THE EMOTIONAL REACTION ON ADMISSION TO A TUBERCULOSIS HOSPITAL

By

DAVID BERGER

A THESIS

Submitted to the School of Graduate Studies of Michigan State College of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Department of Psychology

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The purpose of this research was to investigate the emotional response on the part of persons entering a tuberculosis treatment facility as patients for the first time. Three psychological instruments were used to evaluate the reaction; the Rorschach, an original Word Association test, and the Digit-Span test taken from the Wechsler Bellevue Intelligence Scale.

An experimental group of forty newly-admitted patients and a matched control group of forty patients who had been hospitalized for at least six months were utilized. The experimental group were seen on the day of their arrival at the hospital and again six weeks later in a retest situation. The control group was similarly tested twice with a six-week interval between tests. To analyze the effect of the admission experience on the tests the difference between the shifts in the scores in the two groups from the first to the second test was calculated.

The major hypothesis tested was that the initial admission into a tuberculosis hospital would provoke a stress reaction recognizable in the test performance. The study was considered disparate from other psychological investigations of the human response to stress. First the problem involved a real-life situation involving stress as compared to the more traditional simulated laboratory stress employed in most other studies. Second the effects of stress were measured over a period of time rather than

simply measuring the immediate response under threat as done heretofore.

The Rorschach test was examined both atomistically in terms of the single scores and also in its total configuration. Atomistically stress tended to affect the protocol by; (1) decreasing productivity, (2) increasing reality testing, (3) decreasing the breadth of interest, (4) increasing reaction time, (5) increasing the number of whole responses, (6) decreasing the number of common detail responses, (7) decreasing inner phantasy, (8) decreasing emotional contact with the environment, (9) increasing feelings of inferiority, (10) increasing evasive defenses, and (11) decreasing the ability to think in terms of group standards. In terms of the configurational analysis it was shown that the entire Rorschach record reflected the effect of the stress situation.

The Word Association test was analyzed both in terms of response time and adequacy of response. The stress involved in the admission situation influenced the response to the test as evidenced by a delay in reaction time as well as in a less adequate response. Disturbance on this test was reflected both in response to specifically "loaded" words as well as to the test in general. Specificity of disturbance was revealed most clearly by the reaction time analysis while generality of disturbance

was best reflected by the adequacy of response type of analysis.

The Digit-Span test proved capable of measuring the stress situation in terms of the three scores obtained. Stress reduced the digits-forward, the digits-backward, and the total digits scores.

The major hypothesis was considered substantiated by the results and it was felt that the three tests could be considered sensitive to the type of stress situation encountered in this study. The study was also thought to have heuristic value in promoting a sample and situation for future research in the problem of anxiety.

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INTRODUCTION TO THE PROBLEM

A. The Disease Tuberculosis

Tuberculosis has plagued man from the time of the earliest records of civilization. Institutional care is a rather recent innovation in the treatment program. Brompton Hospital for consumptives, in London, established in the second quarter of the nineteenth century, was the first such facility. In 1882, Robert Koch, a little known German physician, discovered the tubercle bacillus. This discovery was the cornerstone of the modern treatment program, as conducted in contemporary sanatoria.

The disease, tuberculosis, is a chronic recrudescent disease caused by the tubercle bacillus. Today probably half a million Americans harbor active infectious processes. The mortality in the United States is approximately forty-five thousand persons each year. In 1900, the likelihood of anyone in the United States dying of tuberculosis was better than five times as great as it is today. Rest, diet, and hygienic measures have been the major factors of control. Drug therapy and mechanical techniques for restriction of lung motility have been increasingly helpful and promise to reduce the morbidity further.

Despite the encouragement offered by the many new medical developments, a visit to any large diagnostic center will add a sobering note. One invariably finds long waiting lists of persons with diagnostically active tuberculosis biding their time until bed space is available for them in the public sanatoria. This country now has approximately one hundred thousand beds for persons with tuberculosis outside of mental and penal institutions (7). The balance between the number of billets in public insitutions and the demand for them is as precarious now as it was twenty years ago. More thorough case-finding techniques, as well as the pressure of the increasing population, have placed an added burden on the available facilities.

To meet this situation, hospital administrators and public health authorities have urged continued research to find optimal conditions for the growth of healthy lung tissue. Activity has been carried forth in many diverse areas of the treatment program.

B. Tuberculosis and Personality

Since ancient times, medical people have recognized the intimate relation between personality and disease. With the development of scientific medicine there was a tendency to reduce the interest in personality and to

place the major emphasis on organic processes. In the last fifteen years, medicine has once more directed its attention to the impact of personality on disease. In this reawakening, psychic influences were accepted initially only as precipitating factors. Gradually, a broader perspective was developed in the psychosomatic movement which conceived of the personality of the patient and his illness as alternate views of the same unit. The symptoms of tonsillitis were, for example, associated in 1935 by Weizsäcker (45), with severe emotional crises in the lives of his clients. Similar observations were reported by Booth (8) in 1935 in attacks of acute encephalitis and Parkinson's Disease.

The psychoanalytic movement has also contributed to the understanding of medical problems. The personality of patients suffering from colitis, as well as that of gastric ulcer patients, have been described in detail by Franz Alexander (2). He maintained that the physical complaints were caused by disturbed motor and secretory function.. In many cases he related this disturbed function to emotional conflict resulting from repressed cravings for love and affection.

The relation between the diseased tuberculous patient and his personality has been studied over a period of years. At the turn of the century, articles began to

appear in the literature discussing the possible correspondence between the disease and certain emotional symptoms which had been observed with some regularity. In the last decade and a half, there has been a marked increase in these articles and in the attention accorded them. However, much of the material is inconclusive and the inconsistent conclusions make for confusion.

Dr. Canby Robinson (33) laid great stress on the distinction between disease and illness, pointing out that the former is an abnormal state of the body resulting from a foreign injurious agent, while illness is a process in which the individual is prevented from performing efficiently in his usual everyday activities. Dr. Robinson asserted that the majority of tuberculous patients who were ill were ill fundamentally as a sequel to their disturbed and uncontrolled emotions. Dr. George W. Crile (9) had documented his observations of patients driven to chronic invalidism, and at times, death, by such emotions as fear, grief, and anxiety.

Shultz (38) after analyzing the literature on the emotions of the tuberculous patients in 1942, found that the opinions could be organized into three categories: (1) that the toxic condition caused the personality deviations; (2) that bodily states are influenced by emotions, and vice versa, and; (3) that cultural and

socio-economic conditions adversely influence the lives of the patients and emotional changes are engendered.

Moorman (26) asserted that after the observer corrected for the increased psychic energy resulting from enforced physical rest, there seemed to be a marked excitation of the mind with increased creativity. He held that this greater reactivity is the product of toxic elements manufactured by the tubercle bacillus. Thompson's work (42) supported this general thesis. He suggested that the toxic agents may be so potent as to disrupt the patient's psychic apparatus and produce mental aberration. Jelliffe and Evans (18) formulated the hypothesis that the tubercular condition irritates the nerve cells causing a general disharmony in cellular communication. Hayes (16) suggested that the centers for nervous and mental control are invaded by the toxins which render the patient less effective physically and mentally. Munroe (28) aligned himself with this view and indicated that it was likely that those of high literary attainment and artistic accomplishment such as Brönte, Stevenson, Chopin, and Keats were affected in an exaggerated way by the bacillus, enabling them to create their masterful productions. The extreme position taken under this general formula was to show a relationship between psychosis, particularly schizophrenia, and tuberculosis (12, 20, 24).

This rather radical position has been subjected to considerable criticism (23, 35).

Shock and Jones (37) disagreed with the above views and maintained that personality changes would more likely result from the increased reserve of energy attending compulsory bed rest. They rejected the position that the toxic factor was instrumental in the emotional symptoms.

Muhl (27) studied the reaction to tuberculosis in women and concluded that they revealed a varied personality picture including increased sexual drive, impairment of their ability to evaluate ethical problems, cyclic emotionality, and dissociative trends. Strecker, et al (41) championed the position that depression and anxiety are the two most prominent emotional responses exhibited. They felt that increased sexual drive and the euphoric trends emphasized in other articles were not accurate observations. Shultz (39) has made one of the few psychometric approaches to the problem by administering the Bernreuter Personality Inventory to tuberculous patients. In comparing his results with the general norms, he found the patients more neurotic, more lacking in self sufficiency and self confidence, more introverted, more submissive, and more gregarious. The ambiguity of such findings emphasizing the introverted as well as the gregarious nature of a population reflects the general

state of equivocation in the literature.

Another objective attempt is reported in the paper by Albee (1), describing his work with two groups of patients, one composed of veterans with pulmonary tuberulosis, and the other composed of veterans with chronic illnesses other than tuberculosis. The groups were equated as far as possible and given the Minnesota Multiphasic Personality Inventory Test (M.M.P.I.). Both groups were found to deviate on each scale of the M.M.P.I. in the direction of maladjustment, with the tuberculous group significantly more manic and feminine. No relationship was found between the degree of emotional disturbance and the severity of the tubercular infection.

Opposed to this latter conclusion were the findings of Ellis and Brown (11). They compared the totals of Rorschach summaries of two groups of hospitalized female pulmonary tuberculosis patients, thirteen in each group. The two groups were equated except for their prognoses. One group was classified as a recovery group and the other as a declining group. It was demonstrated that the declining patients as compared with the recovering patients were less productive and less creative, enjoyed less emotional contact with their environment, had narrower interest patterns and were less conventional in their thinking as these psychological processes are measured by the Rorschach. The authors concluded that

mental and emotional factors are related to the cure of tuberculosis.

Another Rorschach study of pulmonary patients was conducted by Singelsen (40). He compared tuberculous and cardiac patients with each other and with normals on the Rorschach. His results were as follows:

1. No difference in number of responses among the three groups.
2. No difference in reaction time among the three groups.
3. Both tuberculous and cardiac patients had a high per cent of good form in comparison to normals.
4. Both tuberculous and cardiac patients gave fewer movement responses than normals with the tuberculous patients lower than the cardiac.
5. The frequency of color responses was high for tuberculous patients and low for cardiac. The tuberculous patients were felt to be the extratensive type as a group.
6. There were no differences on the number of whole responses for the three groups.
7. There were no differences between the cardiac and tuberculous patients in the amount of

shading although both groups were lower than the normals.

8. Both pathological groups were low in their response to white space.

9. There were no differences in the animal per cent for the three groups.

10. The tuberculous group had the highest number of anatomy responses.

It seems clear that the studies cited have produced much conflicting material which invites corroboratory evidence or refutation. Thus the investigation of the problem of the personality of the tuberculous patient and his reaction to the disease is compatible with the principle to treat the patient who has the disease, rather than the disease that has the patient. It was assumed for the purpose of this study that the character and attitude of the patient contribute materially to the severity and duration of his illness. The present study purported to demonstrate that psychology can develop certain concepts of adjustment and maladjustment which may be meaningful in the understanding of the tuberculous patients.

C. The Hospitalized Patient and his Environment.

We have had considerable opportunity in the gathering

of our data to observe the patient on his arrival at the sanatorium and in his response to treatment. Many patients bring with them rather distorted ideas of what the sanatorium will be like. Some anticipate a dismal, perhaps bleak institution with coughing patients suffering all about them. Others arrive, bolstered by a spirited health official, expecting to find a sumptuous hotel. All feel the sudden impact of their separation from the community and react accordingly. One young married woman, whose husband preceded her into the sanatorium as a patient, complained that her reception was "cold and impersonal". Another young married woman spoke of fears of being placed in a ward "with a lot of old women".

The first few weeks of sanatorium life are many times tearful ones. Admission to a sanatorium means to many patients that the ranks of the family have closed behind them, and that they are isolated and abandoned. Sanatorium life many times involves an intrinsic alteration in the life expectancies of the patient. On the other hand, some patients may react to the situation in a positive manner. Such people usually respond to treatment by maintaining prolonged hospital residence. One such patient with a minimal amount of disease elected to be bedfast for twenty-two months despite his doctor's encouragement to engage in moderate exercise as early as the sixth month of

his hospital stay. His family were being maintained through his disability benefits and he was apparently perfectly happy to spend his time in a leisurely recovery.

The hospital itself means many things to the patients. For some, it becomes home, and the previous life is reflected upon as an unpleasant interlude. For others, the new environment becomes repugnant and highly irritating, the coughing of fellow patients becomes exasperating, the institutional food is unattractive, and the routinized life lacks charm.

Bed rest, another aspect of the treatment situation, involves considerable readjustment on the part of the patient. Rest for the tuberculous patient is only remotely akin to rest when applied to the tired, healthy individual. For the tuberculous patient, rest means lying in bed on a single pillow, physically and emotionally relaxed, twenty-four hours a day, for a year or more as prescribed by the attending physician. This does not imply that the patient is limited to lying on his back. The repertoire of positions is dependent upon the extent of the disease and the area of the lung or lungs infected. In general, though, the patient is encouraged to assume different positions in order to promote pulmonary drainage.

The patient confined to a bed is obviously completely dependent for all his needs on the attention of nurses and staff assistants. Some people find this situation very

threatening. Their old dependency conflicts are activated and generate anxiety. They complain about their position and reject the prospect of being treated "like a child". Others protest against the hospital and complain about accommodations, food, or their roommates. There are also those patients who seem to have adjusted too well, the patients who are overimpressed with the need to adhere to bed rest. Some patients have to be prodded continually to take the initiative when the time arrives to leave bed. They become obsessed with the dangers involved in activity and virtually refuse to resume a normal life after their disease has been arrested. Under such circumstances they commonly experience symptoms such as fatigue, cold sweats, and elevated temperatures. To such people, leaving the hospital after a long illness is a fearful experience. Plans for physical and vocational rehabilitation often are completely rejected by this group.

CHAPTER II

THE NATURE OF THE PROBLEM

A. Purpose of the study

The purpose of the present study was to determine some of the characteristics of the emotional response of tuberculous patients on admission to a sanatorium To accomplish this task, material obtained from a battery of three psychological techniques, the Rorschach, an original Word Association Test, and the Digit Span Test, has been employed.

B. Experimental Design

The design of the experiment entailed the use of an experimental and a control population. Both populations were subjected to a test-retest experience. A group of incoming patients (hereafter referred to as the experimental group) were seen and tested on the day of their arrival for hospitalization. Six weeks after the initial contact with these patients, they were retested. The control group was composed of a matched group of long-term hospitalized persons (hereafter referred to as the control group). This group was seen in a similar test-retest situation with a comparable six-week interval between contacts. In this manner differences in the test-retest

performance of the experimental group were considered meaningful only if they were significantly different from analogous differences in the control group.

The procedure of the experiment is represented schematically in Figure 1.

Experimental Group		Control Group	
Test	Rorschach Word Association Digit Span	Test	Rorschach Word Association Digit Span
6 weeks		6 weeks	
Retest	Rorschach Word Association Digit Span	Retest	Rorschach Word Association Digit Span

Fig. 1. Experimental Procedure

Treatment for tuberculosis may well be described as a series of stress situations. A number of situations peculiar to the treatment program could presumably have been selected for study. The reaction to prodromal symptoms, the reaction to a positive diagnosis, the reaction to periodic X-Ray findings, the reaction to knowledge that surgical intervention has been recommended, the reaction to a rehabilitation program, as well as the reaction to discharge itself are all situations which involve severe readjustments on the part of persons

hospitalized with tuberculosis. The admission experience was ultimately selected because it involved but few of the complications usually encountered in the other situations. Typically, the admission situation, in some measure, interrupts ties with the previous way of life.

Different patients may resist hospitalization for various periods of time, but the act of arriving and taking up residence is both sudden and abrupt. It is temporally discrete. It has the "here and now" quality which Gordon Allport described, "as an unanalyzable blend of space and time". (3, p. 554) Further, since hospitalization invariably involves considerable time, the patients were available for a subsequent reexamination. A population of newly hospitalized patients is exposed to a fairly uniform and constant environment. Hospital life is highly ritualized with a minimum of opportunity for novel, external stimulation. On the basis of these conditions it was assumed that changes in test performance over the six-week interval in the experimental group should reflect largely the patient's adjustment to the hospital and his efforts to restore his effective communication with the environment after the original stress response to the admission experience. We thus had available a group of persons who were experiencing an objective, real-life situation, who were examined and observed over a span of time.

During the six-week interval between the two tests the patient's environment was relatively controlled. It was necessary, however, to impose one further limitation on the sample to insure the constancy of the stress situation. Only those persons who were being hospitalized for tuberculosis for the first time were included in the study.

C. Evaluation of Design

In the present study an attempt was made to incorporate features which have been disregarded to some extent in many clinical studies. First, the major interest was with persons in a real life situation. Rabin made a plea for experimentation which offers an opportunity "to become acquainted with human 'life problems' as distinguished from those frequently dealt with in the psychological laboratory". (14, p. 11) This exhortation seems to be directed against the clinician's increasing reluctance to become involved in man's everyday response to life. Yet many of these same clinicians level derogatory remarks against the experimental psychologist's efforts to generalize from the rat to man. Who can say that the hiatus between man in the laboratory and man in his everyday pursuits is less crucial than the gap between the rat in the experimental box and man in life. The second feature in the design which warrants particular attention

is the effort to measure and to examine sequential changes in human behavior over a period of time. In this manner, the effects of stress can be measured within an experimental group as well as between an experimental population and its control population.

A six-week interval was selected between the test-retest contacts to allow the patient ample opportunity to make some adjustment to his new environment and to begin to reconcile his demands with the limitations of his new regimen. Differences in test performance in the experimental group's performances could conceivably be due to one of three influences or some combination of them. First, the shock on entering the hospital could produce deviations on test behavior. Second, the six-week adjustment interval might serve to reduce the intensity of shock and in turn be reflected on the tests. And last, the tests themselves may be somewhat unreliable and yield differences between the two performances.

The first two possibilities were consistent with the assumptions underlying the study. The reliability of the tests required control. The group of long-term hospitalized patients were utilized for this purpose.

D. Description of Testing Conditions and Procedure

Contact with incoming patients was established at the Herman Kiefer Hospital and at the William H. Maybury Sanatorium. Both are municipally owned institutions serving metropolitan Detroit. Herman Kiefer Hospital is located in Detroit proper and serves as the community facility where most of the contagious diseases are routed for isolation. It provides bed space for one thousand tuberculous patients. Maybury Sanatorium is the affiliated installation located approximately twenty two miles out of Detroit, near Northville, Michigan. Maybury Sanatorium accomodates approximately eight hundred and thirty tuberculous patients. It is devoted exclusively to the treatment of tuberculosis.

Contact with long-term patients was limited to the population at Maybury Sanatorium since there proved to be fewer restrictions on the research procedure at that facility. Assignment of a patient, in Detroit, to one or the other hospital is adventitious, being a matter principally of position on the waiting list and bed space available at any time.

The waiting list for hospitalization was compiled at the diagnostic clinic at Herman Kiefer Hospital. All positive tuberculous cases discovered in Detroit were

processed in this clinic. If the patient decided to enter a public treatment facility rather than a private sanatorium, his name was entered on the list. Those patients who were acutely ill were given special consideration and were usually hospitalized as soon as possible.

On the day the patient entered the hospital, he was seen initially by a medical stenographer who obtained personal data for the hospital records. A brief orientation followed during which the patient was given a mimeographed form explaining the system of regulations and privileges which govern the treatment program. This form is reproduced in Appendix A. If medically feasible, the patient was then referred to the author for the purpose of testing. All patients were seen individually by the author. The tests were administered on each occasion in the following sequence; Rorschach, Word Association, and Digit Span. The testing was conducted from December, 1951, to May, 1952. Every effort was made to indoctrinate the incoming population as well as the control group with the impression that the research was sponsored by the institution. The purpose of the study as described to the subject was to evaluate the interests and aptitudes of tuberculous patients so as to be able to appraise the services offered by "their" hospital. Patients were given

the option of participating. All but three elected to cooperate. It was explained to both the experimental and control groups that they would have an opportunity to try some further work a number of weeks after the first test. All but four subjects cooperated in the retest situation after they had agreed to the first test. It was necessary to discard the records of the four who objected to the retest.

Testing was carried out at Maybury Sanatorium in an office reserved for the investigator. At Herman Kiefer Hospital, where more crowded conditions prevailed, it was necessary to use an office adjoining the nurses' office on the admission floor. In both situations the testing program was respected by the staff and a minimum of interruptions occured. The examiner wore a white coat, the conventional attire of the professional staff. An effort was made to make each patient feel comfortable. Cigarettes were offered. Patients were encouraged to remove their facial masks which the medical stenographer had instructed them to wear in the presence of visitors. Considerable time was spent in gaining some insight into the patient's frame of mind and in inspiring a receptive attitude to the tests.

E. Description of the Sample

The total sample numbers eighty subjects, forty in the experimental population and forty in the control group. The subjects for the experimental group were selected as they entered the hospital and the sanatorium. Medical considerations were assiduously honored at all times. Patients entering treatment who were in acute distress or who were in any manner non-feasible for our program were not seen. An age range of eighteen through forty-six years was adhered to. It was also necessary for the subject to have an average acquaintance with the English language in order to be able to respond intelligently to the test material. A considerable number of displaced persons and immigrants from Mexico were admitted during the period when this sample was being compiled. The problem of verbal facility and fluency in this group was evaluated during the preliminary discussion with each prospective subject. The disproportionately small representation of Negroes in the research sample as compared to the hospital population seemed to be due to two factors. First, the Negro population in the institutions appeared to respond more slowly to treatment and, as a result, fewer beds for Negroes were available through discharged cases. Secondly, the Negroes as a group seemed to be more acutely ill on admission and were less apt to be cleared for testing.

After working with a newly admitted patient, a control subject was selected who had been hopitalized continuously for at least six months. The control subject was matched with an experimental subject on the following six variables: age, sex, race, marital status, education, and diagnostic classification. The diagnostic impressions were those agreed upon by the medical staff on the Tuesday following admission. The classification nomenclature of far advanced, moderately advanced, and minimal were those adopted from the Committee on Diagnostic Standards of the American Trudeau Society, Medical Section, National Tuberculosis Association (39). The standards as described by the organization are as follows:

> Minimal -- slight lesions without demonstrable excavation confined to a small part of one or both lungs. The total extent of the lesions, regardless of distribution, shall not exceed the equivalent of the volume of lung tissue which lies above the second chondrosternal junction and the spine of the fourth or body of the fifth thoracic vertebra on one side.
>
> Moderately Advanced -- one or both lungs may be involved, but the extent of the lesions shall not exceed the following limits; slight disseminated lesions which may extend through not more than the volume of one lung or the equivalent in two lungs, dense and confluent lesions which may extend through not more than the equivalent of one third of the volume of one lung, total diameter of cavities less than 4 cms.
>
> Far Advanced -- lesions more extensive than moderately advanced. (39, p. 33)

For the control group, the diagnostic impression at the time of their more recent X-Ray report was utilized

rather than the admission diagnosis. It was believed that this would allow for a more accurate matching with the experimental partner. Table I lists the total population in terms of the six characteristics used in the matching procedure. Table II is a summated list of the six characteristic on which the two samples were matched.

Originally it was intended to match the two groups on a seventh variable, the socio-economic status of the patient. However this proved excessively complicated in that it made the matching much more difficult. The data available on the vocational adjustment of the patient population was very sketchy and it was deemed unwise to classify the members of the samples on this basis. When the patients were consulted individually the information obtained from the male population relative to the degree of skill involved in their work was quite precise. However, in discussing ths situation with the female population, it was found that a large number were not gainfully employed and that their appreciation of the degree of skill involved in their husbands' or fathers' work was highly unreliable. It was decided to limit the matching to the six variables illustrated in Tables I and II in the interest of a much more exact comparison.

TABLE I

MATCHED CHARACTERISTICS OF THE SAMPLE

A		B		C		D		E		F		G	
Code No.		Age		Sex		Race		Marital Status		Education		Diagnostic Impression	
I	II	I	II	I	II	I	II	I	II	I	II	I	II
74	174	21	23	M	M	W	W	M	M	8	9	Mod	Mod
50	150	18	18	F	F	W	W	S	S	11	11	Mod	Mod
77	177	44	45	M	M	W	W	M	M	12	11	Min	Min
7	107	33	33	F	F	W	W	M	M	9	8	Min	Min
17	117	21	20	F	F	W	W	S	S	12	12	Mod	Mod
48	148	19	19	F	F	W	W	M	M	12	11	Mod	Mod
78	178	18	18	F	F	W	W	S	S	11	11	Mod	Mod
53	153	43	41	F	F	W	W	M	M	6	6	Mod	Mod
20	120	41	39	M	M	W	W	W	M	8	7	Mod	Mod
51	151	25	26	M	M	W	W	S	S	11	10	Mod	Mod
13	113	22	23	F	F	N	N	M	M	11	11	Far	Far
49	149	33	33	F	F	N	N	Sep	Sep	8	8	Far	Far
14	114	44	44	F	F	W	W	M	M	7	8	Mod	Mod
42	142	23	24	F	F	W	W	M	M	10	11	Mod	Mod
33	133	28	27	F	F	W	W	M	M	12	11	Far	Far
2	102	45	45	M	M	W	W	Sep	Sep	7	7	Far	Far

TABLE I (Cont'd)

A		B		C		D		E		F		G	
I	II	I	II	I	II	I	II	I	II	I	II	I	II
39	139	44	41	M	M	W	W	M	M	7	7	Far	Far
3	103	28	28	M	M	W	W	M	M	12	12	Mod	Mod
84	184	25	27	F	F	W	W	M	M	12	12	Min	Min
15	115	45	43	M	M	W	W	M	M	10	9	Mod	Mod
8	108	29	30	M	M	W	W	M	M	9	10	Far	Far
25	125	30	30	F	F	W	W	M	M	12	11	Mod	Mod
70	170	34	33	F	F	W	W	M	M	11	12	Mod	Mod
55	155	35	35	F	F	W	W	M	M	10	11	Mod	Mod
73	173	35	34	M	M	W	W	M	M	12	12	Mod	Mod
79	179	45	44	M	M	W	W	M	M	12	12	Mod	Far
59	159	32	32	M	M	W	W	M	M	8	9	Mod	Mod
11	111	26	27	F	F	W	W	M	M	12	12	Mod	Mod
52	152	23	25	M	M	W	W	M	M	11	11	Far	Far
62	162	34	32	F	F	W	W	M	M	12	10	Far	Far
75	175	39	37	M	M	W	W	M	M	8	10	Mod	Mod
41	141	20	21	M	M	W	W	S	S	12	12	Min	Mod
8	108	28	27	F	F	W	W	M	M	12	12	Mod	Mod
200	300	37	38	M	M	W	W	M	M	10	11	Far	Far
64	164	26	29	M	M	W	W	M	M	12	12	Mod	Mod
65	165	23	22	M	M	W	W	S	S	12	11	Mod	Mod

TABLE I (Cont'd)

A		B		C		D		E		F		G	
I	II	I	II	I	II	I	II	I	II	I	II	I	II
26	126	26	27	M	M	W	W	M	M	10	9	Mod	Mod
63	163	41	41	M	M	W	W	M	M	9	10	Far	Far
4	104	36	35	M	M	W	W	M	M	9	11	Mod	Mod
57	157	25	23	F	F	W	W	M	M	10	12	Mod	Mod

Explanation of Table:

Column C--M-Male, F-Female
D--W-White, N-Negro
E--M-Married
S-Single
Sep-Separated
W-Widowed
F--Education (Highest grade completed)
G--Min-Minimal
Mod-Moderately Advanced
Far-Far Advanced

Sub Column I-- Experimental Group
II-- Control Group

TABLE II

SUMMATED CHARACTERISTICS OF EXPERIMENTAL AND CONTROL SAMPLES

Population Variables	Experimental Sample	Control Sample
Male	21	21
Female	19	19
White	38	38
Negro	2	2
Married	31	32
Single	6	6
Separated	2	2
Widowed	1	0
Average Age	31.10	30.98
Average Education	10.23	10.30
Minimal Findings	4	3
Moderate Findings	26	26
Far Advanced Findings	10	11

F. Description of the Instruments

1. The Rorschach Test.

The Rorschach Test is an instrument developed by the Swiss Psychiatrist, Hermann Rorschach. He published his original report in 1921 (34). The test consists of a series of ten ink blots. The blots are exposed one at a time to the subject who is instructed to describe anything he may see in the blot. The responses to each blot, as well as the subject's elaboration of each response elicited in an inquiry period, are recorded by the examiner. It is the record of the subject's response and the scores assigned to the responses which comprise the data for experimental analysis. The tests were administered and scored by the Beck method (4).

2. The Word Association Test

The Word Association Test used in this battery was developed by the author. The procedure for administering the test was identical with the original word association technique introduced as a clinical tool by Jung (19). The instructions given to the subject were as follows:

I am going to read a list of words to you one by one. As I say each word, I want you to say another word, the very first one that comes to your mind after you hear my word. I want you to say your word as quickly as you can. I shall not repeat any words, so if at any time you are not sure what my word is, respond to what you think it was. Now, let's try five practice words. Remember now, each time I give you a word, you give me the first word that you

think of. Are you ready for the practice words?

The test was composed of sixty words selected from an original list of one hundred seventy-eight words taken from the Thorndike-Lorge Word List (43). The original one hundred seventy-eight words were all common words, occuring more often than thirteen times in the tabulation of one million words. The list was mimeographed and given to a group of twenty tuberculous patients with instructions to assign each word to one of five categories with which they judged the word to have the highest degree of association in an emotional sense. The five categories were:

(1) family relation and home life
(2) social contacts outside the home
(3) health
(4) economic situations
(5) neutral

The final list of sixty words was composed of five words assigned to each of the first four categories and forty words assigned to the neutral area. The average agreement on placement of the sixty words selected by the twenty judges was eighty-eight per cent with a range from seventy-five per cent to one hundred per cent. The final list which was administered in the experiment is presented in Appendix B. The twenty words assigned to the first four categories were considered crucial words. The areas

they were associated with were assumed to represent dimensions of emotional conflict on entering a sanatorium. The forty words selected from category five were termed neutral words.

In the presentation of the words the sequence pursued the pattern of one crucial word followed by two neutral words. The crucial words were staggered through the list so that one word from a crucial category was presented and followed by two neutral words, then another word from the second crucial category followed by two neutral words, etc..

The responses were scored in terms of the subject's reaction time as well as the adequacy of the response word. Reaction times were calculated by means of a mechanical stop watch calibrated in tenths of a second. The watch was activated just after the stimulus word was spoken and halted when the subject responded. The adequacy of the response was evaluated by means of a scale taken from Sharp (36), and abridged. The response was judged on this scale as disturbed or non-disturbed and one point was scored for each disturbed reaction. The scale is as follows:

Non-Disturbed

(1) Equivalent - definition or synonym

(2) Logical - logical relation to stimulus word

Disturbed

(1) Chain - related to previous response

(2) Perseverated - repetition of previous response

(3) Personal - related to self

(4) Indeterminate - relationship not apparent

(5) Multiple - more than one word in response

(6) Echo - repetition of stimulus word

3. The Digit Span Test

The Digit Span Test was taken from the Wechsler Bellevue Intelligence Scale (44). The subject was required to repeat a series of progressively longer digits read to him by the examiner. In the first section of the test, the subject simply repeated the digits in the same order in which the examiner presented them. In the second section, the subject was asked to reverse the order of the digits from the sequence of the examiner's presentation. A digits-forward score, a digits-backward score, and a total score were calculated.

CHAPTER III

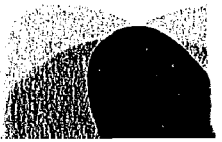
THEORETICAL ORIENTATION

This chapter deals with the theoretical implications of the experimental setting. Each test and its place in the battery is justified, and a number of hypotheses to be tested in the evaluation of the obtained data are presented.

A. Theoretical Formulation

In the discussion in Chapter I the impact of the admission experience on the composure of many of our subjects was described. It was from the observations of these reactions that a theoretical structure was fabricated for this research. One outstanding reaction noted, and perhaps the most striking, was a tense, fearful apprehensiveness. Another manifestation was the apparent lack of communication between the incoming patients as they waited their turns to speak with the medical stenographer. The waiting room always seemed the most unfriendly spot in the hospital.

It did not seem difficult to empathize with these people. The predicament of having to change one's established patterns of life is a frightening one. When a person is obliged to leave his customary environment and reestablish himself with an alien group, it is



understandable that he experience considerable anxiety. It seems fair to say that a change of this type imposes a certain degree of fear simply because the newly admitted patient does not know just what to expect. In most cases, life has not demanded such drastic redintegrations of him. Practiced skills for coping with such situations are conspicuously absent. No rehearsals have been possible; the situation surrounds him and he is now part of it. It was also necessary to realize that regardless of his plight the patient's previous life had not been without satisfactions. How this new and untried way of life could yield compensating satisfactions was most perplexing to the newly arrived patient.

Such a conflict situation offered an opportunity to deal with anxiety in human beings outside of the laboratory, a precarious business at best. It was not only a situation which isolated people from their daily pursuits but one which also posed a severe threat to life itself. Many patients expressed insidious fears of bodily distortion and mutilation. The purpose of this study was to measure the disorganization of behavior associated with this situation.

Dr. Beck, in his discussion of personality has pointed out, "The happenings originating outside of him (the individual) are in instances grossly destructive,

such as disease or accidents. They affect his functioning equipment, that is to say they alter the unit personality. For the individual after suffering damage is not the old self minus some portion of personality. He is in fact a new person, a new whole . . . Thus in consequence of the modifications, there has been a reorganization of the potentialities that remain available and the result is something other than the old self." (4, p. 5)

We proposed to measure the response to this type of "destructive happening" by means of three verbal tests. Language being the rich clue to personality it is, it seemed justifiable to look for the tension struggle in the words of the experimental population. As Murphy contended in his discussion of fear and preoccupations attending anxiety, and the manner in which such conditions impinge upon the functioning organism, " . . . the tension is there and it suffices". (29, p. 264)

In his discussion of traumatic neuroses and the conditions which prompt them Fenichel stated: "Unmastered quantities of excitement built up by sudden overwhelming events as well as by chronic strain, create very painful sensations of tension". (13, p. 118) It is this tension which is presumably responsible for the resultant block in functional behavior and which impels the individual to mobilize his energies to meet the crisis situation. It

would follow then, that when an individual is thus obliged to focus his energies on an urgent external situation, his response to standard psychological procedures would be markedly influenced.

At this point we will refer to a distinction made by Freud wherein he differentiated anxiety into objective anxiety and neurotic anxiety. The objective variety was considered to be appropriate anxiety, being a sort of dread of an external danger in a very natural or rational manner. Neurotic anxiety, on the other hand, was characterized as free-floating anxiety which affixes itself to any available stimulus object. The concern here was primarily with the first type, objective anxiety, and the manner in which it influences behavioral responses.

B. Applicability of the Three Psychological Tests

Now let us examine the stimulus materials with which this research was concerned. First, we encounter in the Rorschach test perhaps the outstanding contemporary projective device. What rationale lies behind the use of this instrument in this experiment?

First, it must be understood that the Rorschach test is composed of a series of relatively unstructured field situations with an infinite potential for eliciting perceptual experiences. To enhance this neutral value of

the stimulus material the verbal instructions are relatively free of set, allowing the subject to project on the strength of any self-induced motivational pattern.

There is considerable evidence in the literature to indicate that the Rorschach test is capable of measuring radical environmental pressures. Kimble (22), was interested in the effects of a social milieu on the test. He administered the test twice, one time in the standard situation and again in a situation with two observers present. The two situations were offered in reverse order to half of the sample population in order to control the test-retest factors. The findings were significant for the experience balance (the movement and color determinants). The weight of the color was much more pronounced in the social situation, while the movement responses were dominant in the standard testing situation.

Other investigators have attempted to simulate real life situations in the laboratory and to observe the effect of the manufactured situation on the Rorschach test. Williams (46) employed an artificial stress situation in an attempt to determine how it was related to intellectual control and emotional responsivity. The intellectual control factor (F Plus) in the Rorschach test was found to have a moderately high correlation (r = .61) with efficiency of performance under stress. The same measure of control

(F Plus) when limited to the achromatic plates was correlated .72 with the external measure of stability under stress.

Eichler (10) conducted another experiment to test the sensitivity of the Rorschach test to a simulated stress situation. He utilized a threatening shock situation to induce anxiety in an experimental group. His results were as follows:

1. Anxiety increased the number of weighted shading responses.
2. Anxiety decreased the number of whole responses.
3. Anxiety reduced the number of responses.

Three other signs did not reach an acceptable level of confidence but came within limits which would make them at least suggestive. They were as follows:

1. Anxiety reduced the number of P responses.
2. Anxiety increased the number of card rejections.
3. Anxiety decreased the number of weighted color responses.

These findings suggest that the Rorschach test is an efficacious method for estimating the effect of anxiety on personality structure. The test was then a means, in this research, for assaying the subject's response to entering

the hospital and for evaluating the extent to which the subject is disturbed through the influence of objective anxiety.

The second tool, the Word Association Test, has a long and exalted history in the development of psychological techniques. Galton (15) is accredited with devising the technique later adopted by Wundt and Freud and perfected by Jung (19). In its contemporary application (17) there has been a trend to use the test to ferret out areas of emotional conflict. Since we were interested in the conflict generated in a specific situation, it was thought that this technique should prove productive. Jung's rationale for the test adds weight to its selection for this study. He maintained that the association experiment is merely a section from man's psychological experience. For him, daily life itself could be conceived of as an elaborate association experiment. Words are symbolic representations of action and situations. It is obvious that people do not always think or behave precisely or intelligently. So in the association experiment, prolonged reaction times and responses of questionable quality are to be found where the stimulus excites emotionally accentuated complexes. The Word Association Test employed in this research was designed specifically to activate areas of presumed conflict.

The Digit Span Test, the third instrument employed, is generally believed to provide a measure of the subject's capacity to attend freely to external stimulation. Rapaport asserts that it may be considered a test of attention, which he considers to be a function of the "ego's efficacy in controlling these specifically deployed emotional and intellectual energies so that their ideational representatives enter consciousness at appropriate times only" (32, p. 169). Attention, for Rapaport, is the effortless ability to absorb material and to maintain contact with reality. If the individual is plagued with inappropriate affect or anxiety, this ability is often markedly hampered. It could be expected, then, that many individuals confronted with admission to a tuberculosis hospital will suffer an appreciable emotional response which should be communicated via a reduced digit span performance.

To summarize, it seemed that this battery of tests should reflect the effects of the admission situation as it impinged on the personalities of the experimental population.

C. Hypotheses

The major hypothesis with which this research is concerned is that the patient's initial admission into a

tuberculosis hospital generates an appreciable anxiety reaction. To investigate this hypothesis the three psychological tests were administered as described and their results scrutinized for evidence of anxiety. A number of minor hypotheses were formulated in an effort to predict the manner in which the anxiety would be manifested on each test. These hypotheses were consistent with the theoretical framework presented, with the character of the tests employed, and with related findings taken from the literature.

1. Hypotheses Dealing with the Rorschach Test

(1) Two judges will be successful in identifying the first record of the two protocols taken from the experimental group as the more anxious performance.

(2) Anxiety will be instrumental in reducing productivity.

(3) Anxiety will be instrumental in increasing the number of card rejections.

(4) Anxiety will be instrumental in decreasing the number of whole responses.

(5) Anxiety will be instrumental in decreasing the number of human movement responses.

(6) Anxiety will be instrumental in increasing the weight of shading responses (F Sh = .05,

Sh F = 1.0, Sh = 1.5).

(7) Anxiety will be instrumental in decreasing the weight of color responses (FC = .05, CF = 1.0, C = 1.5).

(8) Anxiety will be instrumental in reducing the per cent of animal forms.

(9) Anxiety will be instrumental in decreasing the number of popular responses.

2. Hypotheses Dealing with the Word Association Test

(1) Anxiety will be instrumental in prolonging the reaction time of the crucial words as compared with the reaction time of the neutral words.

(2) Anxiety will be instrumental in increasing the number of disturbed responses to the crucial words as compared with the number of disturbed responses to the neutral words.

(3) Anxiety will be instrumental in prolonging the reaction time to the total list of sixty words.

(4) Anxiety will be instrumental in increasing the number of disturbed responses to the total list of sixty words.

3. Hypotheses Dealing with the Digit Span Test

(1) Anxiety will be instrumental in reducing the Digits

Forward Score.

(2) Anxiety will be instrumental in reducing the Digits Backward Score.

(3) Anxiety will be instrumental in reducing the Total Digits Score.

CHAPTER IV

ANALYSIS OF THE RORSCHACH AS A MEASURE OF THE ADMISSION THREAT

This chapter is devoted to the presentation of the results comparing the Rorschach response of the experimental and control groups. The comparison of the changes in the various scoring variables in the two groups is reported, and the hypotheses in Chapter III which deal with the Rorschach are evaluated in light of the findings presented. In the second section of the chapter an interpretation of the results is made.

A. Comparison of Changes in Rorschach Responses of the Experimental and Control Samples.

As stated in Chapter II, the design of the experiment involved a test-retest situation for an experimental group and a control group. The intent was to demonstrate any significant differences between the amount of fluctuation or change occuring in the two samples from the first test to the retest. Table III shows the mean scores on the various Rorschach variables for the four situations; Experimental I, Experimental II, Control I, and Control II. A perusal of Table III gives the general impression of marked change in the test-retest performance of the

TABLE III

MEAN RORSCHACH SCORES IN THE FOUR TEST SITUATIONS

Rorschach Variable	Mean Experimental I	Mean Experimental II	Mean Control I	Mean Control II
R	16.87	24.20	27.73	28.20
F Plus %	78.48	75.77	75.20	82.62
Number Content Categories	6.72	8.72	9.82	9.62
T/1R	21.57	12.89	13.84	12.41
A%	47.52	44.00	46.12	48.13
H Plus Hd	2.30	4.92	3.22	3.95
W	5.52	3.25	4.25	5.40
D	10.90	19.77	22.50	21.20
Dd	.45	1.07	.95	1.40
M	1.85	3.32	2.15	2.11
Sum C	1.12	2.64	3.29	2.14
Sum Y	1.95	.94	1.20	1.71
Sum V	.36	.24	.31	.36
P	4.95	7.50	7.28	6.85
S	1.25	1.05	2.00	1.32
Cards Rejected*	16	1	2	0

* These are total scores, not means.

experimental group and relatively minor differences in the performance of the control group on the two tests.

In order to evaluate the relative stability of the Rorschach results in the two groups the distribution of scores for each variable was treated in the following fashion. Each individual's first test score was compared with his retest score and the shift was recorded as a difference score. When the first test score was numerically higher than the retest score, the difference score was given a negative sign to indicate a drop in score. When the first test score was numerically lower than the retest score, the difference score is positive. A zero difference score resulted when the two scores happened to be identical. In order to test the significance between the difference in the two group difference scores (experimental difference versus control difference scores) the correlation between the two samples had to be taken into account. The technique for handling this was to compare the difference in scores for the two tests for each experimental subject with the difference in scores for the two tests for his matched companion in the control group. This distribution of differences between difference scores was utilized to determine "t" values. This process is summarized in Table IV. Columns II and III in this table were calculated only to give the reader the direction and

TABLE IV

COMPARISON OF CHANGE FROM TEST TO RETEST BETWEEN EXPERIMENTAL AND CONTROL GROUPS

I Score	II Mean Diff. Score Between Test & Retest In Exp. Group	III Mean Diff. Score Between Test & Retest In Control Group	IV Column II Minus Column III	V σ_D	VI t	VII P
R	7.22 (a)	0.42 (a)	6.80	13.19	3.22	.005 (c)
F Plus %	-2.75	7.42	-10.18	17.74	3.60	.001
# C.C.	1.98	-0.18	2.15	3.10	4.35	.001
T/1R	-8.85	-1.36	-7.49	10.33	4.50	.001
A%	-3.58	2.05	-5.62	14.91	2.35	.025 (c)
H Plus Hd	2.65	0.80	1.85	6.25	1.80	N.S.
W	-2.28	1.15	-3.42	4.19	5.07	N.S. (c)
D	8.88	-0.52	9.40	10.30	5.70	.001
Dd	0.60	0.48	0.12	4.18	0.20	N.S.
M	1.80	-0.02	1.82	3.16	3.57	.0005 (c)
Sum C	1.59	-1.12	2.71	3.13	7.94	.0005 (c)
Sum Y	-1.08	-0.49	-1.56	1.52	6.67	.0005 (c)
Sum V	-0.14	0.09	-0.22	0.68	2.15	.05
F	2.58	-0.50	3.07	2.18	8.60	.0005 (c)
S	-0.20	-0.70	0.50	1.97	1.72	N.S.
Card Reject	-15 (b)	-2 (b)	N o t	C a l c u l a t e d		

magnitude of the change. These figures were not employed in the computations for Columns IV through VII since the latter were based on the mean and variance of the difference between the difference scores distribution. It should be noted that seven of the levels of significance in Column VII were computed by means of the one-tail test of the null hypothesis, since directional differences were predicted for these scores in the hypotheses in Chapter III.

At this point it is expedient to analyze Table IV for a more detailed inpection of the change in each scoring variable.

1. Productivity (R)

R is the total number of associations produced by a subject in any test period. Beck (5) conceived of R as an invoice of the personality's liberation from disabling conflict situations as well as an indication of intelligence. In this study the mean difference between the group shifts in the score R is 6.800. Since the direction of the shift in R was predicted in Rorschach hypothesis 2 the one-tail test of the null hypothesis was used. The "t" for a difference this large is 3.22 which is significant at .005 level. Thus it is possible to reject the null hypothesis and accept Rorschach hypothesis 2 with considerable confidence.

2. The F Plus %

The F Plus % is the quotient resulting from the number of good form responses (F Plus) divided by the total number of form responses. Beck believes that F Plus % is, "an index of accurate perception, of respect for reality, an index of ego strength" (5, p. 20). In this study the mean difference between the group shifts in score is -10.175. Since F Plus was not included among the Rorschach hypotheses the two-tail test of the null hypothesis was used to determine if there was a significant difference between the differences in the two groups. This procedure was employed with subsequent scores when they were not treated in the Rorschach hypotheses. The "t" for a difference this large is 3.60 which is significant at the .001 level. It may be asserted with considerable confidence that there is a significant difference between the amount of change in F Plus % in the two groups.

3. Number of Content Categories (# C.C.)

The number of content categories on the Rorschach records is generally accepted as a measure of an individual's breadth of interest, that is, as an indication of the versatility of his response to the environment. A large number of categories suggests a wide range of interest or responsivity while a limited number of categories usually

signifies a narrow intellectual perspective. In the present study the mean difference between the group shifts is 2.150. The number of content categories was not included among the Rorschach hypotheses. The "t" for a difference of this size is 4.35 which is significant at the .001 level. It may be asserted with considerable confidence that there is a significant difference between the amount of change in the number of content categories in the two groups.

4. Time of First Response (T/1R)

The time for first response is the time which elapses from the moment the examiner hands the blot to the subject until the subject produces a scorable response. This measure is generally accepted as an index to the ease with which the subject reacts to his environment. In the present study the mean difference between the group shifts is -7.49. The time of first response was not included among the Rorschach hypotheses. The "t" for a difference of this size is 4.50 which is significant at the .001 level. It may be asserted with considerable confidence that there is a significant difference between the amount of change in the number of content categories in the two groups.

5. Animal Per Cent (A%)

The animal response is a reaction which refers to

any specie of animal. It may be either an entire animal or part of one. The A per cent is the quotient of the sum of whole and part animal responses divided by the total number of responses in the record. The A per cent is a measure of the adaptivity of an individual. In excess, the A response reflects stereotypy and is seen frequently in feeble minded persons. In the present study the mean difference between the group shifts was -5.625. The "t" for a difference of this size is 2.35 which is significant at the .025 level. Thus it is possible to reject the null hypothesis and to accept Rorschach hypothesis 8 with considerable confidence.

6. The Number of Human Responses

The human response is a percept which incorporates either a whole human form or part of such a form. Included in this grouping are the simulated human forms such as mythological characters, ghosts, religious figures, etc. The H per cent is the quotient derived from the ratio of the sum of the responses involving whole human forms and segmental human forms, divided by the total number of responses in the record. The H response is generally assumed to indicate the capacity of the individual to accept others and to interact with them. In the present study the mean difference between the group shifts was 1.850. The human response was not included among the

Rorschach hypotheses. The "t" for a difference of this size is 1.80 which is not significant. We have no evidence that there is a significant difference between the amount of change in the H per cent in the two groups.

7. The Whole Response (W)

The whole response represents a perception on the part of the subject in which the whole blot area is utilized. While the W response may be divided into a variety of qualitative subtypes such as the additive and instant kind, it is generally conceded to be an indication of intelligence, and more specifically, synthesizing capacity. Beck (5) speaks of W as one measure of functioning intelligence. In the present study the mean difference between the group shifts is -3.425. Since this difference is in the direction opposite from that predicted in Rorschach hypothesis 4 the null hypothesis must be accepted. However it is clear that there is a significant difference between the amount of change in the number of whole responses in the two groups. The two-tailed test of the null hypothesis yielded a "t" of 5.07 which is significant at the .001 level. While Rorschach hypothesis 4 must be rejected it may nevertheless be asserted with considerable confidence that there is a significant difference between the amount of change in the number of whole responses in

the two groups.

8. The Large Detail Response (D)

The D responses are the commonly seen details of the various blots. Beck (5) indicates that such responses represent the subject's ability to deal with the obvious. When this type of response is accentuated in a record, it presumably represents a concrete, practical approach to life on the part of the subject. In the present study the mean difference between the group shifts was 9.400. The D response was not included among the Rorschach hypotheses. The "t" for a difference of this size was 5.70 which is significant at the .001 level. It may be asserted with considerable confidence that there is a significant difference between the amount of change in the number of D responses in the two groups.

9. The Small Detail Response (Dd)

The Dd responses are the less frequently seen details in the ten blots. The Dd response is generally accepted as a measure of the subject's penchant for dealing with small, minute, perhaps inconsequential matters in daily life. In the present study the mean difference between the group shifts was 0.125. The Dd response was not included among the Rorschach hypotheses. The "t" for a difference of

this size was 0.20 which is not significant. We have no evidence that there is a significant difference between the amount of change in the number of Dd responses in the two groups.

10. The Movement Response (M)

The movement response as interpreted by Beck (5) is an index of the subject's creativity and inner phantasy life. Credit for a movement response is most often awarded when the examinee projects human movement into his response. It may also, on rare occasions, be credited in percepts where animals are engaging in human-like activities or where inanimate objects are portrayed in obvious motion. In the present study the mean difference between the group shifts was 1.825. The "t" for a difference of this size was 3.57 which is significant at the .0005 level. Thus it is possible to reject the null hypothesis and accept Rorschach hypothesis 5 with considerable confidence.

11. The Weighted C Response (Sum C)

The use of color in the response to the ink blots is an indication of the subject's emotional response to his environment in Rorschach framework. The previously described C or weighted C score (Sum C) is a composite score of the subject's total response to color. The Sum C response for

any record provides a measure of the intensity of emotional responsivity. In the present study the mean difference between the group shifts was 2.707. The "t" for a difference of this size was 7.94 which is significant at the .0005 level. Thus it is possible to reject the null hypothesis and accept Rorschach hypothesis 7 with considerable confidence.

12. The Weighted Flat Grey Response (Sum Y)

The Y response is a reaction on the part of the subject to the light and dark features of the blots. Beck interprets this type of psychological reaction as an indication of anergic passivity, a feeling in the subject of passivity in the face of threat. The Sum Y score was previously discussed. In the present study the mean difference between the group shifts was -1.562. The "t" for a difference of this size was 6.67 which is significant at the .0005 level. Thus it is possible to reject the null hypothesis and to accept Rorschach hypothesis 6 with considerable confidence.

13. The Weighted Vista Response (Sum V)

The Vista Response is a type of association to the blots in which the shading induces a three dimensional effect. The perception includes the element of distance. Beck (5) maintained that the vista response is an

indication of a type of self appraisal and ultimately a reflection of self inadequacy or feelings of inferiority. The Sum V again is a composite score of weights assigned to V, VF, and FV consistent with the color formula outlined for Sum C. In the present study the mean difference between the group shifts was -0.224. The V response was not included among the Rorschach hypotheses. The "t" for a difference of this size is 2.15 which is significant at the .05 level. It may be asserted with considerable confidence that there is a significant difference between the weight of vista responses in the two groups.

14. The Popular Response (P)

The popular response is a statistical concept. P responses are the most frequent association to the blots. There are a total of twenty such responses to the ten blots. As Beck described the concept it may be thought of as "the highest common denominator of associational content for the population" (5, p. 16). It is conceded by Rorschach workers to be a measure of communal thinking, an index to the individual's ability to conform to social strictures. In the present study the mean difference between the group shifts was 3.075. The "t" for a difference of this size was 8.60 which is significant at the .0005 level. Thus it is possible to reject the null hypothesis and to accept

Rorschach hypothesis 9 with considerable confidence.

15. The White Space or S Response

The S response refers to the type of reaction in which the examinee utilizes the white ground of the blot plate in the association. Such responses are considered to represent either intellectual perseverance or a negativistic orientation. In the present study the mean difference between these group shifts was 0.500. The S response was not included among the Rorschach hypotheses. The "t" for a difference of this size was 1.72 which is not significant. We have no evidence that there is a significant difference between the amount of change in the number of S responses in the two groups.

16. Card Rejections

Under the conditions of the test procedure as outlined by Beck (4) a card is considered to be rejected by the subject if no scorable response is produced within a two-minute time limit. Card rejections are considered to reflect malignant personality trends encountered almost exclusively in psychopathological conditions. In the present research the number of card rejections was so limited that the use of the usual statistical tests was not warranted. Hence the mean difference scores for the two samples are presented in order that the reader may evaluate

the trend. It appears that the shift in the experimental group is much more pronounced than that in the control population.

17. The Configurational Analysis

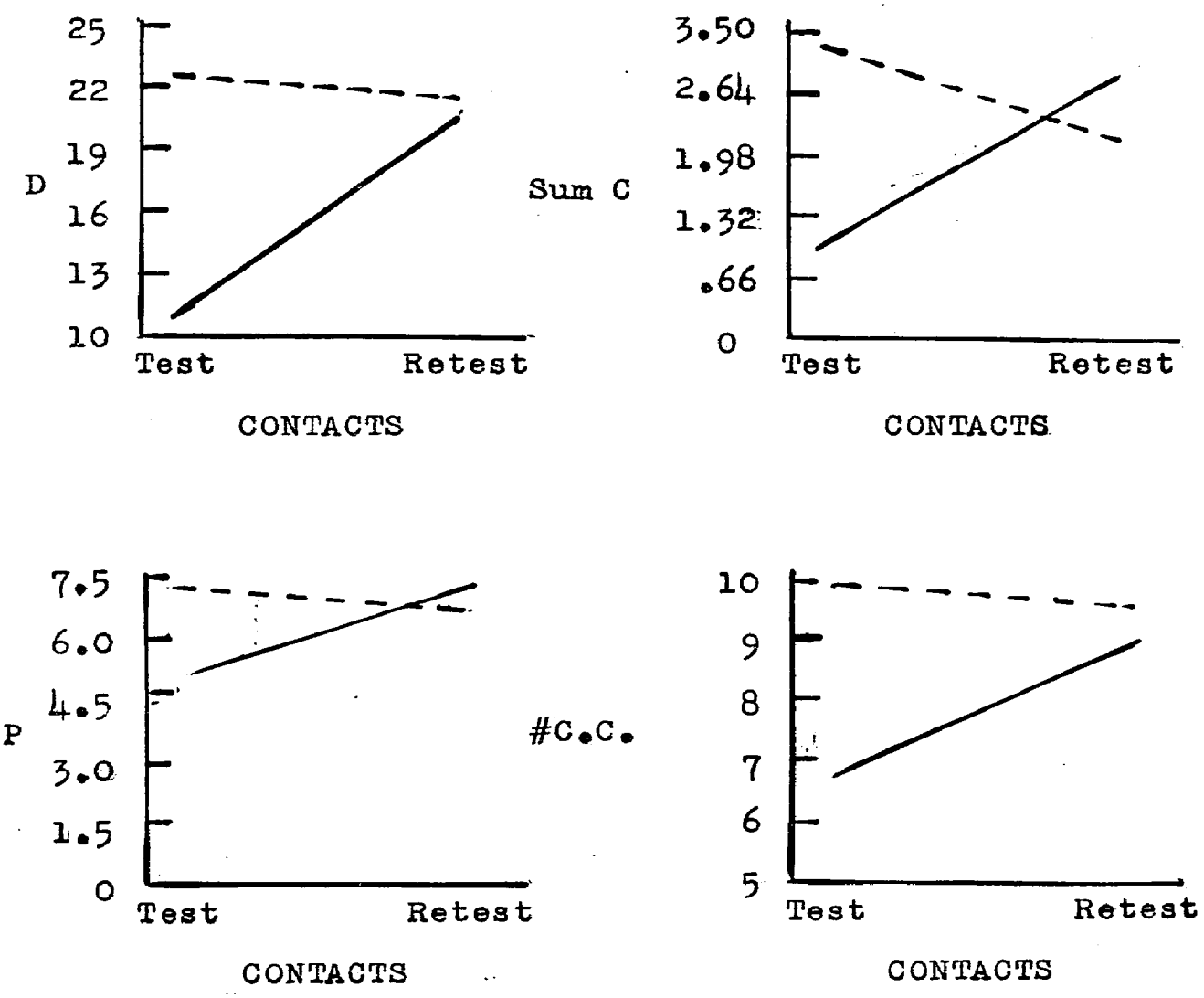
The Rorschach records were also subjected to a configurational examination as contrasted to the single factor analysis already discussed. In this way an estimate of the total Rorschach was obtained in keeping with the clinical use of the test. Two experienced Rorschach workers were given the eighty records of the experimental group. Each individual's two records were paired and clipped together. The two records in each pair were aligned in random order so that the judges had no clue as to which was the original and which the retest. The following instructions were given to the judges.

> There are eighty records here, two different records from each of forty subjects. The two records of each subject have been paired off for your inspection. The numbers of the paired records are presented below. You are to check the number of the record in each pair which you judge to be the more anxious record of the two.

The question of the reliability of the judgments between the two raters was answered through a chi square test of their agreement against chance agreement. The two judges were in agreement on thirty three out of forty of the pairs of records. The chi square proved significant beyond the one per cent level.

The validity of the judgments was also treated by a chi square analysis. One judge made thirty five correct judgments out of forty pairs of records. The second judge made thirty six correct judgments out of forty pairs of records. The chi square for the judge with the poorer record proved significant beyond the one per cent level. Thus the null hypothesis is rejected and Rorschach hypothesis 1 is accepted with considerable confidence.

In summary of this section, eight of the nine hypotheses dealing with the Rorschach test have been confirmed and accepted at levels of probability which are scientifically rigorous. Figure 2 portrays graphically a number of the shifts from test to retest. The difference between the experimental and control groups was always more pronounced on the first test. The single Rorschach hypothesis found untenable (W) was demonstrated to shift significantly in the direction opposite from that predicted. There are supplementary findings in the Rorschach test which are also of interest, although they were not among the areas for investigation included in the experimental hypotheses. Statistically significant shifts in the experimental performance beyond that in the control performance were demonstrated for F Plus %, number content categories, time for first response, D, and Sum V. Table V presents the summary of the significance tests performed on the Rorschach scores.



Solid Line = Experimental Group, Broken Line = Control Group

Fig. 2. Shifts in Four Rorschach Variables from Test to Retest in the Two Groups.

TABLE V

SUMMARY OF RORSCHACH FINDINGS

I Score	II Type of Test	III Significant Shifts Demonstrated	IV Level of Significance
R	1	X	.005
F Plus %	2	X	.001
# C.C.	2	X	.001
T/lR	2	X	.001
A%	1	X	.025
H Plus Hd	2		N.S.
W	1	X	N.S.
D	2	X	.001
Dd	2		N.S.
M	1	X	.0005
Sum C	1	X	.0005
Sum Y	1	X	.0005
Sum V	2	X	.05
P	1	X	.0005
S	2		N.S.
Number of Card Rejects	3	X	By Inspection

Column II -- 1 - one-tail test used to confirm experimental hypothesis.
-- 2 - two-tail test used to explore differences in Rorschach scores not treated in experimental hypothesis.
-- 3 - raw number presentation.

B. Interpretation of Rorschach Findings

Before the interpretation of the above findings was undertaken, a justification for the comparison of two Rorschach populations with significantly deviant response totals was indicated. The traditional criticism of a raw score procedure is grounded in the position that under the condition where two populations produce deviant response totals, any difference in the scoring variables is simply the reflection of the difference in the response totals. In an effort to handle this alleged difficulty, many experimenters have become involved in per cent approaches as well as far more elaborate and abstruse statistical manipulations. While it is doubtful whether such techniques have achieved the purpose for which they were intended, it is questionable whether they were really needed at all. The traditional position in this problem makes the assumption that the response total is the independent variable instigating changes in the other scoring symbols, as it itself fluctuates. The position taken in this research was that the response total is in reality the dependent variable mirroring the dynamic differences in personality reflected in the independent approach, determinant and content factors. Certainly the evidence points to a differential change in the scoring variables with a change in R. If the approach, determinant,

and content variables were the dependent variables they have been held to be, it would be expected that the scores would change directly with change in R. From the evidence provided in this study, it may be seen that in instances where the response total increases, there is a decrease in certain scoring variables. It seemed more parsimonious to take the view that the response total, as such, was simply a summary statistic dependent upon the remainder of the scoring profile for its character.

In general, the direction of the changes in Rorschach scores was in accord with the commonly accepted signs of stress on the Rorschach test. In the present study, stress has (1) significantly reduced the responsivity (R), (2) increased reality testing (F Plus %), (3) decreased the breadth of interest (# C.C.), (4) increased reaction time (T/1R), (5) increased the number of whole comprehensive responses (W), (6) decreased the number of common detail responses (D), (7) decreased the amount of inner living and creativity (M), (8) decreased the emotional participation with the environment (Sum C), (9) increased the dysphoric feelings and prompted feelings of inferiority (Sum Y - Sum V), (10) increased the need to be evasive and concrete in response (A%), and, (11) reduced the ability to think in terms of group standards or mores (P), as these functions are regarded to be measured on the

Rorschach.

One finding was at variance with anxiety signs demonstrated in other studies. Eichler (10), as previously reported, found that an artificially induced stress situation he employed tended to reduce the number of whole responses given. Postman and Bruner (31) concluded that stress affected the individual's ability to perceive a complex stimulus in its entirety. In their study the perception of whole sentences under a stress condition was impaired. In the present study stress facilitated the perception of whole responses. At first glance this appeared to be incompatible with the general findings. Under more precise inspection the whole responses in the first test of the experimental group were found to be of the simplest, undifferentiated type. They probably represented the most elementary type of response available. The exorbitant number of bats, butterflies and animal skins seen in the anxious situation apparently involved a minimal effort for the individual, undoubtedly requiring less psychic energy than that invested in delineating the blot into its common large details.

It seems clear that a stress situation such as used in this research is capable of altering the immediate integration of the personality to the extent that the perceptual apparatus is severely influenced. The Rorschach

test may be considered sensitive to this type of threatening situation. The response to the Rorschach test under the impact of the stress was notably consistent with the Freudian position on anxiety. Freud postulated that the consequences of an environmentally perceived threat were typically behavioral anxiety and defensive measures. The response to the Rorschach vividly depicts such defensive structure in operation. The impression obtained from the records is one in which the subjects are responding to an overwhelming need to avoid the frightening implications of their situation, to reduce their contact with it in every feasible manner, and to erect a protective barrier of inactivity. In essence this describes the popular Rorschach term "constriction". Free communication with environmental forces is reduced, greater reliance is placed on intellectual controls, and the direction of critical processes is focused on the self.

According to Freud, the psychological structure of the individual is geared to the purpose of removing excitation from the organism. In the case of fear, the removal process may be accomplished through physical or psychological exclusion where either the excitation is deposed or the organism withdraws from contact. Many times withdrawal is the only avenue for dealing with the situation since other means for discharging the fear

stimulus are not available. When such a situation arises, action toward the stimulus excitation must be postponed until the means for coping with it have been differentiated. During the interval in which experimental actions are undertaken for handling the excitation, the individual may be said to experience a tension struggle. This apparently was the situation for a large number of the experimental population on entering the hospital. The Rorschach portrait of their reaction to the stress situation is compatible with an interpretation of inhibition and delay of response. In order to avoid the experience of danger which might attend the discharge of tension through immediate action the subjects commonly resorted to a general retrenchment of their psychic energies.

CHAPTER V

THE RESULTS OF THE WORD ASSOCIATION TEST

The findings obtained from the Word Association test are presented in this chapter. In the first section, the response to the test was subjected to an analysis on the basis of the subject's reaction times. In the second section, the adequacy of the response word was investigated. In the third section, an interpretative summary of the findings is presented.

To review the structure of the test, it should be remembered that there were sixty words ordered in the same sequence each time the test was given. Of the sixty words, there were forty neutral words and twenty crucial words. The crucial words were composed of five words assigned to each of four threatening areas gleaned from the literature on the adjustment of tuberculous patients. The four areas were family relations, social relations outside the home, economic situations, and health. The words which were included on the test as representative of these areas were selected for this purpose in a pilot study with in-hospital tuberculous patients.

A. Reaction Time Findings

The reaction time is a measure of the temporal

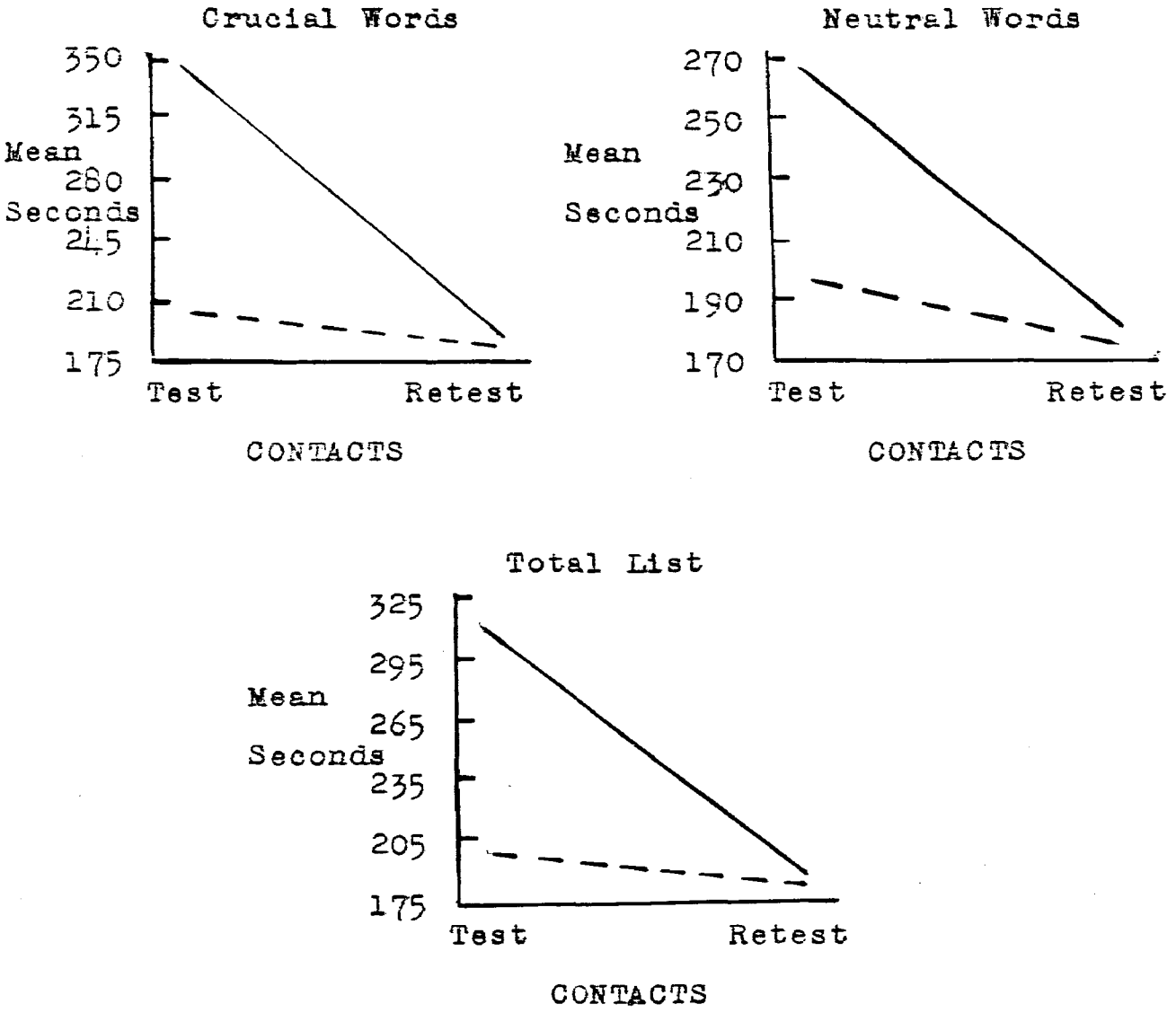
interval which elapsed between the time the stimulus word was pronounced by the examiner, and the time the subject responded with an association. The median reaction time was calculated for each word.

Table VI lists the mean of the median reaction times in the four experimental settings. The reaction times listed were determined by averaging the medians of each word group. It may be seen that in each test situation the speed of response to the neutral words was more rapid than it was to the crucial words. In other terms, the latency of response time for the crucial words was greater than that for the neutral words. The latency factor was numerically greatest in the experimental group's initial test experience. Both populations profited from the first test in that they demonstrated more rapid responses on the retest. Figure 3 graphically represents the shifts in the mean reaction time.

TABLE VI

MEAN OF THE MEDIAN REACTION TIMES IN THE FOUR EXPERIMENTAL SETTINGS

	Mean Reaction Time			
	Exp. I	Exp. II	Control I	Control II
Total List	3.07	1.85	1.98	1.77
Crucial Words	3.48	1.90	2.01	1.80
Neutral Words	2.66	1.80	1.95	1.75



Solid Line = Experimental Group, Broken Line = Control Group.

Fig. 3. Shifts in the Mean Reaction Time from Test to Retest in the Two Groups.

Table VII summarizes the response latency to the crucial and neutral words in test one of the experimental group. To compute this, the average of the medians of each pair of neutral words which followed a crucial word was computed. The mean difference was then the mean of the difference between the median reaction times of each crucial word and the average of the median reaction times of the two neutral words which followed it. The mean difference was found to be .819 which meant that the mean response to the crucial words was .819 seconds slower than the mean response to the neutral words. Since the direction of this shift was predicted in the Word Association hypotheses the one-tail test of the null hypothesis was employed. In subsequent situations dealing with comparisons treated in the hypotheses the same procedure was followed. The "t" for a difference of this size was 5.42 which is significant at the .0005 level. Thus it is possible to reject the null hypothesis and to accept Word Association hypothesis 1 with considerable confidence.

TABLE VII

DIFFERENTIAL REACTION TIME TO CRUCIAL AND NEUTRAL WORDS IN TEST I EXPERIMENTAL GROUP

Mean Difference	σ_D	t	P
.819	.658	5.42	.0005

In Table VIII a summary is made of the mean difference between the reaction time to the crucial and neutral words in the retest of the experimental group. The mean difference technique described for Table VII was here again utilized. The mean difference was 1.02 signifying a longer reaction time again for the crucial words. Since this situation was not included among the Word Association hypotheses the two-tailed test of the null hypothesis was used. This technique was followed with all the subsequent situations not treated in the Word Association hypotheses. The "t" for a difference of this size was found to be 2.27 which is significant at the .05 level. It may be asserted with considerable confidence that the crucial words required more time for response than the neutral words in the experimental group's retest.

TABLE VIII

DIFFERENTIAL REACTION TIME TO CRUCIAL AND NEUTRAL WORDS IN TEST II EXPERIMENTAL GROUP

Mean Difference	σ_D	t	P
1.02	1.98	2.27	.05

In Table IX a summary is made of the mean difference between the reaction time to the crucial and neutral words in the first test of the control group. Employing the

same mean difference technique, the difference was found to be .060. In this situation the crucial words once again yielded a longer reaction time. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size was .77 which is not significant. We have no evidence that there is a real difference between the reaction time to the crucial and neutral words in the control group's first test.

TABLE IX

DIFFERENTIAL REACTION TIME TO CRUCIAL AND NEUTRAL WORDS IN TEST I CONTROL GROUP

Mean Difference	σ_D	t	P
.060	.342	.77	Not Significant

In Table X a summary is made of the mean difference between the reaction times to the crucial and neutral words in the retest of the control group. The same mean difference method was used and the difference obtained was .047, again demonstrating the longer reaction time for the crucial words. This situation was not included among the Word Association hypotheses. The "t" for a difference of this this size was .063, which is not significant. We have no evidence that there is a real difference between the

reaction time to the crucial and neutral words in the retest of the control group.

TABLE X

DIFFERENTIAL REACTION TIME TO CRUCIAL AND NEUTRAL WORDS IN TEST II CONTROL GROUP

Mean Difference	σ_D	t	P
.047	3.288	.063	Not Significant

Table XI summarizes the mean difference in the reaction time of the experimental and control groups in test I to the entire list of sixty words. The mean difference of 1.115 was computed by comparing each experimental record with the record of the matched control subject. The experimental group took an average of 1.115 seconds longer to respond in the first test than the control group. The "t" for a difference of this size was 15.42, which was significant at the .0005 level. Thus it is possible to reject the null hypothesis and to accept Word Association hypothesis 3 with considerable confidence.

TABLE XI

DIFFERENTIAL REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS IN TEST I TO THE ENTIRE TEST

Mean Difference	σ_D	t	P
1.115	.566	15.42	.0005

Table XII summarizes the mean difference in the reaction time of the experimental and control groups in test I to the neutral words. The mean difference was obtained as described for Table XI. It was found to be .712, which reveals the longer reaction time to the neutral words in the experimental group as compared to the control group. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size was 13.9, which was significant at the .001 level. It may be asserted with great confidence that the experimental group's reaction time to the neutral words on the first test was significantly retarded as compared to the control group's reaction time to the neutral words on the first test.

TABLE XII

DIFFERENTIAL REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS IN TEST I TO THE NEUTRAL WORDS

Mean Difference	σ_D	t	P
.712	.136	13.9	.001

Table XIII summarizes the mean difference in the change of the reaction time from the first test to the retest in the two groups to the entire test of sixty words. These differences were computed by finding the difference between each experimental person's difference and the matched control person's difference. The mean inter group difference was 1.061 which indicated that the experimental group had a mean difference 1.061 seconds greater than the control group. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size is 13.42 which is significant at the .001 level. It may be asserted with great confidence that the experimental group's reduction in reaction time from the first to the second test was significantly greater than the control group's reduction.

TABLE XIII

DIFFERENTIAL CHANGE IN REACTION TIME OF EXPERIMENTAL AND CONTROL GROUPS TO THE ENTIRE TEST

Mean Difference	σ_D	t	P
1.061	.609	13.42	.001

B. Findings Regarding Adequacy of Response

The adequacy of the individual's response to the stimulus word was evaluated on the previously discussed

scale taken from Sharp. Each response was scored adequate or disturbed.

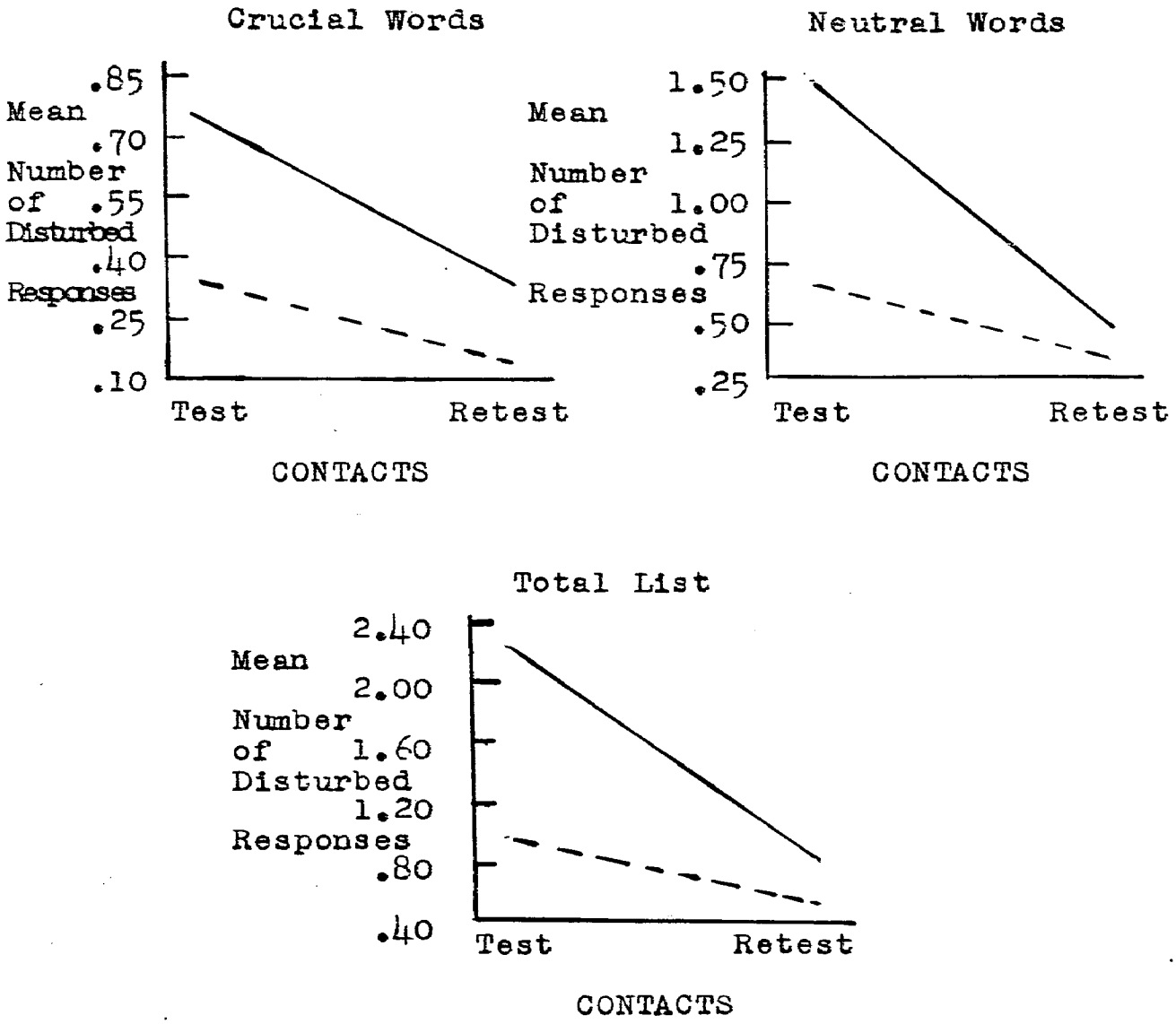
Table XIV reports the mean number of disturbed reactions in the four experimental settings. The number of disturbed responses was calculated for the total list of words, for the crucial list of words, and for the neutral list of words. This table was analyzed in detail as was the similarly constructed table dealing with the reaction time dimension.

TABLE XIV

RESPONSE ADEQUACY IN EXPERIMENTAL AND CONTROL GROUPS

Score	Mean Exp. I	Mean Exp. II	Mean Control I	Mean Control II
Number of Disturbed Responses to Total List	2.25	.80	1.00	.45
Number of Disturbed Responses to Crucial Words	.75	.35	.35	.15
Number of Disturbed Responses to Neutral Words	1.48	.48	.63	.30

Figure 4 graphically represents the mean number of disturbed responses in the experimental and control groups.



Solid Line = Experimental Group, Broken Line = Control Group.

Fig. 4. Mean Number of Disturbed Responses in the Experimental and Control Groups.

Table XV summarizes the mean difference in the number of "disturbed" responses to crucial and neutral words to test I in the experimental group. The number of disturbed responses for each crucial word was doubled in order to control for the greater number of neutral words in the word list. The mean difference found was .02 indicating that there was an average of .02 more disturbed responses to crucial words than disturbed responses to neutral words. The "t" for a difference of this size was .40, which is not significant. Thus we must accept the null hypothesis and reject Word Association hypothesis 2 since there is no evidence that there is a real difference between the number of disturbed responses to crucial words and the number of disturbed responses to neutral words in test I for the experimental group.

TABLE XV

DIFFERENCE IN NUMBER OF "DISTURBED" RESPONSES TO CRUCIAL AND NEUTRAL WORDS IN EXPERIMENTAL GROUP IN TEST I (CRUCIAL X 2)

Mean Difference	σ_D	t	P
.02	2.501	.40	Not Significant

Table XVI summarizes the mean difference in the number of "disturbed" responses to the crucial and neutral words

to the retest in the experimental group. The number of disturbed crucial words was again multiplied by two to adjust for the original difference in frequency. The mean difference found was .22, indicating that there was an average of .22 more disturbed responses to crucial words than to the neutral words. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size was .905, which is not significant. We have no evidence that there is a real difference between the number of disturbed responses to crucial words and disturbed responses to neutral words in the retest for the experimental group.

TABLE XVI

DIFFERENCE IN NUMBER OF "DISTURBED" RESPONSES TO CRUCIAL AND NEUTRAL WORDS IN EXPERIMENTAL GROUP IN RETEST (CRUCIAL X 2)

Mean Difference	σ_D	t	P
.22	1.518	.905	Not Significant

Table XVII presents the mean difference in the number of "disturbed" responses to the crucial and neutral words to the first test in the control group. The number of disturbed crucial words was doubled in the analysis as discussed in the description of Tables XV and XVI. The

mean difference found was .08, indicating that there was an average of .08 more disturbed responses to crucial words than to the neutral words. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size was .32, which is not significant. We have no evidence that there is a real difference between the number of disturbed responses to crucial words and disturbed responses to neutral words in test I for the control group.

TABLE XVII

DIFFERENCES IN THE NUMBER OF "DISTURBED" RESPONSES TO CRUCIAL AND NEUTRAL WORDS IN CONTROL GROUP IN TEST I (CRUCIAL X 2)

Mean Difference	σ_D	t	P
.08	1.56	.32	Not Significant

Table XVIII summarizes the mean difference in the number of "disturbed" responses to the crucial and neutral words to the retest in the control group. The number of disturbed crucial words was adjusted by the formula described above. The mean difference found was -.02 indicating that there was an average of .02 more disturbed responses to the neutral words than to the crucial words. This situation was not included among the Word Association

hypotheses. The "t" for a difference of this size was .157 which is not significant. We have no evidence that there is a real difference between the number of disturbed responses to the crucial words and disturbed responses to neutral words in the retest for the control group.

TABLE XVIII

DIFFERENCES IN THE NUMBER OF "DISTURBED" RESPONSES TO CRUCIAL AND NEUTRAL WORDS IN CONTROL GROUP ON TEST II (CRUCIAL X 2)

Mean Difference	σ_D	t	P
-.02	.791	.157	Not Significant

Table XIX summarizes the findings relative to the adequacy of response to the total list of sixty words in terms of the difference between the experimental and control groups in test I. The difference was calculated by comparing the number of disturbed responses in the record of each experimental person and the record of the matched control person. The mean difference is 1.275 indicating that the experimental group had an average of 1.275 more disturbed responses to the first test than did the control group. The "t" for a difference of this size was 4.09 which is significant at the .0005 level. Thus the null hypothesis may be rejected and Word Association hypothesis 4 accepted

since we have considerable confidence that the experimental group has significantly more "disturbed" responses in the first test performance than the control group.

TABLE XIX

DIFFERENCES IN THE NUMBER OF "DISTURBED" RESPONSES TO THE TOTAL LIST OF SIXTY WORDS BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS IN TEST I

Mean Difference	σ_D	t	P
1.275	1.951	4.09	.0005

Table XX summarizes the findings relative to the adequacy of response to the list of neutral words in terms of difference between the experimental and control group on test I. The differences were obtained by comparing each experimental record with the matched control record. The mean difference is .85, indicating that the experimental group had an average of .85 more disturbed responses to the neutral words in the first test than did the control group. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size was 3.32 which is significant at the .001 level. It may be asserted with considerable confidence that the experimental group has significantly more disturbed responses to the neutral words in the first test experience than has the control group.

TABLE XX

DIFFERENCES IN THE NUMBER OF "DISTURBED" RESPONSES TO THE NEUTRAL WORDS BETWEEN THE EXPERIMENTAL AND CONTROL GROUPS ON TEST I

Mean Difference	σ_D	t	P
.85	1.604	3.32	.001

Table XXI summarizes the mean difference in the change of the number of disturbed responses from the first test to the retest in the two groups for the entire list of sixty words. These differences were obtained by finding the change in each experimental person's two records and comparing it to the analogous change in his matched control's two records. The mean difference was .850, which indicated that the experimental group had a mean difference change in the number of disturbed responses of .850 greater than the control group's change. This situation was not included among the Word Association hypotheses. The "t" for a difference of this size is 2.60 which is significant at the .05 level. It may be asserted with considerable confidence that the difference between the change in the reaction time to the whole test in the experimental and control groups is significant.

TABLE XXI

DIFFERENCE IN CHANGE IN THE NUMBER OF "DISTURBED" RESPONSES BETWEEN THE FIRST TEST AND THE RETEST OF THE EXPERIMENTAL AND CONTROL GROUPS FOR THE ENTIRE LIST OF SIXTY WORDS

Mean Difference	σ_D	t	P
.850	2.043	2.60	.05

C. Interpretative Summary of the Word Association Test Findings

The direction of the findings in terms of the reaction time factor was in every case consistent with the theoretical orientation. Stress invariably provoked a retardation in the response of the subject. The analysis of the adequacy of the response was not as convincing. Consonant with the theoretical implications of the anxiety-producing situation the experimental group consistently produced more "disturbed" responses than the control group. However when the number of disturbed responses to the crucial words was compared with the number of disturbed responses to the neutral words no significant difference was found. It should be emphasized that while no significant differences occured on this level of analysis, the direction of the differences found was with but one exception suggestive of a trend toward greater disturbance

in reaction to the crucial words. The one exception resulted in the retest situation of the control group, the response to the neutral words required a longer reaction time than did the crucial words. In general, then, it may be said that the stress has delayed the reaction of the subjects and influenced the subject in the direction of less adequate or more "disturbed" responses. The adequacy of the response in terms of the proximity of the stimulus word to the stress situation is far from conclusive.

The evaluation of the efficacy of the crucial-neutral word dichotomy in demonstrating a stress reaction on the test produced results of interest. The Word Association test as a clinical instrument has been employed under two distinct theoretical frameworks. As already mentioned, Jung was the first to use the test. He maintained that there was a specificity of response so that the individual's tension areas or complexes were reflected in the atypical response to words which are psychologically related to these areas. In this framework, the test could be utilized to isolate emotionally laden personality conflicts. Kephart and Houtchens (21) disputed Jung's formulation that "complex" words are followed by disturbed responses. They presented evidence to show that scores on the association-motor test are independent of the word list used. They found subjects earned fairly consistent scores on two different lists.

Further, they emphasized the finding that little or no relationship in disturbance was found on identical words in two different tests.

The present study provided evidence to support the contentions of both theories; (1) the specificity approach of Jung's position, and, (2) the generalized reaction held by Kephart and Houtchens. The crucial words were selected to determine if patients arriving for hospitalization were sensitive to areas associated with their immediate situation. In defense of Jung's position it may be seen that the experimental group was sufficiently disturbed to respond with a significantly slower reaction to the crucial words in both the first and second test situations. On the other hand, the analysis of the comparison of the crucial and neutral words in terms of response adequacy did not prove significant in any of the four testing situations, while the comparison of the experimental and control groups' adequacy of response to the total test was highly significant. This would lend weight to the Kephart-Houtchens point of view. Perhaps the important factor contributing to these two antagonistic views is the variable utilized in the analysis. Jung's specificity view was confirmed by means of a reaction time treatment while the Kephart and Houtchens position was made more credulous by scoring the response on the basis of its adequacy.

Another finding of some substance was the apparent method of defense against stimulus material inimical to the personality. The results would strongly suggest that many times the adequacy of the response was sustained at an acceptable level at the expense of a delay in reaction time. Within the limitations of the reliability of the two methodologies the data indicated that an analysis of the Word Association test is more profitably made on the basis of reaction times rather than the system of adequacy of response used in this research.

One final conclusion seemed warranted by the Word Association findings, namely, that the type of tension generated in the experimental situation was manifested as free floating anxiety. It was shown that the experimental group was significantly more distressed in its response to neutral words in the first test performance than was the control group in its first test performance. This was demonstrated in terms of both reaction time and adequacy of response. Thus there is evidence to show that in responding to an objective external danger, the human organism often times demonstrate activity which suggests a type of neurotic or free floating disturbance. The anxiety becomes associated with environmental materials not necessarily closely related to the objective threat. The distinction proposed by Freud between objective and neurotic anxiety

may well be a purely speculative distinction abstracted from the complexities of human response patterns.

CHAPTER VI

ANALYSIS OF THE DIGIT SPAN FINDINGS

The digit-span test was the third test administered to the two populations. The digits were pronounced one each second and an effort was made to avoid any modulation or variation in voice quality throughout the many series. The scores were retained in raw form rather than converted into weighted scores.

A. Results

In Table XXII the mean raw scores for digits forward, digits backward, and total performance are presented. It may be seen that the experimental group achieved an increment in their retest over their first test for each of the three scores. The control group demonstrated contrasting results in that they produced only nominal changes from the first test to the retest.

TABLE XXII

DIGITS FORWARD, DIGITS BACKWARD, AND TOTAL MEAN SCORES OF DIGIT-SPAN TEST

Scores	Exp. I	Exp. II	Cont. I	Cont. II
Digits Forward	5.57	6.49	6.20	6.22
Digits Backward	4.00	5.18	5.05	4.98
Total Score	9.58	11.65	11.22	11.20

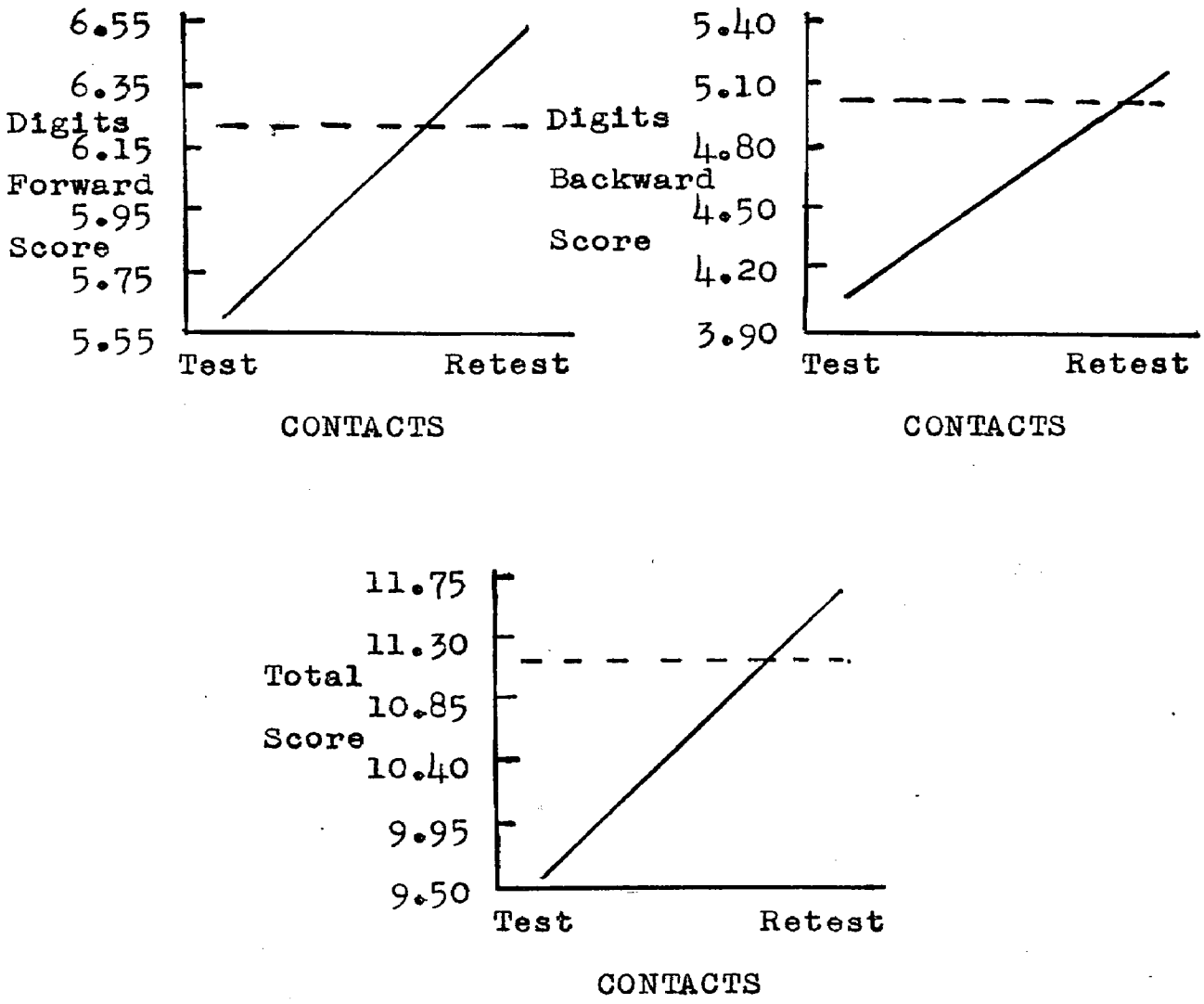
Figure 5 represents graphically the shifts in the two groups on the three indices of the Digit-Span test. The difference between the experimental and control groups was always more pronounced on the first test.

Table XXIII summarizes the changes in the three scores earned by the two research populations on the Digit-Span test. On the Digits-Forward test the experimental group demonstrated a mean increase from test I to the retest of .87 greater than the control group. The "t" for a difference of this size is 4.58 which is significant at the .0005 level. Thus the null hypothesis may be rejected and Digit-Span hypothesis 1 may be accepted with considerable confidence.

TABLE XXIII

COMPARISON OF CHANGE FROM TEST I TO RETEST IN EXPERIMENTAL AND CONTROL GROUPS ON THE THREE DIGIT-SPAN SCORES

Score	Diff. Mean Difference	D	t	P
Digits-Forward	.87	1.20	4.58	.0005
Digits-Backward	1.25	1.36	5.68	.0005
Total Score	2.12	2.13	6.22	.0005



Solid Line = Experimental Group, Broken Line = Control Group.

Fig. 5. Shifts on the Three Indices of the Digit-Span Test in the Two Groups.

On the Digits-Backward test the experimental group demonstrated a mean increase from test I to the retest of 1.25 greater than the control group. The "t" for a difference of this size is 5.68 which is significant at the .0005 level. Thus the null hypothesis may be rejected and Digit-Span hypothesis 2 may be accepted with considerable confidence.

On the total-digits score the experimental group demonstrated a mean increase from test I to the retest of 2.12 greater than the control group. The "t" for a difference of this size is 6.22 which is significant at the .0005 level. Thus the null hypothesis is rejected and Digit-Span hypothesis 3 is accepted with considerable confidence.

B. Interpretation of Findings

The direction of the significant changes found in each case conformed with the theoretical framework employed in the research. The experimental group's performance on the three scores obtained indicates that the stress situation has impaired their attention. It was also shown that the impairment was more obvious on the Digits-Backward score than on the Digits-Forward score. This is further evidence for the effect of the stress since the Digits-Backward score is considered more vulnerable to tension. Thus the

results attest to a deficit in immediate memory, and a generalized reduction in efficiency in the experimental population at the time of admission may be inferred.

It seemed justifiable to conclude that the Digit-Span test is a sensitive tool for measuring the type of anxiety aroused in this study.

CHAPTER VII

SUMMARY

The purpose of the present investigation was to assay the emotional reaction to the initial hospitalization of persons with active tuberculosis. The investigation was conducted by means of three psychological instruments; the Rorschach, an original Word Association test, and the Digit-Span test taken from the Wechsler Bellevue Intelligence Scale.

An experimental group of forty persons who were newly admitted patients, and a control group of forty persons who were hospitalized continuously for at least six months, were used in the investigation of the admission reaction. The experimental group was seen on the day of arrival in the treatment facility. The control group was matched individually with the experimental group on the six variables; age, sex, race, education, diagnostic finding, and marital status. All tests were conducted individually. The design of the research involved a test-retest for both populations with a six-week interval interposed between contacts. The analysis of the data was carried out primarily by means of the comparison of differences between the test results from the first test to the retest in the two groups. McNemar (25) has discussed and justified this

approach to the study of shifts in behavior in two groups over a period of time. Preliminary observation of patients' reaction to hospitalization furnished the basis for the hypotheses pertinent to this problem. The major hypothesis was that the initial admission into a tuberculosis hospital would provoke a stress reaction recognizable in the test response.

A. Findings Related to the Admission Situation

The Rorschach was treated statistically both atomistically in terms of the single scores, and in its entirety by means of an evaluation of the total configuration. In general, the atomistic changes on the Rorschach related to stress were; (1) a decrease in productivity, (2) increased reality testing, (3) a decrease in the breadth of interests, (4) an increase in reaction time, (5) an increase in the number of whole comprehensive responses, (6) a decrease in the number of common detail responses, (7) a decrease in inner phantasy and creativity, (8) a decrease in emotional participation with the environment, (9) an increase in dysphoric feelings, and feelings of inferiority, (10) an increase in the need to be evasive and concrete in response, and (11) a decrease in the ability to think in terms of group standards. It was also demonstrated that the Rorschach could be used as a measure

of total personality adjustment in this stress situation. Two judges were very successful in selecting the first Rorschach records as the more anxious from the two Rorschach records of each person in the admission group.

The Word Association test was composed of crucial and neutral words. Crucial words were words emotionally related by in-hospital patients to areas mentioned in the literature as sources of conflict for tuberculous patients. Neutral words were not readily associated with these areas. The test results were analyzed in terms of reaction time and adequacy of response. The stress involved in the admission situation influenced the response to the test as evidenced by a delay in reaction time and a less adequate response. The analysis of the differential response to the crucial and neutral words revealed statistically significant differences in reaction time. No significant differences were found when analysis was made on the basis of response adequacy. An attempt was made to reconcile the antagonistic views of the interpretation of the test as promoted by Jung and by Kephart and Houtchens. Jung's specificity of response point of view was corroborated by an analysis of response in terms of reaction time. Generality of response as sponsored by Kephart and Houtchens, was substantiated by means of analyzing the adequacy of response. A further analysis of the test indicated that the stress situation

was manifested as free floating anxiety rather than as objectively fixed anxiety.

The Digit-Span test proved capable of measuring the stress situation in terms of the three scores obtained. Stress reduced the digits forward, the digits backward, and the total digit scores.

B. Conclusions

First, it seemed clear that the three tests have justified their employment. Each test has proved capable of eliciting a differential response in the type of stress condition utilized in the study. Aside from minor discrepancies, the results obtained were consistent with the theoretical orientation discussed in Chapter III and the major hypothesis has been ratified.

The implications of the present study for the treatment of tuberculous patients were quite real. It seemed that patients, on entering the hospital, were psychologically distressed. Their ability to behave integratively and to deal maturely with their situation was hampered. They were fearful and unable to mobilize their best efforts to understand the new environment.

It has been shown that this reaction is a generalized anxiety pattern in which the tension is affixed to any convenient environmental object. Thus, it was plausible

for a patient to fear the nurse during his early adjustment to the hospital even though he had no contact with her "strep" needle. It is fallacious to expect the newly admitted patient to appreciate the reality of his situation. Perhaps the more serious indoctrination programs should be postponed for a month or so until the tension can begin to dissipate itself. Ideally, this early adjustment period would involve as much individualized attention for the patient as the hospital facilities will permit. Counseling and psychotherapy, when medically feasible, should be undertaken at the earliest possible point in the treatment program. The patient should not be called upon to make major decisions regarding his own treatment or the care of his family during this period. His response is apt to be much more adequate if he is given an opportunity to relieve his tension before the burden of his own welfare or that of his family is imposed upon him. It would seem that unless the dominant household and familial conflicts are settled prior to hospitalization, the treatment program may be irreparably disrupted.

The present study is also thought to have heuristic value in so far as it describes a sample and a situation which seemingly may be employed for future research in the problem of anxiety. The methodological limitations of "laboratory" stress have been acknowledged by most reputable

workers. The possibilities for extending our information and understanding of the real-life response to stress seems promising.

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APPENDIX A

EXERCISE CLASSIFICATION FOR TUBERCULOUS PATIENTS

Bed Rest Stage 0

Full nursing care. Position in bed, number of pillows, etc, to be decided by physician. No radio, television, reading, writing, or other acitivity, except by permission of doctor. No smoking. May be moved from bed for only the most urgent needs. Physician may limit visiting to members of the family as he feels necessary to patient's welfare.

Bed Rest Stage I

Patient may not be out of bed except on physician's order. May sit up for bedpan only. May read and write short letters while lying down. No card playing. No telephone calls except emergency with permission of doctor. May listen to radio and view television if assisted in tuning. Transportation always per stretcher. Wash hands and face and brush teeth. Wrap sputum cup (attendant to set out supplies for this if necessary). Shampoo on order of doctor.

Bed Rest Stage II

Patient may sit up to perform daily personal toilet and for all meals. Assist with own bed bath (attendant will always wash back and may help with washing legs). Shampoo monthly on stretcher. No card playing. Wrap sputum cup and change sack at bedside. May sit up to read or write letters for

short periods only if permitted by doctor. Transportation per stretcher. Supplies to be within reach (on table if dresser is not close enough to bed).

Bed Rest Stage III

May sit on bedside chair for bedmaking, barbering, and for one or two periods up to 20 minutes per day as prescribed by physician. Take own bed bath (attendant to wash and rub back). O. T. (Occupational Therapy) on prescription. Transportation by wheelchair.

Moderate Exercise Stage I

May walk to bathroom once in morning for bowel movement and while there may wash face and hands, brush teeth, etc. Use bedpan and/or urinal remainder of day and night. Transport per wheelchair. Shampoos may be given with patient sitting in chair. O. T., school work, and rehabilitatation services on doctor's permission.

Moderate Exercise Stage II

May walk to bathroom twice daily. May take tub or shower bath (attendant to clean tub). Bedpan and/or urinal at night only. Care of own drinking glass, water bottle. Transport per wheelchair when leaving ward. Prepare his laundry.

Moderate Exercise Stage III

Bathroom three times daily. (Patient to care for his own urinal and bed pan.) Wrap and dispose of sputum cup and paper sacks. May use phone during hours permitted. Straighten bed. Church or movie passes if permitted by doctor.

Moderate Exercise Stage IV

Bathroom permission. Clean tub himself. Walk to X-Ray, clinic, O. T., etc. May attend church, movies and other entertainments when issued permit card by physician. Patient to straighten and make own bed, keep table and dresser tidy. May visit other patients with permission, play cards or other games in solarium.

Exercise Stage I

Patient may walk to the dining room for meals as prescribed by the doctor.

Exercise Stage II

May take walking exercise outside the building (inside during bad weather) as prescribed by physician. Equivalent time may be spent in O. T. Dept. doing craft or similar activity. Complete responsibility for bed and bedside unit.

APPENDIX B

WORD ASSOCIATION LIST

Practice Words - hat, foot, boat, save, strong.

1. family
2. barrel
3. box
4. party
5. chalk
6. copy
7. appetite
8. cover
9. eagle
10. income
11. early
12. echo
13. child
14. far
15. feather
16. crowd
17. forest
18. frog
19. doctor
20. giant
21. grass
22. bills
23. green
24. hill
25. household
26. insect
27. leaves
28. dance
29. mixture
30. moon
31. examination
32. mountain
33. narrow
34. debt
35. post
36. river
37. home
38. mud
39. round
40. friend
41. second
42. sheep
43. hospital
44. spin
45. stone
46. money
47. string
48. suppose
49. marriage
50. swift
51. sword
52. community
53. thick
54. thunder
55. fever
56. valley
57. white
58. expense
59. open
60. wave