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A Clinical Investigation of the Schizophrenia Scale of the Minnesota Multiphasic Personality Inventory

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A CLINICAL INVESTIGATION OF THE SCHIZOPHRENIA SCALE OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

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VITA

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CHAPTER I

HISTORICAL INTRODUCTION

In the long history of mankind attempts at personality diagnosis by means of trait description have never failed to appear. This is not to say that these attempts have always met with success, but it is true that the tendency to generalize and make judgments regarding the personality characteristics of one's fellow men has made itself manifest and given birth to various systems of personality classification. Some of these systems have been frankly subjective and unscientific, while others have attempted to ground themselves in public experience as a valid basis for scientific generalization. An attempted scientific rationalization of public experience is found in the famous bodily humors theory of Hippocrates.

It is interesting to note, however, that prior to the era of positive science the art of personality diagnosis had been limited to the objective approach, that is, the method by which one person observes and then describes the personality traits of another. No known instance exists of the type of self-descriptive activity so widely prevalent in modern personality tests. Perhaps this is an indication of knowledge on the part of the ancients that personality diagnosis is an art and not susceptible of strict quantification. It may also indicate that, as more astute observers of human nature, the ancients were convinced that no man is in possession of such a degree of self-knowledge as would qualify him to

give a completely accurate description of himself. One might also conjecture that since the early philosophers and later the Christian theologians were more concerned with the ultimate nature of man, and were convinced of his individual worth as a person, no great drive was felt toward adding up traits which, after all, were merely the phenomenological aspects of the reality under investigation.

In any event, whatever the cause, it is certain that prior to the rise of positive science and the rebirth of the mentality which asserted: "Everything that exists, exists in some amount and can be measured," there was no such thing as a special personality test. It may be that the loss of philosophical perspective regarding the nature of man as a person in "modern" times has led to an intensification of fruitless effort to describe and classify endlessly without knowledge of the essential nature of the thing under observation.

In actual practice this method has not led to the truth, nor have satisfactory empirical methods of personality description been evolved. The default of the modern attempt at quantifying personality has led to a return to qualitative investigations of the empiriological aspects of person.

In this study we shall concern ourselves with one phase of a well-known and widely-used personality test in an attempt to determine its value in clinical practice. The particular personality test which is the subject matter of this study represents the culmination of some thirty years of effort in the field of structured tests.

The story of this effort to develop an adequate, controlled answer paper-pencil personality questionnaire can be said to begin with Woodworth and his Personal Data Sheet.[1] Woodworth developed this questionnaire in response to a need for some more rapid method of screening out psychiatric liabilities among the men in the armed forces in World War I. Woodworth included as simple and direct questions in the Data Sheet all those items which he found related to psychiatric symptoms in numerous case histories of psychoneurotics. The questionnaire asked for "yes" or "no" answers to each of the items.

Of the criticisms that have been levelled against this type of instrument, the most obvious and common is that a simple unqualified "yes" or "no" answer is often practically impossible and would issue in ambiguity. Another, and perhaps even more obvious criticism, is that by judicious selection of items, the subject can paint almost any personality portrait desired. In other words, the test, if it works at all, will work only if the subject is completely frank and cooperative in his approach. Dissimulation is easy and is the order of the day when some crucial event hangs upon the test results, as is the case in an employment situation.

A further development of this type of questionnaire was brought out by Laird in his Colgate Mental Hygiene Scales.[2] Laird attempted to get away from the categorical "yes" or "no" responses and their consequent

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1 G. B. Watson, "Tests of Personality and Character," Review of Educational Research, II, (1932) 187-188.

2 Ibid., 188.

ambiguity by having the subject place a check along a graphic rating scale between the two extremes.

A trend in the direction of omnibus or comprehensive personality inventories developed. For example, Bell devised an "Adjustment Inventory" which purported to cover aspects of home, health, social and emotional adjustment. [3] Bell himself made claims that the inventory was not a research instrument but an actual clinical tool, implying thereby that it could be used as a finished product and valid clinical decisions based thereon. He also maintained that no special training was needed to administer or score and interpret the inventory. Maller [4] quotes these claims of Bell with somewhat surprised scorn and amusement.

In 1933 Bernreuter developed what has proven to be the most widely used test of self-description, the Bernreuter Personality Inventory. [5] The scale purports to yield scores for neurotic tendency, self-sufficiency, intraversion-extraversion, and dominance-submission.

The Bernreuter Personality Inventory has been subjected to much destructive criticism which we can take as representative of the prevailing attitude toward structured personality tests in general. Maller, [6] quoting Kuznets, [7] has this to say: "According to Kuznets, 'the high validity coefficients obtained by Bernreuter are to a large degree spurious,'

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3 J. B. Maller, "Character and Personality Tests," Psychological Bulletin, 32, (1935), 501.
4 Ibid., 501.
5 D. E. Super, "The Bernreuter Personality Inventory: a Review of Research," Psychological Bulletin, 39, (1942), 95.
6 J. B. Maller, "Character and Personality Tests," Psychological Bulletin, 32, (1935), 503.
7 G. Kuznets, "An analysis of Bernreuter's Personality Inventory," Psychological Bulletin, 31, (1934), 585.

because the correlations between the Inventory and other tests are due to the large number of items taken from those tests; 50 items of the Inventory came from Thurstone's Schedule and 31 from Allport's A-S Study."

Darley and Ingle [8] found that the Bernreuter Inventory failed to distinguish among individuals who had previously been diagnosed as psychotic and non-psychotic. Landis and Katz [9] using Bernreuter's and Thurstone's inventories arrived at approximately the same conclusion.

Kelly, Miles, and Terman [10] using the Stanford M-F test conducted a study designed to investigate the "Ability to Influence one's Score on a Typical Paper-Pencil Test of Personality." They found the widely prevalent criticism justified, namely, that a subject is normally inclined to check socially acceptable responses resulting from his conscious effort to paint an acceptable picture or from a failure of perspective because of rationalization and insufficient self-knowledge. Their subjects were able to change their scores on this particular test to a great degree.

The number of such personality tests is legion. It would be futile to examine all in detail. Some are general inventories; others single out one specific trait. All are subject to the following criticisms, constructive and destructive, summarized by Maller: [11]

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8 J. G. Darley and D. J. Ingle, "An Analysis of the Bernreuter Personality Inventory In Occupational Guidance," Bulletin of the Employment Stabilization Research Institute, University of Minnesota, 3, (1934), 585.

9 C. Landis, and S. E. Katz, "The Validity of Certain Questions Which Purport to Measure Neurotic Tendencies," Journal of Applied Psychology, 18, (1934), 343-356.

10 E. L. Kelly, C. C. Miles, and L. M. Terman, "Ability to Influence One's Score on a Typical Paper-Pencil Test of Personality," Character and Personality, 4, (1936), 206-215.

11 J. B. Maller, "Personality Tests," Personality and the Behavior Disorders, Chap. 5, Vol. 1, 187, TheRonald Press Co., New York, N.Y., 1934.

> ADVANTAGES.-These tests are easily constructed, perhaps too easily, and they include a variety of personality characteristics. They are useful in classroom discussions of the nature of personality and its measurement, in the psychological clinic, if used by a competent psychologist, and as instruments of research for the study of central tendencies in personality and its component elements. They are conveniently administered to individuals and groups, easily scored and tabulated, and the results are readily subjected to statistical analysis.
>
> LIMITATIONS.-Because of the mechanical simplicity, the inventory lends itself to indiscriminate use. Many of the questions are too complex to be answered by yes or no, and probably differ in meaning to different individuals. Furthermore, people are annoyed by personal questions and, in some instances, would be unable to answer such questions in any dependable manner... Since the answers can be faked by the examinee, the score can be made to vary at will from one extreme to another... The results are dependent upon conditions under which the test is given, and it is rare that these are comparable to the conditions prevailing during the process of standardization.

A final and very important criticism that can be made of paper-pencil personality inventories is this: People do things for very different motives. It does not seem possible to get behind every action of a person and determine his exact motivation. Furthermore, every person has a certain complexus of closely interwoven ideals which are, even to him, only half-conscious at best. If one could determine what these are, one would then be able to understand his personality far better. But it is at this precise point that structured tests break down.

With this the brief survey of the relative merits and disadvantages of the controlled answer paper-pencil test may be closed. The authors

of the test which is the subject matter of this study claim that they have avoided many of the pitfalls common to the structured personality tests. In the next chapter we shall discuss the purpose and method of the study and describe the Minnesota Multiphasic Personality Inventory.

CHAPTER II

THE PROBLEM AND ITS SCOPE -- DESCRIPTION OF THE TEST METHOD AND TECHNIQUES

The problem of this study, as originally conceived by the writer, is to carry out a clinical investigation of the validity of a well-known and widely used personality test on a group of recognized psychotic persons of both sexes drawn from a state hospital population.

The test of choice in this study was the Minnesota Multiphasic Personality Inventory, individual form, -- hereafter designated as the MMPI. The choice of this test was not based on grounds of pure academic or theoretic interest but on practical clinical experience. The test appeared on the clinical scene at the time when the United States was entering the World War II. The authors put forth the test with certain claims which, for the most part, were accepted uncritically. Little time was at hand to carry out research on this new test. It was something tangible with many apparent virtues that could be set to immediate use -- and it was. The test has been adopted in clinical practice by many hospitals, clinics, and institutions, but no great mass of research has arisen checking the claims of the authors. The present study is an attempt in this direction.

The great enthusiasm and interest that has been manifested in the projective personality techniques has tended to cast a shadow upon the structured personality tests. The MMPI, representing the most adequate

development of that type of test, should be given closer investigation.

The study here undertaken limits itself to a clinical investigation of 80 cases of schizophrenia. The emphasis, naturally, is upon the schizophrenia scale (Sc) of the MMPI. The particular questions to be determined are these: What faith can one place in the MMPI, and the Sc scale in particular, as an aid in diagnosing or screening out cases of schizophrenia? Can the Sc scale itself be used as an absolute diagnostic criterion? If so, what is the particular efficacy of the questions which make it a valid measure of that category of mental abnormality? If not, wherein does it fail, and to what degree? If the Sc scale itself cannot be taken as a valid single diagnostic determinant, is there anything in the test pattern taken as a whole which might serve as an adequate substitute? Do any other scales or any group of scales reveal schizophrenia better than the Sc scale taken by itself? Is the MMPI of singular value in the case of any one particular group of schizophrenics? And finally, are there any items in the Sc scale and in the other scales which seem particularly well-suited and adapted to diagnose the psychosis under investigation?

All these questions arise when one considers the problem. Of course, the degree of importance which any particular one assumes varies a great deal.

A few words describing the test itself are now in order. The authors, Starke R. Hathaway, Ph.D. and J. Charnley McKinley, M.D., succinctly

describe their test in the following words:[1]

> The Minnesota Multiphasic Personality Inventory is a psychometric instrument designed ultimately to provide, in a single test, scores on all the more important phases of personality. The point of view determining the importance of a trait in this case is that of the clinical or personnel worker who wishes to assay those traits that are commonly characteristic of disabling psychological abnormality. The instrument itself consists of 550 statements, each printed in simple language on a separate card, covering a wide range of subject matter - from the physical condition to the morale and the social attitudes of the individual being tested... The subject is asked to sort all the cards into three categories indicated by guide cards, True, False, and Cannot Say.

The 550 cards are placed in a wooden box. The subject picks each one of these cards out individually and then places it in what he feels is the proper category. Twenty-six different headings are available under which the550 items are grouped.[2]

At present the personality characteristics which are available for scoring on this test are: Hypochondriasis, Depression, Hysteria, Psychopathy, Masculinity-Femininity, Paranoia, Psychasthenia, Schizophrenia, and Hypomania. In addition, the authors have attempted to get around the usual criticisms of this type of test by devising special validity scores: The Lie scale, Cannot Say, F scale, and the K scale.[3]

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1 S. R. Hathaway and J. C. McKinley, The Minnesota Multiphasic Personality Inventory, Manual for, 1, The Psychological Corporation, New York, N.Y., 1943.

2 Ibid., 6.

3 Of the four "validity" scales, only the last, the K scale is now accepted as measuring what it is supposed to measure by the authors. Cf. S. R. Hathaway and P. Meehl, "The K Factor as a Suppressor Variable in the MMPI," Journal of Applied Psychology, 30, (1946), 525.

No more need by said at present concerning the general nature of the test, since this is not within the special problem of this study. One interesting point regarding the so-called normal group the authors used in standardization should be noted. The normals used by the authors consisted of the relatives and friends of the patients at the hospital. These were tested as they came to the hospital for thepurpose of visiting. The normals were asked one question: whether they were under doctor's care at the time of the examination. If they declared that they were not under a doctor's care, they were presumed normal on that single basis. [4] This type of standardization procedure may be subject to criticism. However, no attempt shall be made to discuss the standardization further. If the tool works empirically, then its use can be recommended; but should it fail, one might well wonder whether the standardization did not have an important role in rendering the test of limited value.

With regard to the individual items for each scale, the authors state that they were "formulated partly on the basis of previous clinical experience. Mainly however, the items were supplied from several psychiatric examination direction forms, from the various textbooks of psychiatry, from certain directions for case taking in medicine and neurology, and from the earlier published scales of personal and social attitudes." [5]

Having seen in a general way the grosser aspects of the MMPI, it is now appropriate to investigate at closer range one particular scale of the

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4 S. R. Hathaway and J. C. McKinley, "The Minnesota Multiphasic Personality Inventory: V Hysteria, Hypomania, and Psychopathic Deviate," Journal of Applied Psychology, 28, (1944), 155.

5 S. R. Hathaway and J. C. McKinley, "A Multiphasic Personality Schedule: I Construction of the Schedule," Journal of Applied Psychology, 10, (1940), 249.

test, the scale which is the chief concern of this study - the Sc scale. The authors have the following to say about the Sc scale:[6]

> The Sc (preliminary) scale measures the similarity of the subject's responses to those patients who are characterized by bizarre and unusual thoughts or behavior. There is a splitting of the subjective life of the schizophrenic person from reality so that the observer cannot follow rationally the shifts in mood or behavior.
>
> The Sc scale distinguishes about 60 per cent of observed cases diagnosed as schizophrenia.[7] It does not identify some paranoid types of schizophrenia, which, however, usually score high on Pa...
>
> Most profiles with a high Sc score will show several other high points, and further clinical sorting will need to be carried out by subjective study of the case.

In the above statement it is apparent that the authors are fairly cautious about their claims for the Sc scale of the MMPI. They point out that it is a preliminary scale, and that it does not work in about 40 per cent of diagnosed schizophrenics. No breakdown into types is offered, nor has any detailed investigation of the clinical possibilities of the Sc scale been carried out. The authors do state that although the Sc scale may not by itself be absolutely diagnostic, certain other scales when taken in conjunction may give a typical profile or picture.

One remaining point needing clarification is this: What do the authors understand by the diagnostic label "schizophrenia"? For a clarification and amplification of their understanding of the various diagnostic categories employed in their test the authors refer the reader to a standard

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6 Manual for the MMPI, 6.

7 In a personal communication to the writer, the authors state that the highest per cent they have obtained is 50, and that the emphasis in diagnosing schizophrenics with the MMPI should be on profile analysis.

text in the field of psychiatry.[8] This problem shall be examined in the following section on method and techniques.

The method pursued in this study is relatively simple. The MMPI was administered to 80 patients who had been diagnosed as **schizophrenics** by the psychiatric staff at the Chicago State Hospital. This statement immediately raises the question indicated in the paragraph above. Granted that the psychiatric staff diagnosis is accurate, did the psychiatrists have the same thing in mind as did the authors when they constructed the Sc scale? For an explanation of their understanding of schizophrenia, the authors point to Noyes' Modern Clinical Psychiatry. It may be well to examine briefly Noyes' description of schizophrenia and determine whether that description in general sets out accurately the bases used by thepsychiatric staff in making a diagnosis. In making this application of Noyes' description to the criteria used by the psychiatric staff the judgment of the writer will have to be accepted, since he has attended the diagnostic sessions and is in a position to make this judgment.

The following characteristics are described by Noyes as typical of schizophrenia:[9]

> ...there appear an apparent poverty and disharmony of feeling and tone. The dulling of finer feelings and insidious narrowing of **interests** noted in the incipient stages become **progressive.** As the disease progresses and the emotional impoverishment increases the patient becomes indifferent, not merely to those sentiments and intangible values that make life worth

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8 A. P. Noyes, Modern Clinical Psychiatry, 2nd Ed., Philadelphia, W. B. Saunders, 1939.

9 Ibid., 439-452.

living for the person in mental health, but, apparently existing at a vegetative level, he may be unconcerned as to fundamental needs and comforts....This persistent mood, or emotional rigidity, has no relation to external circumstances or experiences and little or none to conscious mental content.

The other distrubance of affect is an emotional disharmony, often first exhibited by inappropriate laughter or silly giggling....A state known as depersonalization may exist. In this the individual feels himself changed throughout in comparison with his former state. As a result he no longer acknowledges himself as a personality. His actions seem mechanical and automatic and he observes them as if a spectator.... Among the disturbances of affect in schizophrenia one occasionally meets hypochondria. Sometimes this depressive preoccupation with subjective bodily feelings seems to have for its purpose the exclusion of a disturbing contact the problems of realtiy.... Interest, and therefore, attention is centered on subjective creations, on matters within and without the patient....As the disease progresses there is a tendency for associative connections to become disturbed, at times becoming so broken or incomplete that the patient's utterances become fragmentary, disconnected, illogical or even unintelligible....The dominant ideational content of the schizophrenic is often delusional in nature...dalusions tend to be grotesque, to be loosely organized, to center around themes of persecution, of grandiosity, and of sex....In no other form of mental disorder do hallucinations or the projection of inner experiences into the external world in terms of perceptual images, occur in the presence of clear consciousness so frequently as in schizophrenia....Unconscious and dissociated tendencies give the patient a feeling of being forced or controlled.... A common disturbance of activity in the schizophrenic is an avoidance of concrete or spontaneous activity, a loss of initiative and purpose and the development of a state of inaction....Another disturbance of conation is negativism which may manifest itself in a perversity of behavior in the form of antagonism to the environment....

This somewhat extended quotation from Noyes suffices to provide a broad picture of schizophrenia. It will be noticed that those characteristics having to do largely with observation on the part of another, for example, grimacing and mannerisms, have been omitted for the sake of brevity. The characteristics presented constitute for the most part subjective states of mind which can be reported by the subject. In the writer's opinion, the items of the Sc scale conform closely to Noyes' description of schizophrenia. It is equally clear, from the experience of the writer, that thepsychiatric staff diagnoses are in accord with Noyes' description in that they have used the same fundamental criteria.

Thus, what Hathaway and McKinley mean by the term "schizophrenia" and what thepsychiatric staff understands by that term is basically the same. No mention has been made of the traditionally recognized "types" of schizophrenia. In the writer's opinion this would be superfluous. Agreement between the authors and the psychiatric staff on this point may be presumed. No real problem poses itself here, because no attempt is made in the MMPI to distinguish between "types" of schizophrenia.

The method then will be to check actual test results of schizophrenics on the MMPI against clinical diagnosis.

Anyone familiar with the psychiatric entity known as schizophrenia will raise another question immediately: Have the cases used in this study not been selected? How could valid test results have been achieved by simply taking a random sample of schizophrenics? In answer to this question the writer admits that some selection necessarily had to occur. All schizophrenic patients are not able to summon up the amount of integration

and concentration required to sort out 550 statements. It is evident then that only those schizophrenics with sufficient contact with reality could be used. Furthermore, this type of test presupposes a fair degree of literacy, so that many possible test cases had to be set aside because the patient was unable to comprehend the meaning of the statements as presented by the printed word. The writer could cope with this problem only by judiciously questioning the patient during the test as to the meaning of the items. In this way some indication was obtained as to whether the patient was able to read the items with understanding. Further estimates could be made from the patient's intelligence quotient as measured by the Wechsler-Bellevue Scale of Intelligence.

To the best of the writer's knowledge no other selection factor entered into the experiment. Given a sufficient amount of native intelligence, literacy, and contact with reality, the subjects were taken at random from among the patients awaiting diagnostic work-up at the Receiving Hospital. Of the 80 patients used in this study 37 were males, 43 females. The average age was 32 years with a range from 15 to 53 years. Table I summarizes the data regarding the patients' ages, sex, and gives the number of each type of schizophrenia in the group.

After routine administration and scoring of the 80 records the first and natural object of interest was the number of cases in which the Sc scale of the MMPI could be taken by itself as an absolute diagnostic criterion. To determine this, all records with a Sc score of 70 or above, and which score was the highest of all other scales, were counted. This number was then divided by the total number of cases to give the per cent

of cases in which the Sc score was above 70 and the highest in the record. On such records one could then by mere inspection of the profile make a diagnosis of schizophrenia.

Next, the per cent of cases in which the Sc score was above 70 but not necessarily the highest score was determined; and finally, ignoring the limits of pathology the per cent of cases in which the Sc score was the highest score, whether below or above 70, was calculated.

Since Hathaway and McKinley [10] claim that although the Sc score on some records of schizophrenics may be within normal limits, the Pa or the Pt will usually be high, an investigation was conducted to determine the number of cases in which the Pt was above 70 and highest. The same procedure was carried out for the Pa scores.

The next step in the study involved finding the means of the scales of the MMPI. This was undertaken in order to determine whether any preference existed on any particular scale, and particularly on the Sc scale. Once the mean T scores were obtained, it then became possible to construct a "typical" profile based on these means. The probable error of the mean and standard deviations were also calculated for each of the obtained means.

In an effort to determine the general trend of scores in relation to the Sc score, all the T scores of all the other scales were correlated with the Sc score.

Finally, an item analysis of all the personality scales of the MMPI was conducted to determine the relative diagnostic importance of the various items and their bearing upon schizophrenia.

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10 Manual for the MMPI. 6.

TABLE I

THE AGE, SEX AND SUBDIAGNOSTIC CLASSIFICATIONS BY NUMBER OF CASES OF EIGHTY SCHIZOPHRENIC PATIENTS SELECTED AT CHICAGO STATE HOSPITAL

Number cases schizophrenia - total	80
Average age - years	32
Age range - years	(38) 15-53
Number of males	37
Number of females	43
Number and Types of Schizophrenia	
Paranoid	31
Mixed	17
Undetermined	22
Simple	4
With Manic Features	2
Catatonic	2
In Psychopathic Personality	1
Hebephrenic	1

The above described procedure was carried out on the 80 cases of schizophrenia without reference to types of schizophrenia. It will be noted that of the 80 cases of schizophrenia, 31 were diagnosed as paranoid schizophrenia. This being the largest single diagnostic sub-category a special attempt was made to see if the MMPI would distinguish this group from the main body of cases of schizophrenia. Obviously this group was chosen because the only two other large single diagnostic sub-categories were: Mixed and Undetermined. These labels speak for themselves.

Mean T scores with probable errors and standard deviations were obtained for all scales in this group of 31 paranoid schizophrenics. The

paranoia and schizophrenic scores were correlated to see the direction of the relationship between them. One would expect a fairly high degree of correlation between the Pa and Sc scales when administered to clinically diagnosed paranoid schizophrenics.

The next attempted breakdown into obvious groups was that between males and females. This was done to see if any significant sex differences existed. Both groups were treated separately with negligible results.

During the course of the study it was noticed by superficial profile analysis that the young early cases of schizophrenia seemed to obtain what appeared to be more "typical" schizophrenic profiles. That is, they were the cases which one would naturally select, on the basis of profile analysis, as markedly pathological, and some as prima facie schizophrenic. The natural inference from this observation seemed to be that the age factor might play an important role in the type of record obtained. Accordingly the 80 cases were broken into three age groups and each group was analyzed separately. Means, probable errors, and standard deviations were found for each of the scales within each age group. Significant results were obtained with the youngest group consisting of 33 cases. An item analysis was conducted with the Sc scale of this group.

No further analysis of the collected data was attempted. The limitations of certain of the techniques employed and a fuller indication of the statistical methods employed shall be set out in the general discussion of actual results.

Before going into a detailed account of the findings of the study, it might be valuable to summarize the available information regarding research along similar lines, that is, paper-pencil investigations of schizophrenia, and more particularly, MMPI investigations of schizophrenia. The following chapter undertakes to set forth these findings briefly.

CHAPTER III

RELATED RESEARCH

Test results on schizophrenics using tests other than the MMPI have been uniformly disappointing. Several studies using the Bernreuter Personality Inventory have appeared. Yu administered the Bernreuter Inventory to two groups of psychotics; schizophrenics and manics. [1] He found the schizophrenics more introverted, submissive, and neurotic on the Inventory, but the differences were not sufficiently clear-cut for differential diagnosis. In other words, there was a trend but not strong enough to enable one to distinguish with certainty and accuracy between such supposedly opposed disease entities as schizophrenia and mania.

Landis and Katz administered the Bernreuter Inventory to 224 patients, 40 of whom were out-patients. [2] The blanks were scored for neurotic tendency. Among the schizophrenics of the group 23 per cent were above the 90th percentile in neuroticism and 48 per cent were above the 70th percentile.

In a similar study of a psychotic group reported by Marshall, among the schizophrenic cases of the group 80 per cent of the males and 60 per cent of the females were above the 50th percentile for neuroticism. [3] However, the paranoids were all below the 50th percentile. This study likewise used the Bernreuter Inventory.

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1 E. P. Yu, "A Personality Study of Two Groups of Psychotics," Psychological Bulletin, 31, (1934), 586.

2 C. Landis, L. Zubin, S. Katz, "The Validity of Certain Question Which Purport to Measure Neurotic Tendencies," Journal of Applied Psychology, 18, (1934), 343-356.

3 H. Marshall, "Clinical Applications of the Bernreuter Personality Inventory," Psychological Bulletin, 30, (1933), 601.

Page, Landis, and Katz summarize some of the other personality test findings in the following words: [4]

> Using a modification of the Neymann-Kohlstedt test of introversion-extroversion Gilliland and Morgan found that the test tended to differentiate that the test tended to differentiate schizophrenics from manic-depressives but failed to distinguish normals from psychotics. Campbell, working with a small number of subjects found a tendency for dementia praecox patients to be more introverted than manic-depressives, on the Heidbreder Scale. A similar tendency was found by De Angelis who used the Bernreuter Inventory. Contrary results have been obtained by Smith. Using the Thurstone Neurotic Inventory (which is held byits authors to be more of a test of introversion than extroversion), Smith found that the manic-depressives reported an average of over 20 per cent more neurotic traits than did the schizophrenics.

The authors of the above quotation then saw fit to study the so-called schizophrenic syndrome by the questionnaire method. They devised their own personality questionnaire and focused on the following problems: [5]

> 1) The compilation of a reliable and valid list of schizoid traits.
> 2) The relative number of schizoid traits reported by schizophrenic and manic-depressive patients, and normal individuals.
> 3) The relative occurrence of specific schizoid traits among schizophrenics, manic-depressives, and normal individuals.

The result obtained by the authors are presented in the following summary: [6]

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4 J. Page, C. Landis, and S. Katz, "Schizophrenic Traits in the Functional Psychoses and in Normal Individuals," American Journal of Psychiatry, XIII, (1934), 1214-1215.

5 Ibid., 1213.

6 Ibid., Pp 1222-1223.

> From the data collected, the following conclusions are offered:
> 1) The normal and schizophrenic groups possess on the average about the same number of schizophrenic traits...
> 2) Analysis of individual traits fails to reveal a dichotomy of personality types underlying schizophrenic and manic-depressive patients. There is some indication that normal individuals possess somewhat different traits then psychotic individuals, but in general, all groups tend to have the same personality traits...

From the above quoted studies we can see that attempts to diagnose and differentiate schizophrenia using various paper-pencil personality tests have met with dubious success.

The question may now be asked, what has been done on the test of choide, the MMPI? Unfortunately, few studies have appeared which cover our particular problem: The Sc scale of the MMPI and schizophrenics. Some success has been reported with the MMPI and delinquents. [7] Other studies have appeared on the use of the MMPI in vocational adjustment [8] and in the selection of military personnel. [9]

As far as the writer has been able to ascertain, only two studies have appeared which may be said to have any direct bearing on the problem. The first of these studies was undertaken by Benton. [10] Benton administered the MMPI to 85 patients with known disorders and certain diagnoses. In summarizing his findings Benton states that the test is not successful in

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7 D. F. Capwell, "Personality Patterns of Adolescent Girls: II Delinquents and Nondelinquents," Journal of Applied Psychology, 29, (1945), 289-297.

8 L. R. Harmon and D. N. Wiener, "Use of the MMPI in Vocational Adjustment," Journal of Applied Psychology, 29, (1945), 132.

9 H. A. Abramson, "The Minnesota Personality Test in Relation to Selection of Specialized Military Personnel, "Psychosomatic Medicine, 7, (1945), 178-184.

10 A. L. Benton, "The Minnesota Multiphasic Personality Inventory in Clinical Practice," Journal of Nervous and Mental Diseases, 102,(1945), 416-420.

identifying schizophrenics. It is interesting to note that of the 85 patients, 10 were diagnosed as schizophrenics; and of these 10 schizophrenics 5 gave "positive" results on the Sc scale. Benton considered results "positive" if the trend in question showed a T score of 70 or more, or if a T score of 65-69 was obtained and was the highest score on the test. Benton based his generalization regarding the efficacy of the Sc scale of the MMPI on a study of 10 cases! This study can hardly be looked upon as throwing much light on the problem.

The second study, as reported by Pacelle, Piotrowski, and Lewis is far more helpful and represents a serious attempt at scientific research. [11] The particular problem of the writer was not the main point of the authors' investigation, but was incidental to the study. The authors were interested in determining the effects of electric shock therapy on personality traits in psychiatric patients. For this purpose the authors used 75 patients. Of these patients 40 were classified as schizophrenics. The tests used were the Rorschach and the MMPI. Only the relevant portions of the study shall be described.

The MMPI was given before treatment, repeated within a week after treatment, and then given again 3 to 4 weeks later. We shall utilize the results of the first testing only.

The authors divided the group of schizophrenics into the "improved" and the "unimproved" and have reported their results on the basis of that division. Tables II, III, and IV summarize these findings. No standard

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11 B. L. Pacella, Z. Piotrowski, N. D. C. Lewis, "The Effects of Electric Convulsive Therapy on Certain Personality Traits in Psychiatric Patients," American Journal of Psychiatry, 104, (1947), 83-91.

deviations are given by the authors for the first test. Deviations are reported for both tests 2 and 3, but these, unfortunately, have no relevancy for our study. An examination of the results shows that the Sc scale of the MMPI has not met with phenomenal success. The authors present no further breakdown of their groups of schizophrenics on the basis of age, sex, or type. Apparently no item analysis was attempted.

TABLE II*

THE MEAN T SCORES OF THE PERSONALITY SCALES OF THE MMPI ON 22 IMPROVED CASES OF SCHIZOPHRENIA AND 18 UNIMPROVED CASES AS CALCULATED BY PIATROWSKI, PACELLA, AND N.D.C. LEWIS

SCHIZOPHRENIA		
	IMPROVED N = 22	UNIMPROVED N = 18
SCALES	MEANS	MEANS
Hs	60.14	62.11
D	68.73	69.67
Hy	60.82	63.39
Pd	61.91	68.22
Mf	56.00	55.50
Pa	58.64	60.44
Pt	62.41	66.50
Sc	65.27	70.33
Ma	53.77	56.89

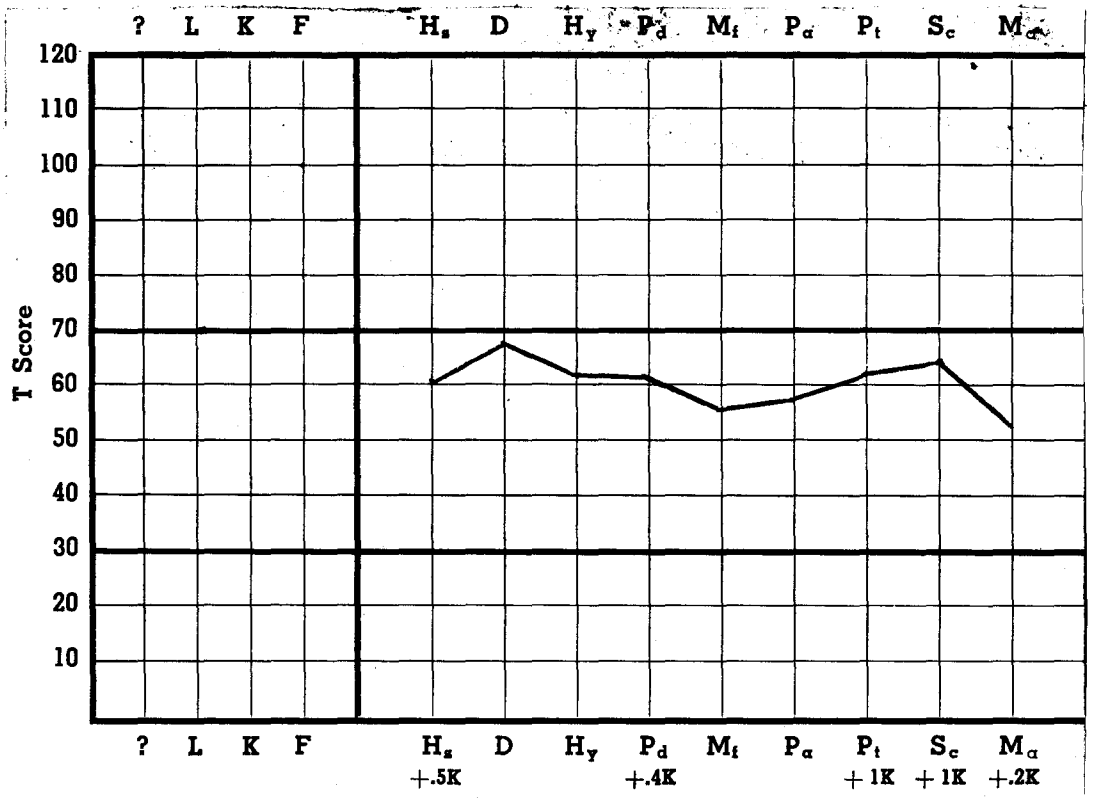
* Ibid., p. 86. The above is an adaptation of the data presented by the study.

TABLE III*

A GRAPHIC PRESENTATION OF THE PERFORMANCE OF 22 CASES

OF SCHIZOPHRENIA WHICH LATER IMPROVED

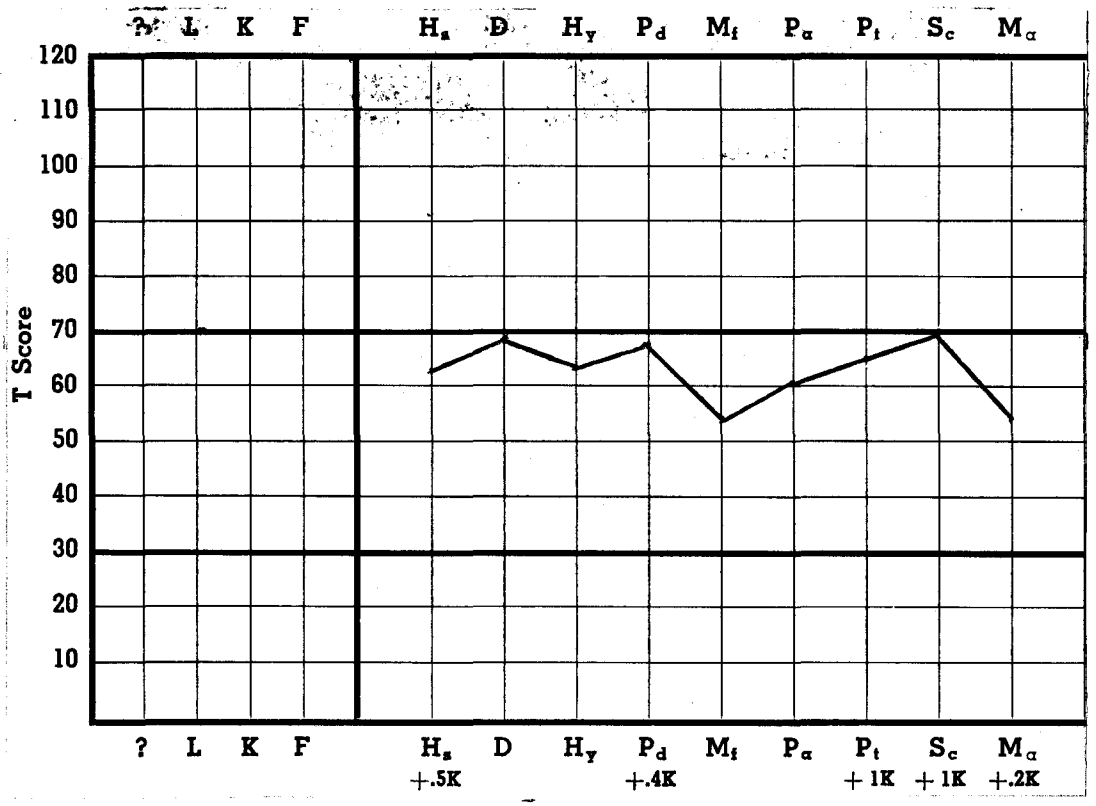
BASED ON THE MEAN T SCORES



* Ibid. P. 87. Profile is as presented by Piatrowski, Pacella, and Lewis.

TABLE IV*

A GRAPHIC PRESENTATION OF THE PERFORMANCE OF 18 CASES OF SCHIZOPHRENIA WHICH WERE UNIMPROVED BASED ON THE MEAN T SCORES



* Ibid.

CHAPTER IV

RESULTS -- A

In this chapter are set forth the findings concerning the MMPI and schizophrenia. In accord with the plan indicated in Chapter II, the results found by using the staff diagnosis as a basic criterion are indicated by per cent of agreement. In this the procedure is similar to that of Benton cited in Chapter III. The first step was to consider scores of 70 or over on the Sc scale as positively indicative of pathology. Attention was focused solely upon the Sc scale. The fact that some of the other scales were also at 70 or even higher was ignored. Calculating the per cent of agreement then on this basis between the Sc scale and the staff diagnosis, it was found that in 41 per cent of the cases of diagnosed schizophrenia was the Sc scale 70 or above. This, it is immediately seen, is quite a low figure even when compared with the claims of Hathaway and McKinley.[1] They originally claimed a 60 per cent agreement, and later, in a personal communication, lowered this figure to 50 per cent. And yet this is not placing too great a demand on the test, for the fact that other scales were in many instances higher than the Sc scale has been ignored.

Pushing the test to the limit, it was discovered that in only 22 per cent of the cases was the Sc score the highest of all the scales--either above or below the pathological score of 70; and in only 20 per cent of the cases was the Sc scale the highest and also above 70. This latter

1 Manual for the MMPI, 6.

situation would, ideally speaking, constitute the best test of the Sc scale. Theoretically if the Sc scale really works to the point that it can be relied upon to make a diagnosis in almost every instance, one would expect the majority of schizophrenics in this study to score above 70 on this scale, and one would expect this score to be the highest of all the other scales. In practice, this did not happen, as is abundantly evident.

Keeping in mind the admonition given by the authors to the effect that sometimes one can make a better diagnosis of schizophrenia by examining a significantly high Pa or Pt scale, an endeavor was made to discover the number of instances in which the Pa scale was 70 or above. Taking this step produced a per cent of 37; and going one step beyond, it was found that in 12 per cent of the cases the Pa score was the highest scale and above 70. The same procedure was carried out for the Pt scale; in 28 per cent of the cases was the Pt score 70 or above; and 2.5 per cent was the Pt scale highest and 70 or above.

The results obtained on the MMPI using this rough measure of validity would seem to justify considerable caution in the use and interpretation of the Sc scale. This conclusion is in line with the thinking of the authors who feel that schizophrenia, if it is diagnosed at all by the MMPI, shall be found by means of profile analysis.

With this in mind, but still focusing on the Sc scale, an evaluation can now be made of the findings obtained by averaging the 80 scores on the Sc scale. With an eye to constructing a "typical" schizophrenic profile, the arithmetic means of the other scales were also calculated.

Turning our attention now to the findings on the Sc scale we note that the mean T score is 69.4. This result seems to compare favorably with that obtained by Pacella, Piotrowski, and Lewis cited above. In that study, on the unimproved schizophrenics, they obtained an average of 70.33. Further it will be noted that this obtained mean of 69.4 is actually the highest of the scales. This would seem at least to indicate a strong positive trend in the "trait" measured. However, when one considers the reliability of the obtained mean in terms of its probable error, the results become much less significant. Using ±4PE as the limits of practical certainty, we may be certain that the true average (the chances are 99 in 100) lies within the limits 69.4 ± 4 x 1.24 or between 74.4 and 64.4 as T values. The same situation holds true when we attempt to ascertain just how these scores are distributed or dispersed. The measure of variability or dispersion used was the standard deviation. In the Sc scale the S.D. was 16.36. This is the largest S.D. obtained for any scale. It is difficult to generalize, or perhaps it would be more correct to say, it is easy to over-generalize concerning the S.D., but this much may be said in a rough way: On the basis of the obtained S.D. the middle two-thirds of the scores will fall roughly between score 85.76 (69.4 + 16.36) and score 53.04 (69.4 - 16.36). Thus the obtained mean of 69.4 loses much of its potential significance, that is, extreme caution must be exercised in making generalizations because of the great variability or range of the actual scores.

TABLE V*

MEAN T SCORES, PROBABLE ERRORS OF THE MEANS, STANDARD DEVIATIONS, AND COEFFICIENTS OF CORRELATION ON THE MMPI OF EIGHTY CASES OF SCHIZOPHRENIA

SCALES	MEANS	PEm	S.D.	r
?	52.11	.40	5.28	.24 Sig.
L	54.28	.59	7.76	-.54 V. Sig.
K	52.50	.69	10.52	.05 N. Sig.
F	60.22	.69	10.51	.85 V. Sig.
Hs	56.76	.88	11.63	.52 V. Sig.
D	64.87	1.14	14.92	.32 V. Sig.
Hy	58.50	.83	11.02	.63 V. Sig.
Pd	64.31	.77	10.22	.46 V. Sig.
Mf	56.63	.70	9.24	.81 V. Sig.
Pa	63.47	1.02	13.56	.55 V. Sig.
Pt	62.87	1.07	14.40	.78 V. Sig.
Sc	69.40	1.24	16.36	
Ma	59.44	1.03	13.46	.37 V. Sig.

* In the above table a summary is presented of the findings on the entire 80 cases. It will be noted that the arithmetic mean of average has been obtained for each scale as have also the probable errors of the mean and the standard deviations. It will be further noted that coefficients of correlation have been worked out. The listed "r"s represent the correlation of each scale with the Sc scale. The general

The same type of reasoning can be applied to the other scales which have relatively high mean scores. It will be noted that they also have relatively large PEm's, and S.D.'s, namely, D, Pd, Mf, Pa, Pt, and Ma.

An examination of the "r" column of Table V reveals several high positive correlations with the Sc scale. The first scale that exhibits this relationship is the F or "validity" scale. The coefficient of .85 shows a very strong tendency for the F scale to rise with the Sc scale. If one would accept Hathaway and McKinley's original hypothesis that F is a validity scale, then we should be forced to say that the tests are for the most part invalid, especially those with high Sc scores. However, the initial assumption that F is a validity scale has been seriously questioned. Kazan and Sheinberg conclude that a "high F score is only very rarely an invalidating factor in consideration of abnormal subjects, since it indicates the presence of significant and often severe psychiatric cases." [3]

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formula used for "r" is set out below.

$$r_{xy} = \frac{\frac{\text{Sum } xy}{N} - M_x M_y}{SD_x SD_y}$$

The abbreviations "Sig.", "V. Sig.", and N. Sig." following the various coefficients mean: Significant, Very Significant, and Not Significant respectively. In all these instances of correlations the PEr has not been used to test the reliability of an obtained r, but we have used Fisher's test of the significance of r. This has been felt to be necessary in view of the fact that N is below 100. By "significant" it is meant that the probability that a given coefficient of correlation will arise by chance is .05, or 5 chances in 100; by "very significant" is meant a similar probability of .01, or 1 chance in 100. Cf. J. P. Guilford, Psychometric Methods, McGraw-Hill Book Co., Inc., New York, 1936, 335-336.

3 A. T. Kazan and I. M. Sheinberg, "Clinical Note on the Significance of the Minnesota Multiphasic Personality Inventory," American Journal of Psychiatry, 102, (1945), 181-183.

Further, Meehl points out that the F score seems to go up with the severity of the psychosis and is not an invalidating factor. [4] Finally, one of the original authors of the MMPI, collaborating in a study with Meehl, has this to say about the F scale: [5]

> The MMPI variables F and L were not formally validated originally, but were presented on face validity, that is, we assumed their validity on a priori grounds...
>
> It was early discovered that Schizoid subjects... obtained high (F) scores because, due to delusional or other aberrant mental states, they said very unusual things in responding to the items and thus obtained high F scores.
>
> Clinical experience suggests that the usual critical score of 70 is too low in the case of F. We have found that scores ranging up to...80 are more often a reflection of 'validly' unusual symptoms and attitudes than an indication of invalidity in the rest of the profile due to misunderstanding, etc.

As has been seen above, the obtained "r" of .85 between F and Sc clearly substantiates the view that F is a measure of severity of psychosis or mental confusion, and need not be looked upon as invalidating a test.

The next high positive correlation that appears is that between Mf and Sc-.81. However, again, care must be exercised in interpreting this finding, since it is not altogether clear just what the Mf scale does measure. It seems certain that Mf does not measure homosexuality. The most that can be said is that it may measure the amount of interests and attitudes which a person of either sex has in common with the opposite sex. Thus we can say that there is a tendency for a schizophrenic female to possess

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4 P. E. Meehl, "Profile Analysis of the MMPI in Differential Diagnosis," Journal of Applied Psychology, 30, (1946), 523.

5 P. E. Meehl and S. R. Hathaway, "The K Factor as a Suppressor Variable in the MMPI," Journal of Applied Psychology, 30, (1946), 535-536.

somewhat masculine interests and vice versa for the male schizophrenic. Whether the possession of such interests and attitudes increases conflict, makes adjustment more difficult, and is a partial causative factor in the ultimate breakdown is open to question. Further investigation along these lines might prove interesting and fruitful.

The remaining high correlation is one of .78 between Pt and Sc. This is to be expected, since Pt measures the degree of obsessive thinking. This finding is in close agreement with the results obtained by Hathaway and McKinley. [6] They found a correlation of .75 between Pt and Sc on abnormal subjects.

Moderately high positive correlations exist between Hs and Sc and between Hy and Sc. One would expect the appearance of a fairly good relationship between Hs and Sc, since the traditional descriptions of schizophrenia have always emphasized a strong element of somatic preoccupation in the psychosis. One would also expect the fairly high relationship between Hy and Sc, since the Hy scale supposedly represents the over-emotional type of reaction as a form of maladjustment. This is also a component of the schizophrenic reaction type.

Table VII presents in a graphic way the "typical" profile obtained from the 80 cases. The obtained means are used in its construction. In interpreting it one must keep in mind the calculated probable errors and standard deviations.

As mentioned earlier, of the 80 cases, 31 were diagnosed as paranoid schizophrenia. Since this was the largest single subdiagnostic category,

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6 Manual for the MMPI, 6.

we separated this category from the other types of schizophrenia in an effort to determine whether or not the presence of this large group of paranoid schizophrenics influenced our results with the 80 cases to an appreciable extent. It was also hoped that some characteristics peculiar to paranoid schizophrenics might appear on the MMPI. Of the 31 paranoid schizophrenics studied, 15 were males, and 16 were females. The age range was from 19 to 53 with a mean age of 37. A statistical summary of the findings is presented in Table VI below.

A coefficient of correlation of .79 was obtained between the Pa scale and the Sc scale; applying Fisher's criterion, this correlation is very significant. A cursory examination of the mean scores for the various scales reveals a very close approximation to the results obtained with the entire 80 cases. The probable errors of the mean and the standard deviations are rather large. It is surprising to note that the mean Pa score for the 31 diagnosed paranoid schizophrenics is two points <u>below</u> the mean Pa score for the entire group of 80 cases! This may possibly be due to the fact that the other types of Sc more easily admit to unusual mental states such as delusions and paranoid ideation, while the true paranoid schizophrenics are more wary and evasive.

Table VIII represents a graphic illustration of the findings on the group of 31 paranoid schizophrenics.

Next, the males and females were held apart and separate calculations made for each group. The results were negligible in that there were no significant sex differences, not did the results obtained in either case vary to any extent from the results obtained for the 80 cases.

TABLE VI

A STATISTICAL SUMMARY OF THE PERFORMANCE OF 31 CASES OF PARANOID SCHIZOPHRENIA ON THE MMPI PRESENTING THE MEAN T SCORES, PROBABLE ERRORS OF THE MEANS, AND THE STANDARD DEVIATIONS

PARANOID SCHIZOPHRENIA N= 31			
SCALES	MEANS	PEm	S.D.
?	53.03	.61	5.20
L	54.06	.24	2.00
K	55.16	1.13	9.33
F	59.22	1.19	9.85
Hs	56.09	.96	7.94
D	60.58	1.16	9.59
Hy	57.06	1.23	10.20
Pd	64.51	1.11	9.33
Mf	56.35	1.24	10.25
Pa	61.45	1.42	11.75
Pt	58.25	1.72	14.42
Sc	65.90	1.57	13.04
Ma	57.83	.63	5.20

TABLE VII

A GRAPHIC PRESENTATION OF THE PERFORMANCE OF 80 SCHIZOPHRENIC PATIENTS ON THE MMPI CONSTRUCTED BY USE OF THE MEAN T SCORES

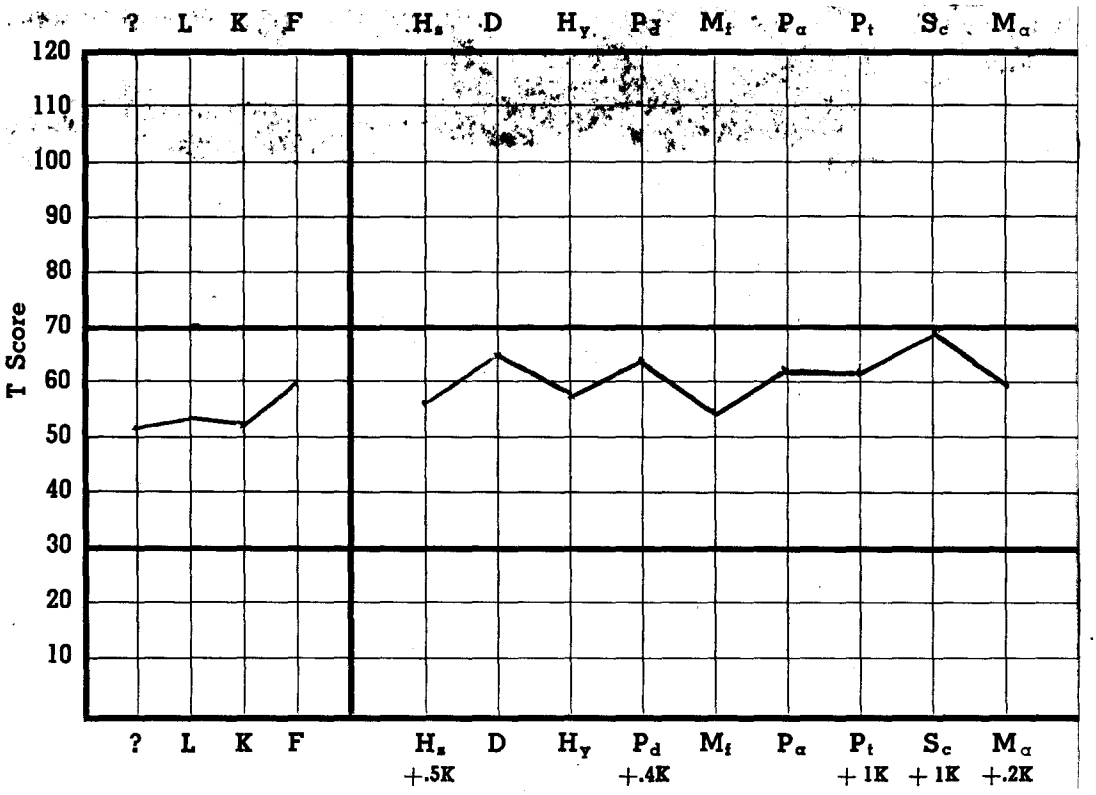
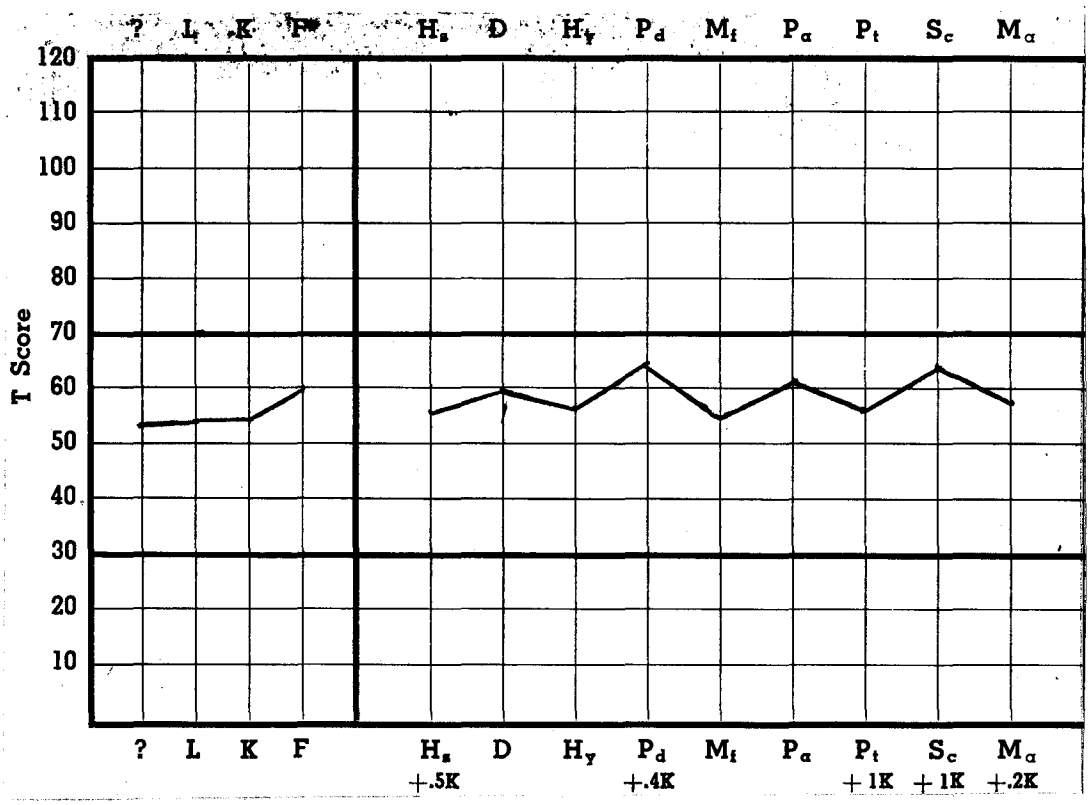


TABLE VIII

A GRAPHIC PRESENTATION OF THE PERFORMANCE OF 31 CASES

OF PARANOID SCHIZOPHRENIA ON THE MMPI

BASED ON THE MEAN T SCORES



It was noted on superficial profile inspection that the young early cases of schizophrenia seemed on the whole to obtain more bizarre and unusual looking profiles. This suggested the possibility of an age factor. Accordingly, the group of 80 schizophrenics was divided into three age groups: *

1) Age range 15-29 (33 cases)

2) Age range 30-40 (31 cases)

3) Age range 40-53 (16 cases)

The results of this method of procedure are summarized in Tables IX, X, and XI for each group and are presented graphically in Tables XII, XIII, and XIV.

It seems apparent from an inspection of the results on each age group that an age factor has played a role. This is brought out quite graphically on the "typical" profiles for the three age groups. Here we observe pictorially the so-called "levelling off" process traditionally expected in schizophrenics with advancing age. The youngest age group exhibits a degree of disorganization and dissociation on the MMPI which is markedly pathological; and it is significant that by far the most abnormal score is that for the Sc scale (mean of 77.21). The next age group exhibits a definite lowering of scores to within normal limits. The last age group manifests a profile which is in all respects "normal." To account for this

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* This method has seemed to work best. Better results were obtained by using profile inspection than by arranging the scores and/or the ages in descending order and then attempting to find a point at which a division might be made on the basis of an easily observed dropping-off of either scores or age. The relationship of low scores with greater age and vice versa was easily seen at the extremes, but it was impossible to discover any single point which might be used as a clean line of division.

TABLE IX

THE MEANS, PROBABLE ERRORS OF THE MEANS, STANDARD DEVIATIONS AND COEFFICIENTS OF CORRELATION OF THE SCORES ON THE MMPI OF 33 CASES OF SCHIZOPHRENIA WITHIN THE AGE RANGE 15 TO 29

SCALES	MEANS	PEm	S.D.	r
?	53.00	1.33	7.87	-.07 N. Sig.
L	55.30	2.59	15.33	-.02 N. Sig.
K	50.93	1.63	9.70	-.60 V. Sig.
F	64.00	1.69	10.04	.80 V. Sig.
Hs	59.72	1.69	10.04	.75 V. Sig.
D	68.93	2.37	14.03	.45 V. Sig.
Hy	59.78	1.31	7.75	.87 V. Sig.
Pd	68.30	1.86	11.03	.26 N. Sig.
Mf	59.06	2.09	11.87	.43 V. Sig.
Pa	67.87	2.39	14.18	.62 V. Sig.
Pt	69.03	3.12	18.52	.58 V. Sig.
Sc	77.21	3.17	18.79	
Ma	60.36	1.89	11.23	.74 V. Sig.

TABLE X

THE MEANS, PROBABLE ERRORS OF THE MEANS, AND STANDARD DEVIATIONS OF THE SCORES ON THE MMPI ON 31 CASES OF SCHIZOPHRENIA WITHIN THE AGE RANGE 30 TO 39

SCALES	MEANS	PEm	S.D.
?	53.22	.86	7.07
L	55.03	.22	1.81
K	53.67	.99	8.19
F	58.90	1.24	10.25
Hs	54.83	1.18	9.80
D	61.61	1.61	13.34
Hy	55.00	1.31	10.82
Pd	62.06	1.24	10.25
Mf	57.38	.56	4.69
Pa	61.16	1.48	12.25
Pt	60.03	1.27	10.49
Sc	65.45	2.28	18.84
Ma	59.64	1.74	14.07

TABLE XI

THE MEANS, PROBABLE ERRORS OF THE MEANS, AND STANDARD DEVIATIONS OF THE SCORES ON THE MMPI OF 16 CASES OF SCHIZOPHRENIA WITHIN THE AGE RANGE 40 TO 53

SCALES	MEANS	PEm	S.D.
?	51.43	.45	2.64
L	53.81	.84	5.00
K	54.37	1.90	11.23
F	57.37	2.22	13.19
Hs	55.75	1.51	8.94
D	60.62	2.71	16.06
Hy	59.50	1.54	9.11
Pd	59.25	3.10	18.52
Mf	54.90	1.85	11.00
Pa	58.00	1.58	9.38
Pt	56.50	1.69	10.05
Sc	60.25	2.36	14.00
Ma	54.87	1.49	8.83

TABLE XII

A GRAPHIC PORTRAYAL OF THE PERFORMANCE OF 33 SCHIZOPHRENICS WITHIN THE AGE RANGE 15 TO 29 ON THE MMPI BASED ON THE MEAN T SCORES

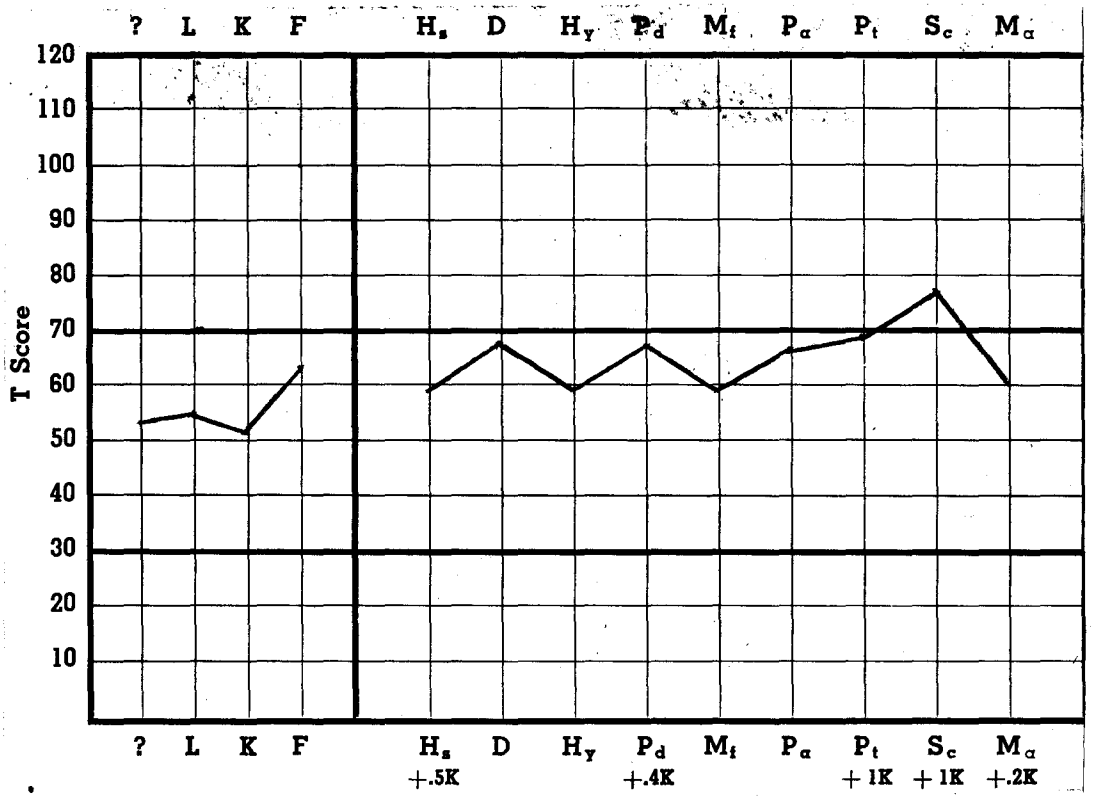


TABLE XIII

A GRAPHIC PORTRAYAL OF THE PERFORMANCE OF 31 SCHIZOPHRENICS WITHIN THE AGE RANGE 30 TO 39 ON THE MMPI BASED ON THE MEAN T SCORES

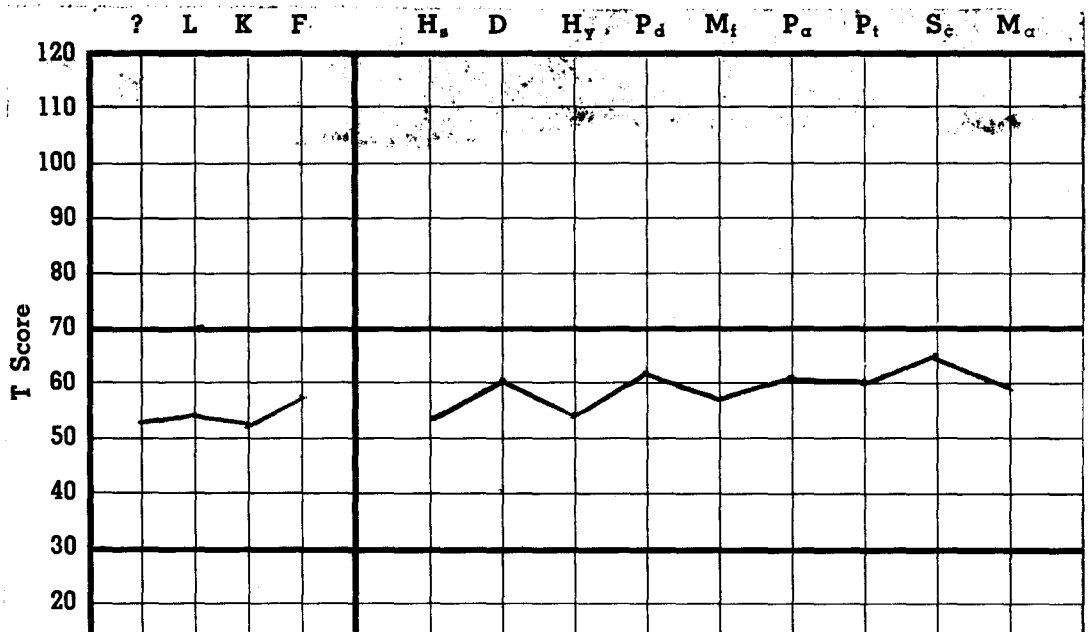
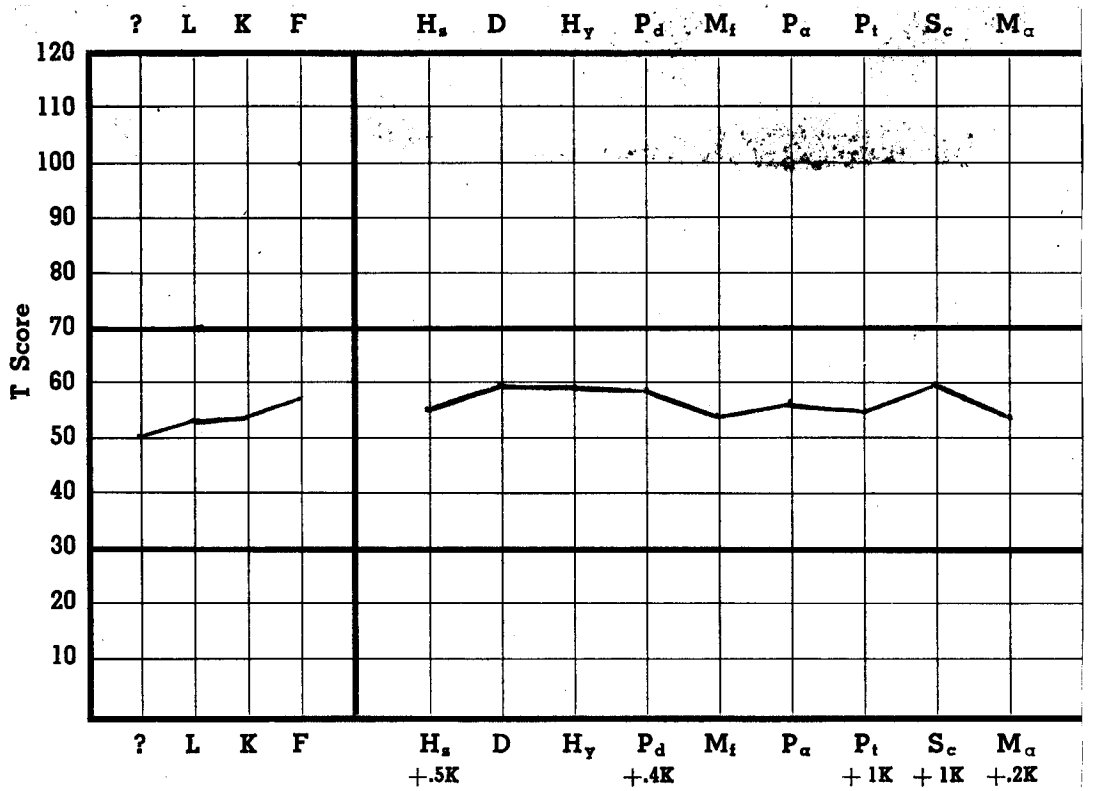


TABLE XIV

A GRAPHIC PORTRAYAL OF THE PERFORMANCE OF 16 SCHIZOPHRENICS WITHIN THE AGE RANGE 40 TO 53 ON THE MMPI BASED ON THE MEAN T SCORES



phenomenon it seems reasonable to assume, as is often clinically evident, that in the early stages of schizophrenia the conflicts are acute and the emotional reaction a violent one leading to a great deal of mental confusion. In this condition the patients are ready to admit most of their pathological mental processes with little critical control or insight. However, this must be modified by stating that this is not true in all cases of schizophrenia, that is, there are many cases in which the onset of the disease is insidious. This fact probably accounts for the extreme variability of scores (S.D. of 18.79) and makes prediction and generalization on the basis of test findings almost a practical impossibility.

Contrasting the first age group with the results of the entire 80 cases a general tendency is noted for the young early cases to be much less on the defensive in taking a test of this kind. Their guard seems to be down, and they tend to be rather harsh in their judgments of themselves and their conduct. This "over-honesty" is manifest in the negative correlation (-.60) between the K scale and Sc. In other words, the higher the Sc score tends to go, the more prevalent do feelings of inferiority and inadequacy become. We also noted a marked increase in the direction of somatic preoccupation in the earlier cases with high Sc scores. This is brought out by the increase in coefficient of correlation from .52 between Hs and Sc on the 80 cases to a correlation of .75 between the same scales on the age group 15-29. Corroboration for the assumption of hyper-emotionality in the younger schizophrenics appears in the marked increase in r between Hy and Sc from .63 for the 80 cases, to .87 between Hy and Sc with the age group 15-29. Further evidence of the general

presence of hyper-emotionality with consequent hyper-activity is brought out in the very great increase in r between Ma and Sc from.37 for the 80 cases to.74 for the 33 youngest cases. A moderate increase in Pa also occurs. However, these conclusions apply only to those cases in which the Sc score has been revealing. It is difficult to make any valid statements for the group in general without severe qualifications. These findings may be helpful in the hands of a skilled clinician where the MMPI is used as merely one of a battery of tests.

ITEM ANALYSIS — B

An extensive item analysis was conducted in an attempt to discover the relative diagnostic significance of the various test items. The primary object of interest, of course, was the Sc scale with its items. One would expect a fair amoung of agreement among diagnosed schizophrenics on the items making up the Sc scale. The items of the Sc scale were chosen for their diagnostic potentialities. If a given item is descriptive of a typical schizophrenic process, then one might logically expect most diagnosed schizophrenics to agree on that item. Empirically this was not the case.

For purposes of convenience the results of the item analysis have been placed in the appendix. There can be found a listing of the items which go to make up the different scales and the actually obtained per cent of agreement among the schizophrenics regarding any particular item.

Perhaps from the ppor results obtained on the mean T scores with the great variability one could have predicted equally poor success for the item analysis. The results were inconsistent and at times contradictory. A cursory inspection of the appendix will fortify this impression.

The analysis of the items of the Sc scale on the entire 80 cases was singularly insignificant. Analysis of the responses of the 33 youngest and most pathological cases also failed to show a sufficient amount of agreement and consistency among the patients to provide a safe and sure basis for generalizations.

Somewhat more definite results with much higher percentages were obtained on the other scales. However, since none of these scales purports

to measure a psychosis (as does the Sc scale by its very title) no clear cut picture descriptive of any psychosis was obtained. It is interesting to point out that a picture was obtained, nevertheless, which might have some bearing upon the pre-psychotic schizophrenic personality. At least it may be validly said that the schizophrenics used in this study tended to describe themselves as suspicious, mistrustful, and quarrelsome, entertaining strong feelings of aggression and hostility coupled with the opposite tendency to give up and withdraw from further environmental stimulation. Mood swings were also described from extreme hyperactivity to retardation and depression. Obsessive thinking is noted. In addition these schizophrenics felt that they were markedly sensitive, impatient, stubborn, and allowed the spirit of revenge and vindictiveness to overcome them quite often. Finally, there is a definite indication of deep dissatisfaction with the home situation. None of these "traits" considered in themselves, or even taken together, necessarily describes a particular psychosis; but they do point to unwholesome attitudes which would tend to make an individual "psychosis-prone".

The study of the items on the different scales of the MMPI, while contributing little of positive value to the present thesis, has nevertheless been included in the appendix, since it was felt that it would be of definite value in future research. One might, for example, wish to take those items above fifty per cent and construct from them a new Sc scale which would be more discriminative and selective in screening out the clinical entity known as schizophrenia. One might wish to investigate the possibility of isolating certain prodromal factors in mental illness on the basis of the data which we have included in the appendix.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the clinical value of the Sc scale of the MMPI. In carrying out this investigation the problem had necessarily to broaden so as to include other scales and factors in the MMPI. Eighty cases of schizophrenia diagnosed as such by the psychiatric staff at the Chicago State Hospital were used in this study.

In treating the diagnostic possibilities of the Sc scale taken by itself we found that, on the basis of per cent of agreement with staff diagnosis, it fails to distinguish, at the outside limits, more than 59 per cent of the cases. In only 41 per cent of the cases was the Sc score at or above the pathological T score of 70; if one takes as an absolute diagnostic criterion only those instances in which the Sc scale is above 70 and the highest of all the scales, then the per cent drops to 20.

On the basis of these findings one would seem warranted in stating that no certain conclusions should be drawn from the mere fact that a high Sc score appears on any single test. The most that can be said is that the appearance of a relatively high Sc score suggests the necessity for further clinical investigation. In this way, in the hands of an experienced clinician and not a mere psychometrician, the MMPI might be used as a rough screening device.

The results obtained by averaging the T scores for each scale are also without much diagnostic significance or predictive value. The mean Sc score for the 80 cases did show a positive trend in the direction of schizophrenia, but was within "normal" limits. Add to this the fact of a large

standard deviation, and the validity of any generalizations based on these results becomes even more doubtful. Somewhat better results were obtained when the 80 cases were divided into three age groups. The youngest age group consisting of 33 cases did yield a pathologically high mean Sc T score which score was the highest of all the scales. But here again the probable error of the mean and the standard deviation tended to negate the potential statistical significance of the results. By comparison results on other scales were worse.

The item analysis on the Sc scale itself was equally without much value. In this connection it would be valuable to have on hand the results of item analysis on a normal control group. Agreement as to certain items contained in scales other than the Sc scale seemed to be more frequent and offered the promise of some diagnostic help in a rough way. A description of schizophrenia as revealed by the MMPI was attempted on the basis of these more frequently checked items.

All in all it would seem that one cannot accept the test findings of the MMPI indiscriminately in attempting to diagnose schizophrenics. The most that can be said for the Sc scale is that sometimes it works and sometimes it doesn't. Profile analysis fails to give much more help, except to indicate that some serious mental pathology is present which warrants further investigation.

The practical conclusion then that can be drawn from this study regarding the MMPI and schizophrenia is that in each case of suspected schizophrenia in which the MMPI is administered a detailed item analysis should be carried out rather than absolute confidence placed in the diagnostic ability of the T scores taken by themselves or as a whole. In this

way statements indicating mental pathology may be brought to light which would otherwise have been masked by a purely quantitative treatment. This kind of use of the MMPI affords an easy approach to the extensive clinical interview.

It is evident that the results of this study are in substantial agreement with the findings in previous research concerning the use of structured personality tests in the diagnosis of schizophrenia. That such a similar result has been obtained in this study adds to the growing weight of evidence that the true fault does not lie with the tests themselves primarily, but with the current psychiatric nosology. In other words, it would seem more probable that this test has failed to diagnose schizophrenia because there is no single clinical entity which might be given that name. Rather there are many psychotic reaction types which have been insufficiently distinguished and have been consequently lumped under the general term schizophrenia. This is at least a distinct possibility and must be taken into account in any evaluation of the test results on the MMPI.

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APPENDIX II

TABLE XVI

THE RESULTS OF THE ITEM ANALYSIS OF THE SCHIZOPHRENIA SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF THE TOTAL NUMBER OF PATIENTS WHO "CHECKED" EACH PARTICULAR ITEM*

ITEM	PER CENT	ITEM	PER CENT	ITEM	PER CENT
C-18	58	A-30	30	E-40	20
E-42	56	B-36	29	G-53	20
C-6	53	D-32	29	H-30	19
J-41	50	F-49	29	A-48	19
F-18	49	G-20	29	B-1	19
F-44	49	G-34	29	G-47	18
G-21	46	H-53	29	H-8	18
H-12	46	I-27	28	A-27	15
D-33	45	C-11	28	G-10	15
F-35	40	A-44	28	H-11	15
F-42	40	A-21	28	A-42	15
A-26	38	B-2	26	H-20	14
A-20	36	C-47	26	G-55	14
A-36	35	I-3	26	C-52	14
H-32	35	G-53	25	A-25	14
A-41	34	E-17	25	I-2	11
F-39	34	H-55	25	G-7	11
A-38	33	A-37	24	F-1	11
C-5	33	E-38	24	C-16	10
C-10	33	A-22	23	E-20	10
E-24	33	C-51	23	G-9	10
I-35	33	A-43	23	G-11	10
B-50	31	H-16	23	C-15	9
G-51	31	E-22	21	C-14	6
I-23	30	A-19	20	H-27	5
H-13	30	E-37	20	C-13	5

* Only the symbols for each item are listed with the per cents. The reader should refer to the master listing of all the items in Appendix I. Care must be taken by referring to the (R) or (L) after each statement to determine whether the patients have agreed or disagreed with the statement.

TABLE XVII

THE RESULTS OF THE ITEM ANALYSIS OF THE SCHIZOPHRENIA SCALE OF THE MMPI ON THE THIRTY-THREE YOUNGEST CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM FOR THIS AGE

ITEM	PER CENT	ITEM	PER CENT	ITEM	PER CENT
F-44	60	I-3	39	H-30	27
C-6	57	I-27	39	G-34	24
F-42	57	I-35	39	G-18	23
J-41	57	A-21	36	A-42	21
E-42	56	C-11	36	A-43	21
A-20	54	E-22	36	A-48	21
F-18	54	A-22	33	E-17	21
G-21	51	A-44	33	G-53	21
C-10	48	G-11	33	H-20	21
F-39	48	D-32	33	A-27	18
H-32	48	H-55	33	E-20	18
A-26	45	A-19	30	F-1	18
H-12	45	A-30	30	G-7	18
A-36	42	B-1	30	G-10	18
A-38	42	B-36	30	H-11	18
D-33	42	C-53	30	A-25	15
E-24	42	E-38	30	C-52	15
F-35	42	G-55	30	G-9	15
H-13	42	H-16	30	C-16	12
I-23	42	H-53	30	C-13	9
A-41	39	G-20	29	C-15	9
B-50	39	A-37	27	I-2	9
C-5	39	B-2	27	C-14	6
C-47	39	C-51	27	H-27	5
F-49	39	E-37	27		

TABLE XVIII

THE RESULTS OF THE ITEM ANALYSIS OF THE HYPOCHONDRIASES SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
B-20	39	A-44	25
B-10	38	B-28	23
B-18	37	C-17	23
A-32	36	A-2	22
A-47	35	A-14	21
A-31	35	A-46	21
A-4	33	A-13	20
A-40	33	A-12	18
B-9	33	A-48	18
A-5	31	A-55	18
A-36	31	B-17	18
A-1	29	A-42	16
A-16	28	B-15	15
A-50	28	B-16	11
B-8	26	B-12	10
B-27	25	A-15	7
A-10	25		

TABLE XIX

THE RESULTS OF THE ITEM ANALYSIS OF THE DEPRESSION SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT	ITEM	PER CENT
G-32	86	H-43	48	D-18	29
C-48	85	F-44	45	A-1	28
I-4	77	C-33	43	B-8	26
B-36	75	A-6	42	A-40	26
G-25	71	B-30	39	B-2	25
G-31	70	C-18	39	C-17	25
B-6	68	E-36	38	I-27	25
D-10	67	F-42	38	H-55	25
G-49	66	B-18	37	B-28	23
F-36	66	I-39	36	A-8	20
A-3	65	F-51	34	A-2	20
C-31	65	A-4	33	A-23	20
B-3	62	F-39	33	J-50	17
B-4	57	G-12	32	A-27	15
G-38	55	I-34	32	G-23	13
I-37	55	A-18	31	F-38	12
B-31	52	E-24	31	G-7	11
D-22	52	F-45	31	B-12	10
G-37	50	J-51	31	D-41	10
F-34	48	A-24	30	A-15	7

TABLE XX

THE RESULTS OF THE ITEM ANALYSIS OF THE HYSTERIA SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT	ITEM	PER CENT
G-40	77	G-29	43	I-27	27
B-40	75	C-33	41	A-40	27
E-54	73	A-17	39	S-44	26
E-53	72	B-10	39	A-10	25
A-3	70	D-44	39	A-27	25
F-33	57	F-7	39	A-48	25
C-42	56	D-38	38	C-17	25
G-50	55	A-32	37	B-28	23
F-5	55	C-43	37	A-2	22
E-44	52	A-31	35	C-51	22
E-43	51	B-9	33	A-55	21
D-52	50	F-39	33	B-11	21
E-3	48	G-12	33	D-48	21
F-9	48	J-51	33	A-46	20
H-10	48	A-5	32	A-11	19
C-25	47	A-45	32	A-12	19
E-23	47	A-16	31	B-1	19
F-25	47	A-1	29	A-42	14
D-54	45	H-54	29	B-12	11
G-21	44	F-49	28	A-15	8

TABLE XXI

THE RESULTS OF THE ITEM ANALYSIS OF THE PSYCHOPATHY SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
D-51	87	A-4	34
D-2	78	F-39	34
G-25	73	G-12	34
F-36	70	H-32	32
E-46	67	B-49	32
I-30	63	C-12	32
I-26	63	D-30	31
I-13	60	D-32	30
E-44	53	C-47	27
C-6	53	B-53	27
E-43	52	B-48	27
F-5	52	H-31	27
I-12	51	I-27	26
F-8	50	C-7	25
H-26	48	B-55	23
H-12	45	E-17	23
G-18	44	B-42	22
E-12	42	C-35	21
B-52	42	F-50	21
E-50	42	E-37	20
G-30	41	G-55	20
F-7	41	G-54	16
D-38	39	B-47	15
B-51	38	G-53	13
D-44	37		

TABLE XXII

THE RESULTS OF THE ITEM ANALYSIS OF THE MASCULINITY-FEMININITY SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT	ITEM	PER CENT
A-43	80	I-44	55	C-33	42
J-7	76	D-50	55	D-5	42
G-40	76	C-45	52	J-25	42
E-9	75	I-40	50	J-26	40
I-4	75	J-19	50	J-40	40
J-10	69	J-12	49	J-54	40
I-49	68	C-50	49	D-47	39
D-2	67	E-34	49	J-29	38
E-16	66	E-35	49	J-32	38
E-33	66	F-52	48	C-10	33
J-11	62	I-45	48	C-3	32
J-24	60	E-3	47	J-34	32
F-46	60	H-2	47	J-23	28
J-18	60	J-31	45	I-50	28
C-53	59	A-9	44	D-16	26
G-30	59	H-38	44	E-49	23
C-36	58	J-5	44	I-53	22
C-51	58	B-25	43	D-39	20
D-36	58	C-12	43	J-1	18
I-51	56	F-15	43	D-17	16

TABLE XXIII

THE RESULTS OF THE ITEM ANALYSIS OF THE PARANOIA SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
D-52	56	H-9	33
G-50	55	A-36	32
D-50	55	D-35	32
D-46	54	H-3	31
G-6	52	G-34	29
J-41	51	B-54	27
F-10	50	G-52	23
H-26	48	H-16	22
D-54	48	A-22	21
D-53	46	E-37	20
A-9	44	G-55	20
D-33	43	H-8	19
D-55	42	H-11	16
E-12	42	H-25	16
F-35	37	G-54	14
H-6	37	G-53	13
F-51	36	H-7	11
H-49	34	G-9	10
G-16	34	H-4	10
G-12	34	H-14	3

TABLE XXIV

THE RESULTS OF THE ITEM ANALYSIS OF THE PSYCHASTHENIA SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
F-36	68	H-32	33
B-33	61	F-39	32
I-13	61	I-23	31
F-46	58	I-35	31
I-32	55	F-49	28
I-37	53	I-27	27
G-22	53	G-41	27
G-36	51	G-29	27
J-41	50	A-40	26
F-44	50	H-13	26
F-10	48	H-28	26
G-21	48	B-2	25
I-25	47	B-27	25
F-3	46	G-43	25
F-4	46	H-55	25
A-6	45	B-11	23
E-50	43	F-50	23
B-30	41	G-35	21
G-42	39	A-22	20
F-35	37	A-23	20
G-1	37	H-30	19
F-31	36	H-52	19
G-45	36	C-41	15
I-39	35	A-27	12

TABLE XXV

THE RESULTS OF THE ITEM ANALYSIS OF THE HYPOMANIA SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
G-26	82	D-44	38
G-16	65	A-20	37
C-24	55	B-3	37
C-27	55	E-31	33
C-30	55	I-34	33
H-47	53	B-50	32
E-44	53	C-3	32
C-6	53	E-7	32
G-19	52	J-44	32
E-43	51	D-35	31
F-8	50	C-31	31
D-34	50	A-21	28
G-37	49	A-37	28
H-26	49	D-49	28
G-21	46	B-37	27
E-1	44	E-15	27
E-48	44	B-40	26
F-14	43	E-11	21
D-33	43	A-19	20
D-7	42	E-11	21
D-26	42	A-19	20
G-50	42	A-22	20
J-54	42	G-47	20
		H-19	19

TABLE XXVI

THE RESULTS OF THE ITEM ANALYSIS OF THE "K" SCALE OF THE MMPI ON THE ENTIRE EIGHTY CASES LISTING THE PER CENT OF AGREEMENT OR DISAGREEMENT ON EACH ITEM

ITEM	PER CENT	ITEM	PER CENT
D-51	86	I-37	44
B-55	81	C-33	43
G-31	74	F-46	43
I-38	72	E-52	42
A-3	56	I-22	42
F-33	61	I-31	42
C-18	58	F-7	38
C-27	55	F-43	38
E-44	53	G-18	38
F-34	52	C-28	32
D-54	51	G-30	32
F-8	51	J-51	29
E-43	50	F-20	27
D-53	49	D-48	20
G-29	49	G-23	13

APPROVAL SHEET

The thesis submitted by LeRoy A. Wauck has been read and approved by three members of the Department of Psychology.

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

The thesis is therefore accepted in partial fulfillment of the requirements for the Degree of Master of Arts.

July 12, 1948
Date

Frank J. Kobler
Signature of Adviser