THE RELATIONSHIP BETWEEN PSYCHOPATHOLOGY AND CANCER

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ABSTRACT

THE RELATIONSHIP BETWEEN PSYCHOPATHOLOGY
AND CANCER

By

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The great variations occurring in the incidence and progression of cancer in man has been well documented. Most research probing the mechanisms of cancer have been biologically based yet the accrued information derived from this one source has been unable to solve many mysteries related to the incidence and progression of this elusive and bizarre disease.

Since the knowledge of physiology alone was not able to account for the marked differences observed in various malignancies, it was felt that exploration of other variables might offer new insights into the incidence and progression of the disease.

Other investigators have indicated that the new insights into these unanswered questions may be found, in part, in the personality characteristics of the patient. Thus, an attempt was made, in this study, to explore the personality variables of individuals afflicted by malignant neoplasms.

This investigation was based on the hypothesis that there was a greater incidence of emotional disturbance found in cancer patients as compared to individuals without the disease. It was not the hypothesis of this study that intrapsychic conflicts cause cancer. Furthermore, it was hypothesized that patients with the disease would possess particular personality characteristics and those variables would, in turn, be related to the malignancy's progression.

SAMPLE: The sample, in this study, consisted of forty-five males hospitalized in the Lansing area. Three groups, each containing 15 men were selected from local hospitals. Group I was composed of males with rapidly progressing malignancies, Group II consisted of male patients with slowly progressing malignancies and Group III was composed of men who had received bone fractures and had been subsequently hospitalized. All 45 subjects were matched, as closely as possible, for socio-economic status, age, and length of hospitalization.

INSTRUMENTATION: The instrumentation used for assessment included the Minnesota Multiphasic Personality Inventory (MMPI) and the Pre-Morbid (Pm) Quesionnaire which attempted to establish the presence of emotional disturbance prior to the onset of disease and hospitalization.

ANALYSIS: A multivalent analysis of variance was used to see if differences existed in the quantified data

among the three groups. Since this was an exploratory study, alpha was set at the .05 level. The null hypotheses were subsequently rejected; that is, personality differences did exist among the groups as measured by the instrumentation.

RESULTS AND CONCLUSIONS: It was apparent that considerable differences existed among the sampled groups. 1) Personality differencies, as measured by the MMPI, existed between the rapidly and slowly progressing cancer patients. These differences were manifested on the validity (F), psychopathic deviancy (Pd), schizophrenia (Sc) and hypomania (Ma) scales of the MMPI. No differences existed on the Pm Questionnaire between the two cancer groups. 2) Patients with malignancies showed a greater incidence of emotional disturbance as measured by the MMPI, when compared to the Controls. 3) Patients with malignant neoplasms scored significantly higher on the self-reporting Pm questionnaire than the fracture control group. This may indicate that patients with cancer possess a greater historical tendency towards emotional pathology than those individuals in the control group.

It, thus, appears that relationships do exist between emotional stresses and the progression rates of malignancies. However, it must be emphasized that correlation does not imply causation. This investigation was initiated only with the intent to demonstrate

that there are other variables (not biologically based) which may offer new insights into the elusive mechanisms of cancer.

THE RELATIONSHIP BETWEEN PSYCHOPATHOLOGY AND CANCER

By

Richard Lee Gay

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If, therefore, anyone wishes to search out the truth of things in serious earnest, he ought not to select one special science; for all the sciences are conjoined with each other and interdependent; he ought rather to think how to increase the natural light of reason, not for the purpose of resolving this or that difficulty of scholastic type, but in order that his understanding may enlighten his will to its proper choice in all the contingencies of life. In a short time he will see with amazement that he has made much more progress than those who are eager about particular ends, and that he has not only obtained all that they desire, but even higher results than fall within his expectation.

---Descartes

TO:

My wife Lyn

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TABLE OF CONTENTS

		Page
DEDICATION		iii
ACKNOWLEDGEMENTS		iv
LIST OF TABLES		vii
Chapter		
I.	THE PROBLEM	1
	Purpose	3
	Theory	4
	Research Hypotheses	[illegible]
	Overview	[illegible]
II.	RELATED LITERATURE	[illegible]
	The Classical Approach to Cancer Research	10
	Research Related to Psychopathology and Cancer	14
III.	DESIGN OF THE STUDY	24
	Sample	24
	Instrumentation	26
	Test Administration	28
	Testable Hypotheses	29
	Statistical Analysis	30
	Data Collection Procedures	31
IV.	ANALYSIS OF RESULTS	33
	Analysis of the MMPI	33
	Analysis of the Pm Scale	38
	Correlation Matrix	41

Page

V. DISCUSSION 42

The MMPI 42
MMPI Profile Analysis 57
The Pm Questionnaire 62

VI. SUMMARY, CONCLUSIONS, AND IMPLICATIONS . . . 64

Summary 64
Conclusions 70
Implications 71

BIBLIOGRAPHY 73

APPENDICES 76

Appendix A 77
Appendix B 81
Appendix C 83
Appendix D 85
Appendix E 89
Appendix F 97
Appendix G 101
Appendix H 103

LIST OF TABLES

Table		Page
3.1.	Mean Ages and Number of Male Subjects Used in the Sample	26
3.2.	Expected Personality Characteristics of Groups I, II, and III	30
4.1.	Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II and III	35
4.2.	Composite MMPI Profile of the Three Groups	36
4.3.	Analysis of Variance of the Pm Questionnaire for Groups I, II, and III	39
4.4.	Graphic Representation of Between Group Differences on the Pm Scale	40
A.1.	Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II, and III	78
B.1.	Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II, and III	82
C.1.	Correlation Matrix of the Dependent Variables	84
D.1.	Mean MMPI Profile of the Rapidly Progressing Cancer Patients	86
D.2.	Mean MMPI Profile of the Slowly Progressing Cancer Patients	87
D.3.	Mean MMPI Profile of the "Normal" Bone Fracture Control Group	88
E.1.	A Graphic Representation of Between Group Differences on the Individual Scales of the MMPI	90

Table Page

F.1. A Copy of the Initial Contact Sheet and Directions for Answering the Pm Questionnaire 98

G.1. Response Frequencies of the Three Groups, to Each Question, on the Pm Scale 101

H.1. Response Frequency of Groups I, II and III to the Individual Items on Scale 9 (Hypomania) 104

CHAPTER I

THE PROBLEM

The tremendous variations occurring in the incidence and progression of cancer in man have been well established. The progression of Hodgkin's disease, for example, may vary from a few weeks to over twenty years.[1] Nathanson[2] cites over 300 cases of malignancies in which 20 percent of the patients died in one year, while 22 percent were yet alive after five years, and one after twenty-six years. In another article Nathanson[3] discusses malignancies of the breast (N=100) in which the "shortest duration of life from onset of symptoms was one month, the longest, fifteen years, with 18 percent living after five years."

Knowledge of physiology alone, however, does not seem to totally account for these marked differences.

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[1] B. Newman and W. Pushkin, Acute fulminating Hodgkin's disease, J. Amer. Med. Asso., 1951, 146, 335-337.

[2] I. T. Nathanson and C. E. Welch, Life expectancy and incidence of malignant disease, Amer. J. Cancer, 1937, 31, 598-608.

[3] I. T. Nathanson, Cancer of the breast, Amer. J. Cancer, 1936, 28, 40-53.

This thought is reflected by the writings of Weinberg. He is quoted by Gengerilli[4] as stating

> it is generally recognized that cancers which are seemingly similar in their gross and microscopic appearance behave differently in their rates of growth. What is more, a given cancer may vary in its rate of growth from time to time without recognizable extraneous influences. Also, it is not unusual to see cancers which have a rapid growth become arrested following surgical excission, remain dormant for as long as ten to fifteen years, and then show unusually rapid growth.

These observations raise some interesting questions concerning the nature of the cancer process. For example, what factors then could influence the incidence and progression of this elusive and bizarre disease? Also, what factors might determine whether a malignancy will spontaneously regress, remain stationary, grow slowly or rapidly metastasize to surrounding areas? How can one account for patients with similar malignancies who respond so differently to treatment? In part, the answers to these questions may be found in the personality of each patient. For it is conceivable that emotional factors are involved in the cancerous process.

The evolution of new concepts of cancer and the discovery of important and new facts about its incidence and progression are taking a relatively long time in comparison with progress in other diseases. It might

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[4] J. A. Gengerilli, The Psychological Variables in Human Cancer (Los Angeles, University of California Press, 1954), p. 14.

therefore, be advantageous to examine the emotional components of individuals afflicted by malignant neoplasms. In his work with leukemia patients Lawrence[5] stated "if one could determine what factors lead to an unusually long duration, prognosis would be easier and therapy could be evaluated more readily."

It was not the hypothesis of this study that intrapsychic conflicts cause cancer. Rather the study was based on the hypothesis that there is a much higher incidence of emotional disturbance found in cancer patients as compared to individuals without cancer. Further, it was hypothesized that patients with the disease would possess particular personality characteristics; and these variables would, in turn, be related to the malignancy's progression.

Purpose

Most research probing the mechanisms of cancer has been biologically based. The accured information derived from this one source has been unable to solve many of the mysteries related to the incidence and progression of this insidious disease. Therefore, to explore other variables may be quite advantageous for they may prove to offer new insights into the incidence and progression

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[5]S. R. Hathaway and P. E. Meehl, The M.M.P.I. in Military Clinical Psychology (Washington, D.C., U. S. Govt. Printing Office, 1951), pp. 71-111.

of malignancies. The emotional components of the human species cannot be separated from its physiology. It is the purpose, then, of this research to investigate the relationship between these emotional components and cancer.

Theory

The premise upon which this theory rests is that "mind and body" causally interact and that they exert great influence upon one another. The "old" diencephalon, which is the seat of animal drives such as fear, rage, hunger and sex, served man well in his not-too-distant past. The mid-brain enabled him to survive and secure the bare necessities of living, hunting, and reproduction. It has been hypothesized that without these drives, man would not have been able to follow his evolutionary path and would have ceased to exist. Though the diencephalon was necessary for man's survival, it certainly was not sufficient. He was at a physical disadvantage and it was vitally important for him to make accurate discriminations in his environment. The cortex, which is responsible for perception, memory and association, allowed him to do this.

The brain has achieved its highest evolutionary development in the human cortex and the complex interplay of its faculties is called the human "psyche." Yet as man became more gregarious and civilized there was a

greater and growing need for further inhibition of diencephalonic expression. Finer discriminations had to be made now. For if he was to benefit from communal living, blatant aggressive and sexual acts against another member of the community had to be curtailed. As civilization became more sophisticated so did cortical discrimination. The diencephalon, which once was allowed such free expression of its drives, now found itself under the tight control (suppression or repression) of the cortex. The tension and conflict resulting from such diametrically opposed forces have affected every dimension of man's life. The inhibition and subsequent displacement of these drives have resulted in man's triumphs and his ills. Thus according to Simeons,[6] it is the human mind that is held responsible for producing a large number of these maladies.

It was Freud who have preeminence to the study of personality and to the psychic structure responsible for its genesis and change. In addition, he described the mechanism by which it functions and demonstrated the multiple ways in which it manifests itself. For example, speech, dreams, "slips of the tongue," mythology, "accidents" and psychophysiologic reactions are all determined and represent unconscious expressions of Man.

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[6]A. T. Simeons, Man's Presumptuous Brain--An Evolutionary Interpretation of Psychosomatic Disease (Dutton and Co., New York, 1961), p. 1.

These manifestations are all subject to the scrutiny of science and they all lead to a more complete and deeper understanding of the dynamics of man's personality.

In this study the concern, however, is with the relationship the mind has on somatic change. Intrapsychic tensions can be related to a change in pulse rate, blood pressure and respiration. Tensions resulting from conflicts are also related to hives, ulcers, constipation, insomnia and amenorrhea. For example, it is fairly widely held that an internalization of anger due to guilt can eventually lead to an ulcer. Note that the ulcer is not the cause of the guilt or anger, it is the result. Laughlin[7] hypothesizes that these emotions are related to Pyloric constriction, which in turn cuts off the blood supply to the surrounding cells. The cells quickly die and are unable to protect the lower cell layers against acid erosion. Thus, the resulting ulcer is actually related to the introjected and repressed anger.

With the preponderance of evidence to suggest that emotional variables can be related to physiological change it is not unreasonable to suggest that emotional factors are also related to the incidence and progression of malignancies. It is quite tenable to hypothesize that the rates at which malignancies develop are highly related

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[7]H. P. Laughlin, The Neuroses (Washington Butterworth, 1967), p. 453.

to intrapsychic tensions. The point is frequently made that the cancer itself caused the emotional disturbance. The implication being that cancer is a terrible disease which quite often leads the patient to a terminal state. The morbid expectation is supposedly sufficient to cause emotional disturbance in a patient. However, the assumption of cancer producing basic personality change is highly questionable. There is little doubt that the patient experiences mood shifts from day to day (as measured by scales D & Ma on the MMPI) as his treatment progresses. His basic mode of coping, however, does not typically change. The individual's mechanisms of defense remain quite stable throughout his life. The view is widely accepted that an individual's personality is characterized by fairly stable and habitual patterns of response to his environment. Should personality change occur it is usually the result of a predisposed endogenous influence rather than exogenous factors. West[8] addresses himself to this issue when he states that ". . . the basic personality does not change even in the face of a potentially lethal disease is supported by psychological records on many of our cases; records, that have been found in Army and Navy files dating back many years before the onset of the neoplastic process."

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[8] P. M. West, S. I. Rapaport, and C. E. Tempereau, Enzymatic evaluation of therapeutic agents in cancer, Cancer, 1951, 4, 177-183.

Research Hypotheses

The research hypothesis tested was that there is a positive relationship between psychopathology and cancer. More specifically, it was hypothesized that personality variables, as measured by the MMPI would objectively delineate those persons with rapidly and slowly progressing cancers. In addition, individuals suffering from cancer would have a greater incidence of emotional disturbance (Neurosis or Psychosis) than those individuals with no cancer. Finally, it was hypothesized that cancer patients would show a greater historical tendency towards emotional pathology than those persons in the control group.

Overview

In Chapter II the pertinent literature is reviewed. A general survey of traditional research is presented. Following this, a review of studies more closely related to the topic presented in this paper is cited.

The experimental design, statistical hypotheses, instrumentation and samples will be presented in Chapter III. The final Chapters IV, V and VI will contain the results, discussion, summary and conclusions of the analyzed data.

CHAPTER II

RELATED LITERATURE

This study attempted to delineate personality characteristics among: 1) rapidly and slowly progressing cancer patients and 2) between the cancer patients and a control group. The study also sought to demonstrate that a greater historical tendency towards emotional pathology was more evident in the cancer patients as compared to a "normal" population. The emphasis of this study differs from other research related to cancer in the following ways: 1) causation between emotional stress and cancer is not implied, 2) a control group was used so that the main effects were not confounded and 3) an attempt was made to measure personality variables prior to the onset of illness and hospitalization.

The pertinent literature is divided into two categories: 1) a review of the classical approaches to cancer research, and 2) a review of studies more germane to the present study. The proponents of both approaches seek to establish relationships between cancer and their own particular orientation--whether it be biological or emotional. It is essential to be acquainted with both

areas of research in order to appreciate the theoretical positions of each. As was previously stated, it may be quite advantageous to explore a range of variables for they may prove to offer new insights and relationships relevant to our understanding of cancer.

The Classical Approach to Cancer Research

Traditional cancer research has almost exclusively been biologically oriented. This somatic approach to the problem of malignancies may be roughly represented by three classical hypotheses. The first of these is the Irritation hypothesis. It was noted by many physicians that a cancer would appear subsequent to prolonged irritation of the skin or bodily tissue. For example, cancer of the lower lip occurs in pipe smokers at the place where the stem habitually makes contact. The irritations caused by chewing the membrane lining of the cheeks, or by prolonged contact of alcohol against the throat, or the inflammation of tissue due to ulcers or scars were also said to cause cancer. The relationship that exists between irritation and cancer is interesting but it leaves some important questions unanswered. Before causation can be implied, the question must ask why should one of two apparently identical lesions become cancerous and the other not? Similarly, how do we explain the fact that all irritations do not end in cancer; that all pipe smokers, for example, do not acquire a cancerous

lip? It appears then, that the process of cancer is more complex than the irritation hypothesis would allow. Thus, no causation can be implied for the observations subsumed under this hypothesis are only relationships.

The second classical hypothesis is the Microbe or Viral hypothesis. At one time it was felt that cancer was caused by certain bacteria (Bacillus) and more recently the virus has become highly suspect. Bacteria have been ruled out as a causative agent in the development of cancer, however, experimental evidence indicates that filtrable viruses might be a cause of tumor growth in lower animals. Yet the only tumor growth of man that has been experimentally produced by a virus is the ordinary wart.[1] The concept of a viral agent alone causing cancer led to some speculation concerning the contagious nature of the disease or its transmission by contact. Yet as Oberling[2] states

> if cancer really were contagious it might be expected to attack frequently nurses, surgeons, and pathologists, all of whom come into daily contact with it yet without taking any special precautions. But it is no more common among them than among the members of any other profession, nor does it spread through the patient's family as may tuberculosis and other truly infectious diseases.

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[1]Carter and Smith, Microbiology and Pathology (St. Louis, Mosby Company, 1966), p. 674.

[2]C. Oberling, The Riddle of Cancer (New Haven Yale University Press, 1944), p. 36.

The third hypothesis considers the Carcinogenic agents. Important chemical carcinogenic agents are certain members of the coal tar group and their derivatives. Certain of these compounds were used to produce cancer in experimental animals, such as a rabbit, by repeated contact with the skin.[3] Some carcinogens appear to be responsible for a number of occupational tumors in man. As an example, chimney sweep's cancer occurred in around the scrotum because of the trousers ground particles of soot into the skin. Cancer of the bladder has occurred in those who work with aniline dyes. Cancer of the skin is found in laborers such as farmers and sailors who work exposes them to the wind and sunlight.[4] Finally, there seems to be a high relationship between cancer of the lungs and tars resulting from cigarette smoking. Early researchers such as Murphy and Strum[5] painted mice with tar at different points on the animals body, so that no areas of skin ever received enough tar to elicit a tumor though the total amount applied would have been sufficient to produce one. There were no cancers of the skin in the mice treated, but they reported 60 to 78 percent of them

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[3]Carter and Smith, op. cit.

[4]Carter and Smith, op. cit.

[5]J. B. Murphy and E. Strum, Primary lung tumors in mice following the cutaneous application of coal tar, J. Exper. Med., 1925, 42, 639.

developed carcinoma of the lungs. Flory[6] also reported that tar from tobacco was carcinogenic for mice and rabbits. More recently Hammond[7] reported that dogs who were taught to smoke developed cancer and emphysema. He stated that of 36 beagles they had trained to smoke heavily, twelve had developed lung cancer. "The cancer victims had smoked seven to nine unfiltered cigarettes a day over a two and a half year period." Two of the dogs' cancers, it was reported were "indistinguishable from human smokers' lung cancer; the remaining ten were of types that are less common but are also found in men." Hammond also claimed that "dogs that smoked the same number of filtered cigarettes did not develop cancer." The same article also reported similar work by Cohan of the Sloan-Kettering Institute. He devised a method of inserting a plastic tube through an opening in a beagle's trachea and pumped in smoke drawn from cigarettes. "The animals were harnessed in an open box and after a few weeks of gradual conditioning showed signs of addiction." Though the smoking produced emphysema no cancers were found in the dogs.

Though there appears to be a high relationship between certain chemical agents and the subsequent occurrence of cancer no causation can be implied. The

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[6] C. M. Flory, The production of tumors by tobacco tars, Cancer Research, 1941, 1, 262.

[7] E. C. Hammond and W. B. Cohan, Smoking and cancer in dogs, Time, Feb. 16, 1970, p. 48.

carcinogenic hypothesis can neither account for the incidence or progression of neoplasms. For example, it does not explain the fate of the cigarette smoker. Before conclusive statements can be made we must address ourselves to those individuals who have never smoked and yet died of cancer as well as to those individuals who habitually smoke and do not die of cancer.

As was previously stated the zeitgeist for cancer research seems to be biologically oriented with great attention paid to histological techniques and microscopic examination of tissue. There is, however, the emotional sphere of the individual that must also be considered. Therefore, the following pages represent the cancer research which attempts to delineate that affective component.

Research Related to Psychopathology and Cancer

Schmale and Iker[8] noticed that many cancer patients had experienced feelings of hopelessness prior to the clinical appearance of the disease. They subsequently selected forty females (ages 25-40) who were being routinely examined and found to have cervical cytology that was suspect for cancer. Biopsy revealed 14 of the subjects with carcenoma. The authors had hypothesized that

[8] A. H. Schmale and H. P. Iker, The affect of hopelessness and the development of cancer, Psychosomatic Med., 1966, 28, 714.

the experience of specific feelings of hopelessness could facilitate or precipitate the disease. The presence or absence of cancer was predicted on the basis of individual interview data. The primary content of the interview centered around a "hopelessness potential and/or recently experienced feelings of hopelessness." Of the 40 women studied, the interview prediction correctly identified 8 of 14 that had cancer and 23 of 26 that did not. Thus, there were 31 correct predictions and 9 incorrect predictions. Chi square tests resulted in a p value of .007. They also reported a study by Paloncek and Graham (unpublished) in which 49 women with primary cervical cancer were examined. It was found that 27 had suffered loss of a strong emotional attachment prior to the onset of the disease. Though these results are interesting no conclusive inference can be made due to the poorly designed study. The absence of a pre-treatment measure decreases the internal validity of the design. The absence of a control group did not allow for comparisons, thus a confounding effect was not eliminated. Finally, there may have been experimenter biases during the intake interview, for which no apparent adjustments were made.

In an earlier study Tarlau[9] reported that women are slightly more susceptible to cancer than men. About one

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[9]M. Tarlau and I. Smalheiser, Personality patterns in patients with malignant tumors of the breast and cervix, Psychosomatic Med., 1951, 13, 117.

half of the cancers in females are of the primary or secondary sex organs, while roughly 50 percent of all male cancers are of the intestinal tract. In a pilot study Tarlau sought to determine whether there are similar underlying personality patterns in two groups of cancer patients. The two groups consisted of women with cancer of the breast and of the cervix. Tarlau states

> If a psychogenic disturbance is demonstrated in a group of patients with a specific illness, one must determine whether it is a secondary result of the illness, or whether the psychogenic dysfunction existed previously and functioned as a contributory cause of the physical difficulty. It is important to realize that there is a tendency to assume the former conclusion, thus neglecting the possibility of psychosocial factors rendering a state which may be related more to cause than to effect.

The sample consisted of 22 married females between the ages of 27 and 58. Half of the sample had breast cancer while the other half had cancer of the cervix. The three measures used for the investigation were the Rorschach, Draw-A-Person (DAP), and personal interview. The two groups shared some significant similarities: 1) the mothers of the patients were felt to be the dominant parent in 20 of the 22 cases, 2) there was a general disturbance in sexual functioning found among all subjects, 3) on the D.A.P. the breast group was functioning on an oral level, while the cervix group was at a more advanced genital level of development, and 4) both groups showed evidence of homosexual conflict. From the data Tarlau concluded that the breast cancers appeared in women who were

functioning psychologically at a primitive oral level, while cervix cancers appeared in patients who had a genital fixation. According to him these personality patterns, gleaned from the Rorschach data, are probably not the result of the cancer process itself. The existence of these problems previous to the illness is revealed by the interview material. He feels that "there is some evidence present which suggests that the personality structure may play a role in the pathogenesis of cancer of the primary or secondary sex organs in predisposed individuals." Again, a control group and pre-treatment observation were absent, thereby decreasing the interval validity of the design. In addition, the experimenter neglected to use a "double-blind" technique when evaluating the data. Thus experimenter biases may have entered into the acquisition and interpretation of the data. The poorly designed study leaves the author in a precarious position when he attempts to draw conclusions from his study.

Bacon, Renneker, and Cutler[10] describe the breast cancer patient as one incapable of adequate outward expression of such basic drives as anger, aggressiveness, or sex, in whom a resultant inner turmoil is "covered over by a facade of pleasantness."

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[10] C. L. Bacon, R. Renneker, and M. Cutler, A psychosomatic survey of cancer of the breast. Psychosomatic Med., 1952, 14, 453.

Trunnell[11] reports on studies of prostatic cancer in which similar observations were made. The average patient appeared to be of a fairly uniform personality type described as "unusually tractable," "nice," "eager to please," and in general "of a remarkably unaggressive nature."

Blumberg et al.[12] hypothesized a possible relationship existing between psychogenic stress and cancer. They too were impressed by the similarities of personality structure among certain cancer patients. They noted that patients with rapidly progressing cancer were polite, apologetic and, "almost painfully acquiescent." This was in contrast to the more expressive and sometimes bizarre personalities of those who responded extremely well to treatment with long remissions and long survival. His paper was limited to the study of the personality characteristics of persons with malignant diseases and the relationship of those findings to the rate of growth of the cancer. The battery of psychological tests administered to the subjects included the M.M.P.I., Rorschach, T.A.T., and the W.A.I.S. The subjects consisted of 50 male veterans who received palliative treatment with drugs and radiation. The men were divided into two equal groups: those with rapidly progressing, uncontrollable cancer and those with slowly

[11]J. B. Trunnell, Second Report on Institutional Research Grants of the American Cancer Society (New York: Am. Cancer Soc., 1952), p. 181.

[12]Blumberg, Phillips and Ellis, A possible relationship between psychological factors and human cancer, Psychosomatic Med., 16(206), 277.

progressing and easily controllable cancer. The MMPI profiles of patients with rapidly progressing cancers usually showed two or more of the following characteristics:

1. Highly negative 'F-K' values (-12 or more negative), considered indicative of high defensiveness or strong tendency to present the appearance of serenity in the presence of deep inner stress.
2. 'D' values of 55 and over without accompanying increase of the neurotic factors 'Hs' & 'Hy', considered indicative of anxiety or depression unrelieved through neurotic or normal channels of discharge.
3. Low 'Ma' scores (under 60) suggesting an abnormal lack of ability to decrease anxiety through usual outward corrective action.[13]

Though a 'typical' MMPI profile emerged (neg. slope) characteristic of many cancer patients it was the Ma scale that seemed to correlate most highly with the progression of the disease.

Most of the cancer patients who seemed to have slowly developing neoplasms or who possessed exceptional resistance to their growth were successful in either avoiding or reducing excessive emotional stress. Emotional stress was often mitigated by these individuals through one or more of the following behaviors: "normal outward activity;" "psychopathic activity;" "successful anxiety-reducing neurotic activity, such as conversion hysteria;" or "psychotic activity."

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[13] Ibid., p. 277.

Blumberg states that the psychological differences between patients in the two extreme clinical groups were of "such magnitude that in a significantly high percentage of cases they were readily detectable from the results of the MMPI." The medical and psychological classification coincided in 22 out of 25 cases (88%) in the "rapid group," and in 17 out of 25 cases (68%) in the "slow group." The overall accuracy of prediction was 39 out of 50 or 78 percent. The correlation coefficient was used since the groups were dichotomized. It was then converted to a χ^2 which was significant "beyond" the 1 percent level.

The authors conclude that the data obtained suggest that long standing, intense emotional stress may exert a profoundly stimulating effect on the growth rate of an established cancer in man. They feel that human cancer, in many instances, represents a non-adaptation syndrome in which cancer results when other defense mechanisms fail to function.

Blumberg's study offers important observations as to the effect emotional stress may have on malignant growth. Yet the absence of a control group does not allow him to know in what ways, if any, the cancer patients differ from other hospitalized people. Similarly, his statement suggesting the presence of <u>long standing</u> emotional stress would be more valid if he had had an objective measure of that variable.

The present study is also concerned with progression rates of malignancies. However, a control group has been incorporated into the design to cope with the variable of hospitalization. In addition, the Pre-Morbid (Pm) scale was developed to assess the presence of long standing emotional stress which may be indicative of a historical tendency towards emotional pathology.

It is evident that the literature cited, up to this point, has been based on clinical rather than experimental research. Control groups were conspicuously absent and, as a result, various sources of internal and external invalidity were present.

The "one-shot case study" (Campbell, 1968)[14] was the primary pre-experimental design used by these authors. This particular design does not provide a control group or pre-treatment observation. By omitting a control group the authors find themselves in a precarious position, for they cannot know if their "experimental" group differed on any variable other than cancer. By omitting the pre-treatment observation such variables as History, Maturation, Selection and Mortality cannot be accounted for. The internal validity of such designs is therefore weak. Needless to say, this raises some questions as to the veracity of their studies.

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[14] D. Campbell and J. Stanley, Experimental and Quasi-Experimental Designs for Research (Rand McNally, 1968), pp. 5-6.

However, some interesting clinical observations were repeatedly made by these men. For example, several of them noted that prior to the onset of the disease, their patients had had feelings of hopelessness and depression. Feelings of loss of a strong emotional attachment were also observed in the patients. Almost every author noted the patients' inability to outwardly express feelings of anger or hostility. Rather the patient would manifest a facade of pleasantness and acquiescence. Pronounced inhibition was more often seen in those individuals with rapidly progressing cancers, while those with more slowly progressing cancers were characterized as "more expressive" and "bizarre."

Some researchers in this area have suggested that cancer is a non-adaptive response. That is, if the patient cannot cope with his intrapsychic tensions via the main lines of defense, then cancer can result. If he is partially intact and can cope with his conflicts, at least to some extent, then his cancer either progresses slowly or can be held in abeyance by medical treatment. According to these authors it may be that what is seen in the ward of a hospital is the end result which represents the failure of the defense mechanisms. By making these statements they overextend themselves, for their poorly designed studies do not allow for such inferences to be drawn. However, they argue that their clinical

impressions are of some value and, therefore, feel somewhat justified in stating these tenuous conclusions.

CHAPTER III

DESIGN OF THE STUDY

The study was designed to test certain assumptions about personality characteristics serving to differentiate cancer patients from those patients without malignancies. Those assumptions were: 1) personality variables, as measured by the MMPI, will delineate those persons with rapidly and slowly progressing cancers, 2) individuals with malignancies will have a greater incidence of emotional disturbance than those subjects hospitalized for bone fractures, and 3) cancer patients would show a greater historical tendency towards emotional disturbance than those persons in the control group.

Sample

Forty-five males between the ages of 21 and 70 were used as subjects in this study.[1] Thirty males with cancer were selected from the medical hospitals in the Lansing area. They were selected on the basis of rate

[1]See Table 3.1 for mean ages. It should be noted that both the fast progressing group and the bone control group possessed a male of 70 years. However, the range is not representative of the mean or median age.

of progression of their cancers.[2] Group I was composed of fifteen cancer patients with a rapidly progressing disease, while Group II consisted of fifteen cancer patients with a slowly progressing disease. Group III represented fifteen males who had received bone fractures and had been hospitalized as a result of these fractures. Considerable thought was given to the selection of a control group. Recognition was given to the fact that the control group must also consist of hospitalized patients. Yet to avoid a confounding effect other somatic diseases, involving organs of the body, were ruled out. The observation was made that the sampled bone population could be matched quite closely to the other groups in relation to socioeconomic status, length of hospitalization and age. This was generally accomplished with the exception of the age variable (which is not greatly deviant). The possibility exists, however, that the younger men were more active and hence, more prone to physical accidents.

See Table 3.1 for the mean ages and number of subjects interviewed.

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[2]Each cancerous disease has a characteristic average duration which is familiar to medical clinicians. For example, in acute Myeloblastic leukemia (average duration 4-6 mos.) one month is "rapid progression," 12-18 mos. is "slow" and 2-8 mos. is "average" (Blumberg '54). It must be emphasized, however, that the progression of each malignancy was judged "rapid" or "slow" by the attending physicians. Their medical decision concerning rate of progression was based, not alone on clinical norms, but on their familiarity with their patient's history and his present condition.

TABLE 3.1.--Mean Ages and Number of Male Subjects Used in the Sample.

	Number of Males = 45		
	Rapidly Progressing	Slowly Progressing	No cancer, Bone Control
Group	I (R)	II (S)	III (C)
Number of males	15	15	15
Mean ages	57	54	40

Instrumentation

The instruments used for assessment included the Minnesota Multiphasic Personality Inventory (MMPI), and a questionnaire which attempted to establish the presence of psychopathology which may have existed prior to hospitalization. The MMPI is designed to provide an objective assessment of some of the major personality characteristics that affect personal and social adjustment. "The carefully constructed and cross-validated scales provide a means for measuring the personality status of literate adolescents and adults together with a basis for evaluating the acceptability and dependability of each test record."[2] Dahlstrom also states that the sampling procedure used to obtain the basic reference group provided a surprisingly close approximation to a cross-section of the adult population in age, education and urban-rural residence.

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[2]G. W. Dahlstrom and G. S. Welsh, An MMPI Handbook (University of Minnesota Press, 1965), p. 43.

The MMPI Normative Group (as summarized in the handbook):[3] (1) The first group consisted of 724 normal test subjects and was composed of men and women who were accompanying patients or visiting friends and relatives at the University of Minnesota Hospital. No subject was used if he was under the care of a physician. (2) The second group of normal cases consisted of 265 subjects (152 men) examined at the testing bureau of the University of Minnesota. They were seeking precollege or college guidance. (3) The third group consisted of 265 normal white-collar workers in various W.P.A. projects. (4) The use was also made of a group of 254 patients who were suffering from a variety of physical disorders and who had been examined in the medical wards of the University of Minnesota Hospital.

The forty item true-false questionnaire (see Appendix G) was designed to assess the presence of emotional pathology prior to the onset of illness and hospitalization. The questionnaire is composed of two scales from which two separate raw scores are then derived. The first score derived is the Lie score (L) which contains 15 items composing the Lie Scale on the MMPI. This score indicates the validity of the respondents answers to the questionnaire. The second score is designated as the Pre-Morbid score (Pm) and is composed of items which may

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[3] Ibid., p. 44.

indicate the presence of long standing emotional stress or pathology in the individual. Examples of the statements on this questionnaire are: (1) "I always used to worry about something," (2) "I had emotional problems," (3) "I had nervous problems when I was younger," (4) "I often felt that things were not real," (5) "Even when I was with people I felt lonely much of the time," (6) "When I got angry it was best not to show it" and (7) "I had many physical discomforts." All statements were placed in the past tense. Each individual was told to give his own opinion about himself, as he was in the past, prior to his illness. This is opposed to the instructions given for the MMPI which asked the subject to respond to the statements the way he "felt now, in the present."

Test Administration

The fifteen subjects in each group were given the R-Form of the MMPI and a mimeographed copy of the Pm questionnaire. The length of time for completion of the tests and interview ranged from one to seven days. In the majority of cases the tests were administered only after the patient's disease and plans for treatment had been explained to him. There were cases, however, where the attending physician preferred that the patient not know of his formal diagnosis. In no case was testing done when the patient was under stress due to treatment or if he was in a terminal state. Interview information

consisted of age, occupation, marital status, onset and duration of illness. Personal impressions of the individuals such as affect, thought content and mannerisms were also noted.

Testable Hypotheses

The following null and directional hypotheses were stated in order to test whether differences did indeed exist between the groups:

Ho1: There will be no differences in personality characteristics between the Rapidly and Slowly progressing cancer patients as measured by the instrumentation.

Ha1: There will be personality differences between the Rapidly and Slowly progressing cancer patients in the direction indicated by Table 3.2.

Ho2: Individuals with cancer will show no differences in the incidence of emotional pathology as compared to the males with bone fractures.

Ha2: Individuals with cancer show a greater incidence of emotional disturbance than those males hospitalized for bone fractures.

Ho3: Cancer patients will show no greater historical tendency towards emotional pathology than those persons in the control group.

Ha3: Cancer patients will show a greater historical tendency towards emotional disturbance than those males in the control group.

TABLE 3.2.--Expected Personality Characteristics of Groups I, II, and III.

	Rapidly Progressing	Slowly Progressing	No Cancer Bone Control
M.M.P.I.	Neurotic or Psychotic Profile with elevations on scales Hs and D and a relative depression of scales Pd & Ma.	Neurotic or Psychotic Profile with elevations on scales Hs, D, Pd, and Ma.	"Normal" Profile with scales within the "normal" limits.
Pm Questionnaire	Previous Indication of Psychopathology or emotional stress.	Previous Indication of Psychopathology or emotional stress.	No Previous Indication of Psychopathology or emotional stress.

Statistical Analysis

A Multivariate Analysis of Variance was used to ascertain if differences existed in the quantified data among the three groups. Alpha was set at .05 to test the individual Univariate F ratios (for each dependent variable) in addition to the overall Multivariate F.

The actual significant differences between group means had to be discerned by confidence intervals since a Post Hoc Analysis (Scheffé or Tukey) is not feasible due to the interdependence of the error terms in a multivariate analysis. The general concensus is that the most accurate estimate of differences between means can be found by simply

computing confidence intervals for each of the pair wise contrasts of interest. The procedure is to calculate a confidence interval at the desired alpha level (.05) by using the least square estimates of contrasts and the standard errors (of the least square estimates). The formula used for the t-confidence interval is $(M_1 - M_2) - {}^{t}\alpha/2\ (\sigma_M) = 0$.

The analyzed data are presented in the following tables: the analysis of variance of the MMPI appears in Table 4.1. In Table 4.2 a Composite MMPI Profile of the three groups is presented. This will enable the reader to obtain an overall view of the profiles. The Appendix contains a graphic representation of the individual MMPI scales that differ significantly. The analysis of variance of the Pm questionnaire is found in Table 4.3 and is followed by Table 4.4 which gives a histogram of between group differences on this instrument. Table G.1 (see appendix) presents response frequencies of the three groups, to each of the questions. Finally, in Table C.1 (appendix), a correlation matrix of the dependent variables is presented.

Data Collection Procedures

The experimental instruments were administered in Ingham and Sparrow Hospitals between the summer of 1969 and spring of 1970.

Prior to the collection of data a meeting was held with the individual hospital administrators to receive their cooperation and permission to enter the hospital and carry out the study. The next step was to contact and make appointments with the private physicians who typically placed their patients in these two hospitals. The purpose of these meetings was to explain the research and obtain their permission to interview and test their patients. Once this was accomplished final permission from each patient was then needed before testing could begin. To obtain the names of cancer and fracture patients, it was necessary to visit the floors of both institutions at least twice a week. The head nurses of each floor would then note any new patients who fit the criteria. The patients were told that the information obtained was confidential and that the data sheets would be coded. They were then given the test instructions and told that "the questionnaires would be picked up in a day or two." After the questionnaires were collected, the patients were given the opportunity to ask questions in order to ameliorate any anxiety generated by the tests. Most patients did have questions relating to the instrumentation. However, it appeared that the patients were mostly enjoying the opportunity to "vent" their anxieties and fears on an "interested party."

CHAPTER IV

ANALYSIS OF RESULTS

The general hypothesis being tested is that there is a positive relationship between psychopathology and cancer; that is, the rapidly and slowly progressing cancer patients will differ from each other on the MMPI. Males with malignant growths will have a greater incidence of emotional disturbance and will, therefore, possess more abnormal MMPI profiles than those with bone fractures. Cancer patients will show a previous indication of emotional disturbance, prior to their illness, as measured by the Pre-Morbid (Pm) Scale. By contrast the fracture control patients will show no previous indication of pathology prior to their illness.

Analysis of the MMPI

Initially alpha was set at the .05 level. A Multivariate Analysis of Variance of the MMPI for groups I, II and III yielded an F ratio of 5.5201. The probability of this ratio was found to be $p < .001$. Similarly, upon inspection of the individual univariate F ratios, significant differences between groups were found. Thus, the

null hypotheses can be rejected. Personality differences do exist between the sampled groups (see Table 4.1).

In Table 4.2 a composite MMPI profile of the three groups is presented. This allows the reader an overall comparison of the personality differences existing among the groups. Significant differences are found on the three validity scales L, F and K. Hypochondriasis, Depression, Psychopathic Deviacy, Psychasthenia, Schizophrenia and Hypomania are among the clinical scales that differ significantly.

As was stated all three null hypotheses were rejected: 1) personality characteristics, as measured by the MMPI did discriminate between the rapidly and slowly progressing cancer patients, 2) individuals with cancer did show a greater incidence of emotional disturbance than the males hospitalized for bone fractures, and 3) cancer patients revealed a greater historical tendency towards emotional disturbance (as measured by the Pm scale) than males in the control group.

In the following paragraphs the quantitative differences observed on the MMPI are discussed. In Chapter V interpretive statements are made about these quantitative differences.

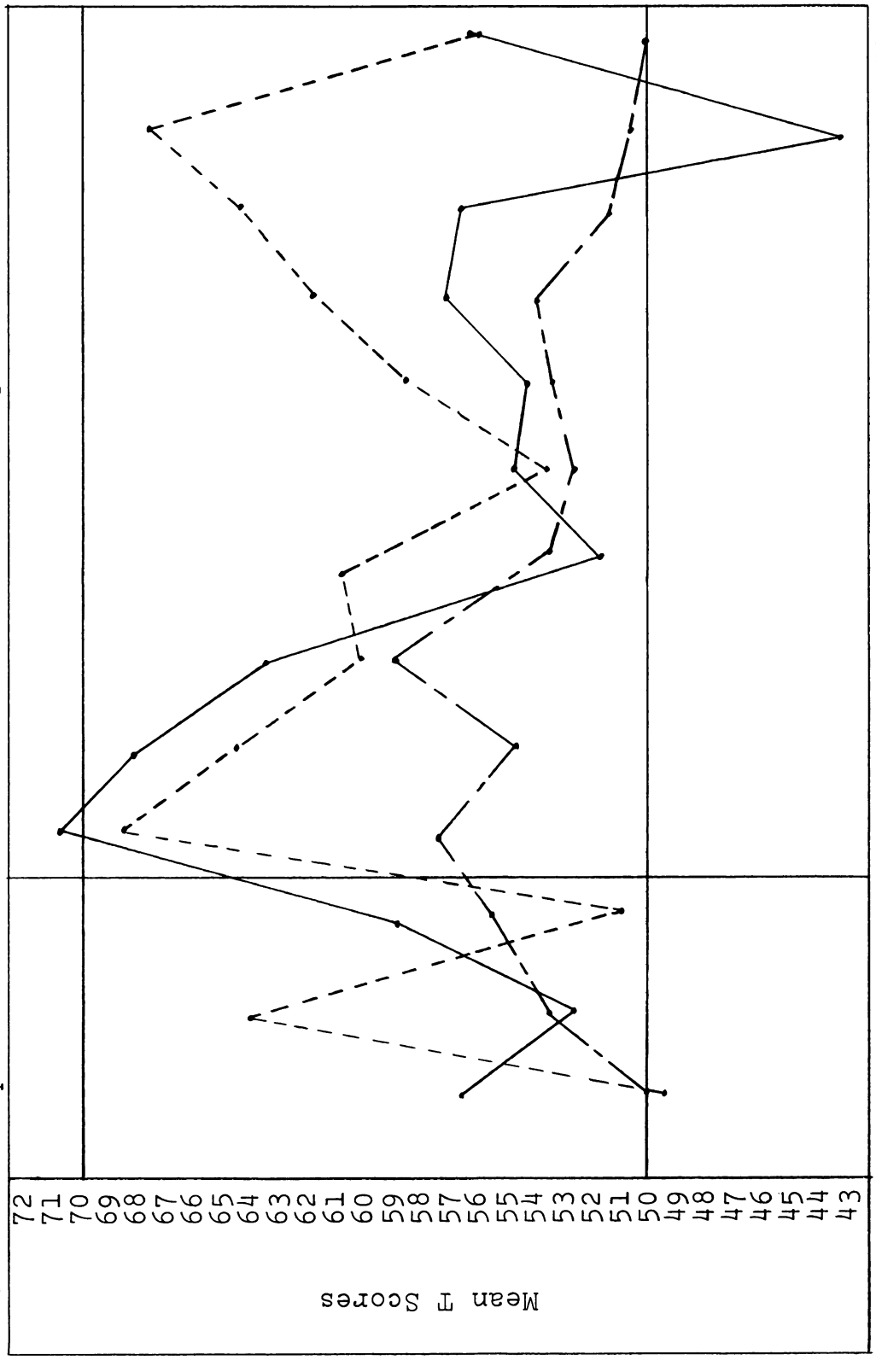
On scale L of the MMPI the groups differed from each other at the .02 level. The rapid (R) group scored significantly higher than the slow (S) group, while the

TABLE 4.1.--Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II and III.

MMPI Scale	Groups		Means	Probability of F-Ratio	Direction of Significance	
L	Rapid	(R)	56.73	.0203	R>S*	(R)>(S)=(C)
	Slow	(S)	49.73		R>C*	
	Control	(C)	50.00		S=C	
F	Rapid	(R)	52.73	.001	S>R*	(S)>(R)=(C)
	Slow	(S)	64.06		S>C*	
	Control	(C)	53.46		R=C	
K	Rapid	(R)	59.06	.0243	R>S*	(R)>(S)=(C)
	Slow	(S)	50.73		R=C	
	Control	(C)	55.13		S=C	
Hs	Rapid	(R)	70.73	.0005	R>C*	(R)=(S)>(C)
	Slow	(S)	68.73		S>C*	
	Control	(C)	57.13		R=S	
D	Rapid	(R)	68.06	.0006	R>C*	(R)=(S)>(C)
	Slow	(S)	64.73		S>C*	
	Control	(C)	54.33		R=S	
Hy	Rapid	(R)	63.86	.1218	R=S	(R)=(S)=(C)
	Slow	(S)	60.00		R=C	
	Control	(C)	58.93		S=C	
Pd	Rapid	(R)	51.53	.0040	S>R*	(S)>(R)=(C)
	Slow	(S)	60.86		S>C*	
	Control	(C)	53.20		R=C	
Mf	Rapid	(R)	54.80	.6862	R=S	(R)=(S)=(C)
	Slow	(S)	53.53		R=C	
	Control	(C)	52.20		S=C	
Pa	Rapid	(R)	54.06	.2422	R=S	(R)=(S)=(C)
	Slow	(S)	58.86		R=C	
	Control	(C)	53.33		S=C	
Pt	Rapid	(R)	57.53	.0230	S>C*	(S)>(C)=(R)
	Slow	(S)	61.66		R=S	
	Control	(C)	53.73		R=C	
Sc	Rapid	(R)	56.60	.0005	S>C*	(S)>(C)=(R)
	Slow	(S)	64.66		S>R*	
	Control	(C)	51.20		R=C	
Ma	Rapid	(R)	43.33	.0001	S>R*	(S)>(R)=(C)
	Slow	(S)	67.86		S>C*	
	Control	(C)	50.66		C>R*	
Si	Rapid	(R)	56.20	.0615	R=S	(R)=(S)=(C)
	Slow	(S)	56.06		R=C	
	Control	(C)	50.00		S=C	

*Statistically significant at the .05 level.

TABLE 4.2.--Composite M.M.P.I. Profile of the Three Groups.



slow group and the controls (C) earned statistically equal scores. The F scale successfully discriminated between the groups at the .0001 level of significance. Here the slow group scored higher than the rapid progressors and controls, but no differences appeared between the rapid and control groups. The rapid group scored significantly higher ($p < .02$) than the slow group on the K scale. No differences were found, however, between R and C or between S and C.

Differences on the Hypochondriasis scale (Hs) were significant at the .0005 level. The rapid group and the slow group both scored higher than the controls, yet group R and group S were essentially equal. The Depression scale (D) yielded differences between the groups at $p < .0006$. On this scale the rapid progressors were greater than the controls, and the slow progressors were greater than the controls, but no differences between the rapid and slow progressors were found.

No significant differences ($p < .1218$) were found among the three groups on the Hysteria scale (Hy). Differences did occur, however, on the Psychopathic Deviacy scale (Pd) at the .004 level. Group S scored higher than group R or group C, but the rapid and control groups showed no differences on this scale. The Identity scale (Mf) did not discriminate among the sampled groups ($p < .6862$). Nor were there any differences between the

groups on the Paranoid scale (Pa) $p < .2422$. No differences were found between the rapid and slow progressors or between group R and group C on the Psychasthenia scale (Pt); yet group S scored higher than group C on this index ($p < .0230$).

Differences were evident on the Schizophrenia scale (Sc) at the .0005 level. Here, the slow progressers scored higher than either the controls or rapid progressors, but no difference existed between these latter two groups. All three groups earned significantly different ($p < .0001$) scores on the Hypomania scale (Ma). Group S scored higher than the rapid progressors, and they (S) also scored higher than the controls. The controls, however, scored higher than groups R on this particular scale. No differences were apparent ($p < .0615$) among the groups on the Social Introversion scale (Si).

Analysis of the Pm Scale

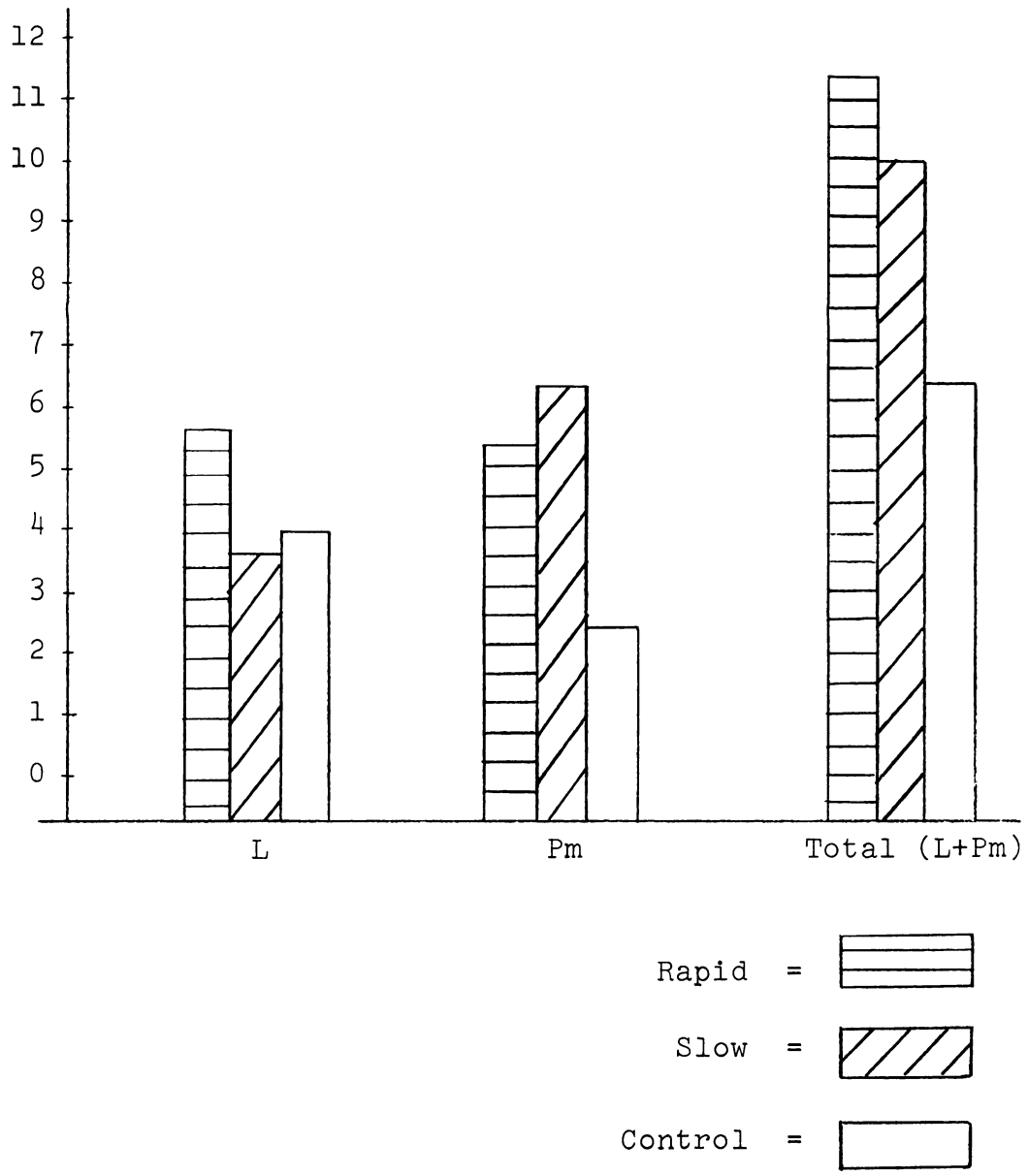
A Multivariate analysis of the Pre-Morbid scale (Pm) resulted in an F ratio of 6.4490. The probability of this ratio was $p < .0001$. Both Univariate F ratios, representing the L and Pm scores, demonstrated that differences between groups existed. It was found that both cancer groups scored significantly higher on the Pm scale than did the bone control group (see Tables 4.3 and 4.4). Thus, the third null hypothesis was rejected.

TABLE 4.3.--Analysis of Variance of the Pm Questionnaire for Groups I, II and III.

Pre-Morbid Questionnaire	Groups	Means	Probability of F Ratio	Direction of Significance
L Scale	Rapid (R)	5.73		R>S*
	Slow (S)	3.66	.0386	R=C
	Control (C)	4.00		S=C
Pm Scale	Rapid (R)	5.66		S>C*
	Slow (S)	6.46	.0019	R>C*
	Control (C)	2.53		R=S

*Significant at the .05 level.

TABLE 4.4.--Graphic Representation of Between Group Differences on the Pm Scale.



The cancer patients demonstrated a greater, self-reported historical tendency towards emotional disturbance than did the control group.

The quantitative differences observed on the Pm Scale will be presently discussed, but interpretive statements will be withheld until Chapter V. On scale L of the Pm questionnaire the rapid progressors scored significantly higher ($p < .0386$) than the slow progressors. Group R equaled group C and group S equaled group C on this scale.

Significant differences were apparent between the groups on the Pre-Morbid scale ($p < .0019$). The slow progressors and the rapid progressors each scored higher than the controls. There was no difference between the rapid and slow progressors.

Correlation Matrix

The correlation Matrix of the dependent variables is presented in the Appendix. The highest correlations are found among the neurotic scales (Hs, D, Hy, and Pt). High relationships existed in the neurotic triad (Hs, D, and Hy) which in turn was highly related to Psychasthenia (Pt).

CHAPTER V

DISCUSSION

In this chapter an integration of theory and results will be presented and discussed. Analysis of the data lead to some interesting results which in general, were supportive of the hypotheses set forth at the onset of the study. The implications of these results are intriguing for definite personality differences did exist between the three groups. The two cancer groups themselves differed along personality dimensions, and certain personality characteristics differentiated the cancer patients from the control group. In addition, historical differences in emotional adjustment were evidenced among the three sampled groups. The observed differences among the groups were measured by the MMPI and the Pre-Morbid Questionnaire. Each instrument was discussed in terms of 1) objective group differences and 2) group differences based on clinical observations.

The MMPI

Initially, a delineation of the MMPI scales was made. Each was defined and discussed in relation to the

three groups sampled. The differences among the groups for each scale were then discussed and interpretive statements made. Finally, an individual profile analysis for each was presented to demonstrate the overall personality differences present among the groups.

Upon inspection of Table 4.1, it is evident that the three groups do differ significantly ($p < .0001$) on several personality scales. Those individuals with rapidly (R) progressing malignancies scored significantly higher ($p < .02$) on the Lie (L) scale than the more slowly progressing cancer patients (S). However, no difference exists on the Lie (L) Scale between the slow progressors and the bone fracture group (C). The rapid groups not only scored higher on L than did the other two groups, but also higher than the general population from which the test was standardized. Dalstrom and Welch[1] state that the Lie scale is a validating score that "affords a measure of the degree to which the subject may be attempting to falsify his scores by always choosing the responses that place him in the most acceptable light socially." The content of the L scale involves aggressive feelings, bad thoughts, temptations and lack of control or conformity. Scale L is sensitive to the subject's tendency to cover up and deny what he considers undesirable personal faults.

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[1]Dahlstrom and Welch, op. cit., p. 47.

A high L score indicates lack of personal insight and is indicative of a passive, insecure and rigid individual. Such defensive denial often accompanies a naive hysteroid view of oneself and the world. Such a person may be pious, emotionally repressive, possess a strong super-ego and may have a poor understanding of the motives behind his own actions or the consequences of them.[2] The following are some items that compose the Lie scale. A "False" response to any of the following statements would increase the individual's raw score on L. (1) "I do not always tell the truth." (2) "I get angry sometimes." (3) "Once in a while, I put off until tomorrow what I ought to do today." (4) "Sometimes when I'm not feeling well, I am cross." (5) "I do not like everyone I know." (6) "My table manners are not quite as good at hime as when I am out in company."

The Rapid (R) group's score is representative of a deliberate, though naive, distortion. Groups S and C responses to scale L more closely approximated that of the general population. Subjects scoring within this latter range usually experience less guilt and repression than those scoring high on L. As stated in Chapter I, a major theorem of the psychoanalytic approach suggests that internalization of aggression, due to guilt, may have deleterious effects to one's physical health. The

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[2]Dalstrom and Welch, op. cit., p. 49.

Lie scale, then, may offer some clue to the progression rate of various malignancies.

On the F scale, it was the slowly progressing group that scored significantly higher ($p < .0001$) than either the rapid or control group. No difference was found between these latter two groups. Many of the items on the F scale deal with peculiar thoughts and beliefs. Others have to do with apathy, lack of interest in things or denial of social ties. Many other items relate to family relationships or childhood experiences. A few were related to religion, attitudes toward the law and a lack of comfortable control over impulses. Persons going through a transition in traditional values and mores may respond to some of the F items in a different way than persons who are more accepting of or more free from such ties and demands.[3] Similarly, someone who feels intensely and is defensive about a particular set of political or religious connections may endorse some of the F scale items, to which most subjects do not subscribe.

An elevated F may be interpreted in several ways, depending on its relationship with the other validity and clinical scales. For example, if F is elevated simultaneously with certain clinical scales (T-score of 70 or higher) severe pathology may be evident. However, if F is an isolated peak it may represent individuals

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[3]Dalstrom and Welch, op. cit., p. 49.

who are more complex and restive. Further interpretations of the F scale will be offered when the profile analysis is discussed.

The K score is also a validity scale. It represents ego strength or the defensiveness of an individual. A high K score, especially in relation to L, represents defensiveness against psychological weakness and is indicative of an attempt to appear "normal."

Subjects getting a high score on K not only deny personal inadequacies, tendencies toward mental disorder and trouble in controlling themselves (with regard to temper), but also withhold criticism of others. The diphasic elevation of scales L and K, in relation to the R group, gives further impetus to the "internalized aggression" hypothesis. Conversely, a high K is an indicator of psychological health and "intact" ego boundaries, if the other scales are within normal limits.[4] The individual may have a high degree of self-acceptance and may be quite satisfied with himself. This self-acceptance is more characteristic of the Bone Control profile.

A low K, relative to F, often indicates low self-esteem in an individual who may be over-critical in his self-evaluation. Low K scores are obtained by admitting

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[4]Alfred B. Heilbrum, Social-learning theory, social desirability and the MMPI, Psych. Bulletin, 1964, 61(5), 377-387.

a variety of difficulties in what Goodenough[5] has described as "a peculiar kind of exhibitionism which takes the form of an urge to display one's troubles and confess one's weaknesses." This ability to expiate or exhibit one's intrapsychic tensions may be related to the slower progression of malignancies in the slow group.

The validity scales play an integral part in the interpretation of an MMPI profile. For this reason, frequent reference will be made to the scales when interpreting 1) the clinical scales, and 2) the overall profile.

The Hypochondriasis scale (Hs) measures the amount of abnormal concern about bodily functions. Individuals scoring high on this scale frequently complain of pains and bodily disorders which are difficult to identify and for which no clear organic basis can be found. However, Laughlin[6] contends that "the clinician must also bear in mind that the presence of clearly established organic disease does not rule out the simultaneous presence of various degrees of emotional disturbance." Rosenfeld[7] considers the hypochondriacal state as a long-standing

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[5]F. L. Goodenough, Mental Testing: Its History, Principles and Applications (New York: Rinehart, 1949), p. 408.

[6]Laughlin, op. cit., p. 453.

[7]H. A. Rosenfeld, Psychotic States (London: Hogarth Press, 1965), p. 200.

problem which constitutes a defense against schizophrenic or paranoid conditions. Fenichel[8] points out that

> among the impulses that are withdrawn from object to organ representations in hypochondriasis, the hostile and sadistic impulses appear to play a particularly pronounced role. The original hostile attitude toward an external object is turned inward (introjected) against the ego, and hypochondriasis may serve as a gratification of guilt feelings.

Both cancer groups scored significantly higher ($p < .0005$) on the Hs scale than the other hospitalized group (Bone Control). The two cancer groups do not differ significantly on this scale. Upon inspection of the individual items, it is impossible to determine whether endogenous or exogenous factors account for scale elevations.

It may be that the morbid bodily preoccupations and physical discomforts experienced by cancer patients are not necessarily due to situational stress. Rather, these somatic preoccupations and discomforts may be a result of a long-standing defense against unacceptable aggressive impulses.

The Depression scale (D) was designed to measure the degree or depth of depression in a patient. This mood state is characterized generally by pessimism of outlook on life and the future, feelings of hopelessness and poor morale. Dynamically, depression results when a real or

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[8] O. Fenichel, The Psychoanalytic Theory of Neurosis (New York: Norton, 1945), pp. 261-265.

perceived loss of a love object occurs. This felt loss signals feelings of alienation and rejection with subsequent feelings of anger. The anger is then internalized, rather than being displaced, for fear of additional rejection and reprisal.

The rapid progressors and slow progressors do not differ significantly on the D scale. However, both groups scored significantly higher ($p < .0006$) on this scale relative to the Bone Control group (which scored in the "normal" range).

The elevated D scores, characteristic of the cancer population, may be a result of long-standing conflict. Yet, it is also highly probable that the scores represent reactive depression. That is, individuals with cancer often are apprehensive about their fate once this ominous disease has been diagnosed. The resulting depression could be due to a sense of loss of their world.

The degree to which the subject is like patients who have developed conversion-type symptoms is measured by the Hysteria scale (Hy). The hysterically disposed individuals are more immature psychologically than any other group.[9] The symptoms typically range from tics, paralyses, conversions to cardiac symptoms. Hysterics are quite suggestible and many of their symptoms can be removed by authoritative direction. Often the symptoms

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[9]Dalstrom and Welch, op. cit., p. 57.

are "miraculously" alleviated by a minister or by some conversion of faith. However, they normally will reappear if the stress continues or recurs. The hysteric's main line defenses are denial and repression. Symptoms often return when the defenses fail to mask the underlying unacceptable sexual or aggressive impulses. Though all three groups are elevated, relative to the standardized means, no significant differences exist between the groups on this scale.

The Psychopathic Deviate scale (Pd) was developed to measure the personality characteristics of the amoral and asocial sub-group of persons with psychopathic characterologic disorders. Characteristic of the psychopath is his repeated disregard for social customs, an inability to profit from experience and an absence of deep emotional response. Their emotional shallowness in relation to others is seen particularly in sexual and affectional display (which they are unable to give).

The psychopath often presents a pleasing personality and is able to make positive impressions on others. He may go undetected by friends until demands are made and he is forced to show a sense of responsibility or emotional loyalty. The psychopathic individual is also characterized by chronic hostility and aggressive feelings even though they may not be overtly manifested. Yet, he is able to act on his impulses thus affording some relief of the

chronic hostility. As was mentioned, his aggressive behavior is not always overt and many of his angry acts are subtle and passively aggressive.

On this scale, the slow progressors have significantly higher scores than the other two groups ($p < .004$). The rapid group and the control group are not significantly different. In fact, the rapid progressors achieved the lowest T-score among the sampled groups.

The implications for the low Pd are interesting for the ability to act on one's impulses serves as a cathartic effect. The cathartic effect, therefore, may partially be related to the slow progression of malignancies and their quick response to medical therapies. The converse, however, may be more applicable to the rapidly progressing malignancies. That is, the rapid groups inability to reduce tension may be related to their poor response to medical therapies.

The Mf scale measures the tendency toward masculinity or femininity of interest patterns. A high score indicates basic interest patterns in the direction of the opposite sex. There were no significant differences among the groups and their T-scores were within a few points of each other.

Individuals who are characterized by suspiciousness, oversensitivity, delusions of persecution, reference and grandeur usually obtain a high score on the Paranoia

scale (Pa). These people are sensitive, emotional and prone to worry. They often project their unacceptable wishes and impulses onto others. An individual with an elevated Pa readily becomes involved in various activities of interest and then internalizes the activity so that it becomes personally relevant or important. Should anyone question or challenge the activity, the paranoid becomes sensitive and is quick to defend it. No significant differences exist between the groups on this scale. The slow progressors, however, had the highest T-score, and they were followed by the rapid progressors.

People troubled by obsessive-compulsive behavior or phobic fears score high on the Psychasthenia scale (Pt). Frequently, psychasthenia is manifested in mild depression, excessive worry, lack of conficence, inability to concentrate, ruminations, morbid introspection, or marked anxiety. Rigidity and hostility are cardinal features of an elevated Pt. These individuals are often seen as idealistic, verbal and quarrelsome. They tend to dichotomize their world and see things in "black or white" terms. Frequently, they have difficulty with "authority figures" and are unable to form satisfying personal relationships.

The slow progressors had the highest score of the three groups on the Pt scale, They scored significantly higher ($p < .02$) on Pt than did the control group, but

there was no significant difference between the slow and fast progressors. Many individuals with an elevated Pt are characterized as anxious, prone to worry, aggressive and fearful.[10] These feelings, though unpleasant, allow some measure for reduction of conflicts. The slow progressors seem to possess more of this ability as compared to the rapid progressors who's emotional life seems to be highly repressed. The ability to be anxious or aggressive may be related to the slow progression of neoplasms.

Subjects with a high T-score on the Schizophrenia scale (Sc) are characterized by bizarre and unusual thoughts or behavior. There is a splitting of the subjective life of the schizophrenic person from reality so that the observer cannot follow rationally the shifts in mood or behavior. These individuals are sensitive, hostile, irritable, resentful and oversensitive. That is, they have difficulty in controlling their aggression, whether it is overt or covert. These people tend to be quite opinionated, autocratic, constrained and cold. Yet, they can also display imaginative and sharp-witted behavior. It is not unusual for others to judge them to be self-sufficient, but the appearance of self-sufficiency is a withdrawal mechanism to protect against the frightening world. When pressures mount, they are likely to

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[10] Dalstrom and Welch, op. cit., p. 179.

withdraw into a fantasy world and daydream excessively about that ideal world.

The slowly progressing cancer patients scored significantly higher ($p < .0005$) than the remaining two groups on Sc. The rapidly progressing group, however, did not differ from the controls (S > R = C).

Normally a diagnosis of schizophrenic reaction is not made solely on the basis of an elevated Sc. The simultaneous elevation of scales F and Sc are needed before a thought disorder can be inferred. The slow progressors have a trend in this direction; that is, elevations on F and Sc. The total groups, of course, cannot be categorized as schizophrenic, but a definite psychotic "flavor" is present (especially with Hs elevated) relative to the other groups. It may be that the resulting "looseness" of the thought process mitigates anxiety, which in turn may be related to the rate of progression.

The Hypomania scale (Ma) measures the personality trait characteristic of persons with a high overproductivity in thought or action. Individuals with an elevated Ma are active and enthusiastic and they frequently find themselves in trouble because of undertaking too many things. At times, they may also be somewhat depressed, though it is not readily recognized. Typically these people are sensitive, thoughtful, anxious and nervous. The Ma scale is often thought of as the "energy"

scale and often serves as a catalyst for acting-out behavior, especially when paired with the Pd scale. A low or submerged score (below T-score of 50) on this scale is usually indicative of people who are using repressive defenses and find it difficulty to "discharge energy" or tensions.

Significant differences ($p < .05$) are apparent among all three groups. The control group scored near the standardized mean. The slow progressors scored well above the mean, while the rapid progressors scored well below the T-score of 50. It appears that individuals with high Ma scores have a vehicle for releasing tensions and anxieties. This mechanism is especially true for the slow progressing cancer patients who also have an elevated Pd. The combination allows a relative freedom from inhibiting anxieties. Hathaway and Meehl[11] state that "these people are extroverted, talkative, energetic, frequently irritable, abusive and occasionally violent." However, the converse is true for the rapidly progressing cancer patients. Apparently their repressing mechanisms do not allow for such free expression of tensions and anxieties.

The repressive mechanisms typically used by the rapid group can be inferred from other MMPI scales, in addition to the Ma index. The direction each individual

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[11]Dahlstrom and Welch, op. cit., p. 192.

responds to the specific questions on the hypomania scale can be found in Appendix H. The responses clearly account for: 1) the heavy reliance on repressive mechanisms as used by the rapid progressors and 2) the relative lack of repression (in the slow group) which is supplanted by expression of feelings and affect. An example of a question, found on the Ma scale, is "I work under a great deal of tension." Not a single patient in the rapid group endorsed this item whereas a third of each of the remaining groups (S and C) responded in a positive way. Repression is thus indicated in the rapid group by their inability to admit to feelings of tension. The relative lack of repression is indicated by the responses given by the slow and bone control groups.

The Social Introversion scale (Si) attempts to measure the tendency to withdraw from social contact and other people. The higher the score the more reclusive the individual. A high Si score seems to implicate a general insecurity. Subjects with a high Si are unable to make decisions without vacillation or hesitations. They are usually rigid and inflexible in thought and action, over-controlled and somewhat dubious about their own abilities. They appear to others to be free of pretense and usually conscientious.

Individuals with low Si scores are expressive, active, competitive persons. Often they tend to be

exhibitionistic, aggressive and hostile in their personal relations. No significant differences exist among the groups. The control group's score was at the mean. The rapid and slow progressors were slightly elevated and nearly identical. The cancer population, then, is slightly more withdrawn than the bone control group. However, the difference is not significant.

MMPI Profile Analysis

An individual profile analysis for each group was presented to demonstrate the overall personality characteristics among the three group. Each analysis is based on this author's clinical opinions and observations. The overall profile configuration is considered when making interpretive statements. Yet "unlike the researcher, the clinician cannot and should not make rigid and categorical use of the cutting scores on the validity (and clinical) scales."[12] Many statements related to the profiles may be viewed as subjective evaluations yet certain objective criteria have been established for profile interpretation. Through "blind" analysis, many similar conclusions are reached by the independent observers. It should be emphasized that the best use of the MMPI is made when it is combined with information from other sources.

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[12]Dahlstrom and Welch, op. cit., p. 118.

Male cancer patients composing the rapidly progressing group are typically highly repressed and constricted individuals; they apparently deny and repress any feelings related to aggressive or sexual fantasies. There is little personal insight into their own motives or the consequences of their behaviors on others. This lack of insight is often accompanied by a naive hysterical view of the individual's world. These men possess a great deal of anger which probably occurred subsequent to early rejection and loss of love. The anger, however, is not shown overtly for fear of further punishment and reprisal.

Thus, the anger is turned from the external object and internalized against the self with depression and morbid bodily preoccupations supplanting the anger and rage. The rapid progressors appear to have somewhat of a delusional system structured around their somatic complaints.

The ability to reduce tensions and derive satisfaction from the reduction is a sign of normal mental functioning. Yet from the MMPI, it is evident that the rapid progressors are not able to successfully reduce their intrapsychic tensions. They, instead, maintain the stress which would seem to result in an uncomfortable inner life.

The slowly progressing cancer patients are much less constricted or repressed as compared to the rapid progressors. It appears, however, that the slow progressors would be less likable as people, for they are able to be openingly aggressive, acerbic, irritable and quarrelsom. As a group, the slow progressors are quite in contact with their feelings, unpleasant as they may be. Though there is a great amount of anger, which is internalized as a result of guilt, the "slow" patients possess a vehicle for reducing the uncomfortable tensions. This group is able to admit to a number of emotional difficulties among them are: 1) an abnormal concern about bodily functions, 2) anxiety, 3) confusion, 4) anger, 5) depression and 6) feelings of intrapsychic tensions. The lack of repressive defenses (relative to the rapid group) allows for a high energy level which can serve as a catalyst for acting-out behavior. The ability to expend or displace emotional energy is indicative of emotional health. The converse is also true, that is, when an individual "binds" his energy and cannot afford to displace it, then emotional pathology may result. It would also appear that the slow progressors are more flexible and less rigid as compared to the rapid group. This would indicate the slow group is not as restricted in their range of behaviors as is the rapidly progressing group.

Few, if any, direct interpretations can be made about a "normal" profile whose T-scores are close to 50. The males in the bone control group possess such a profile. However, if normalcy can be assumed from the profile configuration, several inferences may be drawn.

The control group appears to be relatively free from debilitating anxieties and conflicts. The normal tensions and anxieties they do experience, however, are successfully reduced either by an intact defensive system or through displacement. They appear to be flexible and possess a relatively wide range of behaviors which they are free to use. That is, they are not bound to one behavior, which serves as their sole source of satisfaction. Therefore, their tie to reality is not tenuous for if one mode of coping is thwarted, they may then turn to other alternative sources to meet their needs.

It may also be hypothesized that they are motivated and goal oriented. The cancer groups are also goal oriented, but a qualitative difference exists between the cancer patients and the control group. The cancer groups' motivation appeared to be compelled and forced; the control group's motivation, however would seem to be more purposive and free from constraining contingencies.

Another criteria for emotional health is an individual's tie with reality. The control group seems to be intact and comfortably bound to reality. The cancer

patients, as opposed to the controls, are less intact and appear to be more irrational and confused. For example, a delusional system based on bodily preoccupations was evidenced in the cancer patients while no such delusional system was evidenced among the controls.

There also seems to be more moderation in emotional response among the individuals of the control group. The moderation found in the controls is contrary to the intensity of emotional response as found in the cancer patients.

Finally, the control group is more accurately characterized by "secondary process." Secondary process indicates a balance and compromise between one's needs and his environment. Conversely, the cancer patients are characterized more accurately by "primary process" which consists of the individual's biological and emotional needs without regard to reality.

In brief summary:

1. The cancer patients possess more psychopathology than the bone control group. The composite profiles of both cancer groups suggest the presence of a psychoneurosis, more specifically, hypochondriasis.
2. The rapidly progressing patients are covertly angry and possess no adequate

vehicle for relieving their intrapsychic tensions.

3. The slowly progressing patients are also troubled with unacceptable feelings such as anger. Yet, they are able to mitigate many uncomfortable tensions through various forms of catharsis.
4. The bone fracture control group is relatively free of debilitating conflicts and anxiety. Their profile is within the "normal" limits.

The Pm Questionnaire

As the reader will recall, the Lie score on the pre-morbid scale was derived from the MMPI. The subjects were asked to respond to the questionnaire as they felt in the past, prior to their illness. The Lie scale was used so that some measure of validity of the Pm questionnaire could be ascertained. Though the L items were repeated in the Pm questionnaire, the subject's responses may still be assumed valid since no T-score (on the Lie Scale) reached 70. The Pm scale itself consisted of twenty-five statements, which supposedly would delineate the pre-morbid personalities of the three groups. The two cancer groups differed significantly ($p < .001$) from the bone control group.

The fact that cancer patients scored significantly higher than the bone control indicates that their earlier emotional adjustment was probably more tenuous than the control groups adjustment.

Typically, an emotionally disturbed individual clings more tenaciously to hurtful memories of the past, as compared to the normal person. The normal individual is more able to "forget" the unpleasant experience and expend his energy in present and future thought. The neurotic person, however, is more preoccupied with the past and tends to recall past trauma whether it is real or imagined. If the authenticity of the "self-report" can be accepted, then the cancer patients possess a greater historical tendency towards emotional pathology as compared to the control group. That is, the pathology and stress go beyond the moment and are not necessarily situational.

CHAPTER VI

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The study was designed to test certain assumptions about personality differences between two types of cancer patients and a bone fracture control group. The investigation was generally successful in establishing: 1) personality differences between rapidly and slowly progressing cancer patients, 2) present personality differences between the three groups, and 3) historical differences (self-reported) in emotional adjustment among the sampled groups.

Summary

The great variations occurring in the incidence and progression of cancer in man has been well documented. The development and progression of similar malignant neoplasms may range from weeks to years. Newman[1] addressed himself to this fact when he cited cases of Hodgkins disease that varied in progression from a few weeks to over 20 years.

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[1]Newman, op. cit., pp. 335-337.

Knowledge of physiology alone, however, does not seem to account for these marked differences. Weinberg[2] pointed out that cancers which seem similar in their gross and microscopic appearance behave differently in their rates of growth. These observations raised some interesting questions concerning the nature of the cancer process. What factors, for example, could influence the incidence and progression of this elusive and bizarre disease? How can one account for patients with similar malignancies who respond so differently to treatment? Other investigators have indicated that the answers to these questions were to be found, in part, in the personality characteristics of the patient. The point was made that the emotional components of the human species cannot be separated from its physiology. Therefore, an attempt was made in this study to explore the personality variables of individuals afflicted by malignant neoplasms.

This investigation was based on the hypothesis that there was a greater incidence of emotional disturbance found in cancer patients as compared to individuals without this disease. It was not the hypothesis of this study that intrapsychic conflicts cause cancer. Furthermore, it was hypothesized that patients with the disease would possess particular personality characteristics and

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[2]Gengerelli, op. cit., p. 14.

these variables would, in turn, be related to the malignancy's progression.

The pertinent literature was divided into two categories: 1) a review of the classical biological approaches to cancer research and 2) a review of studies more germane to the present work. The proponents of both approaches sought to establish relationships between cancer and their own orientation, whether it be biologically or emotionally based.

Traditional cancer research has almost exclusively been biologically oriented. The somatic approach to the problem of malignancies may be roughly represented by three classical hypotheses: 1) the Irritation hypothesis, 2) the Microbe or Viral hypothesis and 3) the Carcenogenic hypothesis. Great attention was paid to histological techniques and microscopic examination of tissue. Yet the accrued information derived from this one source has been unable to account for the incidence and progression of malignant neoplasms.

Research related to psychopathology and cancer was also presented. Several interesting clinical observations were repeatedly made by these researchers. Often it was noted that prior to the onset of the disease, their patients had had feelings of hopelessness and depression. Feelings of loss of a strong emotional attachment were also observed in the patients. Almost every author noted

the patients' inability to outwardly express feelings of anger and hostility. Pronounced inhibition, such as this, was more often seen in those individuals with rapidly progressing cancers, while those with more slowly progressing cancers were characterized as "more expressive" and "bizarre."

Some researchers have suggested that cancer is a non-adaptive response. That is, if the patient could not cope with his intrapsychic tensions via the main lines of defense then cancer could result. By making these statements they overextended themselves for their poorly designed studies did not allow for such inferences to be drawn. Yet they argued that their clinical impressions were of some value and therefore felt somewhat justified in stating these tenuous conclusions.

The present study investigated the relationships between personality variables and cancer. The sample, in this study, consisted of forty-five males between the ages of 21 and 70. Three groups, each containing 15 males, were selected from local hospitals. Group I was composed of males with rapidly progressing malignancies and Group II consisted of patients with slowly progressing malignancies. In regards to the progression rate, it should be noted that the "rapid-slow" dichotomy does not accurately describe malignant growth. Rather, the growth rate is represented by a range of progressions,

most accurately described as a bi-modal distribution. Finally, Group III was composed of males who had received bone fractures and had been subsequently hospitalized. All 45 subjects were matched, as closely as possible, for socio-economic status, age, and length of hospitalization. It was generally felt that this goal was achieved.

The instrumentation used for assessment included the MMPI and the Pre-Morbid (Pm) questionnaire which attempted to establish the presence of emotional disturbance prior to the onset of disease and hospitalization.

It was generally hypothesized that subjects diagnosed as cancer patients would currently possess more emotional disturbance than those with no cancer. Furthermore, cancer patients would show a greater historical tendency towards emotional pathology than the control group.

A multivariate analysis of variance was used to see if differences existed in the quantified data among the three groups. The null hypotheses were subsequently rejected. That is, personality differences did exist among the groups as measured by the instrumentation. Significant differences were found on the three validity scales of the MMPI (L, F and K). Hypochondriasis, Depression, Psychopathic Deviacy, Psychasthenia, Schizophrenia, and Hypomania are among the clinical scales that differed significantly.

From the analysis of the data it would thus appear that males with rapidly progressing malignancies are unable to adequately defend themselves against anxiety or to successfully reduce their intrapsychic tensions through thought or action. They typically relied heavily on repressive mechanisms. The converse was found to be true for the slowly progressing group. The slowly progressing group apparently possess a vehicle for releasing anxieties and tension as indicated by the elevated scales F, Pd, Sc and Ma. Thus, this group relied less on repressive mechanisms. This ability to act on their impulses affords them some relief of their chronic hostility. The resulting cathartic effect may be related to the slow progression and this groups amenable response to medical therapies.

On the Pm questionnaire the two cancer groups scored significantly higher than the bone control group. This finding probably indicated that the two groups earlier emotional adjustment was less stable than that of the control group.

It, thus, appears that relationships do exist between emotional stresses and the progression rates of malignancies. However, it must be emphasized that correlation does not imply causation. This investigation was initiated only with the intent to demonstrate that there

are other variables (not biologically based) which may offer new insights into the elusive mechanisms of cancer.

Conclusions

The major findings of the study were as follows:

1. Personality differences, as measured by the MMPI, exist between the rapidly and slowly progressing cancer patients. Rapidly progressing cancer patients are more vulnerable, psychologically, relative to the slowly progressing patients. The rapid progressors are less accepting of their emotional life, especially of their aggressive feelings. They internalize their anger to a greater extent and have few successful methods for coping with or ameliorating these feelings.
2. Slowly progressing cancer patients have the ability (relative to the rapid group) to act on their impulses. This ability was indicated by elevations on scales F, Pd, Sc and Ma of the MMPI. The cathartic effect may partially account for the slow progressing of the neoplasms.
3. Patients with malignancies showed a greater incidence of emotional disturbance as measured by the MMPI (compared to the controls)

and are less able to make adaptive responses to their environment.

4. Patients with malignant meoplasms showed a greater (self-reported) historical tendency towards emotional pathology (as measured by the Pm scale) than those individuals in the control group.

Implications

The following implications for research are suggested:

1. Cross-Validation could be an additional step in circumscribing the cancerous process. Validating procedures would be aided by the information gleaned from this and other studies. However, full cooperation from the medical profession would be needed to obtain a sufficiently large sample.
2. Develop a long term longitudinal study in which patients routinely visiting their physicians are tested with the instrumentation. Predictions could then be checked by follow-up interviews.
3. Obtain a large number of patients with rapidly progressing malignancies. Place each patient in psychotherapy subsequent to the administration of the MMPI. Each

individual could act as his own control thereby mitigating the confounding effects of socio-economic status, age and length of hospitalization. Post-treatment MMPIs would then be administered and observations made to assess the rate of progression.

This latter suggestion has major implications for the control and treatment of malignancies. If the personality pattern of an individual with rapidly progressing cancer could be changed to more closely approximate that of a slow progressor, then the progression of the malignancy may also change. Ideally the process would involve changing the personality constructs from a "rapidly progressing" to a "slowly progressing" profile. If the change in personality then resulted in a change of the malignancies progression the use of psychotherapy, at least as an adjunct, would be indicated.

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APPENDICES

APPENDIX A

ANALYSIS OF VARIANCE OF MMPI VALIDITY AND CLINICAL SCALES FOR GROUPS I, II AND III

TABLE A.1.--Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II, and III.

Group	Mean	S.D.	F	Probability of F Ratio	Direction of Significance
		L Scale			
Rapid Progression (R)	56.73				R>S*
Slow Progression (S)	49.73	7.41	4.28	.0203	R>C*
Bone Control (C)	50.00				S=C
		F Scale			
Rapid Progression (R)	52.73				S>R*
Slow Progression (S)	64.06	6.68	13.48	.0001	S>C*
Bone Control (C)	53.46				R=C
		K Scale			
Rapid Progression (R)	59.06				R>S*
Slow Progression (S)	50.73	8.00	4.07	.0243	R=C
Bone Control (C)	55.13				S=C
		Hs Scale			
Rapid Progression (R)	70.73				R>C*
Slow Progression (S)	68.73	8.26	9.43	.0005	S>C*
Bone Control (C)	57.13				R=S

TABLE A.1.--Continued.

Group	Mean	S.D.	F	Probability of F Ratio	Direction of Significance
		D Scale			
Rapid Progression (R)	68.06				R>C*
Slow Progression (S)	64.73	9.29	8.91	.0006	S>C*
Bone Control (C)	54.33				R=S
		Hy Scale			
Rapid Progression (R)	63.86				R=S
Slow Progression (S)	60.00	6.75	2.21	.1218	R=C
Bone Control (C)	58.93				S=C
		Pd Scale			
Rapid Progression (R)	51.53				S>R*
Slow Progression (S)	60.86	7.66	6.32	.0040	S>C*
Bone Control (C)	53.20				R=C
		Mf Scale			
Rapid Progression (R)	54.80				R=S
Slow Progression (S)	53.53	8.16	.3800	.6862	R=C
Bone Control (C)	52.20				S=C
		Pa Scale			
Rapid Progression (R)	54.06				R=S
Slow Progression (S)	58.86	9.60	1.46	.2422	R=C
Bone Control (C)	53.33				S=C

TABLE A.1.--Continued.

Group	Mean	S.D.	F	Probability of F Ratio	Direction of Significance
		Pt Scale			
Rapid Progression (R)	57.53				S>C*
Slow Progression (S)	61.66	7.55	4.13	.0230	R=S
Bone Control (C)	53.73				R=C
		Sc Scale			
Rapid Progression (R)	56.60				S>C
Slow Progression (S)	64.66	8.65	9.20	.0005	S>R
Bone Control (C)	51.20				R=C
		Ma Scale			
Rapid Progression (R)	43.33				S>R*
Slow Progression (S)	67.86	6.58	54.82	.0001	S>C*
Bone Control (C)	50.66				C>R*
		Si Scale			
Rapid Progression (R)	56.20				R=S
Slow Progression (S)	56.06	7.94	2.98	.0615	R=C
Bone Control (C)	50.00				S=C

*Statistically Significant at the .05 level.

APPENDIX B

ANALYSIS OF VARIANCE OF THE Pm SCALE FOR GROUPS I, II, AND III

TABLE B.1.--Analysis of Variance of MMPI Validity and Clinical Scales for Groups I, II, and III.

Group	Mean	S.D.	F	Probability of F Ratio	Direction of Significance
		L Scale			
Rapid Progression (R)	5.73				R>S*
Slow Progression (S)	3.66	2.29	3.52	.0386	R=C
Bone Control (C)	4.00				S=C
		Pm Scale			
Rapid Progression (R)	5.66				S>C*
Slow Progression (S)	6.46	2.97	7.34	.0019	R>C*
Bone Control (C)	2.53				R=S

*Statistically Significant at the .05 level.

APPENDIX C

CORRELATION MATRIX OF THE DEPENDENT VARIABLES

TABLE C.1.--Correlation Matrix of the Dependent Variables.

	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si	L	Pm	Tt
L	1.00															
F	0.21	1.00														
K	0.49	-0.32	1.00													
Hs	0.42	0.30	0.36	1.00												
D	0.18	0.25	0.15	0.66	1.00											
Hy	0.33	0.11	0.44	0.76	0.56	1.00										
Pd	0.31	0.11	0.17	0.33	0.16	0.31	1.00									
Mf	-0.15	-0.06	-0.23	0.04	-0.14	0.14	0.12	1.00								
Pa	0.28	0.50	0.10	0.25	0.32	0.26	0.15	-0.08	1.00							
Pt	0.12	0.19	0.22	0.70	0.66	0.66	0.19	0.00	0.39	1.00						
Sc	0.35	0.46	0.03	0.42	0.31	0.32	0.29	0.11	0.73	0.53	1.00					
Ma	0.18	0.26	-0.14	0.18	0.15	-0.06	0.12	-0.34	0.14	0.20	0.30	1.00				
Si	-0.12	0.01	-0.22	0.26	0.26	0.27	0.05	0.44	0.24	0.50	0.50	-0.11	1.00			
L	0.84	0.23	0.34	0.39	0.13	0.35	0.31	-0.05	0.23	0.16	0.43	0.08	0.12	1.00		
Pm	0.48	0.30	0.18	0.54	0.42	0.39	0.36	0.02	0.37	0.28	0.50	0.23	0.10	0.54	1.00	
Tt	0.72	0.31	0.29	0.54	0.33	0.42	0.38	-0.01	0.35	0.26	0.53	0.19	0.12	0.84	0.91	1.00

APPENDIX D

MEAN MMPI PROFILES FOR GROUP I (R), GROUP II (S), AND GROUP III (C)

TABLE D.1.--Mean MMPI Profile of the Rapidly Progressing Cancer Patients.

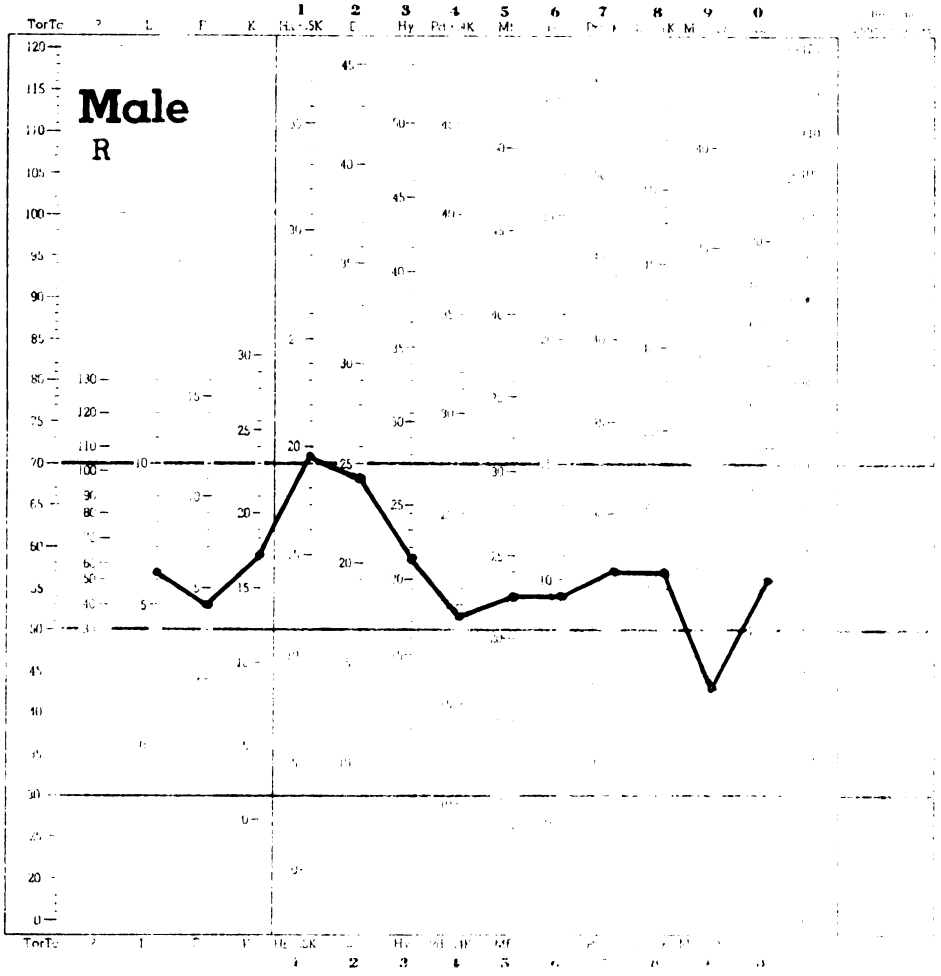


TABLE D.2.--Mean MMPI Profile of the Slowly Progressing Cancer Patients.

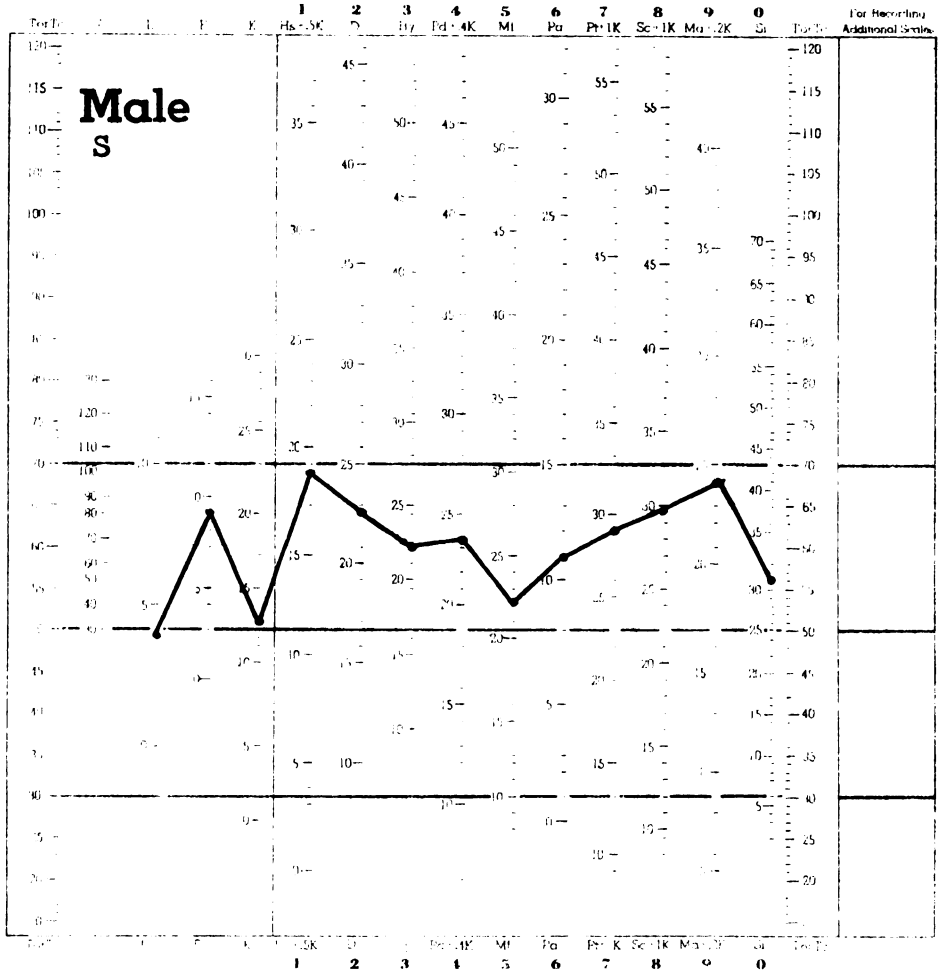
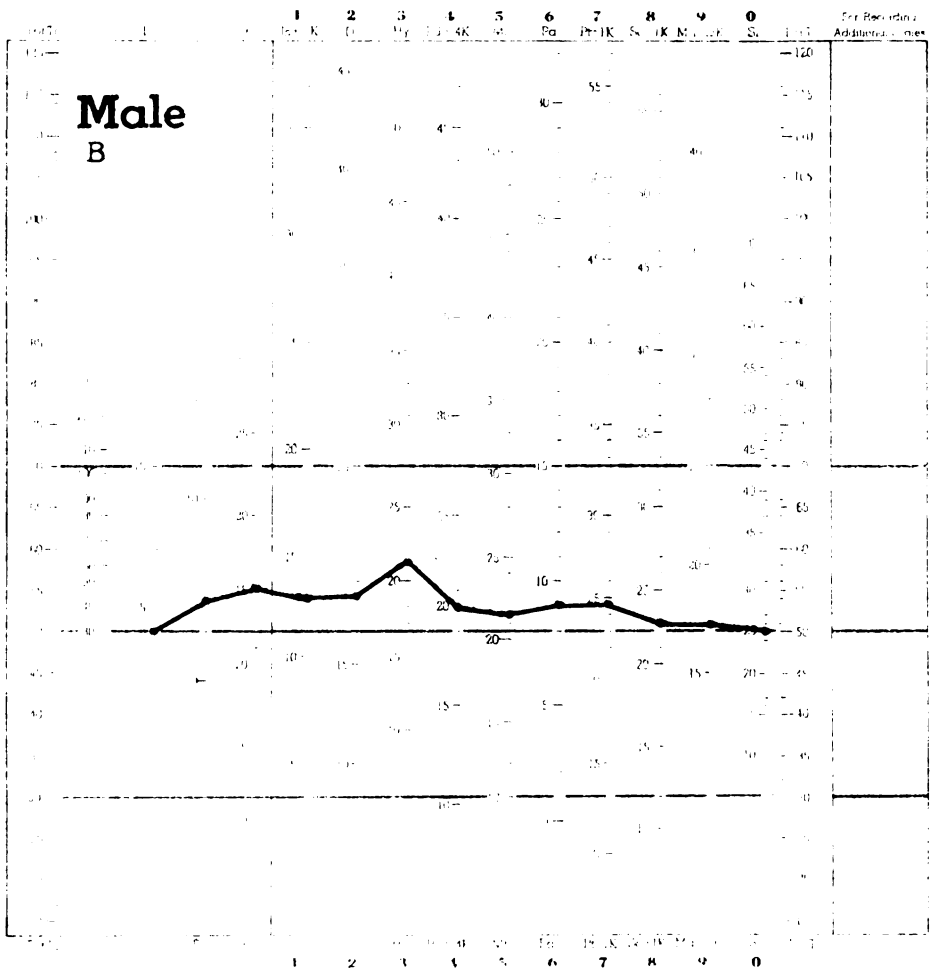


TABLE D.3.--Mean MMPI Profile of the "Normal" Bone Fracture Control Group.

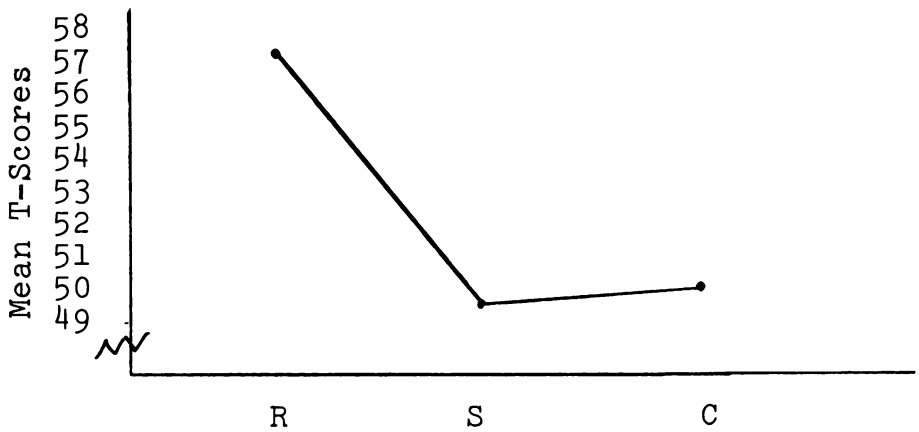


APPENDIX E

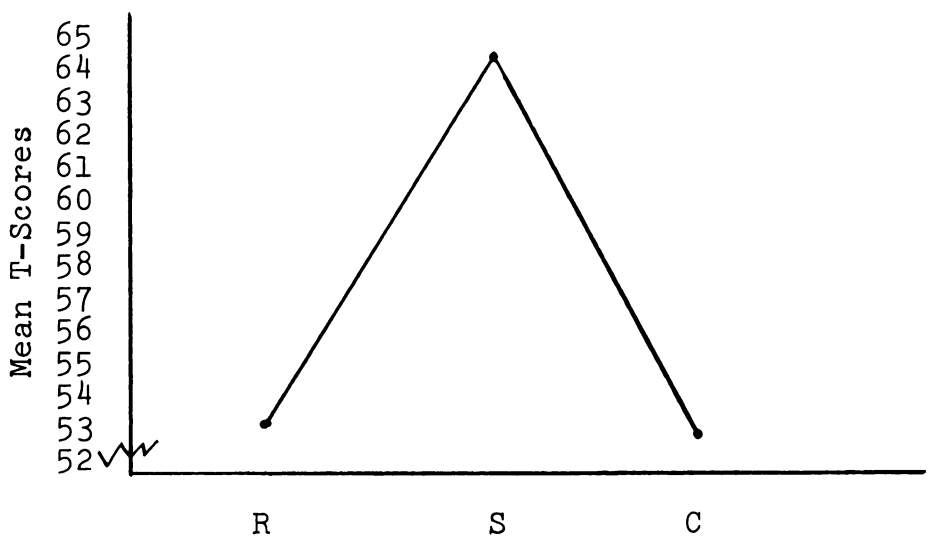
A GRAPHIC REPRESENTATION OF BETWEEN GROUP DIFFERENCES ON THE INDIVIDUAL SCALES OF THE MMPI

TABLE E.1.--A Graphic Representation of Between Group Differences on the Individual Scales of the MMPI.

Lie Scale (L)*



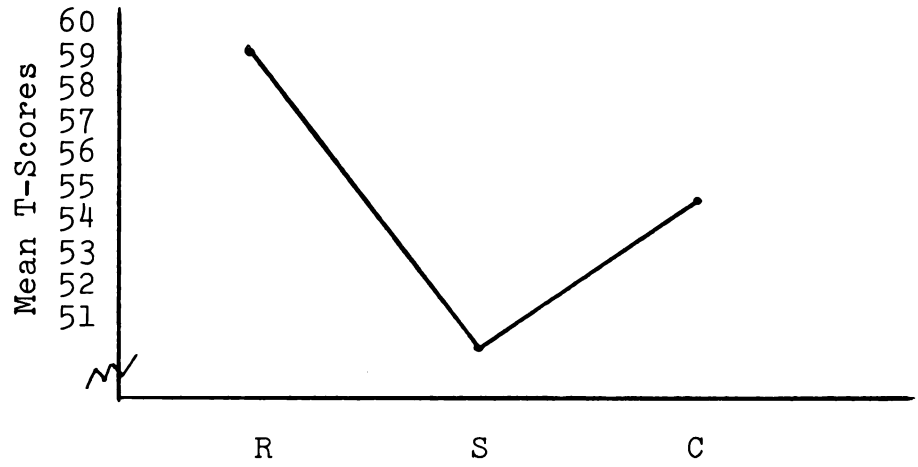
Validity Scale (F)*



* = Significant Between Group Differences at the .05 Level.
** = This author is cognisant that histograms are traditionally used with discontinuous data. However, for purposes of reading ease the above information is graphed as continuous data.

TABLE E.1.--Continued.

K Scale (K)*



Hypoehondirasis Scale (Hs)*

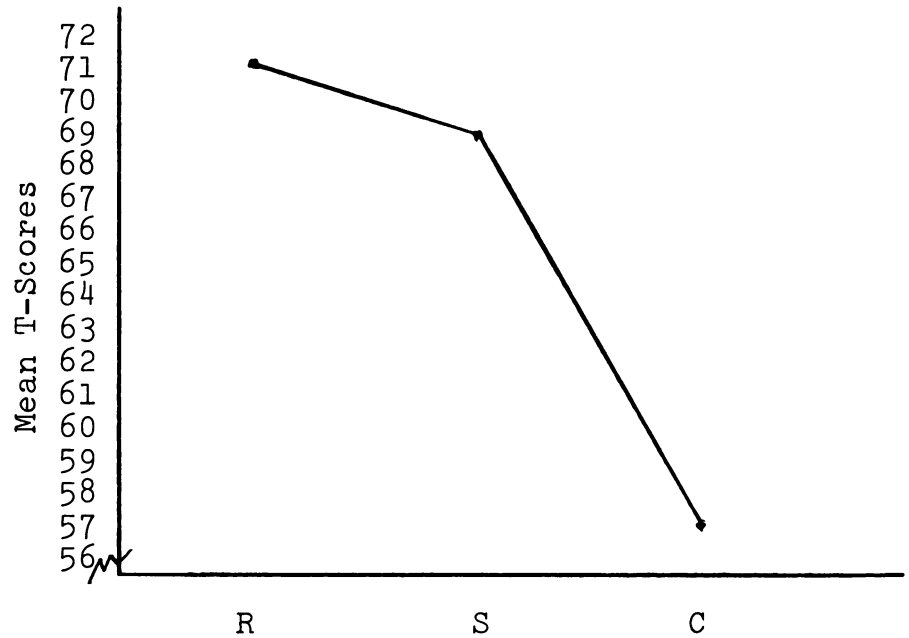
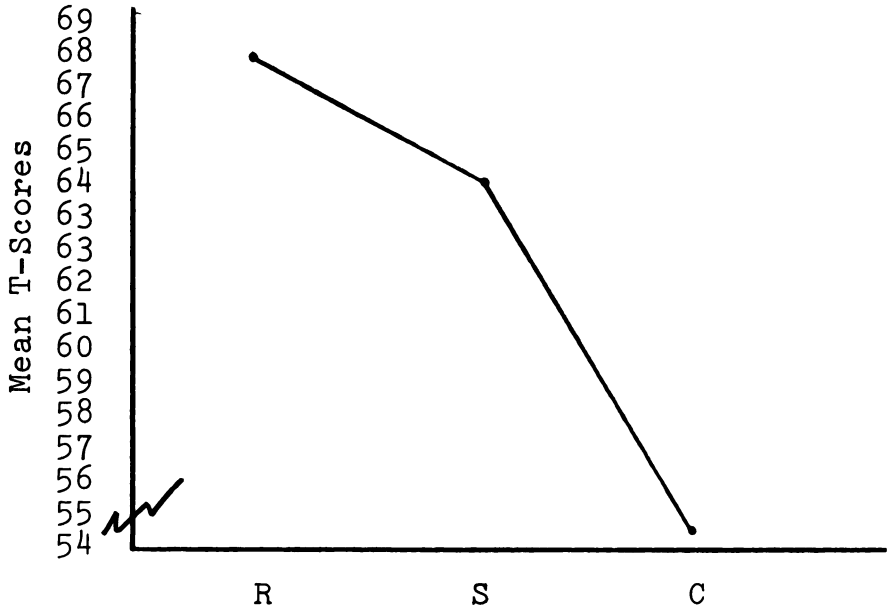


TABLE E.1.--Continued.

Depression Scale (D)*



Hysteria Scale (Hy)

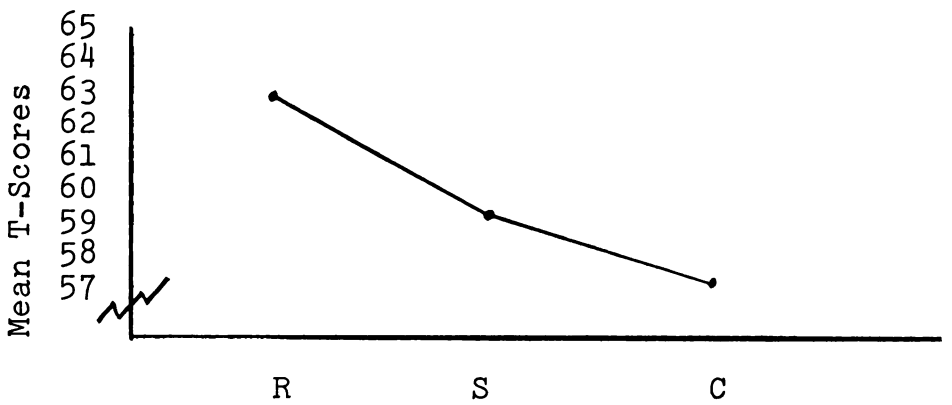
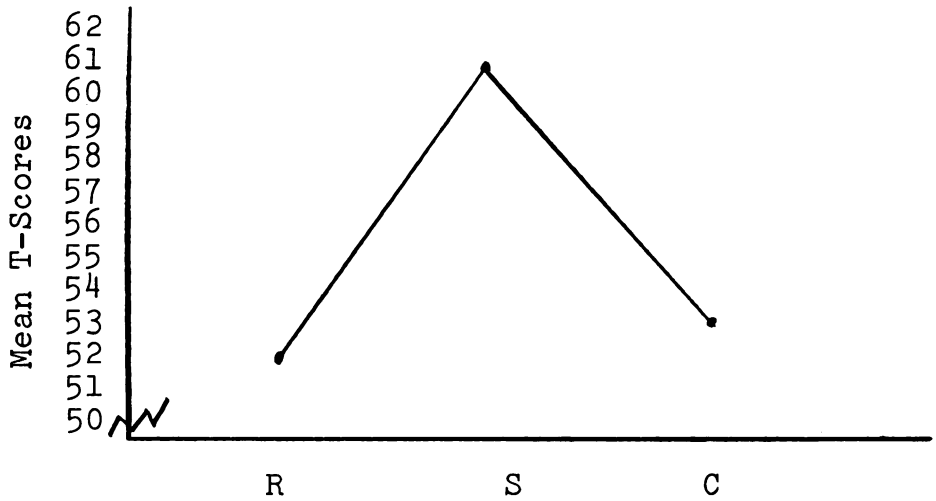


TABLE E.1.--Continued.

Psychopathic Deviate Scale (Pd)*



Masculinity-Femeninity Scale (Mf)

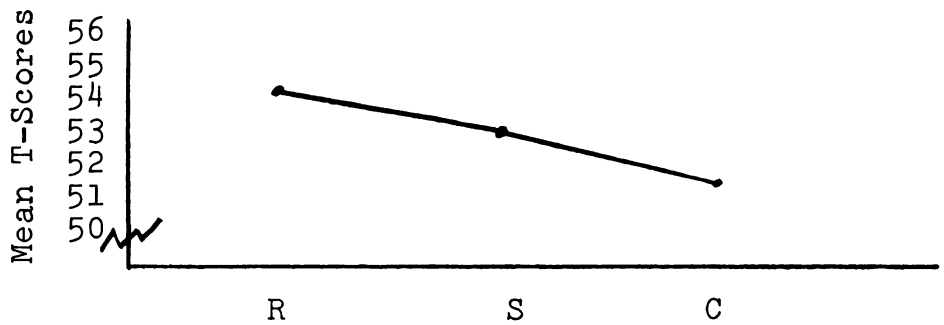
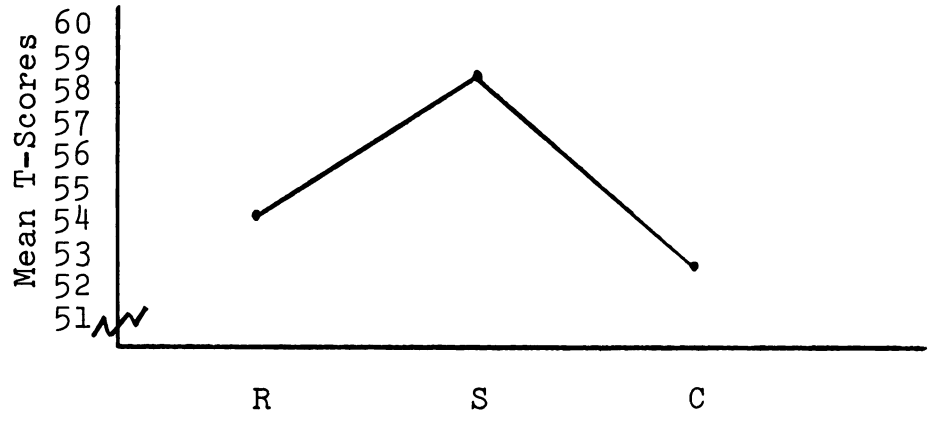


TABLE E.1.--Continued.

Paraneia Scale (Pa)



Psychasthenia Scale (Pt)*

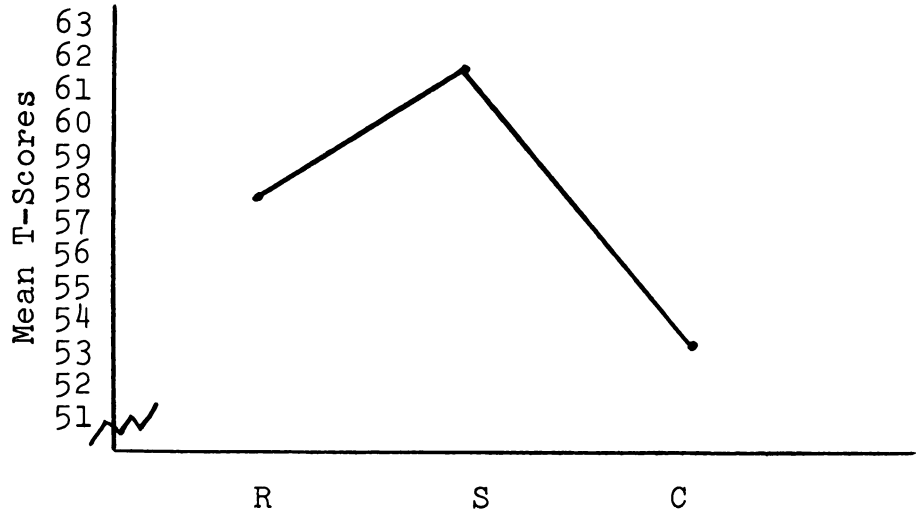
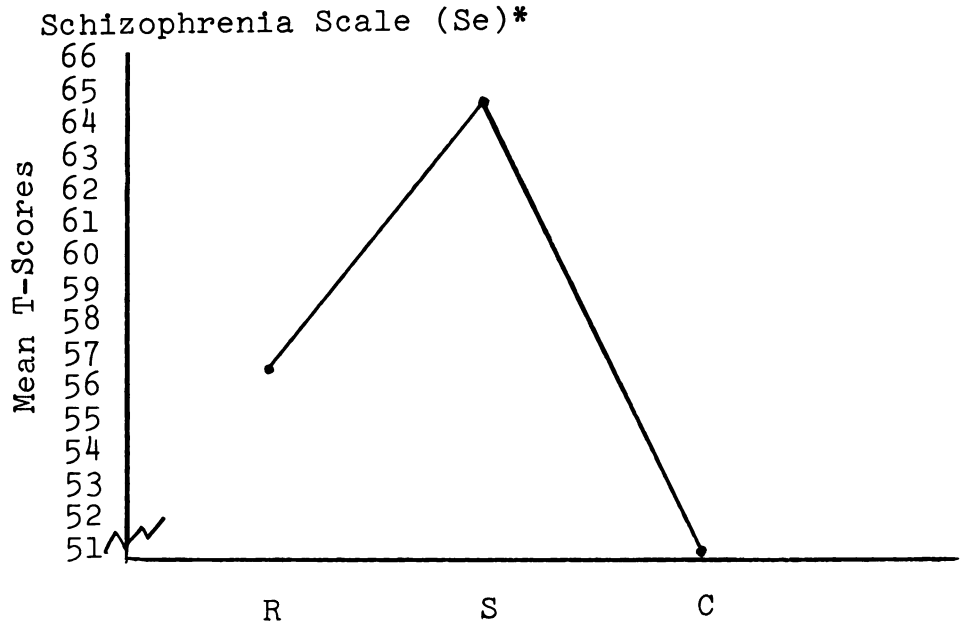


TABLE E.1.--Continued.



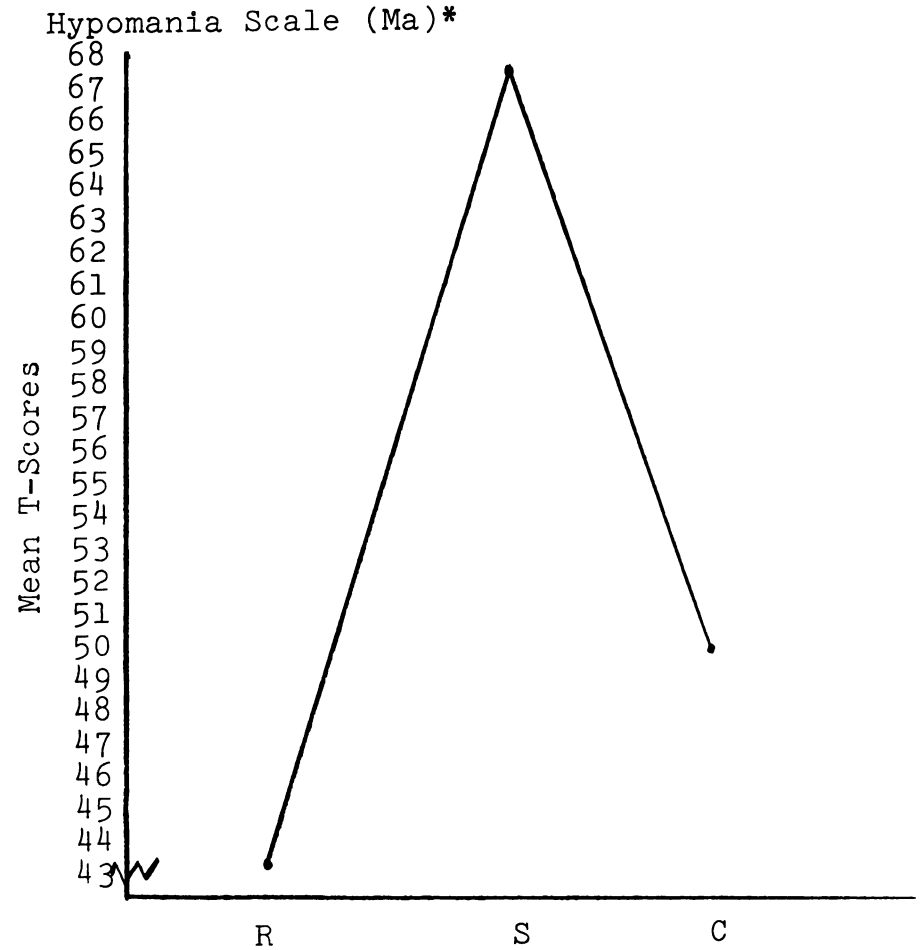
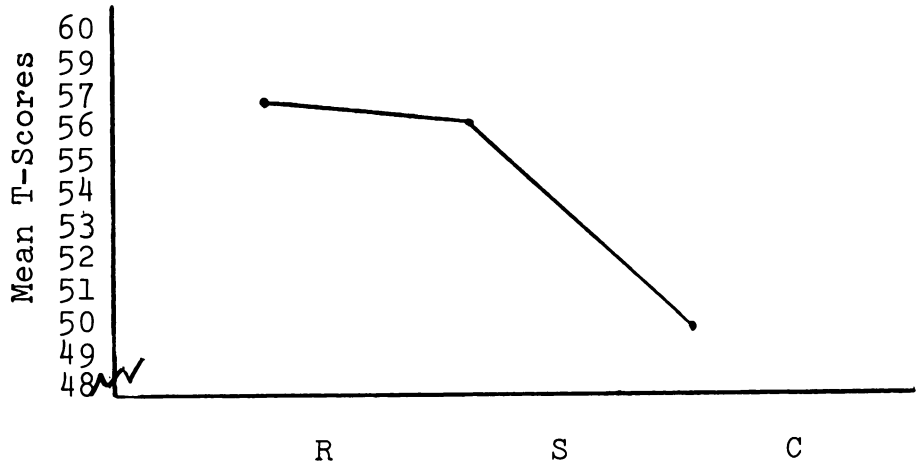


TABLE E.1.--Continued.

Social Introversion Scale (Si)



APPENDIX F

A COPY OF THE INITIAL CONTACT SHEET AND DIRECTIONS FOR ANSWERING THE Pm QUESTIONNAIRE

TABLE F.1.--A Copy of the Initial Contact Sheet and Directions for Answering the Pm Questionnaire.

Examiner: Richard Gay

Code Number _____

NAME: _____

AGE: _____

OCCUPATION: _____

MARRIED? _____

WHEN FIRST ILL? _____

HOW LONG? _____

PROGRESSION: _____

OBSERVATIONS:

TABLE F.2.--

NAME: _____

INTRODUCTION

The purpose of this inquiry is to gain a better understanding of the anxieties and discomforts experienced by people with an illness.

We know that you may not be feeling your best at the present time and we greatly appreciate you taking the time to answer these questions.

Please don't feel rushed but try to answer all the questions.

DIRECTIONS

Read each statement and decide whether or not it USED to be true as applied to you prior to your illness.

If the statement WAS true or usually true, mark it as True (T).

If the statement WAS false or usually false, mark it as False (F).

Remember to give your own opinion about yourself, as you WERE in the PAST, prior to your illness.

Work as accurately as you can. Thank you.

APPENDIX G

RESPONSE FREQUENCIES OF THE THREE GROUPS, TO EACH QUESTION, ON THE Pm SCALE

TABLE G.1.--Response Frequencies of the Three Groups, to Each Question, on the Pm Scale.

Questions	*	R	S	C
1. I always used to worry about something.	T	8	11	6
2. I was in just as good physical health as most of my friends.	F	4	1	0
3. I did not always tell the truth.	F-	10	5	10
4. I had emotional problems.	T	3	7	3
5. Often I had thoughts about suicide.	T	0	0	0
6. I did not read every editorial in the newspaper every day.	F-	3	3	0
7. I often had a great deal of anxiety.	T	6	12	3
8. I had nervous problems when I was younger.	T	5	1	1
9. Once in a while I used to put off until tomorrow what I ought to have done then.	F-	5	5	5
10. I often felt sad and depressed.	T	4	10	0
11. Often I had crying spells or felt like it.	T	0	6	0
12. If I could get into a movie without paying and be sure I was not seen I would have probably done it.	F-	9	6	11
13. I often felt that things were not real.	T	2	9	0
14. I had a nervous breakdown once.	T	1	0	1
15. I would rather win than lose in a game.	F-	4	2	1
16. I used to feel that others would be better off if I were dead.	T	0	0	0
17. Before this illness I was well most of the time.	F	3	0	3
18. I liked to know some important people because it made me feel important.	F-	13	9	10

* = Response Direction (T or F).

- = Identifies a Lie Scale Question.

TABLE G.1.--Continued.

Questions	*	R	S	C
19. Even when I was with people I felt lonely much of the time.	T	0	0	0
20. There used to be something wrong with my mind.	T	0	0	0
21. I did not like every one I knew.	F-	4	0	1
22. I never had difficulty sleeping.	F	8	10	8
23. Life used to be a strain for me much of the time.	T	1	5	0
24. I gossiped a little at times.	F-	11	3	1
25. I had a happy childhood.	F	1	1	0
26. I grew up in a very religious family.	T	9	3	3
27. Sometimes at elections I voted for men about whom I knew very little.	F-	6	3	8
28. Often I felt that sex was wrong or bad.	T	1	1	1
29. When I got angry it was best not to show it.	T	12	11	10
30. I got angry sometimes.	F-	0	1	0
31. No one really understood me.	T	3	0	0
32. I preferred to be alone much of the time.	T	2	2	1
33. Once in a while I laughed dirty joke.	F-	1	1	0
34. I had difficulty getting along with people.	T	0	0	0
35. Frequently I was in trouble with the law.	T	0	0	0
36. At times I felt like swearing.	F-	1	1	1
37. My table manners were not quite as good at home as when I was out in company.	F-	4	4	3
38. Once in a while I thought of things too bad to talk about.	F-	10	9	10
39. Sometimes when I was not feeling well I was cross.	F-	5	4	0
40. I had many physical discomforts.	T	6	4	3

APPENDIX H

RESPONSE FREQUENCY OF GROUPS I, II AND III TO THE INDIVIDUAL ITEMS ON SCALE 9 (HYPOMANIA)

TABLE II.1.--Response Frequency of Groups I, II and III to the Individual Items on Scale 9 (Hypomania).

Questions	Response Frequency		
	Rapid	Slow	Control
True: 9			
A person should try to understand his dreams and be guided by or take warning from them.	1	3	3
I have often had to take orders from someone who did not know as much as I did.	7	11	8
I am an important person.	4	7	5
I have met problems so full of possibilities that I have been unable to make up my mind about them.	5	7	7
It wouldn't make me nervous if any members of my family got into trouble with the law.	7	5	2
When I get bored I like to stir up some excitement.	2	6	4
It is not hard for me to ask help from my friends even though I cannot return the favor.	3	9	2
I have been inspired to a program of life based on duty which I have since carefully followed.	4	9	5
I never worry about my looks.	5	7	3
I don't blame anyone for trying to grab everything he can get in this world.	1	10	0
At times I have been so entertained by the cleverness of a crook that I have hoped he would get by with it.	1	5	2
If several people find themselves in trouble, the best thing for them to do is to agree upon a story and stick to it.	1	11	6

TABLE II.1.--Continued.

Questions	Response Frequency		
	Rapid	Slow	Control
True: (9)			
At times, I feel that I can make up my mind with unusually great east.	7	9	9
False: 9			
I believe women ought to have as much sexual freedom as men.	4	6	5
False: (9)			
My table manners are not quite as good at home as when I am out in company.	9	6	6
False: L9			
Sometimes when I am not feeling well I am cross.	3	6	2
True: F89			
I have had periods in which I carried on activities without knowing later what I had been doing.	0	5	2
False: K4. True: (59)			
At times my thoughs have raced ahead faster than I could speak them.	6	9	9
False: (K9)			
It makes me impatient to have people ask my advice or otherwise interrupt me when I am working on something important.	9	10	4
True: 29			
I work under a great deal of tension.	0	6	5
False: 349			
I am always disgusted with the law when a criminal is freed through the arguments of a smart lawyer.	2	4	2

TABLE H.1.--Continued.

Questions	Response Frequency		
	Rapid	Slow	Control
True: 3789			
I have periods of such great restlessness that I cannot sit long in a chair.	3	8	6
True: 469			
I know who is responsible for most of my troubles.	5	8	8
True: 489			
At times I have very much wanted to leave home.	2	4	6
True: 59			
Some of my family have habits that bother and annoy me very much.	3	5	3
True: 6789			
At times I have fits of laughing and crying that I cannot control.	0	5	4
True: 689			
I feel that I have often been punished without cause.	1	7	3
False: 6. True: (9)			
Something exciting will almost always pull me out of it when I am feeling low.	3	7	6
False: 69. True: (0)			
I have never done anything dangerous for the thrill of it.	9	7	6
True: 789			
Once a week or oftener I become very excited.	1	4	2
True: 89			
At times I have a strong urge to do something harmful or shocking.	1	3	2

TABLE H.1.--Continued.

Questions	Response Frequency		
	Rapid	Slow	Control
I have had attacks in which I could not control my movements or speech but in which I knew what was going on around me.	2	4	0
My people treat me more like a child than a grown-up.	1	6	4
I have had blank spells in which my activities were interrupted and I did not know what was going on around me.	0	5	2
False: 890			
My speech is the same as always (not faster nor slower, or slurring; no hoarseness).	11	5	5
True: 9. False: (2)			
I sometimes keep on at a thing until others lose their patience with me.	5	10	9
I have at times stood in the way of people who were trying to do something, not because it amounted to much but because of the principle of the thing.	3	4	6
I sweat very easily even on cool days.	5	9	5
I do not blame a person for taking advantage of someone who lays himself open to it.	0	7	1
True: 9. False: (3)			
I drink an unusually large amount of water every day.	2	6	5
True: 9. False: (36)			
Some people are so bossy that I feel like doing the opposite of what they request, even though I know they are right.	4	6	6

TABLE H.1.--Continued.

Questions	Response Frequency		
	Rapid	Slow	Control
True: 9. False: (0)			
When I was a child, I belonged to a crowd or gang that tried to stick together through thick and thin.	2	5	5
True: 0. False: (K349)			
I find it hard to make talk when I meet new people.	5	10	6
When in a group of people I have trouble thinking of the right things to talk about.	5	9	5
True: 0. False: (K49)			
It makes me uncomfortable to put on a stunt at a party even when others are going the same sort of things.	4	8	3