CANCER:  AN ORGANISMIC APPROACH

BY

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## ACKNOWLEDGMENTS

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# CHAPTER I

## THE PROBLEM

During the last fifteen years, increasing emphasis
has been placed on the psychophysiological aspects of
cancer. Conferences on this subject were held by the
New York Academy of Sciences in 1966 and 1969, the
latter of which indicated tacit acceptance of sociocul-
tural and psychological parameters in the initiation
and development of neoplastic disease. This attitude
is portrayed in Lawrence LeShan's (1969, pp. 628-629)
observation that:

> ...an individual does not just "get" the malig-
> nancy, which starts on the cellular or immuno-
> logical or endocrinological or psychological
> level. The entire organism eventuates towards
> cancer. His total biography, involving all
> its levels, moves in a direction leading to a
> total, organism-in-an-environment situation,
> which we term "neoplastic disease." ..."cancer"
> is a total organismic situation...

Studies seeking to define the relevent variables in
cancer etiology have been conducted from a variety of
viewpoints, of which some good general summaries are
available (Bahnson, 1969b; Brown, 1966; LeShan and Worth-
ington, 1956). In general, findings show the approaches
may be dichotomized into those dealing with the internal
personality structure of the individual, using both

objective and projective personality techniques as well
as psychoanalytic theory and interpretation, or those
dealing with the influence of environmental factors,
especially those of a stressful nature, from both an emo-
tional and a physiological point of view.

### Personality Structure and Organization

David Kissen, whose work was recently reviewed (Bahn-
son, 1969a), found the most significant characteristic of
the personality of the cancer patient to be a "poor outlet
for emotional discharge" (Kissen, 1966a, 1967). He used
the Maudsley Personality Inventory (MPI) and the later
Eysenck Personality Inventory (EPI) to test his clinical
impressions, obtaining the high extraversion and low neu-
roticism, or emotional lability, scores which he inter-
preted as describing those with poorly discharged emo-
tions.

Similar findings were observed by Bahnson and Bahn-
son (1964, 1969) who describe cancer patients as using
denial and repression as their most effective defenses.
By these defenses, the patient blocks the normal means
used as outlets for the disturbing impulse. With all
external discharge blocked, the drive must be discharged
internally or somatically. Other psychoanalytically
oriented studies have described the cancer patient as one
who typically bears the anal characteristics of rigidity
and a need for mastery and control in his object relation-
ships (Booth, 1965, 1969). This rigidity of personality

makes it difficult for him to achieve a satisfactory
change in object relationships, and he tends to be unable
to make such adjustments after the loss of an object.

## Environmental Influences

Empirical justification of the influence of diffi-
culty in object relationships seem to be indicated by
typical data of studies investigating the life history
of the cancer patient. Leukemias and lymphomas have been
observed to occur in situations where the patient must
deal with loss, separation and hopelessness (Greene, 1966)
and uterine cervical cancer was predicted by Schmale and
Iker (1966) in 36 out of 51 cases on the basis of recent
life history showing reactions of a feeling of hopeless-
ness to a recent life event within the last six months.
These data yielded a two-tailed probability of $p. < 02$.
Psychotherapeutic investigations have indicated the cancer
patient experiences a life characterized by despair,
loneliness, and frequently self-condemnation, perhaps
deriving from traumatic experiences of loss in early
childhood (LeShan, 1966).

There are indications that psychosocial environmental
factors providing experiences of stress have significance
in the etiology of cancer through the mediation of
endocrine or immunologic factors. Friedman, Glasgow
& Adler (1969)studying host resistance, concluded that
psychosocial environmental factors can modify resistance
to infectuous and neoplastic disease. Kavetsky, Turkevitch

and Balitsky (1966) observed they could modify the course of a malignant process by affecting the mechanisms of hormonal balance and the level of protective reactions of connective tissue through higher central nervous system and hypothalamic paths. Along this line, Rasmussen (1969) found an interaction of stress and resistance in two types of virus tumors; and Solomon, in reviewing results of investigations on the influence of stress and emotional distress on the immunologic system concludes that "there are considerable data to link personality factors, stress, and, particularly, failure of psychologic defenses to the onset and course of cancer and of infectuous and autoimmune diseases (1969, p. 340)." Southam, in discussing the growth and spread of cancer observes that:

> It seems probable that (the) immune mechanisms maintain a constant surveillance of the body's cells, recognizing as abnormal those cells that undergo neoplastic transformation from whatever cause and destroying them before they develop into tumors....These mechanisms are markedly depressed by corticosteroid hormones, and therefore it should not surprise us that they may be depressed by emotional stress that results in elevated levels of corticosteroids    (1969, p.474).

### Stress as Life Crisis

One difficulty in determining the effects of stress is the variability of subjective interpretation of events as stressful. This subjective evaluation depends both on the particular response of the individual and the nature of the stress, whether acute or chronic (Bennette, 1969; Katz et al, 1969; Kissen, 1967). Recently a more effec-

tive objective means of evaluating individual stress has
been suggested by Rahe and his associates (Holmes & Rahe,
1967; Rahe & Arthur, 1967; Rahe, McKean, & Arthur, 1967).
In these studies, any situation which requires a change
or adjustment on the part of the individual is considered
stressful, regardless of whatever positive or negative
quality there might be in the subject's emotional res-
ponse. Events requiring adjustment, from a minor viola-
tion of civil law to the death of the spouse, were tabu-
lated and experimentally rated as to the severity or
amount of adjustment required. Each of the 41 categories
on the scale was then assigned a number of Life Change
Units (LCU's) from LCU 11 to LCU 100. It was observed
that an excessive sum of LCU's for a particular year
coincided with the onset of illness, and was termed a
"life crisis." These life crises were found to be pre-
dictive of the onset of illness (Rahe, 1969).

Individual - Environmental Interactions

It seems that neither the data referring to individual
personality factors nor those referring to the effects
of environmental stress satisfactorily explain oncogenesis.
It is possible that an investigation of the interplay
between the life situation and personality features
may lead to more fruitful results. Kissen (1967)
has suggested the possibility of a significant interplay
between the life situation and the personality feature
"poor outlet for emotional discharge" (p. 29) with the

interaction of these significantly influencing whatever
biological predisposition there may be for neoplastic
disease. He speculates that excessive requirements
for readjustment in a limited period of time may threaten
the life-adaptation of the cancer-prone individual,
and, due to the rigidity of his personality structure,
cause a response of hostility. Because of his inability
to find satisfactory outlets for emotional discharge,
this hostility is accumulated internally.

Other investigators have observed results consistant
with this viewpoint. Mezei and Nemeth (1969), using Ror-
schach responses, observed a dissolution of the body image
of cancer subjects. They interpreted this to be the result
of self-aggression due to internally accumulated hostility.
Because of his poor emotional outlet, the cancer subject
directs this aggression inwards towards himself. Other
investigators have noticed characteristics indicative of
self-aggression, such as the assumption of total responsi-
bility for their own failings, emphasis on their own
ignorance and helplessness, and lack of expression of
hostile feelings and emotions (LeShan, 1966; Schmale,
1958; Solomon & Moos, 1964). In addition, the progres-
sion of neoplastic disease has been related to the inability
to express strong anxiety or depression outward (Blumberg,
West, & Ellis, 1954) and, more specifically, to the expres-
sion of hostility (Stavraky et al., 1968).

## The Self Concept

Just as it has seemed necessary to find a more objective means for evaluation of environmental stress, so a more objective means of identifying such a concept as self-aggression may be productive for purposes of research. Such concepts may be studied as possible components of a total self concept of an individual. One instrument for evaluating this self concept, the Tennessee Self Concept Scale (TSCS), has uncovered significant correlations between the self concept of an individual and other aspects of his life. William Fitts, author of the TSCS maintains that "each individual's self concept provides a kind of central, or core, set of data which enables us to understand and predict many aspects of his behavior" (Fitts and Hamner, 1969, p. 1). Recent research indicates this self concept may play an important part in the process of healing, by influencing his attitudes towards illness and medical care (Schwab, Clemmons and Marder, 1966), as well as in directing outward behavior. In this last regard, elements of the self concept have been indicated to be important variables in delinquent behavior (Fitts and Hamner, 1969). There are also indications that the self concept approach may be applicable to somatic illnesses, as suggested by Ashcroft and Fitts (1964).

## The Present Study

The purpose of the present study is to determine whether the variables of recent life crisis and particular

data of the self concept are, at least, descriptive
of the cancer patient, and may serve to distinguish
him from members of other groups. The primary hypotheses
are twofold. First, the cancer patient will show
distinguishable personality characteristics, capable
of differentiating him from the control groups. Specifi-
cally, the cancer patient will have an overall low
level of self concept, falling below the mean of the
normative data as well as below those of the two control
groups. Second, the cancer patient will show evidence
of recent LCU's of 150+, the range termed a life crisis,
within the two years prior to testing.

Other findings which may be hypothesized on the
basis of previous research are that the cancer patient
will show a positive social self, in line with the
social extraversion factor, but a negative family
self, reflective of his difficulty with close object
relationships.

These data are considered to hold an advantage
over previous testing programs. This is particularly
true in regard to the definition of stress as life
events requiring adjustment. The LCU's present an
objective, and somewhat quantifiable, means for evaluating
such a concept as stress without total reliance on
subjective reports of a prior emotional experience.
Personality variables still present the difficulty
of a lack of behavioral definition. However the self

concept approach may be an improvement over previously used personality constructs in the light of its definite behavioral correlations, such as those found between the self concept and delinquent behavior (Fitts & Hamner, 1969).

The control groups have been chosen to approximate as many of the possibly relevant variables of the cancer group as feasible. The "well" controls are expected to differ significantly from the cancer group both in number of recent life changes and in level of self concept. These two factors may be expected to show a balancing effect, with those members of the "well" group who show more negative self concepts having fewer LCU's, and those with a greater number of LCU's also exhibiting a more positive self concept. Conversely, the cancer group will be expected to exhibit a greater preponderance of negative self concept and high LCU totals combined.

The emphysema group was chosen as that group of medical patients most closely allied with the lung cancer group. Both groups have illness centering in the lungs, both have similar smoking history, and medical diagnosis differentiating between the two is often uncertain until a thorough testing program is completed. However, given all these similarities, it is the expectation of this study that the two groups will be differentiated on the basis of personality factors.

CHAPTER II

METHOD

Subjects

The experimental group consisted of 30 subjects under
treatment for lung cancer in the Veteran's Administration
Hospital, Oklahoma City, Oklahoma. Control groups con-
sisted of 30 emphysema patients at the same hospital, and
30 veterans residing in Oklahoma City. The latter com-
posed the "well" control group. As particular personality
factors may apply to a population of smokers vs. non-
smokers, subjects were controlled for smoking history. In
addition, all were male, of approximately the same
broad age range, 23 to 87.

Instruments and Measurements

Subjects were given two questionnaires. One was the
Recent Life Changes Questionnaire (RLC), (Rahe, 1969),
covering experiences for the two years prior to testing.
This questionnaire was experimentally developed from
scores of 394 subjects using scaling techniques on 41 life
event items. High correlations have been obtained as
to the relative order and magnitude of the items, between
groups divided as to age, sex, marital status, socioeco-
nomic class, and religious and educational background. A

direct linear relationship was found in studies covering
a ten-year period, between life change unit (LCU) totals
per year and health changes in the subsequent two years.
A life crisis was then defined as any cluster of events
whose individual values summed to 150+ LCU. A life crisis
was found to be a necessary, but not sufficient, antecedent
for health change (Rahe, 1969).

The second instrument used for testing was the Clini-
cal and Research Form of the Tennessee Self Concept Scale
(TSCS) (Fitts, 1956). This scale was standardized on 626
normals and several hundred psychiatric patients. It
consists of 100 self-descriptive statements to which the
subject responds on a five point response scale which
ranges from "completely false" to "completely true." The
TSCS yields 29 separate scales measuring various aspects
of self concept. The major areas are:

Positive Scores: The individual's general level of self
esteem is reflected in the Total Positive (TOT P) score.
This is partitioned into a 3 X 5 matrix of sub-scores.
The three rows of the matrix measure the person's internal
frame of reference, the subject's concept of what he is,
how he feels about himself, and what he does. The five
column scores represent an external frame of reference
and reflect his concept of his physical self, moral-ethical
self, personal self, family self, and social self.

Variability Scores: These scores reflect the consistancy
of the self concept across the various dimensions. A high

degree of variability or inconsistancy is found in persons
who tend to show compartmentalization of certain areas.
This results in poor integration of the self concept.
Variability scores are shown for total variability as well
as that for rows (internal reference), and columns (exter-
nal reference).

Distribution Scores:  The responses to each item on the
TSCS are noted by the numerals from one to five.  A "5"
response indicates a "completely true" answer, while a
"1" response indicates "completely false."  Uncertain
individuals may use an excess of "middle" or "3" responses,
while others qualify their responses consistantly ending
with an excess of "4" or "2" responses.  Extreme responses
of "5" or "1" indicate still a different pattern.

Self Criticism (SC):  This scale is based on ten items
from the MMPI L, or Lie, Scale.  It reflects the person's
openness or admission of derogatory facts about himself.
Low scores may indicate a deliberate effort to distort
the other scores on the scale.

Conflict Scores:  The items on the Scale are couched to
yield a balance of positively and negatively expressed
statements.  Some subjects may describe themselves by
affirming positive attributes, but by being unwilling
to deny negative ones, or conversely, by denying negative
qualities but being unwilling to affirm the positive.
Both these tendencies of overdenying negative attributes
or overaffirming the positive are reflected in the Net

Conflict (Net C) Score, which measures both the amount
of conflict and its direction. However, sometimes these
scores may be variable and cancel each other out. As a
result, in addition to the Net C score, the items pertain-
ing to this issue are also summed non-algebraically to
give a Total Conflict (TOT C) score. "High scores indi-
cate confusion, contradiction, and a general conflict in
self perception" (Fitts, 1965, p. 4).

Empirical Scales: Several empirically derived scales are
included. These include the Personality Disorder (PD)
scale, Psychosis (Psy) scale, and Neurosis (N) scale
which are used in psychological diagnostic categories,
the General Maladjustment (GM) scale, the Defensive Posi-
tive (DP) scale, and the Personality Integration (PI)
scale. The DP scale is a more subtle measure of defen-
siveness than the SC scale, the GM scale measures adjust-
ment-maladjustment on a continum, and the PI scale indi-
cates an overall level of adjustment.

Other Scales: The Number of Deviant Signs (NDS) is a
score reflecting the deviant features across all other
scores. It differentiates psychiatric patients from non-
patients with about 80% accuracy (Fitts and Hamner, 1969).
The True/False ratio (T/F) is a measure of general
response set.

Reliability on the individual scales of the TSCS,
as given in the Manual, ranged from .60 to .92 based
on a test-retest with 60 college students over a

two-week period.

## Procedure

The members of the two in-patient groups were acquired through a weekly testing program carried out on three wards of the V.A. Hospital during the months of March through August, 1971. In this way, subjects were obtained who had, for the most part, been hospitalized for only brief periods of time. Some of the subjects in each condition were unaware of their medical diagnosis. Each admission to the three general medicine wards who was considered a likely candidate for either of the two patient groups was interviewed and asked to participate in the study. They were told that the research was being done under the auspices of the Oklahoma Medical Research Foundation on people who had different types of lung diseases. Of the 101 patients interviewed, 66 were tested (6 of whom, subsequent to testing, were diagnosed as not belonging to either of the two groups in question), 11 were adjudged too sick to participate, and 24 refused to participate. After the tests were scored, one member of each of the patient groups was eliminated due to the highly deviant scores. In both cases a deliberate falsi-fication of test results was indicated. All testing was carried out by the author and one assistant, qualified in the use of psychometric techniques.

During the same period of time, the well controls were tested by arrangement with the Veterans of Foreign

Wars, Post #1857, in Oklahoma City. This provided 22 of

the 30 subjects. The others were secured by the testers

from the general population of male veterans with smoking

history.

## Statistical Analyses

Four step-wise linear discriminant function analyses

were computed to examine differences among the three groups

of subjects and also between each possible pair of groups:

lung cancer and emphysema (CAN-EMP), lung cancer and well

(CAN-WEL), and emphysema and well (EMP-WEL). The predictor

variables used to differentiate among the groups were the

scores of the scales of the TSCS and the RLC question-

naire. For the RLC data, the LCU totals were summed over

the entire two-year period and over each individual year.

The analyses provided a discriminant function for each

group based on a weighting system maximizing the variance

between groups while minimizing the within groups variance.

Each subject received a discriminant function score and

was then assigned to that group whose mean discriminant

function was closest to that score.

The analysis also indicated the order of selection

of the variables in forming the discriminant function.

Each variable selected was the one which contributed most

to a prediction system already containing the other

variables selected. An F test with g-1, and n-g-p df

was used at each step to determine whether the predictor

contributed significantly to accounting for the remain-

ing variance (n = total no. of $\underline{S}$s, g = no. of groups,

p = no. of predictors).

After this initial phase of the analysis, those
variables which met certain specifications were included
in the final "best" prediction system. Several criteria
were followed in choosing this final system.

1.   To avoid the problem of shrinkage, the number of
final predictor variables used was limited to the first
few variables selected in the initial phase of the analy-
sis.  In the case of the three group comparison, this
provided a subject to predictor ration of 12:1, while
in the two group comparisons this ration varied from
approximately 12:1 in the EMP-WEL comparison, to 10:1
in the CAN-EMP, and 7:1 in the CAN-WEL comparisons.

2.   In selecting the final prediction system, an
attempt was made to keep the number of misclassifica-
tions at a minimum.

3.   At each step in the initial analysis an F statistic
was computed to test the significance of each variable
in the prediction system at that step, given the con-
tribution of the other variables in the system at that
time.  The significance of any one variable is subject to
change at each step as other variables are added to the
system,  (Weiner, 1969).  It seemed desirable that each
variable in the final system be significant at the .10
level.  In fact, all predictors were significant at $p. < 05$
in each of the final systems, with two exceptions, one

significant at the .10, and the other at the .25 level.

The proportion of Ss statistically assigned to the same group as their medical diagnosis was computed for each of the group comparisons after the final prediction systems were determined. In addition, the probability of a subject being assigned to each particular group was computed. These data give a practical indication of how well the discriminant classification system matched the original diagnosis. Another check on the ability of the discriminant functions to correctly classify was accomplished by a cross validation sample. Of the original groups of Ss, 20 in each group were used in the establishment of the prediction systems, and the remaining 9 or 10 withheld. This sample was then classified using the scores obtained from the previously established discriminant functions.

A Chi Square test was used to compare the members in each group who had undergone sufficient stress for a life crisis in the past two years, on the basis of good or poor personality integration.

# CHAPTER III

## RESULTS

### Comparison: Lung Cancer, Emphysema, And Well Groups

The hypothesis of no difference between means on scores in these groups was rejected. Five variables were selected as a prediction system for classifying members of the three groups. The F values to enter these variables in the discriminant functions, as well as the F values for the final prediction system are given in Table I.

### TABLE I

SELECTION ORDER AND TESTS OF SIGNIFICANCE OF
STATISTICALLY SIGNIFICANT VARIABLES
DISCRIMINATING AMONG CAN, EMP,
AND WEL GROUPS

| Variable | df | F Value to enter | Final Prediction System df | F |
|---|---|---|---|---|
| PI scale | 2,57 | 18.458** | 2,53 | 5.320** |
| Moral-ethical self | 2,56 | 4.624* | 2,53 | 8.119** |
| Physical self | 2,55 | 6.463** | 2,53 | 5.407** |
| TOT C | 2,54 | 4.868* | 2,53 | 6.455** |
| Net C | 2,53 | $3.112^{a}$ | 2,53 | $3.112^{a}$ |

**$p < .01$    *$p < .05$    $^{a}p < .10$

The first variable selected was the Personality
Integration (PI) scale on the TSCS. Examination of
group means on this variable showed the CAN group to
have the lowest PI scores, followed by the EMP and WEL
groups in that order. The WEL group approximated the
normative data on this variable while the CAN group
scored two standard deviations, and the EMP group one
standard deviation below the mean. (See Appendix for
a listing of the mean scores of each variable found to
be a significant contributor to any of the four predic-
tion systems, for the original groups, cross validation
groups, and normative data.) The remaining four
variables which significantly contributed to the classi-
fication system were, in order of selection, the moral-
ethical self, physical self, TOT C, and Net C.

Proportions of subjects statistically classified
the same as their medical diagnosis, from both the
original and cross validation groups, are given in
Table II.

One of the original hypotheses was that the CAN
group members would show LCU totals, summed over the
previous two years, exceeding 150, or the level termed
a life crisis. This prediction was realized in 23 of
the 29 CAN Ss or 79 percent of the group. However,
there were no significant differences among the group
mean LCU totals, so the formal hypothesis of no differ-
ence was retained. This was due to the fact that not

only did the CAN and EMP groups show individual LCU totals in excess of a life crisis, but the WEL group also showed similar high totals. Since one a priori hypothesis was that diagnostic group membership would be influenced by an interaction between level of self concept and LCU totals, a Chi Square test was run comparing differences, see Table III. Using the Ss in all three groups who had LCU totals in excess of 150, against the scale level on the PI scale, it was observed that a significant proportion of well Ss had PI scores at or above the mean of the normative data, as opposed to those in each of the sick groups who had a preponderance of PI scores below that mean (Chi Square = 23.72, df = 2, p < .001).

TABLE II

PROPORTION OF STATISTICAL CLASSIFICATION OF
CAN, EMP, AND WEL GROUPS MATCHING
MEDICAL DIAGNOSIS

|  | Proportion of Correct Classifications |
| --- | --- |
| Original Groups | |
|  | p(EMP classified EMP) = .45 |
|  | p(EMP classified EMP) = .45 |
|  | p(WEL classified WEL) = .90 |
| Cross Validation Groups | |
|  | p(CAN classified CAN) = .56 |
|  | p(EMP classified EMP) = .22 |
|  | p(WEL classified WEL) = .70 |

TABLE III

COMPARISON OF PI LEVEL FOR CAN, EMP, AND WEL
GROUP MEMBERS HAVING LCU TOTALS
IN EXCESS OF 150 LCU

|  |  | CAN | EMP | WEL | Totals |
|---|---|---|---|---|---|
| Personality Integration Scale Level | 10+ | 2 | 3 | 14 | 19 |
|  | <10 | 20 | 24 | 7 | 51 |
|  | Totals | 22 | 27 | 21 | 70 |

Comparison:   Lung Cancer and Emphysema

Four variables were selected as a prediction sys-
tem in differentiating between the CAN-EMP groups.  In
order of selection these were the distribution of "5"
responses, TOT C, social self, and DP.  The F values to
enter these variables in the discriminant functions,
and the F values of the final prediction system are
given in Table IV.  All are significant at the .01
level, in the final system.  The CAN group was signifi-
cantly higher than the EMP group on number of "5" res-
ponses, social self concept and the DP scale, but was
lower in total conflict.

The proportions of Ss statistically classified the
same as their diagnostic groups, for both the original
and cross validation groups, are given in Table V.  The
probabilities of classification in the group chosen are
shown in Table VI.  These probabilities were computed

for each of the two-group comparisons. As expected, there were no significant differences between mean LCU totals for these two groups.

TABLE IV

SELECTION ORDER AND TESTS OF SIGNIFICANCE OF
STATISTICALLY SIGNIFICANT VARIABLES
DISCRIMINATING CAN AND EMP GROUPS

| Variable | df | F value to enter | Final Prediction System | |
| --- | --- | --- | --- | --- |
| | | | df | F |
| No. of "5" responses | 1,38 | 4.695* | 1,35 | 12.624** |
| TOT C | 1,37 | 7.103* | 1,35 | 13.431** |
| Social self | 1,36 | 2.589[b] | 1,35 | 10.157** |
| DP scale | 1,35 | 7.965** | 1,35 | 7.965** |

**$p < .01$     *$p < .05$     [b]$p < .25$

TABLE V

PROPORTION OF STATISTICAL CLASSIFICATION OF
CAN AND EMP GROUPS MATCHING
MEDICAL DIAGNOSIS

| | Proportion of Correct Classifications |
| --- | --- |
| Original Groups | |
| | p(CAN classified CAN) = .75 |
| | p(EMP classified EMP) = .95 |
| Cross Validation Groups | |
| | p(CAN calssified CAN) = .56 |
| | p(EMP classified EMP) = .56 |

## TABLE VI

### FREQUENCY DISTRIBUTION OF PROBABILITIES OF CLASSIFICATION FOR CAN AND EMP GROUPS

| Probability of classification | Frequency | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Original Groups | | | | Cross Valid. Groups | | | |
| | C-C | C-E | E-E | E-C | C-C | C-E | E-E | E-C |
| .95 - 1.00 | 4 | | 3 | 1 | 1 | 2 | 1 | |
| .90 - .94 | 4 | | 2 | | | | | 1 |
| .85 - .89 | 2 | | 3 | | 1 | | | |
| .80 - .84 | 1 | | 2 | | | | | 1 |
| .75 - .79 | 1 | 1 | 1 | | 1 | | | |
| .70 - .74 | 2 | | 1 | | | 1 | 1 | 1 |
| .65 - .69 | | | 2 | | | | 2 | |
| .60 - .64 | 1 | 2 | 3 | | | 1 | | 1 |
| .55 - .59 | | 1 | | | 2 | | | |
| .50 - .54 | | 1 | | | | | 1 | |
| Totals | 15 | 5 | 19 | 1 | 5 | 4 | 5 | 4 |

C-C - Cancer S classified cancer (correct class.)
C-E - Cancer S classified emphysema (misclassification)
E-E - Emphysema S classified emphysema (correct class.)
E-C - Emphysema S classified cancer (misclassification)

### Comparison: Lung Cancer and Well

Six variables were included in the prediction system chosen to discriminate group membership between these two groups. These were, in order of selection, the distribution of "5" responses, the moral-ethical self, physical self, behavioral self, GM scale, and LCU totals for the most recent year. Three of the six had an F value to enter significant at the .01 level, two were significant at $p < .05$, and the final variable included was significant at $p < .25$. Table VII shows the order of selection and F values to enter the system,

as well as the F values of the final prediction system.
The CAN group scored significantly higher than the
WEL group on all variables except the physical self,
where they scored lower.

TABLE VII

SELECTION ORDER AND TESTS OF SIGNIFICANCE OF
STATISTICALLY SIGNIFICANT VARIABLES
DISCRIMINATING CAN AND WEL GROUPS

| Variable | df | F value to enter | Final Prediction System df | F |
|----------|-----|------------------|------|---|
| No. of "5" responses | 1,38 | 47.199** | 1,33 | 34.789** |
| Moral-ethical self | 1,37 | 10.322** | 1,33 | 6.238* |
| Physical self | 1,36 | 7.257* | 1,33 | 10.216** |
| Behavioral self | 1,35 | 5.057* | 1,33 | 13.252** |
| GM scale | 1,34 | 5.936* | 1,33 | 7.469[b] |
| LCU - 1 yr. totals | 1,33 | 1.909[b] | 1,33 | 1.909[b] |

**$p < .01$    *$p < .05$    [b]$p < .25$

The proportion of cases statistically classified
correctly, using this system, for the original and
cross validation groups is given in Table VIII.  The
probabilities of classification in the group chosen are
shown in Table IX.  This frequency distribution shows

the probabilities of correct classification to be negatively skewed, while the probabilities of misclassification to be spread over the range of values.

TABLE VIII

PROPORTION OF STATISTICAL CLASSIFICATION OF
CAN AND WEL GROUPS MATCHING
MEDICAL DIAGNOSIS

|  | Proportion of Correct Classifications |
| --- | --- |
| Original Groups | p(CAN classified CAN) = .95<br>p(WEL classified WEL) = 1.00 |
| Cross Validation Groups | p(CAN classified CAN) = 1.00<br>p(WEL classified WEL) = .90 |

An interesting observation on these data, in addition to the effectiveness of classification, is that the mean scores for the first variable chosen as a predictor of group membership showed the WEL group approximating the normative data, but the CAN group, in both the original and cross validation samples, scoring beyond the second standard deviation above the mean (see Appendix).

## TABLE IX

### FREQUENCY DISTRIBUTION OF PROBABILITIES OF CLASSIFICATION FOR CAN AND WEL GROUPS

| Probability of classification | Frequency | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Original Groups | | | | Cross Valid. Groups | | | |
| | C-C | C-W | W-W | W-C | C-C | C-W | W-W | W-C |
| .95 - 1.00 | 19 | | 16 | | 8 | | 7 | 1 |
| .90 - .94 | | | 2 | | | | | |
| .85 - .89 | | | | | | | | |
| .80 - .84 | | | 1 | | | | | |
| .75 - .79 | | | 1 | | | | | |
| .70 - .74 | | 1 | | | | | | |
| .65 - .69 | | | | | 1 | | 1 | |
| .60 - .64 | | | | | | | | |
| .55 - .59 | | | | | | | | |
| .50 - .54 | | | | | | | 1 | |
| Totals | 19 | 1 | 20 | 0 | 9 | 0 | 9 | 1 |

C-C = Cancer S classified cancer (correct class.)
C-W = Cancer S classified well (misclassification)
W-W = Well S classified well (correct class.)
W-C = Well S classified cancer (misclassification)


Comparison:  Emphysema and Well

Only three variables contributed significantly to a prediction system discriminating between these two groups.  Each of these had a highly significant F value to enter the system $(p < .01)$, as is shown in Table X. Also shown are the F values for the final prediction system.  In order of selection, these variables were physical self, moral-ethical self, and TOT C.  In both the original and cross validation groups the EMP mean

scores on the physical self scale were more than one standard deviation below the mean of the WEL group and the normative data, which resemble each other. The EMP groups were also one standard deviation above the mean of both WEL and normative groups on the TOT C score (see Appendix), and significantly higher than the WEL group on the moral-ethical self concept.

TABLE X

SELECTION ORDER AND TESTS OF SIGNIFICANCE OF
STATISTICALLY SIGNIFICANT VARIABLES
DISCRIMINATING EMP AND WEL GROUPS

| Variable | df | F value to enter | Final Prediction System | |
|---|---|---|---|---|
| | | | df | F |
| Physical self | 1,38 | 20.005** | 1,36 | 33.216** |
| Moral-ethical self | 1,37 | 15.542** | 1,36 | 16.720** |
| TOT C | 1,36 | 11.708** | 1,36 | 11.708** |

**$p < .01$

The proportion of group members statistically classified correctly is given in Table XI. The probabilities for classification in the group chosen are given in Table XII. As with the CAN-WEL comparison these data are negatively skewed for correct classification.

TABLE XI

PROPORTION OF STATISTICAL CLASSIFICATION OF
EMP AND WEL GROUPS MATCHING
MEDICAL DIAGNOSIS

|  | Proportion of Correct Classifications |
|---|---|
| <u>Original Groups</u> |  |
|  | p(EMP classified EMP) = .80 |
|  | p(WEL classified WEL) = 1.00 |
| <u>Cross Validation Groups</u> |  |
|  | p(EMP classified EMP) = .89 |
|  | p(WEL classified WEL) = .80 |

TABLE XII

FREQUENCY DISTRIBUTION OF PROBABILITIES OF
CLASSIFICATION FOR EMP AND WEL GROUPS

| Probability of Classification | Original Groups | | | | Cross Valid. Groups | | | |
|---|---|---|---|---|---|---|---|---|
|  | E-E | E-W | W-W | W-E | E-E | E-W | W-W | W-E |
| .95 - 1.00 | 13 |  | 13 |  | 7 | 1 | 4 | 1 |
| .90 - .94 | 1 | 1 |  |  |  |  | 2 |  |
| .85 - .89 |  | 1 | 3 |  |  |  |  |  |
| .80 - .84 | 2 |  | 2 |  |  |  | 1 | 1 |
| .75 - .79 |  |  |  |  |  |  | 1 |  |
| .70 - .74 |  |  | 1 |  |  |  |  |  |
| .65 - .69 |  |  | 1 |  | 1 |  |  |  |
| .60 - .64 |  |  |  |  |  |  |  |  |
| .55 - .59 |  | 2 |  |  |  |  |  |  |
| .50 - .54 |  |  |  |  |  |  |  |  |
| Total | 16 | 4 | 20 | 0 | 8 | 1 | 8 | 2 |

E-E = Emphysema S classified emphysema (correct class.)
E-W = Emphysema S̄ classified well (misclassification)
W-W = Well S classified well (correct class.)
W-E = Well S̄ classified emphysema (misclassification)

## CHAPTER IV

## DISCUSSION

Before examining data from the four discriminant function analyses, it seems appropriate to look at the findings in regard to the primary hypotheses. One original hypothesis assumed the cancer patient would show a TOT P score lying below the mean of the other two groups and of the normative data. It was therefore surprising on first examination of the data to discover the CAN group scoring above the mean of both control groups and of the normative data, on this variable. Closer examination of the data showed that of the eight scales composing the TOT P the CAN group scored below the mean on only one scale, that of the physical self. Not only was the null hypothesis retained, it was beginning to appear that the CAN group was sick in body only and had a well functioning, self-actualized personality. These results would lie in total opposition to the organismic view of the individual taken by this study.

However, there are significant indications that this is not an accurate interpretation of these data. Instead it appears that an artificially positive view of himself is presented by the cancer subject, not for

the purpose of appearing "good" or fooling the investi-
gator, but because it is an essential defense of his
personality system. The meaning of this defense will
be discussed after the relevant indications of its
presence are presented.

The general self portrait presented by the cancer
patient will be described. On the one hand, besides
maintaining a high positive self concept, the cancer
patient sees himself as morally and ethically better
than average (moral-ethical self high), socially very
competent (social self high), behaviorally slightly
better than normal (behavioral self high). On the
other hand, he shows an extremely low level of person-
ality integration (PI low) and a large degree of con-
flict (high TOT C and Net C). These indicate a large
degree of compartmentalization, confusion, and contra-
diction in the self concept, as well as a high degree
of acquiescent response set. These indications are
hardly consistant with the picture of the well func-
tioning individual presented above.

That the defensive distortion of scores is
carried out on a deeper level than a conscious wish to
appear "good" is indicated by a combination of two of
the scales of the TSCS. The first is the self criti-
cism scale (SC), on which the CAN group shows an
adequate level of admission of human frailties. A
low SC score indicates deliberate distortion as the

scale is derived from the MMPI Lie Scale. In the scores of the CAN group no deliberate distortion is apparent. On the other hand, coupled with this normal level of SC is a high DP score. This scale indicates subtle defenses and "a high self description stemming from defensive distortion (Fitts, 1965, p. 5)."

According to the results of this study, the most important variable for evaluating personality differences in these individuals is the PI scale. Recent research (Fitts, et al. 1971) has found high PI scores in individuals who also show high TOT P, low C, and low V scores. Conversly, low PI scores are found in individuals with low TOT P, high C, and high V scores. The high TOT P of the CAN group in this study is a definite discordancy in this picture, as it is aligned with very low PI, high C, and high V scores.

As a result of these indications of defensive distortion, it would appear that the most meaningful variable for evaluating personality functioning in these individuals is the PI score. This was the variable most effective in predicting membership among the three groups, correctly classifying 37 of the 58 original group subjects and 16 of the 28 cross validation group members. Since this is exploratory research, it seemed justifiable to explore the results along this line, rather than accept the null hypothesis of no difference between group means on the basis of the TOT P scores.

The second major hypothesis was concerned with the effect of "stress" as a relevant variable in differentiating the well from the two patient groups. Formally stated, it held that there would be no difference in means between the three groups in regard to LCU totals. The original F values for all analyses proved non-significant in regard to LCU totals summed for the two-year period or for the period one to two years prior to the time of testing. In the CAN-WEL analysis, the LCU totals were significant (p < .25) for the most recent year prior to testing. Accordingly the null hypothesis was retained in two of the three cases and rejected in the case of the most recent year LCU totals.

Because of an a priori hypothesis concerning the combined effect of self concept level and LCU totals as an important factor in the onset of illness, a comparison was run using these data. PI scores were used instead of TOT P scores, as a measure of personality functioning not distorted by the defensive positive factor. The lack of significant differences among the mean LCU totals was considered to be due to the fact that the well controls showed LCU totals in excess of the 150 LCU, life crisis level, indicative of the onset of illness, for 21 of the 30 Ss. (This may be compared with the 23 of 29 CAN Ss, and 27 of 29 EMP Ss who also exceeded the life crisis level.) When these three groups of LCU 150+ Ss were compared for a below or

above the mean level of PI, using a Chi Square test,
the differences were highly significant. This indi-
cates that the personality integration of the well con-
trols who had not succumbed to illness, even though
they had been subjected to considerable life stress,
was above average. In addition, each of the CAN Ss who
showed a level of recent life stress below that con-
sidered necessary for the onset of illness, also showed
an extremely poor level of personality integration, in
the area of two to three standard deviations below
the mean.

Another possible explanation for the high LCU
totals for the well group is that this particular
sample contains many individuals who are summing LCU
totals toward the onset of illness, which has not yet
appeared.

<div align="center">Discussion of Results Discriminating<br>Among All Three Groups</div>

As previously discussed, the most important vari-
able for discriminating among all three groups was the
PI score. Following this variable came the moral-
ethical self concept. In this regard, the typical S in
the CAN group shows what may be interpreted as a defen-
sively high view of his moral-ethical self. This may
be one indication of a concern with illness, and possi-
bly terminal illness, and as such be seen as a charac-
teristic acquired after the onset of illness. However,

it appears that the high scores here may be a defen-
sive characteristic which is deep seated in the per-
sonality and applied to this situation to allay anxie-
ties over the possibility of terminal illness.  Rather
than deal with emotion as strong as anxiety, these
individuals seem to be saying, "I have nothing to worry
about."  Since Ss in this study reside in an area of
the country where moral and ethical concerns are empha-
sized by the strong fundamentalist religious denomina-
tions, it is questionable whether this predictor should
be broadly generalized.

The illness factor itself is seen in the low
physical self concept shown by both the sick groups.
As might be expected, this variable differentiates
among groups in the three group comparison, as well as
between the CAN-WEL and EMP-WEL groups.  One unusual
aspect is that the CAN group shows a more positive
physical self concept than the EMP group, in spite of
the difference in severity of illness.  This difference
was significant in the CAN-EMP comparison at the .10
level.  Although this only suggests a trend, the differ-
ence may be interpreted as another instance of defensive
distortion and attempted positive outlook to avoid deal-
ing emotionally with the uncomfortable realities of the
situation.

Another indication that the high scores of the CAN
group are indeed defensive distortions is seen in the

fourth predictor variable of this system, the TOT C
score. A high score on this scale represents a high
level of confusion, contradiction, and poor self per-
ception within any area of self perception. The final
predictor variable used in this analysis, the Net C
level is a further sign of the over affirmation of posi-
tive qualities used by the CAN S. Normally, scores
on this scale are in the negative range, approaching
zero, showing a balanced view of the self. Scores
above the mean indicate an affirmation of positive
qualities but an inability to deny negative attributes.
The CAN group scored more than one standard deviation
above the mean on this variable.

<center>Discussion of Results Discriminating<br>Cancer From Emphysema</center>

In the three group comparison, the greatest
difficulty in discrimination was between the CAN and
EMP groups. This is not surprising since this control
group was originally selected on the basis of its great
similarity to the CAN Group, both in diagnostic
signs and in smoking history. It is then to be
expected that when focusing on all three groups there
will be more likelihood of statistical misclassification
than is to be expected when the CAN and EMP groups are
compared without the WEL group.

More exact discrimination is possible when atten-
tion is focused solely on differences between these
two groups. In this case, the most effective predic-

tor variable was the distribution of "5" or positive
yes ("completely true") responses. This fits in nicely
with the hypothesis that the CAN $\underline{S}$ utilizes a positive
distortion of his situation, as a means of avoiding
anxiety or depression. On the basis of the research
reviewed in the introductory section, this may be
explained by his wishing to avoid strong emotion,
since he has a poor outlet for discharging such emotion.
A quick "yes" answer may serve as a means of escape
from considering unpleasant questions or ideas. That
the "completely true" answers do not indicate certainty
of opinion, rather than avoidance of emotionally laden
issues, is shown by the high TOT C scores, the second
most important predictor variable in this system. The
high scores of the CAN group on this scale show signi-
ficantly more contradiction and confusion than in the
EMP group (p < .05).

One of the minor hypotheses of this study was that
the CAN group would have a high social self concept.
This is in line with the extraversion factor discussed
in Chapter I as typical of the cancer patient. Social
self concept does correlate .64 with extraversion as
measured by other personality measures shown in the TSCS
Manual (p. 27). This variable did prove to be one of
the significant predictor variables in discriminating
between the CAN and EMP groups (p < .01). However,
the second part of this hypothesis, that the CAN group

would show a low family self concept, due to difficulty in object relations, was not supported. In line with previous data, this could be explained by the operation of the false positive outlook of the CAN Ss, and their unwillingness to become aware of unpleasant realities.

The other significant predictor in this system was the DP scale, discussed in the TSCS Manual as being a subtle measure of defensiveness, designed to tap hidden defenses. With the inclusion of this variable into the system, 34 of the 40 original group members and 10 of the 18 cross validation group members could be correctly classified. It would appear that the quick, certain, positive response to issues displayed as a characteristic of the personality of the CAN group is an effective means of discriminating members of this group from those as similar in other respects as patients with emphysema.

### Discussion of Results Discriminating Cancer from Well

The most accurate prediction system was developed in the analysis of the CAN-WEL groups. Six variables were used in the final prediction system which proved accurate in classification of 39 of the 40 original group members and 17 of the 19 cross validation group members. As with the CAN-EMP groups, the most important variable in this system was the preponderance of "completely true" responses of the CAN group. Other previously

discussed significant variables were the moral-ethical and physical self. The behavioral self concept also proved important in this analysis, indicating that the CAN S says he is both morally better than average, and also behaves better. He also scores high on the GM scale which is correlated .86 with the behavioral self and .69 with the moral ethical self. For an individial showing such poor personality integration and so much conflict, he does seem "too good to be true!"

The final predictor variable in this system was the LCU total for the previous year, indicating that stress is indeed a factor in differentiating between these two groups.

### Discussion of Results Discriminating Emphysema from Well

In contrast to the comparison of the CAN groups, the EMP-WEL groups show no indications of discrimination on the basis of a false positive outlook. Instead the predictor variables were those which might be expected, attitude toward physical self, moral-ethical self, possibly due to geographical location emphasis, and general personality confusion and conflict. This TOT P score may be understood to be partly the result of serious illness of any sort.

The selection of the EMP group for participation in this study was primarily for the purpose of com-

parison with the CAN group, to ascertain what, if any,
observable differences there were between the two. The
analysis comparing the EMP-WEL groups also primarily
serves to point out how dissimilar this "sick" group is
from the CAN group, when compared to well individuals.
The importance of the physical self concept in dis-
criminating between these WEL and EMP groups seems
readily understandable, simply from an intuitive stand-
point. The distinctive characteristics seem to be
those easily attributable to illness, rather than to
deep seated personality factors. This is another
piece of evidence to indicate that at least cancer-
afflicted (if not cancer-prone) individuals do indeed
have a distinctive and characteristic personality
organization.

CHAPTER V

IMPLICATIONS

For practical purposes there are two issues to
which this study may contribute. The first lies in the
possibility of the variables used providing a diagnos-
tically effective means of differentiating individuals
who already have cancer. The second, and more impor-
tant of the two, is concerned with the possibility of
identifying the cancer-prone individual, by means of
his particular defenses, and offering him therapeutic
assistance in finding more suitable ways of dealing
with emotions, in the hope of prevention of oncogenesis.
Both possibilities are issues for the future, but the
current study at least encourages further research in
the area.

No conclusions can be drawn as to whether the pre-
dictor variables were present prior to the onset of
illness. The close similarity between the CAN and EMP
groups, and the difficulty in establishing a prediction
system to differentiate the two, point to the possible
operation of a common influence, such as hospitaliza-
tion, on the scores of these groups. A comparison of
these data with the same scores for dissimilar hospital

populations (e.g. cardiac) might help to clarify this
point.

Indications which might be interpreted to favor the
existence of distinctive personality differences before
hospitalization, or the onset of illness, are the resis-
tance of the TSCS to reflect short term changes (Fitts
and Hamner, 1969), and the fact that the patients had,
for the most part, been hospitalized only briefly
before the testing. A satisfactory answer to this ques-
tion, however, could only be obtained through longi-
tudinal studies, predicting incidence of cancer in
individuals on the basis of personality variables, and
using long term observations to check the accuracy of
the predictions.

Another interesting possiblity for future research
would be an attempt to modify or arrest the course of
neoplastic disease through the application of psycho-
therapeutic measures designed to encourage more satis-
factory outlets for emotion.

# CHAPTER VI

## SUMMARY AND CONCLUSIONS

In the search for understanding of, and a cure for, cancer, one avenue of approach in recent years has been the investigation of relevant personality variables. In addition, much research has been done on the general illness-producing effects of environmental stress. This study has sought to combine both avenues of approach and attempted to assess the personality tendencies which are descriptive of the cancer patient, the recent amount of stress in his life, and any interaction between these two areas.

On the basis of statistically significant variables, prediction systems were formulated to assign group membership to each subject in original and cross validation groups. Nine personality and one environmental stress variables were found to be significant and were used in at least one of the four prediction systems formulated to classify Ss. For both the original and cross validation groups, these systems ranged in accuracy from 100 percent down to 22 percent correct classification (matching original diagnosis) with 16 of the 18 comparisons showing classification accuracy of at least 56 percent. In addition, a comparison

of at least 56 percent. In addition, a comparison

of the interaction between personality variables and

environmental stress was significant at a level far

exceeding p .001. The conclusions drawn from these

data are that there are definite indications of

distinctive personality characteristics possessed

by people who have cancer, which may have been

characteristic of those people before succumbing

to illness.

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## APPENDIX

### SCORES OF NORM GROUP AND EXPERIMENTAL GROUPS ON TSCS
### SCALES USED IN FINAL PREDICTION SYSTEMS

| | Norm Group Mean | Stan. Dev. | Original Groups Mean Scores CAN | EMP | WEL | Cross-Valid. Groups Mean Scores CAN | EMP | WEL |
|---|---|---|---|---|---|---|---|---|
| Net Conflict | -4.91 | 13.01 | 14.50 | .05 | -1.40 | 8.11 | 15.77 | -3.10 |
| Total Conflict | 30.10 | 8.21 | 37.29 | 44.85 | 31.00 | 49.67 | 43.33 | 34.09 |
| Behavioral Self | 115.01 | 11.22 | 118.59 | 111.59 | 108.20 | 122.44 | 112.77 | 114.09 |
| Moral-ethical self | 70.33 | 8.70 | 77.05 | 71.59 | 66.20 | 74.77 | 74.77 | 70.29 |
| Social self | 68.14 | 7.86 | 73.75 | 71.55 | 67.79 | 73.88 | 76.77 | 70.29 |
| No. of "5's" | 18.11 | 9.24 | 43.89 | 33.84 | 19.39 | 45.66 | 44.55 | 18.09 |
| DP | 54.40 | 12.38 | 65.45 | 53.70 | 52.79 | 60.88 | 61.77 | 57.79 |
| GM | 98.80 | 9.15 | 97.70 | 94.75 | 96.04 | 96.66 | 94.44 | 99.20 |
| PI | 10.42 | 3.88 | 2.60 | 4.45 | 9.95 | 3.22 | 2.00 | 10.00 |

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Thesis: CANCER: AN ORGANISMIC APPROACH

Major Field: Psychology

Biographical:

   Personal Data:   Born in Oklahoma City, Oklahoma, on
      October 15, 1934, the daughter of Mr. and Mrs.
      Eugene Jordan.  Married Laurence Donald Lucas
      on December 27, 1954.  Mother of four children,
      Laird, Matthew, Shawna, and Teresa.

   Education:  Graduated from Classen High School,
      Oklahoma City, Oklahoma in May, 1951; attended
      Bradford Junior College, Bradford, Massachusetts,
      receiving Associate of Arts certificate from
      that institution in June, 1953; attended the
      University of Oklahoma in 1953 and 1954, working
      toward a Bachelor of Arts degree in the field
      of English; received Bachelor of Arts degree in
      the area of psychology from Oklahoma City
      University in 1970; completed requirements for
      the Master of Science degree at Oklahoma State
      University in May, 1972.