

3. Subordinate: the choice word refers to a member of the class which the stimulus word designates, e.g., "tree-pine".

4. Part-whole: the choice word refers to a part of the object to which the stimulus word refers, e.g., "camera-lens".

5. Adjective: the choice word refers to a quality or attribute commonly possessed by the object to which the stimulus word refers, e.g., "silk-smooth".

6. Verb: the choice word refers to an action commonly performed on or by the object referred to by the stimulus word, e.g., "river-flow".

7. Concrete-context: the choice word refers to a setting or context in which the object referred to by the stimulus word is commonly found, e.g., "dream-sleep".

Of the seven relationships, the first three are considered to be essential, abstract meaning relationships. The next four are considered to be non-essential, concrete meaning relationships. The subjects were instructed to choose the response word which meant most nearly the same as the stimulus word. On each of the forty-eight cards the subjects were choosing between an abstractly or concretely related word. The choice of abstractly related words was interpreted to represent a higher degree of abstractive

ability than the choice of concretely related words. There were four introductory cards to ensure the understanding of the test. Also introduced were five control cards on which there was one choice word totally unrelated to the stimulus word. These were used to eliminate the patients who were incapable of doing the test. Subjects who scored three or more unrelated choice words were not considered eligible for the experiment. This control was introduced into the Milgram test.

The testing procedure was as follows. The subject was given the instructions, "I am going to show you a series of cards. On each card you will see a word printed at the top, and two words printed at the bottom. Your task will be to look at the top word and then choose, from the two words at the bottom, the one which is closer in meaning to the word at the top of the card." The subject was given the four sample cards and asked to select a choice word in each case. Then the forty-eight experimental and five interspersed control cards were presented in a fixed order for all subjects.

The scoring of protocols proceeded as follows. Each time a choice word which bore a given relationship to the stimulus word was selected in preference to its mate on the card, the subject received a score of one for this relationship. For example, a supraordinate choice appeared on

sixteen of the experimental cards. If a subject chose the supraordinate relationship on fourteen of the possible sixteen, he received a supraordinate score of fourteen. The maximum scores for each sub-category was: synonym-sixteen; supraordinate-sixteen; subordinate-sixteen; all of which added for a total possible abstract score of forty-eight: part-whole-twelve; adjective-twelve; verb-twelve; and concrete-context-twelve; all of which added to a total possible concrete score of forty-eight. Even though the scores are not completely independent of each other, they do reflect the subjects' differential preferences among the different categories of meaning relationships. The hypothesis that schizophrenics would be more concrete in their conceptualization than normals could be tested by combining relationship scores into abstract and concrete categories and statistically analyzing them for significant differences.

In order to assess socialized action tendencies a projective technique was used, Wagner's Hand Test. The test consists of ten cards approximately four by five inches. On each of these cards except the last one, a hand is drawn in a recognizable, but ambiguous pose. Each subject was told, "I have here a number of cards on which pictures of hands are drawn. I am going to show you the cards, one at a time, and I want you to tell me what it looks like the hands might be doing." The tenth card is blank and the subject

is asked to imagine a hand and then describe what the imagined hand might be doing. The ten cards are handed to the subjects consecutively, in a standardized order and position, one at a time.

The rationale assumed by Wagner is that:

> Both phylogenetic and ontogenetic studies have shown that the use of the hand is intimately associated with the development of intellectual capacities. The hands are most closely linked with the motor functions and with overt activities. No other part of the human organism, aside from the eyes, helps us as much to acquire an optimal orientation in the immediate environment, and in space in general. The understanding of, and orientation in, the third dimension, necessary for any real action are gained through the use of the hands.
>
> It was reasonable to expect that a projective personality test, employing pictures of hands as visual stimuli, would throw light upon the action tendencies of the individual taking the test.[1]

It was also posited that: 1) human behavior is organized; 2) stimulus-specific perceptions of unstructured stimuli must, in some way, reflect higher-order behavioral tendencies; 3) responses to hands in ambiguous poses indicate these hierarchical organizations and are particularly amenable to a classification scheme which is psychologically and diagnostically useful. It was rationally assumed that the human organism interacts with 1) other living things, and 2) other inanimate objects. Hence, the first two major

---

1 B. Bricklin, A. Piotrowski, and E.F. Wagner, The Hand Test, Illinois, 1962, p. 3.

categories were designated Interpersonal and Environmental. It was further postulated that psychological maladjustments manifest themselves in terms of subjective and objective difficulties in successfully effecting interpersonal and/or environmental activities. Consequently, a maladjustive classification was set up which presumably represented a projected failure in carrying through prototypal action tendencies because of internal weakness in the protagonist, or some prohibitive or antagonistic aspect of the interpersonal or impersonal environment. Lastly, it was postulated that a more severe reaction to life's problems would be represented by a failure or collapse of prototypal action tendencies; a disintegration of adaptation with concomitant withdrawal from reality situations and varying degrees of inappropriate behavior. A fourth major category was therefore designated as Withdrawal and represented an inability of the testee to project an appropriate action into the drawn hands.[2]

The Interpersonal category is subdivided into the following sections:

1. Affection: interpersonal responses in which the hand expresses affection, a positive emotional attitude, or an affectionately benevolent attitude towards others.

---

2 E.E. Wagner, The Hand Test, Akron, Ohio, 1962, p. 1.

2. Dependence: interpersonal responses involving an expressed dependence on or need for aid from another individual.

3. Communication: interpersonal responses involving a presentation or exchange of information.

4. Exhibition: interpersonal responses which involve displaying or exhibiting oneself in order to obtain approval from others or to stress some special noteworthy characteristic of the hand.

5. Direction: interpersonal responses which involve influencing the activities of, dominating, thwarting, or directing others.

6. Aggression: interpersonal responses which involve the giving of pain, attacking, injuring, inflicting damage, or actively seizing another person or object.

The Environmental responses are subdivided into the following categories:

1. Acquisition: responses which involve an attempt to acquire or obtain a goal or object. The movement is ongoing and the goal is as yet unobtained and, to some extent, still in doubt.

2. Active: environmental responses which include an action or attitude designed to constructively manipulate, attain, or alter an object or goal. Active responses are distinguished from acquisition in that the object or goal has been accomplished.

3. Passive: environmental responses which include an attitude of rest or relaxation in relation to the force of gravity, and a deliberate and appropriate withdrawal of energy from the hand.

The Maladjusted scores are subdivided into the following classifications:

1. Tension: responses where energy is being exerted but nothing is accomplished. A feeling of anxiety or tension is present.

2. Crippled: responses where the hand is crippled, sore, dead, or disfigured, sick, injured or incapacitated.

3. Fear: responses in which the hand is threatened with pain, injury, incapacitation, or death.

The Withdrawal scores are categorized into:

1. Description: responses which do no more than acknowledge the hand with a few insignificant descriptive details.

2. Bizarre: responses predicated on hallucinatory content, delusional ideation, or other pathological thinking.

3. Failure: responses which are not scorable or the subject rejects the card completely.[3]

After the protocols were scored, the totals and ratios were computed. The pathological score is a composite of Maladjusted and Withdrawal scores with the latter receiving double weight, and is therefore a good approximation of the amount of psychopathology in a record. As shown in Table I of the Manual,[4] the median pathological score for normal adults is 1.7; for neurotics 3.0; and for psychotic groups from 3.5 to 8.5.

The Experience ratio consists of Interpersonal, Environmental, Maladjustive and Withdrawal responses arranged in that order. It is an approximation of the individual's psychological energies. In a normal protocol, the

---

3 Wagner, Op. Cit., p. 5-6.

4 Ibid., p. 20.

Interpersonal and Environmental scores should constitute at least ninety per cent of the total responses. This then represented the cut-off score in the present study for the Social and Non-social categories.

To estimate the reliability of the Word Meaning Test and the Hand Test on the selected population, a test-retest reliability coefficient was computed using the Pearson product moment coefficient of correlation of raw scores:[5]

$$r_{I,II} = \frac{N\Sigma XY - X\Sigma Y}{\sqrt{N\Sigma X^2 - (\Sigma X)^2}\sqrt{N\Sigma Y^2 - (\Sigma Y)^2}}$$

where $r_{I,II}$ = the coefficient of correlation of the first and second administrations.

N = the number of individuals.

X = the raw scores on the first administration of one of the tests.

Y = the raw scores on the second administration of the same test.

The reliability coefficient values for the experimental and control groups on each of the tests are presented in Table I. The reliability coefficient for the experimental group for the Word Meaning Test was .97 and for the Hand Test .98.

---

5 Q. McNemar, Psychological Statistics, New York, 1955, p. 118.

Table I.-

Test-Retest Reliability Coefficients on the Word Meaning Test and the Hand Test for the Experimental and Control Groups.

Instrument	Experimental Group $r_{I\ II}$ N:50	Control Group $r_{I\ II}$ N:50
Word Meaning Test	0.97	0.92
Hand Test	0.98	0.87

The values for the reliability on the Word Meaning Test and the Hand Test for the control group are .92 and .87 respectively. The reliability coefficient values are relatively high, which permits the examiner to proceed with a certain amount of assurance, and lend more credibility to the consequent results.

It is possible that the lower reliability coefficient for the normal group on the Hand Test, .87, might be due to a greater degree of flexibility in responses. According to the literature, a certain amount of flexibility was anticipated in the control group and more rigidity with a tendency to perserverate in the experimental group. This variable reflected in the present study with the Hand Test might further support the use of the instrument for specific diagnostic purposes.

2. Method of Administration.

All the testing in the investigation was conducted by the writer. The tests were administered in the same order for all subjects, first the Word Meaning Test and then the Hand Test. The cooperation of each individual was requested for participation in a research project in clinical psychology. The tests were given individually and each examinee was tested in one session.

As a direct measure of reliability, a retest was given with an interval of at least one day. The test procedure on this day was the same as that of the initial testing session.

3. Sample Population.

The population used in the experimental group was composed of fifty, male, hospitalized schizophrenics, selected from the universe of schizophrenics at the Ontario Mental Hospital. The criteria for inclusion in the study were:

1. Have a diagnosis of schizophrenia for at least two years' duration and a minimum hospitalization of six months.
2. No neurological involvement, including a previous lobotomy.
3. No electric shock treatment within a month prior to testing.
4. Meet the age (25-45) and educational requirements (at least 8th grade).

A study of the diagnostic files and case histories, plus consultations with each patient's psychiatrists were the steps taken to fulfill the criteria.

Absolute control of the administration of drugs was not only impractical, but almost impossible in a modern mental hospital where therapeutic drugs are in constant use. However, a record of the names of the drugs, amount given,

and time administered was kept for each patient. The respective psychiatrists advised the examiner of the capability of each patient of complying with the demands of the testing situation. It was reasoned that if, in spite of therapeutic drugs, the schizophrenics were still concrete in determining meaningful relationships, the results would further substantiate the hypothesis.

The control group was selected from the Royal Canadian Mounted Police, Division A, of Ottawa, Canada. The cross-section sample of fifty men included members of the administrative office staff, protectors of government property, security and intelligence agents and criminal investigators. All of the participating examinees met the age and educational requirements of the experimental group, but had no previous history of psychiatric illness.

Previously reviewed research indicated that age and educational level were important variables to be controlled in studying conceptualization. Therefore, the present experiment attempted to match the groups as closely as possible for means on the variables. The ages of the examinees ranged from twenty-five to forty-five in both groups. The mean age of the experimental group was 37.46 and of the control group 35.90 years. The standard deviations were 5.60 and 4.50 respectively. There were no significant differences between the ages of the groups ($t = 1.49$).

The statistics for the age factor are presented in Table II and the age frequencies appear in the appendix.

The mean educational level for both groups was third year high school. The range for the experimental group was from grade eight to the bachelor's degree. The range for the control group was from grade eight to second year college. The frequencies and means for the educational level are presented in Table III.

In an attempt to adequately sample the schizophrenic universe at the Ontario Mental Hospital, the patients were randomly selected from the diagnostic files. The final list of patients for the experimental group included three simple schizophrenics, thirty catatonics, eleven paranoids and six categorized as Other and Unspecified. Table IV gives the frequencies of the sub-groups. It will be noted that the catatonics predominate. This was true of the hospital population of schizophrenics at the time. The specific environment of the patients might affect performance on the tests, therefore, Table V shows the frequencies of the experimental group according to the Ward Type at the time of testing.

Table II.-

Means, Standard Deviations, Standard Error of Means and t Value for Ages of the Experimental and Control Groups.

Statistic	Experimental Group N:50	Control Group N:50
Mean	37.46	35.90
Standard Deviation	5.60	4.50
Standard Error of Mean	0.80	0.64
t	1.49 not significant	

Table III.-

Frequencies and Means for the Educational Level of Experimental and Control Groups.

Educational Level		Experimental Group N:50	Control Group N:50
College	4	4	0
	3	3	0
	2	0	1
	1	4	8
High School	4	13	16
	3	8	11
	2	9	9
	1	5	3
Grade Eight	8	4	2
	M	11	11

Table IV.-

Frequencies of the Sub-Categories of the Schizophrenic Group. (N;50).

Classification of Sub-groups	f
Simple schizophrenic	3
Catatonic schizophrenic	30
Paranoid schizophrenic	11
Other and unspecified	6

Table V.-

Frequency of the Schizophrenic Group (N:30) in the Types of Wards.

Classification of the Wards	f
Admission	1
Open	20
Infirmary	6
Treatment (continuous)	4
Disturbed	3
Incurable (no road back foreseen)	16

4. Statistical Procedure.

To test the hypothesis outlined in the preceding chapter, the data were submitted to a multiple contingency analysis by means of a multi-dimensional chi square. Complex contingency tables of frequency data from multiple classification designs may be of different forms. The usual formula for chi square was used with the necessary modifications for a multiple analysis.[6]

$$X^2 = \frac{(f_o - f_e)^2}{f_e}$$

where X^2 = chi square

f_o = observed frequencies

f_e = expected frequencies, estimated from the data.

The partition of chi square when probabilities are estimated from marginal totals is as shown in Table VI.[7]

The design using three factors called for one 3-way analysis and three 2-way analyses. The main effects issued from the variables of Conceptualization (A), Socialization (B), and the state of normalcy (C). Therefore the

---

6 L.Y. Dayhaw, Manuel de Statistique, Ottawa, Editions de l'Universite d'Ottawa, 1958, p. 374.

7 B.J. Winer, Statistical Principles in Experimental Design, Toronto, 1962, p. 631.

Table VI.-

Partition of Chi Square When Probabilities are Estimated from Marginal Totals.

Source	Chi Square	df
Total	X^2 total $= \sum\sum\sum \left[(n_{ijk} - n'_{ijk})^2 / n'_{ijk} \right]$	$(pqr-1)-(p-1)-(q-1)-(r-1)$
AB	X^2 ab $= \sum\sum \left[(n_{ij} - n'_{ij})^2 / n'_{ij} \right]$	$(p-1)(q-1)$
AC	X^2 ac $= \sum\sum \left[(n_{ik} - n'_{ik})^2 / n'_{ik} \right]$	$(p-1)(r-1)$
BC	X^2 bc $= \sum\sum \left[(n_{jk} - n'_{jk})^2 / n'_{jk} \right]$	$(q-1)(r-1)$
ABC	X^2 abc $= X^2_{\text{total}} - X^2_{ab} - X^2_{ac} - X^2_{bc}$	$(p-1)(q-1)(r-1)$

where n_{ijk} = the observed frequencies for each of the three classifications, i,j,k.

n'_{ijk} = the expected frequencies derived from the data for each of the three classifications, i,j,k.

total = the total chi square for the three variables.

ab = chi square for a (conceptualization) with b (normalcy)

ac = chi square for a (conceptualization) with c (socialization)

bc = chi square for b (normalcy) with c (socialization)

abc = the interaction term of the three variables, conceptualization, normalcy, and socialization.

interactions were A with B; B with C; and A with C. If there were any significant interactions among the factors, the factorial breakdown enabled its isolation and evaluation and thereby set the limits of generalization.

The degrees of freedom for a multi-dimensional chi square are calculated according to the following:

p = the number of categories in A classification.

q = the number of categories in B classification.

r = the number of categories in C classification.

In the present study there were to categories in each of the three classifications, therefore, p,q,r, each equalled two.

The following chapter will present the results of this investigation along with a discussion of their implications.

CHAPTER III

PRESENTATION AND DISCUSSION OF THE RESULTS

This chapter presents the results and discussion of the findings of this investigation in three sections. The first section deals with the multi-dimensional chi square results and the consequent deductions in terms of the initial hypothesis. The second section presents the results of the statistical analysis of the sub-categories of the Experience Ratio which governed the socialization variable of the chi square. The third section presents the implications of the present findings to past and present research. Lastly, suggestions for further research in the area are proposed.

1. Inter-Group Differences in Conceptualization and Socialization.

The null hypothesis presented in chapter one stated that there are no significant differences in the relationships of abstract-concrete conceptualization and social-nonsocial action-tendencies between normals and schizophrenics. Therefore, a research hypothesis may be stated that there are significant differences in the relationships of conceptualization as measured by Milgram's Word Meaning Test and socialization as measured by Wagner's Hand Test between normals and schizophrenics. It is anticipated that the null

hypothesis will be rejected because schizophrenics will exhibit more concrete conceptualization and nonsocial tendencies and that normals will show abstract conceptualization and social action-tendencies.

In order to test the hypothesis, the data were submitted to a multi-dimensional chi square, in a model with one three-way classification and three two-way analyses using the frequencies of both the experimental and control groups. The three-way was done to attempt to determine if there were any significant differences among the three variables of levels of conceptualization and socialization and normalcy. The three two-way analyses were done to find out which variables contributed to the significance of the total chi square. An interaction was computed to ascertain whether being in one cell of the chi square influenced being consigned to any other cell.

The results of the multi-dimensional chi square are shown in Table VII. The chi square total was 123.68, which for four degrees of freedom is significant at the p .001 level of confidence. The results indicated that there is a significant difference in the three variables of conceptualization, socialization and degree of normalcy. To ascertain what variables contributed to the highly significant difference, three two-way analyses were done. The following were paired: conceptualization and degree of

Table VII.-

The Chi Square Values for the Total Three-Way Analysis and the Three Two-Way Analyses for the Experimental and Control Groups.

Source	Chi Square	df	p
Total	$X^2_t = 123.68$	4	.001
AB	$X^2_{ab} = 57.76$	1	.001
AC	$X^2_{ac} = 32.96$	1	.001
BC	$X^2_{bc} = 32.96$	1	.001
ABC (interaction)	$X^2_{abc} = 123.68 - 123.68 - 0$		

A = conceptualization
B = degree of normalcy
C = socialization

a B.J. Winer, Statistical Principles in Experimental Design, Toronto, 1962, p. 631.

normalcy (AB); conceptualization and socialization (AC); degree of normalcy and socialization (BC). The chi square for conceptualization and degree of normalcy (AB) was 57.76 and for one degree of freedom it was significant at the $p < .001$ level of confidence. The chi square for conceptualization and socialization (AC) was 32.96 which for one degree of freedom was significant at the $p < .001$ level of confidence. The chi square for degree of normalcy and socialization was 32.96 which for one degree of freedom was significant at the $p < .001$ level of confidence. Therefore, the writer may reject the null hypothesis at the $p < .001$ level of confidence that there is no significant difference between schizophrenics and normals for levels of conceptualization and socialized action-tendencies. The three two-way analyses revealed that the three variables contributed significantly to the total chi square.

An interaction was computed by subtracting the three two-way chi squares from the total. In order to check this interaction, the fe's using the sub-totals of the C column for the AB relationship were found. As these fe's were similar to the ones of the first computation, the first obtained two dimensional chi square fe's could be introduced into the formula for the evaluation of the interaction. The result of the interaction computation was zero, which means that whatever is found for a variable

is true at every level of that variable. For example, AB relationship is true of all levels of C, because there is no interaction. Therefore, it was not necessary to study the AB relation at each level of C.

From the results of the data the following conclusions may be deduced. There is a significant trend for schizophrenics to be concrete in conceptualization in terms of preferential selection of word meaning relationships, and asocial in overt behavior as revealed by a predominance of withdrawal responses on a projective test. Contrariwise, normals showed a strong tendency toward abstract conceptualization in selecting meaningful relationships, and socialized action-tendencies indicated by a preponderance of interpersonal responses.

2. The Influences of the Sub-Categories of the Social Dimension on the Total Chi Square Results.

In the present study, the socialization dimension was assessed by means of the Experience Ratio. As mentioned previously, Wagner considered that the normal protocol should exhibit a ninety to ten ratio when the Interpersonal and Environmental responses were combined and opposed to the combined responses in the Maladjusted and Withdrawal categories. Thus, the cut-off scores for the chi square cells for the dimension of socialization were established.

By inspection of the frequencies in the chi square cells it seemed that the loadings might be statistically significant for the experimental and control groups if the number of responses in each sub-category were considered. Therefore, the Experience Ratio was broken down into divisions both for the experimental and control groups and the results are shown in Figure 1. The mean number of responses in the Interpersonal category was 3.22 with a standard deviation of 1.71 for the experimental group. The control group mean was 5.64 with a standard deviation of 1.61. The t was 7.33 and was significant. For the Environmental category, the experimental group had a mean of 3.10 with a standard deviation of 1.62 and the control group mean was 2.68 with a standard deviation of 1.47. The t was 1.87 and was not significant. In the Maladjusted category the experimental group mean was 1.54 with a standard deviation of 1.22. The t was 1.04 and was not significant. For the Withdrawal category the experimental group mean was 3.14 with a standard deviation of 2.12, and the control group mean was .10 with a standard deviation of .25. The t was 10.13 and highly significant. Therefore, there are significant differences between the experimental and control groups for the number of responses in both the Interpersonal and Withdrawal categories. The normals gave significantly more Interpersonal responses and the schizophrenics more

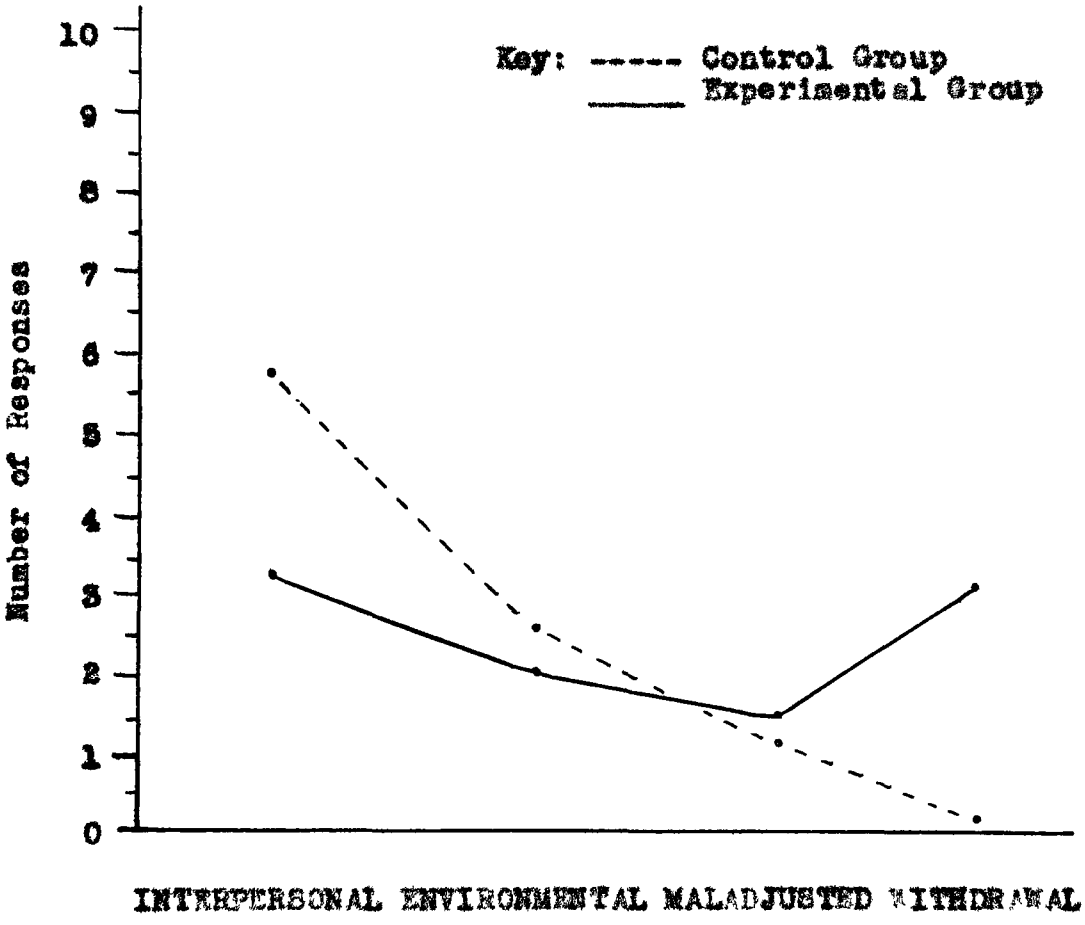


Figure 1.- Means of the Total Scores for the Subdivisions of the Experience Ratio for the Experimental and Control Groups.

Withdrawal responses. Therefore, these two categories contributed greatly to the chi square differences between the groups.

According to Wagner,[1] the normal adult record statistically has forty-seven per cent responses in the Interpersonal category, 40.3 per cent in the Environmental, 10.8 per cent in the Maladjustive, and 1.8 per cent in the Withdrawal category. In the control group of normals for the present investigation the per cents were fifty-six in the Interpersonal, 30 in Environmental, 12 in Maladjustive and 1 in Withdrawal. Thus the categorization tallied well with the findings of the test designer.

The pathological score is a composite of Maladjustive and Withdrawal scores with the latter double weighted and is an approximation of the amount of psychopathology present. Though it is not advisable to adhere rigidly to any one score for interpretation, nevertheless the pathology score is a quantitative index of disturbance. Wagner[2] indicated that the median pathological score for normal adults is 1.7; for neurotics 3.0; and for various psychotic groups the range is from 3.5 to 8.5, with a pathological score of 6 indicative of marked disturbance. The present study

---

1 E.F. Wagner, The Hand Test, Akron, Ohio, 1962, p. 27.

2 Ibid., p. 26.

corroborated the findings, because for a known group of male hospitalized schizophrenics the median pathological score was eight and for the normal group it was one. This result seems to lend further assurance of marked psychological disturbance in the experimental group and relatively little in the control group.

Inspection of the frequency table for chi square in the text, Table VIIa, reveals that there is more of a tendency for normals to be either social or non-social, but consistently abstract in thinking. However, the schizophrenic pattern is one of concrete conceptualization and non-social overt behavior.

3. The Implications of the Present Findings to Past and Future Research.

Despite the differences in approaches, the findings paralleled the results of other investigations. In terms of the contradictory studies of McGaughran[3] who found schizophrenics non-social, but abstract, and that of Wechowicz and Blewett[4] who found them social but not abstract, the

---

3 L.S. McGaughran, "Differences Between Schizophrenic and Brain Damaged Groups in Conceptual Aspects of Object Sorting", in The Journal of Abnormal and Social Psychology, Vol. 54, No. 1, 1957, p. 44-49.

4 T.E. Wechowicz and D.B. Blewett, "Size Constancy and Abstract Thinking in Schizophrenic Patients", in The Journal of Mental Science, Vol. 105, 1959, p. 909-934.

Table VIIa.-

Frequency Table for the Multi-Dimensional Chi Square.

	Normal B1		Abnormal B2	
	Soc.C1	Non-Soc.C2	Soc.C1	Non-Soc.C2
Abstract A1	28	16	2	4
Concrete A2	2	4	1	43

present results showed that the schizophrenics used in the study were non-social and non-abstract. McGaughran used only paranoids to represent the schizophrenic group and these have demonstrated the least deficit in conceptualization.[5,6] The present investigation used a heterogeneous group, as did Wechowicz and Blewett, but assessed the social dimension through an indirect instrument.

The study by Moran and Blake[7] in which schizophrenics were shown to prefer more distantly related words was supported by the present study. When given a choice between a more abstract or a more concrete relationship, the schizophrenics consistently chose the more remote.

According to Whiteman's study,[8] the conceptual deficit increased when social and interpersonal content was involved in the task. The present results seemed to indicate that regardless of the social or non-social content, the concreteness of conceptualization perseverated.

---

5 D. Rapaport, Diagnostic Psychological Testing, Vol. 1, Chicago, Year Book Publishers, 1945, v-573 p.

6 H. Wegrocki, "Generalizing Ability in Schizophrenia", in The Archives of Psychology, No. 254, 1940, p. 121-136.

7 L.J. Moran, F.A. Moran and R.R. Blake, "An Investigation of the Vocabulary Performance of Schizophrenics, II. Conceptual Level of Definitions", in The Journal of Genetic Psychology, Vol. 80, 1952, p. 107-132.

8 M. Whiteman, "The Performance of Schizophrenics on Social Concepts", in The Journal of Abnormal and Social Psychology, Vol. 49, No. 2, 1954, p. 226-271.

Wagner[9] interpreted the Withdrawal score as representative of a relinquishment of meaningful life roles. The schizophrenic group of the present study scored highest on this category, which could indicate such a retreat. The fact that they were comparatively low on maladjusted scores might reveal that there was a cessation of the struggle against disintegration coupled with the withdrawal. This along with the concrete preferences and non-social tendencies rounded out the clinical picture of the schizophrenics of the present study.

In Flavell's[10] study the prediction was that normals would exceed schizophrenics on the abstract score and the results confirmed the postulate at the $p < .01$ level. He posited also that the abstractive preferences would correlate with social integration in schizophrenics and this was realized at the $p < .05$ level. The present study substantiated the two results. The schizophrenics were significantly more concrete than the normals, at the $p < .001$ level and were significantly more non-social, at the $p < .001$ level.

---

9 E.E. Wagner and E. Medvedeff, "Differentiation of Aggressive Behavior of Institutionalized Schizophrenics with the Hand Test", in The Journal of Projective Techniques, Vol. 27, No. 1, 1963, p. 111-113.

10 J. Flavell, Thought, Communication and Social Integration in Schizophrenia: an Experimental and Theoretical Study, unpublished doctoral dissertation presented to the School of Psychology of Clark University, 1955, 1-208 p.

The investigation by Milgram[11] evaluated the performance of schizophrenics, brain-damaged and normals for total abstract score. The schizophrenics and brain-damaged chose fewer abstractly related words than normals, and the schizophrenics more than the brain-damaged. Within the schizophrenic group, the ability to abstract was positively related to ratings on the adequacy of social behavior. However, the ratings were done by nurses on the psychiatric wards and could be considered subjective. The present study used a projective technique by which the patient indicated indirectly his own socialization or lack of it. The results showed that the schizophrenics were both non-social and concrete. Milgram used a t test for differences in word meaning scores and the results showed that the schizophrenic group was significantly superior to the brain-damaged while normals were superior to both clinical groups. The hypothesis that schizophrenics were superior to brain-damaged patients, but inferior to normals in cognition tests was confirmed. The present investigation further confirmed that schizophrenics were inferior to normals on word meaning relationships.

---

11 N.A. Milgram, Cognitive and Empathetic Factors in the Role Attitudes of Schizophrenics and Brain-damaged Patients, unpublished doctoral dissertation presented to the School of Psychology of Boston University, Boston, 1958, 1-86 p.

An axiom of Cameron's approach to schizophrenia was that the basic paradigm could be understood in terms of the intimate relation between thought and socialization. In behavior disorders, as isolation continues, a loss of the ability to utilize thinking modes which are geared to social interaction occurs. As language becomes disorganized, social disarticulation seems inevitable. A vicious circle is consequently set up. In the present research, one would have expected the schizophrenics to withdraw from the testing situation entirely by rejecting the test, instead, a predominance of withdrawal responses occurred on the protocols.

Though Cameron's theoretical position was statistically supported that the disorganization of schizophrenic thinking is symptomatic of social disarticulation, nevertheless, the results showed a conceptual deficit, the nature of which was a preference for concrete conceptual relationships, and a social deficit with the principle characteristics of withdrawal and a lack of interpersonal relationships. In view of this the writer suggests that neither a theory of cognitive deficiency nor one of interpersonal disarticulation are sufficient to explain the relationships of these concurrent variables in schizophrenia. A more comprehensive theory is needed.

It was the purpose of the present study to estimate the difference between known schizophrenics and normals in abstract-concrete conceptualization and in social-nonsocial propensities. In view of Cameron's position, it was anticipated that the schizophrenics would exhibit concrete conceptualization coupled with non-social tendencies. The results supported Cameron's theoretical framework and were statistically significant.

The nature of the present study precluded the establishment of causal relationships. A further study might be designed to attempt to establish the causal link between concrete conceptualization and social disarticulation. Another investigation, exploring quantitatively the relationships between conceptualization and socialization in other nosological groups might prove fruitful. The results might elucidate the diagnostic potentialities of the two variables.

Other possibilities for further study suggested by the present investigation are:

1. To explore the social-nonsocial dimension with a large sample of normals using the Hand Test to discover the patterning.

2. To construct a new word meaning test in which the differences of individual items are systematically varied with a minimum opportunity for irrelevant responses, in order to assess abstractive ability on various levels.

3. To extend the present study by requesting the schizophrenics to give reasons for the selections on the Word Meaning Test in order to evaluate the schizophrenic logic governing the choices.

4. To design an experiment to explore the problem of the developmental aspects of the individual styles of conceptualization in schizophrenics.

5. To design a test including the abstract-concrete continuum, the social-nonsocial dimension and the overinclusion variable to examine the interrelationships.

6. To do an extended study of the relationships between concrete preferences and the one variable of withdrawal.

7. To study the problem of relationship between conceptual thinking styles and personality styles.

A summary of the present investigation and the conclusions drawn are presented in the following section.

SUMMARY AND CONCLUSIONS

This investigation attempted to quantitatively assess the relationship between levels of conceptualization and socialized action-tendencies in male schizophrenics. The hypothesis that there are no significant differences in the relationships of abstract-concrete conceptualization and social-nonsocial action tendencies between normals and schizophrenics was rejected at the $p < .001$ level of confidence. It was found that schizophrenia, concrete conceptualization, and non-social action tendencies occurred together to a significant degree. On the other hand, normalcy, abstract conceptualization and socialized action-tendencies were statistically related variables.

In terms of the subdivisions of the socialized dimension, the Experience Ratio, the two discriminating categories were Interpersonal and Withdrawal. The normals gave consistently more Interpersonal responses and the schizophrenics had significantly more Withdrawal responses.in their protocols.

The theoretical position of Cameron of social disarticulation as a concomitant of concrete conceptualization in schizophrenia was statistically supported. It remains for a further study to attempt to establish causality. The developmental aspects of these two related variables might be studied with profit.

BIBLIOGRAPHY

Bellak, Leopold, Schizophrenia: A Review of the Syndrome, New York, Logos Press, 1958, xv-755 p.
This is a multi-authored work on the varied aspects of schizophrenia. It provides a basic reference to the many faceted syndrome of schizophrenia.

Bolles, Marjorie and K. Goldstein, "A Study of Impairment of Abstract Behavior in Schizophrenic Patients", in The Psychiatric Quarterly, Vol. 12, No. 1, 1938, p. 42-65.
The conclusions from the study show that both normals and abnormals show concrete behavior when it is adequate, but that the schizophrenics are impaired in the ability to use abstract behavior. The present study further explored the problem.

Bricklin, Barry, Zygmunt A. Piotrowski, and Edwin E. Wagner, The Hand Test, Illinois, Thomas Publishers, 1962, vii-95 p.
The greater part of this book is devoted to the use of the Hand Test in clinical practice, including diagnostic hints and procedures for the use of the tool in assessing behavior problems. The implications of the Hand Test data are outlined and this is an aid in interpreting the results of the present study.

Cameron, Norman, "Deterioration and Regression in Schizophrenic Thinking", in The Journal of Abnormal and Social Psychology, Vol. 34, No. 1, 1939, p. 265-270.
The conclusion reached in the article is that schizophrenic thinking can be described neither in terms of a child's thinking nor in that of a deteriorated organic. The chief characteristics of schizophrenic thinking are the imprecise substitute terms and the inability to maintain boundaries. The question posed might be: Is schizophrenic thinking concrete due to imprecision or abstract because of flexible boundaries?

--------, Personality Development and Psychopathology, Toronto, McGraw Hill, 1965, v-774 p.
As a culmination of two earlier works dealing with the biosocial factors of personality, the present volume is more profoundly influenced by a psychodynamic approach to psychology. The book explicitly deals with the inner life of man, and gives an advanced and coherent presentation of the constructs that partially account for the divergent patterns

of behevior. Not only the neurological and conscious events, but also the elaborate unconscious dynamic forces which govern the depths of personality are delineated.

Cameron, Norman, The Psychology of Behavior Disorders, Cambridge, Riverside Press, 1947, vii-598 p.
Social disarticulation as a concomitant of schizophrenia is outlined in the book. Behavior pathology is presented in a systematic biosocial framework.

--------, "Role Concepts in Behavior Pathology", in The American Journal of Sociology, Vol. 55, No. 5, 1950, p. 464-467.
Cameron stated that behavior pathology is related to a paucity of social roles. The schizophrenic has failed to reciprocate in social situations and becomes an asocial, solitary individual. The non-social action-tendencies of the schizophrenic comprise one dimension of the present study.

Goldstein, Kurt, and M. Scheerer, "Abstract and Concrete Behavior: an Experimental Study with Special Tests", in The Psychological Monographs, Vol. 53, No. 2, 1941, vi-151 p.
This is a pioneer study in the elaboration of the various sorting tests. The main contribution is the formulation of the ideas of the concrete and abstract attitudes.

Flavell, John, Thought, Communication, and Social Integration in Schizophrenia: an Experimental and Theoretical Study, doctoral dissertation, Clark University, 1955, 1-208 p.
The study shows that normals exceed schizophrenics in the ability to select meaningful relationships which are essential and abstract and that the ability correlates positively with social interaction. This provides the basis for the present study.

--------, The Developmental Psychology of Jean Piaget, Toronto, Von Nostrand, 1963, vii-446 p.
The book presents the theory and experiments of Jean Piaget. It concludes with a critique by John Flavell. It is helpful in the present study for an expose of Piaget's concepts regarding intellectual development and a detailed account of concrete operations.

Milgram, Norman, Cognitive and Empathetic Factors in the Role Attitudes of Schizophrenic and Brain-Damaged Patients, doctoral dissertation, Boston University, 1958, vii-119 p.

The purpose of the investigation is twofold: to study the nature of the role-taking performance in schizophrenic and brain-damaged patients, and to contribute thereby to an understanding of thought pathology in these clinical groups. The idea of a word meaning test to assess abstractive ability stems from this study.

Wagner, Edwin, "The Use of Drawings of Hands as a Projective Medium for Differentiating Neurotics and Schizophrenics", in The Journal of Clinical Psychology, Vol. 18, No. 2, 1962, p. 208-209.

The author presents data supporting the use of the test as a diagnostic instrument for differentiating neurotics and schizophrenics. A relatively high maladjustment score is reported for both groups and is interpreted as an indication of a struggle against disintegration.

--------, and Eugene Medvedeff, "Differentiation of Aggressive Behavior of Institutionalized Schizophrenics with the Hand Test", in The Journal of Projective Techniques, Vol. 27, No. 1, 1963, p. 111-114.

An interesting interpretation of the significance of the withdrawal score is that a score of one or over is considered to counter-indicate aggression since descriptions, bizarre percepts, and failures are postulated to represent a withdrawal from reality contact and a relinquishment of meaningful life roles.

Whiteman, M., "The Performance of Schizophrenics on Social Concepts", in The Journal of Abnormal and Social Psychology, Vol. 49, No. 2, 1954, p. 266-271.

The purpose of the study is to investigate that social conceptual performance of schizophrenics is impaired relative to that of a normal group, even though both populations were equated on formal conceptual performance. In terms of Cameron's hypothesis, more schizophrenics than controls suffer from social disarticulation, and those who thus suffer have greater difficulty in conceptualization if the material is socially toned rather than neutral. This provides the theoretical basis for the present study.

Winer, B.J. Statistical Principles in Experimental Design, Toronto, McGraw-Hill, 1962, v-638 p.

This statistics book outlines the procedure for the use of a multi-dimensional chi square. The nature of the present data calls for such a statistical model.

APPENDIX 1

SAMPLE OF MILGRAM'S WORD MEANING TEST AND SCORING SHEET

APPENDIX 1

WORD MEANING TEST

22 BACON MEAT(SP) FRY(V)	23 AUTO DRIVE(V) FORD(SB)	24 STOVE OVEN(S) HOT(A)
25 BOAT CANOE(SB) ROW(V)	26 VIOLIN STRINGS(PW) FIDDLE(S)	27 FLOWER GARDEN(CC) ROSE(SB)
28 WATER LIQUID(SP) DRINK(V)	29 EGGS HEN(CC) FOOD(SP)	30 KING CROWN(CC) MONARCH(S)
31 TREE PINE(SB) BRANCH(PW)	32 CAMERA EQUIPMENT(SP) LENS(PW)	33 WEIGHT HEAVY(A) TON(SB)
34 WINTER SEASON(SP) COLD(A)	35 WAGON WHEEL(PW) CART(S)	36 CANDY GUMDROP(SB) SWEET(A)
37 STRING TIE(V) TWINE(S)	38 BREAKFAST MORNING (CC) MEAL(SP)	39 SALOON TAVERN(S) NOISY(A)
40 RIVER MISSISSIPPI(SB) FLOW(V)	41 WORLD GLOBE(S) ROUND (A)	42 BUREAU DRAWER(PW) FURNITURE(SP)
43 LAKE SWIM(V) POND(S)	44 POCKETBOOK PURSE (S) MONEY(CC)	45 MOON SHINE PLANET (SP)
46 CONTAINER BOX (SB) TOP (PW)	47 GRANDMOTHER OLD (A) RELATIVE(SP)	48 DIRECTION NORTH (SB) COMPASS(CC)

WORD MEANING TEST (Cont'd.)

51 BABY TINY(A) INFANT(S)	52 DEER ANTLERS(PW) DEAR(H)	53 PILLOW SOFT(A) BEDROOM(CC)
54 HAIR HARE(H) BLOND(A)	1. TUNE MELODY (S) SING(V)	2 ELECTRICITY DYNAMO(CC) ENERGY(SP)
3 PARCEL PACKAGE(S) WRAPPER(PW)	C3 ENGINE MOTOR(S) BLACKBOARD(NR)	4 BOOK PAGE(PW) NOVEL(SB)
C4 OUTLAW KNOB(NR) BANDIT(S)	5 SALT SPICE (SP) SPRINKLE(V)	6 HOBBY INTERESTING(A) STAMPS(SB
7 HARBOR SHIPS(CC) BAY(S)	C7 RIM PAYMENT (NR) EDGE(S)	8 HOUR TIME(SP) MINUTE (PW)
C8 CELLAR BASEMENT(S) HARD(NR)	9 RABBIT EARS (PW) BUNNY (S)	10 KNIFE DAGGER (SB) BLADE (PW)
C10 COUCH LAMB(NR) SOFA (S)	11 BLANKET WARM (A) COVER (S)	12 DOG POODLE (SB) BARK (V)
13 SICKNESS HOSPITAL(CC) ILLNESS(S)	14 MOTHER PARENT (SP) DEAR (A)	15 BIRD NEST (CC) ROBBIN(SB)
16 STAIRS STEPS(S) CLIMB(V)	17 HAT HEAD (CC) CLOTHING(SP)	18 DREAM NIGHTMARE(SB) SLEEP(CC)
19 MOUNTAIN HIGH(A) ROCKIES(SB)	20 SHIRT GARMENT(SP) SLEEVE(PW)	21 SILK SMOOTH(A) MATERIAL(SP

MILGRAM'S WORD MEANING TEST

NAME:_____ HOSPITAL NUMBER:_____ DATE: TEST I _____ TEST II ____

AGE: _____ EDUCATION: _____ DATE OF ADMISSION: _____

DIAGNOSIS: _____

_____

_____

_____

COMMENTS: _____

_____

_____

	TEST I	PARTIAL TOTALS	TEST II	PARTIAL TOTALS
ABSTRACT- ESSENTIAL				
SYNONYMS				
SUPRAORDINATES				
SUBORDINATES				
	TOTAL ABSTRACT _____		TOTAL ABSTRACT _____	

CONCRETE NON-ESSENTIAL				
PART-WHOLE				
ADJECTIVE				
VERB				
CONCRETE CONTEXT				
	TOTAL CONCRETE _____		TOTAL CONCRETE _____	

	TEST I	II	TOTAL RESPONSES _____	TOTAL RESPONSES ____
NON-RELATED				
TOTAL	____	____		

APPENDIX 2

PRESENTATION OF RAW DATA

Table VIII.-

Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups.

Case No.	Conceptualization: Abstract 1st Admin.	Abstract 2nd Admin.	Concrete 1st Admin.	Concrete 2nd Admin.	Socialization: Experience Ratio 1st Admin.	Experience Ratio 2nd Admin.	A.O.R.	Path. Score
Schizophrenics N:50								
1	35	32	13	16	50-50	40-60	0-3	9
2	38		10		100-0		0-4	0
3	20	18	28	30	60-40	50-50	0-2	8
4	21		27		10-90		0-1	18
5	29	27	19	21	60-40	50-50	2-3	8
6	21		27		0-100		0-0	18
7	28	20	20	28	50-50	60-40	1-3	9
8	31		17		50-50		1-3	8
9	28	25	20	23	30-70	20-80	1-1	12
10	21		27		50-50		0-3	6
11	26	27	22	21	50-50	40-60	0-3	10
12	37		11		60-40		1-2	6
13	20	15	28	33	60-40	50-50	1-4	7
14	41		7		70-30		0-5	4
15	22	18	26	30	10-90	10-90	0-0	16
16	18		20		40-60		1-1	11
17	24	26	24	22	50-50	40-60	0-2	9
18	33		15		50-50		0-4	6
19	24	20	24	26	60-40	70-30	2-4	6
20	21		27		10-90		0-1	18

Table VIII.- (Cont'd.0

Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups.

Case No.	Conceptualization: Abstract 1st Admin.	Abstract 2nd Admin.	Concrete 1st Admin.	Concrete 2nd Admin.	Socialization: Experience Ratio 1st Admin.	Experience Ratio 2nd Admin.	A.O.R.	Path. Score
21	31	36	17	12	40-60	50-50	1-3	9
22	28	35	20	13	70-30	60-40	0-0	6
23	19	20	29	13	60-40	60-40	3-1	8
24	34		14		30-40		1-1	6
25	22	25	26	23	80-40	50-50	2-3	6
26	23		25		20-80		0-1	12
27	31	28	17	20	80-20	90-10	3-2	3
28	27		21		60-40		1-3	8
29	23	20	25	28	70-30	60-40	3-2	6
30	31		17		80-20		0-5	6
31	23	15	25	33	40-60	30-70	0-1	11
32	38		10		70-30		2-4	4
33	20	25	28	25	40-60	20-80	2-1	13
34	39		9		90-10		0-3	1
35	29	30	19	18	70-30	80-20	0-5	6
36	21		17		60-40		1-4	4
37	27	25	21	25	20-80	30-70	0-1	13
38	22		26		40-60		0-0	9
39	39	40	9	8	80-20	90-10	0-4	2
40	27		21		60-40		2-2	5

Table VIII.- (Cont'd.)

Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups.

Case No.	Conceptualization				Socialization			
	Abstract		Concrete		Experience Ratio		A.O.R.	Path. Score
	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.		
41	13	9	35	39	10-90	20-80	0-1	16
42	29		19		70-30		0-2	4
43	37		11		80-20		2-3	3
44	29		19		30-70		0-2	11
45	39		9		70-30		3-2	5
46	29		19		80-20		1-2	4
47	33		15		100-0		0-6	0
48	36		12		30-70		0-2	13
49	34		14		50-50		1-2	8
50	36		12		60-40		1-3	6
Normals N:50								
1	45	40	3	8	80-20	70-30	2-3	2
2	47		1		90-10		1-3	1
3	34	28	14	20	90-10	80-20	2-4	1
4	46		2		60-40		2-2	4
5	45	46	3	2	70-30	80-20	1-5	3
6	44		4		100-0		1-3	0
7	46	43	2	5	90-10	100-0	1-4	1
8	46		2		100-0		0-5	0

Table VIII.- (Cont'd.)

Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups.

Case No.	Conceptualization				Socialization			
	Abstract		Concrete		Experience Ratio			Path.
	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.	A.O.R.	Score
9	40	38	8	10	40-60	50-50	1-3	6
10	35	30	13	18	90-10	100-0	2-6	1
11	47		1		90-10		1-5	1
12	42	45	6	3	100-0	80-20	1-4	0
13	45		3		90-10		2-1	1
14	38	40	10	8	100-0	100-0	4-5	0
15	42		6		90-10		2-3	1
16	46	48	2	0	80-20	90-10	3-2	3
17	46		2		90-10		4-1	1
18	42	46	6	2	90-10	80-20	3-3	1
19	44		4		90-10		2-4	1
20	45	42	3	6	90-10	80-20	1-4	1
21	41	44	7	4	80-20	80-20	4-2	2
22	36		12		70-30		1-3	3
23	42	44	6	4	90-10	90-10	2-4	1
24	40		8		90-10		4-3	1
25	27	19	21	29	70-30	80-20	1-3	3
26	43		5		100-0		0-3	0
27	43	45	5	3	60-40	50-50	0-2	4
28	41		7		90-10		3-4	1
29	43	44	5	4	70-30	70-30	3-2	3
30	46		2		100-0		2-5	0
31	46	47	2	1	80-20	70-30	4-3	2
32	46		2		100-0		1-4	0

Table VIII.- (Cont'd.)

Raw Data for Levels of Conceptualization and Socialized Action-Tendencies for the Experimental and Control Groups.

Case No.	Conceptualization				Socialization			
	Abstract		Concrete		Experience Ratio			Path.
	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.	1st Admin.	2nd Admin.	A.O.R.	Score
33	37	42	11	6	100-0	90-40	7-2	0
34	45		3		90-10		7-2	1
35	47	48	1	0	80-20	70-30	4-3	3
36	45		3		90-10		2-2	1
37	45	47	3	1	70-30	70-30	2-1	3
38	46		2		100-0		2-4	0
39	43		5		90-10		5-3	1
40	27		21		70-30		0-5	4
41	47		1		90-10		3-3	1
42	41		7		90-10		1-5	1
43	37		11		90-10		6-2	1
44	44		4		80-20		2-3	3
45	41		7		100-0		3-2	0
46	47		1		90-10		0-4	1
47	47		1		90-10		1-5	2
48	42		6		90-10		3-3	1
49	41		7		90-10		2-3	1
50	44		4		80-20		3-2	2

APPENDIX 3

FREQUENCY DISTRIBUTION OF AGE FOR THE EXPERIMENTAL AND CONTROL GROUPS

APPENDIX 3

Table IX.-

Frequency Distribution of Age for the Experimental and Control Groups.

Age Group	Experimental Group N:50	Control Group N:50
41 - 45	19	8
36 - 40	16	19
31 - 35	5	17
26 - 30	10	6

APPENDIX 4

ABSTRACT OF

A Study of the Relationships Between Levels of Conceptualization and Socialized Action-Tendencies in Hospitalized Male Schizophrenics

APPENDIX 4

ABSTRACT OF

A Study of the Relationships Between Levels of Conceptualization and Socialized Action-Tendencies in Hospitalized Male Schizophrenics[1]

Experimental studies as well as clinical experience with schizophrenics seem to indicate that there is a tendency for concrete conceptualization and non-social behavior to concur. However, very few objective studies relating the two variables have been reported in the literature.

The present study was concerned with the nature of the conceptual deficit in schizophrenia and its relation to socialized action-tendencies. Milgram's Word Meaning Test was utilized which permitted an evaluation of preferences for word meaning relationships to fall along an abstract-concrete continuum. The socialized action-tendencies were assessed by means of the Experience Ratio on the Hand Test. Two groups matched for age and education were used. The experimental group consisted of fifty hospitalized, male schizophrenics meeting the criteria of a diagnosis of schizophrenia for at least two years' duration and a minimum hospitalization of six months; no neurological involvement; and

---

1 Sister Thomas Francis Lynch, doctoral thesis presented to the School of Psychology and Education of the University of Ottawa, Ontario, July 1964, viii-81 p.

no electric shock treatment within a month prior to testing. The control group consisted of fifty normals who met the age and educational requirements and had no previous record of psychiatric illness. The hypothesis that there are no significant differences in the relationships of abstract-concrete conceptualization and social-nonsocial action-tendencies between normals and schizophrenics was rejected at the $p < .001$ level of confidence. It was found that the normals were significantly more abstract in conceptualization and social in action-tendencies and that the schizophrenics were more concrete in conceptualization and non-social in action-tendencies. However, it was noted that there is more of a tendency for normals to be either social or non-social, but consistently abstract in thinking. Whereas the schizophrenic pattern was one of concrete conceptualization and non-social overt behavior.

The categories of the Experience Ratio which proved most discriminating were the Interpersonal and Withdrawal. The normals gave significantly more Interpersonal responses; the schizophrenics gave more Withdrawal responses. The two groups gave approximately the same mean number of responses in the Environmental and Maladjusted categories.

A theory postulating social disarticulation as a concomitant of concrete conceptualization was postulated by Cameron and statistically supported by the findings of the present research.