THE USE OF THE HAND-TEST FOR DIFFERENTIATING SIMPLE AND PARANOID SCHIZOPHRENICS

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CURRICULUM STUDIORUM

Norbert B. Girardin was born September 18, 1942 in St. Boniface, Manitoba. He received the Bachelor of Arts degree from the University of Manitoba in 1963.

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INTRODUCTION

Projective techniques are constructed for the study of personality, or of certain definite aspects of behavior.

The Hand-Test can be considered as a projective diagnostic technique for the study of behavioral tendencies. The projection of these tendencies is achieved through the use of pictures of hands.

Research with the Hand-Test shows some significant differences between the scores of normals and those of schizophrenics, and between the scores of neurotics and those of schizophrenics.

Does the Hand-Test show reliable discrimination between the diagnostic categories of schizophrenia, and if so, where do these differences lie?

This project proposes to answer this question, by the study of the action tendencies of the two chosen categories of schizophrenia as they will appear on the Hand-Test.

The first portion of this thesis is concerned with a review of the literature on the Hand-Test. The second part treats the experimental design with the elaboration of the basic hypothesis and emphasis on all controlled variables. This is followed by a description of the method of the experiment.

The results obtained are then presented and discussed;

a brief interpretation of the data and suggestions for further research are also included.

CHAPTER I

REVIEW OF THE LITERATURE

In 1957 at the International Congress of Psychology in Bonn, Dr. Zygmunt A. Piotrowski of the Jefferson Medical College in Philadelphia introduced and described the Hand-Test as an instrument which might be used to predict behavior, especially anti-social or aggressive behavior.[1]

This was the beginning of a new projective technique using pictures of hands as the medium for projection.

The first chapter is divided into three parts. The first discusses the relationship between personality and hands and gives the reasons why pictures of hands were chosen as a technique of personality evaluation. Following this is a review of the experiments conducted with the Hand-Test, in which schizophrenics were used. The third part presents a brief summary and introduces the basic problem.

Since the Hand-Test is a relatively new technique in projective testing, the literature is rather brief, but all writings and experiments pertaining to this research will be examined carefully.

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1 Piotrowski, Z.A., "Test Predicts Success", in Science Newsletter, Vol. 78, No. 7, issue of August 13, 1960, p. 109.

1. The Hand-Test and Personality.

The choice of hands for the construction of a projective technique can be well accounted for. There seems to be a major relationship between the use of hands and the behavioral functionning of an individual:

> In the development of the human organism, the ongoing, reciproeal, feed-back relationship between the brain and the hand makes it likely that perceptions and cognitions of semi-structured pictures of hands will mirror significant perceptual-motor tendencies in the subject.[2]

Hands are a major asset in the establishment and maintenance of reality contact. They are in action from the moment of our birth to our last breath of life. Every moment of every day brings forth multiple avenues through which our hands perform. From the moment we rise in the morning, to the moment we go to sleep, they play an active role in our lives.

> They bring us into continuous contact with our environment. They soothe us when we are ill, tentatively checking other body parts to make sure all is well. They play an integral role in all pleasure-seeking activities, and especially in sexual foreplay. In pre-adult years, they serve as the main source of auto-erotic pleasure. They are indispensable in helping us obtain vital necessities.[3]

We can therefore say that the hands constitute

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2 Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 1.

3 Ibid.

somewhat the final check on surrounding reality.

Knowing that human behavior is organized, the perception of unstructured stimuli should reflect higher order behavioral tendencies. Responses to ambiguous pictures of hands are bound to project the internal organization of personality and in such a way that the responses can be classified psychologically.

The human organism interacts with living and inanimate things. The responses to pictures of hands should reflect these tendencies. If not, the individual is blocked by some inner weakness or some other aspect of the impersonal or interpersonal environment. This lack of adaptation can grow to a disintegration and produce a withdrawal from reality at various degrees of inappropriate behavior, from whence come the main scoring categories for the classification and the evaluation of the responses given to the Hand-Test.

2. Studies Involving the Hand-Test.

The first published experiments using this new projective technique were made a few years after it had been introduced. Wagner was the initiator of these first studies.[4]

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[4] Wagner, E.E., "The Use of Drawings of Hands as a Projective Medium for Differentiating Normals and Schizophrenics", in the Journal of Clinical Psychology, Vol. 17, No. 3, issue of July 1961, p. 279-280.

The first tentative study was to examine the use of the test as a medium for differentiating normals and schizophrenics. The sample consisted of fifty randomly selected schizophrenics, of mean age 42.5. This clinical group was composed of ten chronics, eight undifferentiated, five catatonics, seven hebephrenics and twenty paranoid schizophrenics. The normal group consisted of fifty college students of mean age 20.

The quantitative analysis of the results revealed three differences beyond the .001 level of significance. Wagner attributed his findings to factors other than age; he also added that if the connotations of the scoring categories are to be taken literally, a picture of schizophrenia emerges which is in keeping with what is known about their overt behavior: reduction of intellectual efficiency, maladjustive behavior, lowering of the level of activity and withdrawal from reality situations.

The overt behavior of schizophrenics was also studied by Briklin, Wagner and Piotrowski using the Hand-Test.[5] However, this is of no direct concern with this project, although their studies revealed what to expect from schizophrenics on the Hand-Test.

A second experiment also dealing with schizo-

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5 Briklin, B., Piotrowski, Z.A., and Wagner, E.E., The Hand-Test, Springfield, Charles C. Thomas, 1962, 112 p.

phrenics was attempted soon after the first. Wagner explored the possibility of differentiating two known clinical groups, namely diagnosed neurotics and schizophrenics.[6]

The schizophrenic group consisted of forty first admission patients and twenty ambulatory cases. The sexes were evenly divided and the mean age was 32.8.

The neurotics consisted of twenty males and females privately diagnosed by two psychiatrists. They included fifteen anxiety neurotics, five sexual deviates, three traumatic disorders and three reactive depressives. The mean age was 36.

It had been hypothesized that when a schizophrenic produces a withdrawal answer, he is projecting his inability to formulate meaningful action tendencies and to interact appropriately with his impersonal and interpersonal surroundings. Wagner's findings revealed that the schizophrenics scoring more withdrawal answers than neurotics is in keeping with psychological theories. The study found that the two groups differed on the withdrawal category at the .001 level of significance.

It was concluded on the basis of this study that at least some discrimination between schizophrenics and

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6 Wagner, E.E., "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, issue of April 1962, p. 208-209.

neurotics is possible by the evaluation of responses on the Hand-Test.

Other studies have also been attempted with the Hand-Test. Various groups of normal and clinical people were used and assessed. Of these, there were 450 normals, chosen from a wide range of occupations, such as pilots, students, nurses and children, with the sexes always equally divided. Tested were also fifty men and fifty women classified as organic psychotics; neurotics, depressed patients, mental retardates and anti-social personalities chosen from parolees, prisoners and delinquents were also included in the experiments.

Altogether, 1200 cases are reported to have been tested prior to the publication of the Hand-Test. Certainly this total study on the test was bound to have biases, as Wagner reports.[7] Most of the subjects were residents of Ohio; the groups may have been too low numerically and there is a possibility that the chosen groups did not exhaust the dimensions of normalcy and pathology. But still, what had been hypothesized before the experiments was realized in the right directions. Thus, it is possible to generalize within limits to several populations even though the ones chosen might not have been totally representative.

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[7] Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 19.

The experiments with schizophrenics proved this to be true. From the results of his evaluations, Wagner was able to describe the possible answers that should be expected from schizophrenics, and more particularly, from different categories of schizophrenia.

This project is interested in the categories of simple and paranoid schizophrenia only.

No mention is made of the quantitative aspect of these two groups' responses on the Hand-Test.

However, from a qualitative point of view, Wagner says that the paranoid and the simple schizophrenics would tend to give similar impoverished records.[8] These responses would contain anal references and signs of homosexuality, dirt, filth and uncleanliness; some would have grandiose contents and expressions of world catastrophy. But there is no mention of the possibility of finding differences between the responses given by these two groups on different categories of scoring on the Hand-Test.

3. Summary and Basic Problem.

Though overlapping may be expected in the study of different groups with the Hand-Test, fairly reliable groupings of protocols on the basis of clinical diagnosis can be

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8 Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 32-34.

accomplished with this projective technique. The action tendencies of a normal or clinical group are expected to be different from other groups used in comparison, be it as a whole, or only in parts.

This project further explores the Hand-Test by attempting an experimental discrimination between the inner categories of schizophrenia. The purpose of this approach is to find if this new projective technique can show significant differences between two chosen categories of schizophrenia, namely, simple and paranoid schizophrenics, by the exploration of the action tendencies as shown by the Hand-Test.

This project continues Wagner's experiments by penetrating inside one of the groups he used for his studies with the Hand-Test. As Wagner found it was possible to differentiate known clinical groups with the test, such as differentiating schizophrenics from other groups, we proposed to go even deeper and explore the possibility for the Hand-Test to show some significant differences between the inner categories of schizophrenia. Already considered a valuable screening device in clinics, the Hand-Test could maybe serve as a more precise diagnostic instrument.

CHAPTER II

EXPERIMENTAL DESIGN

This chapter presents the procedures involved in the testing of the hypothesis.

The first part of the chapter is devoted to the elaboration of the basic hypothesis. The instrument used, the Hand-Test, is then described with its administrative, scoring and interpretative techniques. Following this is a description of the sample, the course taken in the selection, and the criteria used for the selection. The method of the experiment is treated next in a step by step development of the followed procedure. Finally, we shall see the statistical formulas used in the evaluation of the data.

1. Specific Hypothesis.

As mentionned on the last page of the preceding chapter, the purpose of this research is to find if the Hand-Test can show significant discrimination between two chosen categories of schizophrenia. According to Wagner, these two groups, the simple and the paranoid schizophrenics, should give similar responses to the Hand-Test.[1]

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1 Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 32.

But a doubt may be placed on the existence of such a similarity of responses between the two chosen categories of schizophrenia. Our general hypothesis originates from this doubt.

The basic hypothesis states that there will be no significant differences between the paranoid schizophrenics' and the simple schizophrenics' answers on the Hand-Test.

Two sub-hypotheses were postulated to test the basic:

1. There will be no significant differences between the mean number of responses given by the paranoid and the simple schizophrenics on each major category of the Hand-Test.

2. There will be no significant differences between the mean number of responses given by the two chosen groups on each of the fifteen sub-categories of the Hand-Test.

One other sub-hypothesis was formulated so as to describe the action tendencies of the paranoid and simple schizophrenics as shown by the Hand-Test:

3. There will be no significant differences between the mean number of responses on each major category of the Hand-Test within each chosen group of paranoid and simple schizophrenics.

2. Instrument.

The Hand-Test is a projective diagnostic technique consisting of ten cards on which there are pictures of hands in different poses. The cards are approximately three by five inches in size. There is a drawing of a hand on each card except on the last which is blank. As the cards are presented one at a time, the subject "projects" as he tells what each of the hands is doing. The subject is simply asked: "What might this hand be doing?", or "What is this hand doing?". For the tenth and last card, the examinee is asked to imagine a hand and again tell the examiner what it might be doing.

Non-threatening and brief, the Hand-Test is simple to administer, score and interpret. Standard procedures have been established for these different proceedings. The average administration time is approximately ten mimutes per protocol.

There are four major scoring categories. These are Interpersonal, Environmental, Maladjusted and Withdrawal. They are divided into a total of fifteen sub-categories. The first major category contains six of these, while the other three major categories contain three sub-categories each.

Interpersonal consists of Affection, Dependence, Communication, Exhibition, Direction and Aggression responses.

Interpersonal answers are interpreted as representing interaction with other people. They reveal the interest or sensitivity to human relations.

The Environmental category comprises the Acquisition, Active and Passive responses. This major category represents a generalized behavior or attitude towards the impersonal world. It shows the amount of impersonal concern in an individual.

Maladjustment includes the Tension, Crippled and Fear type of answers. It shows the difficulty an individual has in carrying out various action tendencies. His behavior may be blocked by inner weakness or by an external prohibition. The answers scored in this category will show the distress and the lack of satisfaction for one's personal needs.

The last major category, Withdrawal, is made up of Descriptive, Failure and Bizarre answers. Withdrawal responses show a rupture in reality contact. A prevalence of Withdrawal answers shows a definite break with reality.

The responses are scored into fifteen sub-categories. They are then added up to form the four major categories. A few other computations were also useful to this project. "R" is for the total number of responses an individual gives; this excludes the responses scored as failures. "PATH" represents the pathological score. It is

found by adding the total number of Maladjustment scores to twice the number of Withdrawal scores. Thus, PATH = MAL + 2 WITH.

Another factor considered in this experiment was "AIRT", which is the Average Initial Reaction Time. This is concerned with how many seconds a subject takes before reacting verbally to each one of the ten cards. A secondary measure is "H-L" which is the difference between the highest and the lowest reaction times.

These various measures were used in the analysis of the received data. They were carefully recorded and analysed statistically in favor of the acceptance or rejection of the hypothesis.

The reliability of the Hand-Test was taken into account before the computation of the statistical studies.

The test-retest reliability was established using the pathological score (PATH), found to be a meaningful and representative score for each protocol. The PATH scores obtained in the first administration of the test were correlated with those received on the second administration of the Hand-Test. This was done separately for the paranoid and simple schizophrenics. As s[illegible]n in Table I, the paranoid schizophrenic group gave a total PATH of 177 with a mean of 7.08 per protocol. The retest showed a total of 172 PATH scores, with a mean of 6.88. The computation of Pearson's

TABLE I.- Test-retest Statistics and Reliability Coefficients Using PATH Scores for the Paranoid (P) and the Simple (S) Schizophrenics. (N: P=25, S=25).

Groups	Administration	T	M	SD	"r"
P	TEST	177	7.08	5.80	.855
	RETEST	172	6.88	5.42	
S	TEST	148	5.92	5.41	.81
	RETEST	112	4.48	4.30	

"r" gave a test-retest reliability of .855.

The simple schizophrenic group gave a total of 148 scores on the first administration of the test and a total of 112 PATH scores on the retest. The mean on the first administration was 5.92 and 4.48 on the retest. Reliability was found to be .81.

Reliabilities of .855 and .81 were found to be fairly good with two samples consisting of twenty-five cases each. It was also to be considered that these results were quite similar to those obtained by Wagner in his experiments. Also ascertained using PATH scores, they were found to be .85, .84 and .85 by three different scorers.[2]

PATH scores were used to establish the test-retest reliability because they were found to be very representative of each protocol. They were also used by Wagner in his studies concerning the reliability of the Hand-Test.

3. Sample.

The sample consisted of 25 simple and 25 paranoid schizophrenics, all of which were first admissions. Only males were included in the project. The selections were made from the Ontario Hospitals of Brockville and Kingston. In each of the Hospitals, a complete list of the simple and

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2 Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 18.

paranoid schizophrenics was made. This included approximately sixty in each group. The age of each case, the years of hospitalization, the levels of education and the drugs were examined.

A list of 35 simple and 35 paranoid schizophrenics resulted from this establishing of controls. The two groups were comparable as to age, education and length of hospitalization so as to have no significant differences between the means of these variables.

The final selection of the sample was composed of 25 for each group. Out of the thirty-five chosen at first, some had to be left aside because they were sick or absent. A few were also eliminated because they did not want to cooperate. It was decided that two groups of 25 would eliminate all problems of testing.

The patients used in the experiment had been diagnosed at their admission. They had been examined within a year previous to this project, and each one's diagnosis was discussed with the chief psychologist so as to avoid possible diagnostic errors. The patients with lack of evidence in their diagnosis and those with records of brain damage or suspected of such, were dropped from the selection.

A total of five criteria were used in the selection. Sex, admission, age, education and length of hospitalization were controlled. As shown in Table II, the paranoid schizo-

phrenics had a mean age of 47.2, a mean education of grade 6.6 and a mean length of hospitalization of 8.16 years. The simple schizophrenics had a mean age of 46.3, a mean educational level of grade 6.56 and a mean hospitalization of 9.49 years. These three comparisons did not differ significantly, as the "t" values were .860, .043 and 1.08.

Drugs were also considered in the selection. It is not noted in the literature on the Hand-Test that drugs affect it, but patients with a minimum or no dosage were selected for the experiment. The drugs used were Largactil, Stelazine, Mellaril and Trilafon. The percentage of these as received by the sample appears in Table III.

4. Method of the Experiment.

The experiment involved a test-retest procedure. It was decided that a 24 hour lapse between the two administrations of the test would suffice. Therefore, both in Kingston and in Brockville, the patients were tested at a fixed hour on a certain day, and retested at approximately the same hour the following day. Depending on the wards, either the attendant's office or a spare room was used for both administrations. Each test lasted approximately eight to ten minutes.

Special scoring sheets bearing the subjects' case numbers had been prepared for the responses. An adjoining

TABLE II.- "t" Values of Differences Between the Means of Age, Education and Length of Hospitalization of the Paranoid (P) and the Simple (S) Schizophrenics. (N: P=25, S=25).

Criteria	Groups	M	SD	"t"
AGE	P	47.2	5.38	.860
	S	46.3	6.80	
EDUCATION	P	6.60	3.46	.043
	S	6.56	2.94	
HOSPITALIZATION	P	8.16	3.72	1.08
	S	9.49	4.48	

TABLE III.- Percentage of Paranoid (P) and Simple (S) Schizophrenics Receiving Different Types of Drugs or None.

Groups	Largactil	Stelazine	Taractan	Mellaril	Trilafon	None
P	.52	.08	.12	.08	.04	.16
S	.20	---	.32	.12	---	.36
TOTAL	.36	.04	.22	.10	.02	.26

list with all the names, case numbers and wards was used as a check list; the names were crossed out as the tests were given. Each examinee's sheets for the test and the retest were then joined.

Scoring was done by two correctors who were given as a scoring key the instructions found in the Manual accompanying the Hand-Test.[3] This covered instructions on the four major categories and on the fifteen sub-categories, with various examples and explanations.

Neither of the correctors knew that the responses had been given by schizophrenics. Test and retest sheets were mixed so as to avoid checking on the part of the judges. After one had scored the one hundred protocols, the second corrector was asked to do the same. The first judge scored the responses on separate sheets for each case, while the second marked the answer sheets themselves.

The total number of responses scored by the two judges on the two administrations of the test were then compared to establish the inter-judge reliability. The percentage agreement method was used, the formula being:

$$\frac{\text{Number agreed}}{\text{Number scored}} \times 100$$

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3 Wagner, E.E., The Hand-Test, Akron, Mark James Co., 1962, p. 5-7.

It was found that out of 1,047 responses scored by each of the two judges, they agreed on 960, thus giving a percentage of agreement of 91.69%.

Sheets had also been prepared for the computation of special scores in which this project was interested. These measures were "R", "AIRT", "H-L", and "PATH". These measures were recorded once the scoring had been done, for use in further evaluation of the responses.

5. Statistical Evaluation.

The testing of the hypotheses called for a method of comparisons of means. The "t" test of significance of differences was used. The formula was:

$$"t" = \frac{M_1 - M_2}{\sqrt{\frac{\Sigma x_1^2 + \Sigma x_2^2}{N(N-1)}}}$$

Since the groups used always amounted to twenty-five, the degrees of freedom (df) used in all the studies with "t" was 24.

The required "t" for significance at the .05 level was 2.064; it was 2.797 for significance at the .01 level, and 3.745 for significance at the .001 level.

It is to be noted that scores expressed in propor-

tions had to be used in the study for the comparisons involving the fifteen sub-categories. This was due to the fact that the number of responses varied with each individual tested. Scores expressed in proportions made the results comparable.

Precise decimal places were kept in all studies, and no fractions were rejected.

CHAPTER III

PRESENTATION AND DISCUSSION OF RESULTS

Having seen the procedures involved in the testing of the hypothesis, we shall now examine the results obtained in the multiple computations. The first part of this chapter is devoted to the presentation of results, and it is followed by a discussion of the obtained data.

As the three sub-hypotheses are tested in successive order, tables including the totals, means, standard deviations and "t" values will follow the presentation of the results. Because of the high degree of correlation between the first and second administrations of the test, only the results obtained in the first session will be used.

1. Presentation of the Results.

The comparisons between the total number of responses, "R", the Average Initial Reaction Time, "AIRT", the highest minus lowest scores, "H-L" and the pathological scores, "PATH" were the first to be studied. The data will be seen in Table IV.

In the "R" studies, we omitted the answers scored as failures as they indicate no response. The paranoid schizophrenics gave a total of 247 valid answers, with a mean of 9.88. The simple schizophrenics gave a total of 229

TABLE IV.- "t" Values of Differences Between Means of Paranoid (P) and Simple (S) Schizophrenics' Scores on "R", "AIRT", "H-L", and "PATH". (N: P=25, S=25).

Measures	Groups	T	M	SD	"t"
"R"	P	247	9.88	2.08	1.23
	S	229	9.16	2.62	
"AIRT"	P	160.4	6.41	4.46	.95
	S	137.7	5.50	2.53	
"H-L"	P	218	8.72	6.50	1.33
	S	297	11.88	8.84	
"PATH"	P	177	7.08	5.80	.98
	S	148	5.92	5.40	

answers with a mean of 9.1. This gave a "t" value of 1.23.

The paranoid schizophrenic group had a total of 160.4 seconds in "AIRT", with a mean of 6.41. The other group had a total of 137.7 and a mean of 5.50 seconds. The computation of "t" showed its value to be .95.

The study of "H-L" gave a "t" value of 1.33 between the two groups. The first had a total of 218 seconds and a mean of 8.72 while the second group had a total of 297 and a mean of 11.88.

The fourth comparison was that of "PATH". The paranoid schizophrenics had a total of 177 as compared to 148 for the other group. The means were 7.08 and 5.92; the "t" value was .98.

On these four computations, none of the differences were found to be significant at a level high enough to be considered.

Besides statistical data, observations at the testing sessions were collected. Both groups seemed to react approximately in the same way, though it was noticed that a few simple schizophrenics would hesitate for a while or not answer on the first and last cards. However, general reactions seemed to be similar throughout the testing sessions. The fact that no significant differences were found would agree with a lack of divergences in the reactions.

The testing of the three sub-hypotheses followed

this. The first sub-hypothesis was tested by comparing the means of the paranoid schizophrenics' and the simple schizophrenics' answers on the four major scoring categories. This data will appear in Table V.

On the Interpersonal category, the first group gave a total of 52 responses with a mean of 2.08 while the second groups contributed 63 with a mean of 2.52. The "t" value was found to be 1.05.

The Environmental category showed a total of 116 answers with a mean of 4.64 for the paranoid schizophrenics as compared to a total of 106 and a mean of 4.24 from the simple schizophrenics. The "t" value was .78.

On the third category, Maladjusted, the paranoid schizophrenics gave a mean of .92 responses with a total of 23, and the simple schizophrenics gave a mean of 1.36 with a total of 34 responses. The "t" value was 1.15.

The fourth category was composed of 78 responses and a mean of 3.12 from the paranoid schizophrenic group, and of 57 with a mean of 2.28 from the simple schizophrenics; the "t" value on the Withdrawal category was 1.

None of these differences was considered to be significant at a level high enough to be considered, though each group had a higher score on two different categories.

The second sub-hypothesis postulated in this project was tested by comparing the fifteen sub-categories of

TABLE V.- "t" Values of Differences Between Means of Paranoid (P) and Simple (S) Schizophrenics' Responses on the Four Major Scoring Categories. (N: P=25, S=25).

Categories	Groups	T	M	SD	"t"
INT.	P	52	2.08	2.04	1.05
	S	63	2.52	1.46	
ENV.	P	116	4.64	2.42	.78
	S	106	4.24	2.16	
MAL.	P	23	.92	1.35	1.15
	S	34	1.36	1.28	
WITH.	P	78	3.12	2.99	1
	S	57	2.28	2.80	

scoring to each other, to find if there were any significant differences on these parts of the Hand-Test. The four major scoring categories were divided into their sub-categories and each one was treated individually. Scores expressed in proportions were used in these computations. The data which appears in Table VI, covers the first category.

The study of the Interpersonal category led to the comparison of the Affection, Dependence, Communication, Exhibition, Direction and Aggression responses of the paranoid schizophrenic group with those of the simple schizophrenics.

With a total proportion score of .94 answers and a mean of .038, the first group differed by a "t" value of .84 with the second who gave a total proportion score of 1.42 and a mean of .057 answers. The Dependence followed Affection responses. They were composed of total proportion scores of .47 and .48, with means of .018 and .019 which gave a "t" of .08. The Communication answers showed totals of 1.36 and .76 with means of .054 and .03, and a "t" value of .9.

The paranoid schizophrenics gave a total proportion score of .36 Exhibition answers with a mean of .014 to a total of .09 and a mean of .003 by the other group. The "t" value was 1.4.

The first group gave a total proportion score of

TABLE VI.- "t" Values of Differences Between the Means of the Paranoid (P) and Simple (S) Schizophrenics' Scores (expressed in proportions) on the Interpersonal Category. (N: P=25, S=25).

Sub-categories	Groups	T	M	SD	"t"
AFF.	P	.94	.038	.052	.84
	S	1.42	.057	.101	
DEP.	P	.47	.018	.038	.08
	S	.48	.019	.043	
COM.	P	1.36	.054	.099	.9
	S	.76	.03	.900	
EXH.	P	.36	.014	.032	1.4
	S	.09	.003	.017	
DIR.	P	1.10	.044	.042	1.8
	S	1.96	.078	.089	
AGG.	P	1.03	.041	.041	.1
	S	1.17	.047	.049	

1.10 Direction responses with a mean of .044 while the second group gave a total of 1.96 with a mean of .078. The "t" value was 1.8. The last sub-category showed the paranoid schizophrenics giving a total proportion score of 1.03 responses with a mean of .041 and the simple schizophrenics gave a total of 1.17 with a mean of .047. The "t" value was found to be .1.

None of these differences were found to be significant at a level high enough to be considered.

The second category to be studied was that of the Environmental responses. This category of scoring is composed of Acquisition, Active and Passive responses, as seen in Table VII.

The paranoid schizophrenics gave a total proportion score of .83 Acquisition responses and had a mean of .033. The simple schizophrenics gave a total proportion score of 1.52 answers with a mean of .060. The "t" value was found to be 1.51.

The Active sub-category was the one containing the highest number of responses. The first group gave a total proportion score of 9.22 with a mean of .37. The second group gave a total of 7.97 proportion scores with a mean of .32. The "t" value was 1.03.

The Passive sub-category included a total proportion score of .88 responses for the first group and a

TABLE VII.- "t" Values of Differences Between the Means of the Paranoid (P) and Simple (S) Schizophrenics' Scores (expressed in proportions) on the Environmental Category. (N: P=25, S=25).

Sub-categories	Groups	T	M	SD	"t"
ACQ.	P	.83	.033	.083	1.51
	S	1.52	.060	.087	
ACT.	P	9.22	.37	.17	1.03
	S	7.97	.32	.18	
PAS.	P	.88	.035	.071	.70
	S	.58	.023	.039	

total of .58 from the second group. With means of .035 and .023, the "t" value amounted to .7.

No significant differences were found in this category when comparing the sub-categories to one another. It was observed that the paranoid schizophrenics' responses covered ten times the number of responses included in either two other sub-categories. The simple schizophrenics also scored highest on the Active sub-category which was five times that of Acquisition and ten times that of the Passive responses.

The third sub-category, Maladjusted, included the Tension, Crippled and Fear responses. The data appears in Table VIII.

The paranoid schizophrenics gave a total proportion score of .62 Tension answers and the simple schizophrenics gave a total of .87 proportion scores. The means were .024 and .034. The "t" value was .78.

The first group gave a total proportion score of 1.50 Crippled answers with a mean of .06, and the second group gave a total of 2.17, with a mean of .086. The "t" value was found to be .81.

The Fear sub-category was composed only of simple schizophrenic answers. They gave a total of .18 proportion scores with a mean of .0072. The "t" value was 1.41.

This third category did not reveal any significant

TABLE VIII.- "t" Values of Differences Between the Means of the Paranoid (P) and Simple (S) Schizophrenics' Scores (expressed in proportions) on the Maladjustment Category. (N: P=25, S=25).

Sub-categories	Groups	T	M	SD	"t"
TEN.	P	.62	.024	.049	.78
	S	.87	.034	.046	
CRIP.	P	1.50	.06	.113	.81
	S	2.17	.086	.111	
FEAR	P	----	----	----	1.41
	S	.18	.0072	.025	

differences between the sub-categories. Though they did not produce any Fear answers, the paranoid schizophrenics gave twice the number of Crippled answers as they did of responses scored as Tension.

The simple schizophrenics scored on all three sub-categories. The sub-category of Crippled responses was the highest. It doubled the Fear responses, and nearly tripled the Tension answers.

The Withdrawal major category of scoring included the Descriptive, Bizarre and Failure responses. Table IX presents the data involving the studies with these three sub-categories.

With a total proportion score of 3.79 and a mean of .151, the first group differed, on the Descriptive answers, from the second group who had a total proportion score of 2.39 and a mean of .095 by a "t" of 1.07.

On the Failure sub-category, the total proportion scores were 2.11 and 3.07, with means of .084 and .123. The "t" value was calculated at .66.

The first group gave a total proportion score of 1.37 Bizarre answers with a mean of .055. The second group gave a total proportion score of .09 with a mean of .003. The "t" value was 2.9.

Only one significant difference was found in this category. The "t" value found by the comparison of the

TABLE IX.- "t" Values of Differences Between the Means of the Paranoid (P) and Simple (S) Schizophrenics' Scores (expressed in proportions) on the Withdrawal Category. (N: P=25, S=25).

Sub-categories	Groups	T	M	SD	"t"
DES.	P	3.79	.151	1.76	1.07
	S	2.39	.095	.181	
FAIL.	P	2.11	.084	.15	.66
	S	3.07	.123	.66	
BIZ.	P	1.37	.055	.086	2.90
	S	.09	.003	.017	

Bizarre answers between the two groups was significant beyond the .01 level of confidence, though Bizarre answers constituted the lowest number of responses on the Withdrawal category, for both the paranoid and the simple schizophrenics.

Returning to whole numbers, we noticed that the total number of responses scored on the first administration of the Hand-Test amounted to 529. The Environmental category collected 222 of these, distributed into 116 for the paranoid schizophrenics and 106 for the other group. These scores made up more than one-third of the total number of responses. As seen in Table X, the paranoid schizophrenics scored 10 Acquisition, 96 Active and 10 Passive responses to 16 Acquisition, 84 Active and 6 Passive responses for the simple schizophrenics.

The second highest category was that of Withdrawal, where the first group gave 78 answers distributed into 41 Descriptive, 22 Failures and 15 Bizarre. The simple schizophrenics had a total of 57 made up of 25 Descriptive, 31 Failures and only one Bizarre answer.

The third highest category was Interpersonal. The first group had a total of 52, distributed in 10 Affection, 5 Dependence, 15 Communication, 3 Exhibition, 8 Direction and 11 Aggression. The second group had a total of 63 accumulated by 16 Affection, 5 Dependence, 8 Communication,

TABLE X.- Distribution of the Paranoid (P) and the Simple (S) Schizophrenics' Responses on the Fifteen Sub-categories and the Totals on the Four Major Categories.

		AFF	DEP	COM	EXH	DIR	AGG	Total
INT	P	10	5	15	3	8	11	52
	S	16	5	8	1	21	12	63

		ACQ	ACT	PAS	Total
ENV	P	10	96	10	116
	S	16	84	6	106

		TEN	CRIP	FEAR	Total
MAL	P	7	16	--	23
	S	9	23	2	34

		DES	FAIL	BIZ	Total
WITH	P	41	22	15	78
	S	25	31	1	57

1 Exhibition, 21 Direction and 12 Aggression responses.

The lowest category was Maladjusted where the paranoid schizophrenics collected a total of 23 responses. They had 7 Tension, 16 Crippled, and no answers scored as Fear. The simple schizophrenics had a total of 34 made up of 9 Tension, 23 Crippled and 2 Fear answers.

The third sub-hypothesis was tested by comparing the four major scoring categories with each other within each group. This resulted in six comparisons for each group.

The first comparisons were done using the paranoid schizophrenics' responses. The data appears in Table XI.

Interpersonal compared to Environmental for a divergence of 64 scores gave a "t" value of 3.98. Maladjusted compared to Environmental for a difference of 93 answers gave a "t" of 6.60. These differences were significant beyond the .001 level of confidence.

Interpersonal and Environmental compared to Withdrawal for divergences of 26 and 38 answers gave "t" values of 1.41 and .51 which were not significant. Maladjusted and Interpersonal were then compared to each other for a difference of 29 responses, and gave a "t" of 2.34 which was significant beyond the .05 level of confidence. The last comparison involved Maladjusted and Withdrawal for a dissimilarity of 55 responses, giving a "t" of 3.29. This

TABLE XI.- "t" Values of Differences Between the Means of the Paranoid Schizophrenics' Answers on the Four Major Categories of Scoring. (N=25).

Categories	T	M	SD	"t"
INT.	52	2.08	2.04	3.98
ENV.	116	4.64	2.42	
MAL.	23	.92	1.35	3.29
WITH.	78	3.12	2.99	
INT.	52	2.08	2.04	2.34
MAL.	23	.92	1.35	
ENV.	116	4.64	2.42	.51
WITH.	78	3.12	2.99	
INT.	52	2.08	2.04	1.41
WITH.	78	3.12	2.99	
MAL.	23	.92	1.35	6.60
ENV.	116	4.64	2.42	

difference was significant beyond the .01 level of confidence.

The same procedure was followed for the simple schizophrenics' answers on the four major scoring categories. Table XII presents this data.

The 63 Interpersonal responses were compared to the 106 Environmental, to the 57 Withdrawal and to the 34 Maladjusted to yield "t" values of 3.1, .4, and 2.9. The 34 Maladjusted were then compared to the 106 Environmental and gave a "t" value of 5.6. Withdrawal's 57 answers were compared to the Environmental and Maladjusted to give "t" values of 2.7 and 1.4.

Three of these six last comparisons were significant at a high level of confidence. The comparisons of Interpersonal to the Environmental and Maladjusted categories revealed differences significant beyond the .01 level. The Withdrawal compared to the Maladjusted and to the Interpersonal categories gave differences of a significance far below the .05 level of confidence. The Environmental category of responses gave a significant difference just below the .01 level of confidence when compared to the Withdrawal answers.

The most significant difference was found when the Maladjusted and the Environmental categories were compared to each other. This yielded a "t" value significant beyond

TABLE XII.- "t" Values of Differences Between the Means of the Simple Schizophrenics' Answers on the Four Major Categories of Scoring. (N=25).

Categories	T	M	SD	"t"
INT.	63	2.52	1.46	3.1
ENV.	106	4.24	2.16	
MAL.	34	1.36	1.28	1.4
WITH.	57	2.28	2.80	
INT.	63	2.52	1.46	2.9
MAL.	34	1.36	1.28	
ENV.	106	4.24	2.16	2.7
WITH.	57	2.28	2.80	
INT.	63	2.52	1.46	.4
WITH.	57	2.28	2.80	
MAL.	34	1.36	1.28	5.6
ENV.	106	4.24	2.16	

the .001 level of confidence.

Considering the percentage distribution of the answers on all categories, we noticed that the highest score for both groups was obtained on the Environmental category of scoring. The lowest score for both was on the Maladjusted category. Table XIII presents this data.

The paranoid schizophrenics gave percentages of .431 on the Environmental, .29 on the Withdrawal, .193 on the Interpersonal, and .086 on the Maladjusted. The simple schizophrenics gave percentages of .41 on the Environmental, .24 on Interpersonal, .21 on Withdrawal and .14 on Maladjusted.

The totals of the two groups came out to .217 on Interpersonal, .42 on Environmental, .25 on Withdrawal and .113 on Maladjusted.

2. Discussion of Results.

Altogether 41 statistical studies were computed in this experiment. The ones pertaining strictly to the comparison of the paranoid and simple schizophrenics' answers amounted to twenty-three. Twelve other comparisons were made within the groups themselves.

We shall attempt an explanation of the obtained results in this part of the chapter. Let us first examine the special units measured.

TABLE XIII.- Percentage of Paranoid (P) and Simple (S) Schizophrenic Answers on the Four Major Categories.

Groups	INT.	ENV.	MAL.	WITH.
P	.193	.431	.086	.29
S	.24	.410	.14	.21
TOTAL	.217	.420	.113	.250

The studies involving the comparison of "R", "AIRT", "H-L" and "PATH" did not present any significant differences. This would show that the paranoid and simple schizophrenics will react approximately the same to the general features of the Hand-Test.

The most important study was that comparing the two groups' responses on the four major categories. The "t" values obtained here were not significant at a level of confidence high enough to be considered. It is possible however, that a larger group of paranoid and simple schizophrenics would have increased these differences.

The second study between the two groups' responses involved the comparison of the responses on the fifteen sub-categories. Only one significant difference was found here. This was on the Bizarre category where the first group gave fourteen answers more than the second. The means were .6, and .04. Due to this low frequency, the obtained significant difference should not be given too much consideration. The fourteen other sub-categories did not present any significant differences although divergences in the number of responses were always present except once.

Another important study was that of the comparisons between the four major categories within the groups themselves. These amounted to six for each group. This study helped us observe the action tendencies of the two groups,

as shown within the groups themselves.

In the study with the paranoid schizophrenics, four significant differences were found. These were between the Environmental and Maladjusted, Interpersonal and Maladjusted, Maladjusted and Withdrawal and between Interpersonal and Environmental.

The paranoid schizophrenics scored more on the Environmental category than on any other major category. Their second highest score was on the Withdrawal category which doubled the number of responses on the Interpersonal and tripled those on the Maladjusted category.

In the analysis of the simple schizophrenics' responses, four significant differences were also found. These were between Interpersonal and Environmental, Interpersonal and Maladjusted, Environmental and Withdrawal and between Maladjusted and Environmental.

The simple schizophrenics scored more on Environmental, followed by Interpersonal, Withdrawal and Maladjusted. The significant differences obtained in this study show that the simple schizophrenics would have this order of concentration of their responses on the four major categories, and the two categories in the middle, Interpersonal and Withdrawal would collect approximately the same number of responses. The same can be said about the paranoid schizophrenics' distribution of responses on these four

categories.

This concludes the presentation and discussion of the results of the two groups in the analysis of their responses on the four major categories and on the fifteen sub-categories of the Hand-Test.

SUMMARY AND CONCLUSIONS

Out of 23 studies involving direct comparisons between the paranoid and simple schizophrenics on various aspects of the Hand-Test, mathematical differences were always present except once; however, only one of the differences was significant statistically. This was on the Bizarre sub-category of scoring where the difference was found to be significant beyond the .01 level of confidence. It is to be said that due to the low frequency of these Bizarre responses, the obtained significant difference should not be given too much consideration.

Out of twelve comparisons involving the major categories within each group, eight were significant, distributed into four in each group.

The first sub-hypothesis stating that there would be no significant differences between the two groups' responses on the four major scoring categories of the Hand-Test is to be accepted fully.

The second sub-hypothesis postulating that there would be no significant differences between the two groups' responses on the fifteen sub-categories of the test should also be accepted, though a reserve should be kept for the Bizarre sub-category of scoring which showed a significant difference.

The third sub-hypothesis said that there would be

no significant differences between the mean number of responses on the four major categories within each group. This sub-hypothesis is to be rejected as four differences were found within each group.

As a result of the study of these three sub-hypotheses, the general hypothesis stating that there would be no significant differences between the paranoid and the simple schizophrenics' responses on the Hand-Test is to be accepted with a minor reserve given to the Bizarre sub-category. This would prove true Wagner's assumption, mentionned at the beginning of this project, saying that the paranoid and simple schizophrenics should be expected to give similar responses to the Hand-Test.

As a result of this study, both groups were found to have similar action tendencies revealed by the Hand-Test. The responses on the Interpersonal category revealed their low sensitivity to interaction and their lack of interest in people. The Maladjustment category showed that both the paranoid and the simple schizophrenics have difficulty in carrying out various action tendencies because of subjectively experienced inner weaknesses or external prohibition; it also shows apprehension and distress arising from the failure to achieve need satisfactions.

The responses on the Environmental category revealed that both groups have a tendency towards the impersonal

aspects of life. Both the paranoid and simple schizophrenics denoted a lack of contact with reality by scoring on the Withdrawal category.

If the results from this investigation are to be considered as scientific evidence for the acceptance of the null hypothesis, it would mean that the Hand-Test will not differentiate sub-categories of a known clinical group, schizophrenia.

Studies in this line of experimentation should be continued, so as to find the precise diagnostic value of the Hand-Test in the study of behavioral tendencies.

An experimental discrimination between the qualitative aspects of paranoid and simple schizophrenics' answers on the Hand-Test should be attempted for the further exploration of these two groups as revealed by the Hand-Test.

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--------, "The Use of Drawings of Hands as a Projective Medium for Differentiating Normals and Schizophrenics", in the Journal of Clinical Psychology, Vol. 17, No. 3, issue of July 1961, p. 279-280.

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The project which initiated this one. The same procedures were followed, but with deep analysis of only one clinical group.

APPENDIX 1

ABSTRACT OF

The Use of the Hand-Test for Differentiating Paranoid and Simple Schizophrenics.[1]

Research shows that by the evaluation of scores on the Hand-Test, some discrimination is possible between normals and schizophrenics and between neurotics and schizophrenics. Will the Hand-Test show reliable discrimination between the sub-categories of schizophrenia, and where do the differences lie? This question was studied in this project.

Twenty-five male paranoid and simple schizophrenics controlled for age, education and length of hospitalization were tested twice in 24 hours with the Hand-Test.

A total of 35 studies were made on different aspects of the test. Eight differences were found to be significant when each groups' responses were studies within the groups themselves. In direct comparisons between the two groups, only one was significant; it involved the Bizarre sub-category of scoring.

The quantified results accepted the null hypothesis stating that there would be no significant differences

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1 Girardin, N.B., master's thesis presented to the School of Psychology and Education of the University of Ottawa, Ontario, November 1964, viii-52.

between the paranoid and simple schizophrenics' responses on the Hand-Test, with reserve to the Bizarre sub-category of scoring.

The purpose of this approach was to find if besides differentiating known clinical groups, the Hand-Test would differentiate the inner categories of the clinical groups themselves. This project answered that question negatively.