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## The Relationship Between Experimental Variables and the Occurrence of Duodenal Ulcer

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To the Graduate Council:

I am submitting herewith a dissertation written by William W. Lothrop entitled "The Relationship Between Experimental Variables and the Occurrence of Duodenal Ulcer." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

Gerald R. Pascal, Major Professor

We have read this dissertation and recommend its acceptance:

William O. Jenkins, Clifford H. Swensen, Luke E. Ebersole, Madeline D. Kneberg

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

March 21, 1959

To the Graduate Council:

I am submitting herewith a thesis written by William W. Lothrop entitled "The Relationship Between Experiential Variables and the Occurrence of Duodenal Ulcer." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.

W. W. Lothrop  
Major Professor

We have read this thesis and  
recommend its acceptance:

W. D. Jenkins  
Madeline D. Kreberg  
R. E. Churnale  
C. H. Swensen Jr.

Accepted for the Council:

Alb. Hantling  
Dean of the Graduate School

THE RELATIONSHIP BETWEEN EXPERIENTIAL VARIABLES  
AND THE OCCURENCE OF DUODENAL ULCER

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A THESIS

Submitted to  
The Graduate Council  
of  
The University of Tennessee  
in  
Partial Fulfillment of the Requirements  
for the degree of  
Doctor of Philosophy

---

by

William W. Lothrop

March 1959

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W. W. Lothrop

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## CHAPTER I

### INTRODUCTION

The research about to be reported is part of a larger research program with duodenal ulcer patients carried out at the Veterans Administration Hospital in Atlanta, Georgia, under the direction of Drs. Gerald R. Pascal and William O. Jenkins of the University of Tennessee Psychology Department. This research program has attempted to bring a systematic, behaviorally-oriented approach to the problem of duodenal ulcer. The early work of Bergmann (3) has been followed by sufficient experimental research, notably that of Wolf and Wolff (28), Mittelman and Wolff (16), Gantt (8) and Sawrey (24, 25), to make tentative the hypothesis that there is what may be called a psychogenic factor in the pathogenesis of duodenal ulcer. This hypothesis seems to have been commonly accepted into both medical and psychological thinking. Twenty-six years ago, in fact, Cushing observed that most medical men of that day recognized that "high-strung" individuals were more susceptible to nervous indigestion and peptic ulcer, that the ulcer symptoms became quiescent or even tended to heal when the patients were put mentally and physically at rest, and that these symptoms tended to recur as soon as the patient resumed his former tasks and responsibilities (6). Despite its widespread acceptance, however, the precise relationship of this psychogenic factor to the physiology of duodenal ulcer has not been clearly understood, nor has this psychogenic factor itself been acceptably defined.



Perhaps the best known attempt to specify this psychogenic factor and its relationship to physiological processes is that put forth by Alexander, who postulates that the duodenal ulcer patient has a strong unconscious desire for dependence on others which is unacceptable to him consciously. To avoid anxiety, he compensates for these underlying dependency wishes by consciously striving for success and independence. However, the repressed wishes to be loved and taken care of find expression in stomach symptoms by parasympathetic innervation, causing gastrointestinal stimulation and, in time, the formation of a duodenal ulcer (1). Thus the duodenal ulcer patient is frequently thought of as a hard-driving, efficient businessman or politician.

Other researchers have described other "types" of ulcer patient. In a later work (2), Alexander himself described a type of patient who is overtly dependent, demanding and disgruntled. Kapp, Rosenbaum and Romano (12) found that only six of the twenty patients in their sample could be described as consciously overcompensating by ambitiousness and success strivings. Instead, two other types of "ulcer personality" were found more frequently. One group was characterized by partial acceptance of their dependency needs. They were said to be shy, passive, and showed marked trends of feminine identification in their overt personalities. The other group, the largest in their sample, used socially unacceptable means of handling their dependency needs, such as chronic alcoholism or delinquency. These patients were demanding, had little capacity to delay gratification

of their needs, were openly parasitic on family or relatives, and showed very little guilt or concern over their behavior.

Other studies have shown similar personality differences in the manner of handling dependency needs within the ulcer population itself (5, 22, 27). A recent article by Roth (23), summarizing the research to date, points up the fact that there is a great deal of confusion about the nature of the psychogenic factor in duodenal ulcer. Pascal and Jenkins state, ". . . the confusion existing in this area makes it difficult, if not impossible, to state with any degree of certainty that any specific relationship, other than the vague one of psychogenesis, exists between ulcer and operationally defined psychological variables (20, p. 2)."

In view of the confusion existing in this area, therefore, the present research program has attempted to bring a systematic, behaviorally-oriented approach to the problem. The research was initiated at the hospital's request for a reliable method of predicting the response of their duodenal ulcer patients to medical and surgical treatment. Certain of these patients do not respond successfully to medical therapy, and frequently have to be brought to surgery as a last resort. Some of these patients respond favorably to surgery, while others may become both medical and surgical failures, i.e., experience a return of symptoms after surgery. The task was to determine if any test or behavioral measures could discriminate between these patients on the basis of their response to medical and/or surgical treatment. The research program was carried out in three phases: (1) the determination

of significant individual differences between patients who respond successfully to medical treatment and those who do not; (2) the determination of significant differences between those who respond successfully to surgery and those who do not; and (3), the determination of significant differences between patients who were both medical and surgical failures and a matched group of normal controls.

The first phase of the research, differentiating between medical successes and medical failures, was primarily observational. A short behavioral history and test battery was administered to each ulcer patient shortly after his admission to the hospital. Those patients whose response to the medical regimen had been followed for some time were classified as either medical successes or medical failures, and the analysis was carried out in post hoc fashion. The medical classification of these patients was made by Dr. James C. Crutcher, Assistant Chief of Medical Service at the hospital. A patient was judged to be a medical success if his symptoms had been successfully managed by medical treatment for at least two years. A medical failure, on the other hand, was one whose symptoms had proven to be intractable to medical treatment over a period of time, and who was expected to come to surgery as a last resort in the future. Successive samples of eight medical successes and eight medical failures were analyzed for consistent discrimination on the behavioral variables derived from the case history. Nine variables were found which discriminated between the two groups between the .10 and .001 levels of confidence. The medical failures were found to be characterized by: (1) less education than the medical successes, (2)

inability to work full time, (3) less income, (4) fewer hours sleep per night, (5) difficulty with elimination, (6) less frequent sexual relations, (7) more frequent divorce or separation, (8) more frequent complaints of ill health exclusive of the ulcer symptoms, and (9) less frequent church attendance. These results were thought to indicate that such a behavioristic approach is feasible in this area, and that further research might prove fruitful.

Analysis of the test data obtained in this first phase of the research program indicated that the medical failures tended to score lower on verbal subtests from the Wechsler-Bellevue Intelligence Scale, Form I, but the difference was not significant ( $P = .18$ ). Analysis of the Rorschach protocols essentially produced no significant differences between the medical successes and the medical failures. Scores on the Bender-Gestalt test, however, showed no overlap between the two groups in one sample of sixteen cases and only slight overlap in another, with the medical failures obtaining the highest scores. These results are highly significant statistically, and were interpreted to suggest that the medical failures are more psychiatrically disturbed than the medical successes (13). This conclusion would seem to be in agreement with those of other workers in this area (11).

The second phase of the research program, which involved the discrimination between the behavior of those medical failures who became surgical successes and those who became surgical failures, was an attempt to test the hypothesis that psychological deprivation is a basic covariant of duodenal ulcer, assuming that duodenal ulcer can be

considered a behavioral deviation. A two-point, forced-choice behavior rating scale was constructed by Pascal and Jenkins (20) from the discriminating items found in Phase I, plus items having to do with the concept of environmental deprivation, evolved on an a priori basis, which had not been previously tested. A copy of this scale is presented in Appendix A. The higher the score on the scale, the greater the degree of environmental deprivation. Ratings on the scale were based on an intensive interview designed to elicit specific behavioral descriptions. The scale was tested against eleven surgical successes and five surgical failures. Non-overlapping distributions were obtained, clearly very significant. These results were interpreted to indicate the strong probability that environmental deprivation is a basic parameter of behavioral deviation, of which duodenal ulcer may be considered a variant (7). The scale has also been applied to a group of County Workhouse alcoholics with similar results: the alcoholics score significantly higher than a control group of non-alcoholics. This suggests that the scale has greater generality than its application to duodenal ulcer patients alone (19).

The third phase of the research program constitutes the present research. Having indicated the probability of significant differences within the ulcer population, it remained to apply the same behavioral approach to the problem of finding differences between the ulcer population and the "normal" population. In view of the confusion which exists in this area, as noted previously, it seemed advisable to proceed as though no previous work had been done, staying as close as

possible to a systematic, behaviorally-oriented approach. No hypotheses were to be tested out or assumed, other than the very general one the duodenal ulcer can be considered a behavioral deviation. Rather, the purpose of this research was to collect basic behavioral data, both past and present, from which to generate hypotheses about the various psychogenic factors which might be found to covary with the presence or absence of duodenal ulcer, and to investigate more precise methods of collecting and analyzing behavioral data.

## CHAPTER II

### PROCEDURE

The Ss used in this study were all white male veterans hospitalized at the Veterans Administration Hospital in Atlanta, Georgia. Five patients being treated for a duodenal ulcer were selected, and five patients without ulcer who volunteered to serve as controls. Each ulcer patient was matched with one of the controls as closely as possible on age and education, in order to minimize the differences in behavior and life situations which might be expected if these factors differed greatly within pairs. By equating ages and educational backgrounds as much as possible within pairs of Ss, it was thought that the results obtained could be assumed to be a more direct reflection of the primary dependent variable, presence or absence of a duodenal ulcer. In actuality the difference in ages within any of the five pairs is no greater than three years, and the difference in number of school grades passed is no greater than two grades.

The five ulcer patients used in this study do not represent a random sample of the total ulcer population at the hospital. They were purposely selected as being among the most intractable ulcer cases, medically speaking. These patients had a history of poor response to medical therapy over a number of years, had subsequently been brought to surgery as a last resort, and had experienced a return of symptoms after surgery, some to the point of requiring further surgery. The selection of these patients was made by Dr. James C.

Crutcher, Assistant Chief of Medical Service at the hospital. Brief summaries of their medical histories are presented in Table I. Only the most intractable ulcer patients were selected in order to enhance the possibility of obtaining differences between their behavior and that of their matched controls, assuming, as previous results of the research program have indicated, that the intractable ulcer patients are more deviant in their behavior than those who respond successfully to medical and surgical treatment.

For the same reason, the five controls used in this study do not represent a random sample of the hospital population. In addition to the matching criteria of age and education, these patients were considered acceptable only if they (1) had no service-connected or other known psychiatric diagnoses, (2) were not being treated for any ailment which is generally accepted as psychosomatic in nature, and (3) had no major psychiatric complaints or symptoms as established by a short screening interview. In other words, these patients were selected as being among the "best-adjusted" at the hospital. Over 300 patients were screened to obtain these five controls.<sup>1</sup> Of those finally selected, one was hospitalized with pneumonia, one had a form of lupus (a tuberculous disease of the joints and connective tissue), two had pulmonary tuberculosis, and one was a diabetic who had also contracted pulmonary tuberculosis. Table II lists the identifying

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<sup>1</sup>The author is indebted to the residents and interns of the hospital, and especially to Dr. James C. Crutcher, for their immeasurable help in screening these patients.



TABLE I

## MEDICAL HISTORIES OF THE FIVE ULCER PATIENTS

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Patient 1. The patient's ulcer was first diagnosed in 1942, at the age of 27, while in the service. He was hospitalized in 1944 for bleeding and pain, and a gastroenterostomy was performed. He remained asymptomatic only three months, was hospitalized again in 1946, and a subtotal gastrectomy was performed. From 1946 to 1955 he was hospitalized a total of twelve times, primarily because of chronic anemia and gastrointestinal bleeding. A number of secondary diagnoses were also made, including conversion hysteria, essential hypertension, acute alcoholism with delirium tremens, and pulmonary tuberculosis. In 1955 a marginal ulcer was found, and a vagotomy was performed. Following this, his third operation, some vomiting and anemia still persisted, and the patient again developed a number of secondary symptoms.

Patient 2. The patient's ulcer was first diagnosed in 1943, when he was 23 years old, while in the service. He was hospitalized at that time and again in 1948 with melena and hematemesis, and a subtotal gastrectomy was performed. However, the symptoms of abdominal pain and vomiting persisted, and he was rehospitalized in 1951. He was given the secondary diagnosis of anxiety reaction, chronic, moderate. He was hospitalized twice in 1956 with the same symptoms, and a

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TABLE I (continued)

MEDICAL HISTORIES OF THE FIVE ULCER PATIENTS

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marginal ulcer was suspected.

Patient 3. The patient's ulcer was first diagnosed in 1942 while in the service, at the age of 25, although his symptoms dated back to the age of 14, and a tentative diagnosis of duodenal ulcer was made at age 19. The patient was hospitalized in 1943, 1946 and 1947 with abdominal pain and vomiting. The ulcer perforated in 1953, and was surgically closed. He was hospitalized again in 1954 with continuous pain, vomiting and gastric retention. On the basis of his past history of complications, a hemigastrectomy and vagotomy were thought to be indicated. He remained asymptomatic for a short while after this surgery, but the pains began to return gradually, increasing in frequency and severity. He was hospitalized again in 1956 with cramping pains, weakness and dizziness. A marginal ulcer was suspected but not found.

Patient 4. The patient's ulcer was first diagnosed in 1945, at the age of 21, while he was in the service. He continued to experience intermittent pain after discharge, but was not hospitalized until 1947, when he was hospitalized five times within the year for severe pain and several small bleeding episodes. He was hospitalized again

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TABLE I (continued)

## MEDICAL HISTORIES OF THE FIVE ULCER PATIENTS

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in 1948 after six months of continual pain, and in 1949 with pain, nausea and vomiting. On the basis of his recurrent symptoms, a gastrectomy and vagotomy were performed in 1949. He remained free from symptoms until 1954, when he was hospitalized for pain, nausea and vomiting. He was hospitalized twice for the same symptoms in 1955, when a duodenal ulcer was again diagnosed. When hospitalized again in 1956 with pain and mild bleeding, a subtotal gastric resection was performed, but since then the pain has returned along with occasional nausea.

Patient 5. The patient's ulcer was first diagnosed in 1944, at the age of 26, while he was in the service. His symptoms of abdominal pain, nausea and vomiting, along with loss of weight and appetite, persisted after his discharge, and in 1949 the ulcer perforated. The perforation was closed by surgery, but perforated again in 1951, and a hemigastrectomy was performed. The patient obtained no symptomatic relief, however, and is considered a surgical failure. He has returned to the hospital since his operation with complaints of weakness, dizziness and lack of energy.

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data for each of the five pairs of Ss finally selected.

Each prospective S was told that a research program on duodenal ulcers was being conducted to determine how the behavior of those who develop duodenal ulcers differs from those who do not. It was made clear to them that this would involve being asked a large number of questions about their past and present behavior, consuming as much as eight to twelve hours or more in all. It was also made clear to them that the data would be kept anonymous and that this study would probably not help them personally, but that it was hoped it would benefit future ulcer patients coming to the hospital. Despite this rather forbidding introduction, only two Ss did not wish to volunteer for the study, one who was to serve as a control and one ulcer patient.

The interviews were conducted in privacy, with E recording the conversation on paper as close to verbatim as possible. A common outline and framework for these interviews was provided by the Pascal-Jenkins Behavioral Scales, a copy of which is included as Appendix B. The scale is divided into two parts: the first attempts to measure the S's responses to current stimulus situations in his environment, while the second part attempts to measure his responses to past environmental stimuli. The scale attempts to be comprehensive, and covers all major areas of behavior--eating, sleeping, interpersonal relations, leisure activities, and so on, frequently broken down into more specific areas. For each particular aspect of behavior to be examined, suggestions are made for the type of data to be obtained. With regard to the individual's sleeping habits, for example, such

TABLE II

## IDENTIFYING DATA FOR THE FIVE MATCHED PAIRS

		<u>Age</u>	<u>Education</u>	<u>Marriage</u>	<u>Occupation</u>
<u>Pair #1.</u>	Ulcer	41	9th	M-D-M	farmer
	Control	38	10th	M	R.R. foreman
<u>Pair #2.</u>	Ulcer	38	6th	M-D-M	auto mechanic
	Control	36	9th	M-D-M	electrician
<u>Pair #3.</u>	Ulcer	39	12th	M	textile worker
	Control	39	12th	M	carpenter
<u>Pair #4.</u>	Ulcer	32	8th	separated	unemployed
	Control	32	9th	M	truck driver
<u>Pair #5.</u>	Ulcer	38	5th	M	textile worker
	Control	36	3rd	M	groundskeeper

data as number of hours of sleep per night, frequency of dreaming, use of sleeping aids, naps during the day, and so on, are to be obtained. The scale is thus fairly specific as to the kinds of data to be obtained, but open-ended with regard to the actual handling of the S. The interview is actually a semi-structured situation in which the Behavioral Scales serve as an outline from which to elicit the same general kinds of information from each S.

The aim of the Behavioral Scales is to elicit specific behavioral descriptions (responses) which can be (1) scaled along a continuum (such as amount of alcohol consumed), (2) dichotomized (such as rural vs. urban residence), or (3) counted (such as number of children). Emphasis is placed on obtaining specific descriptions of actual behavior rather than the S's attitudes or opinions of his experiences. For example, the S may state that he and his mother are very close, but his actual behavior with her—the amount of time he spends with her, the number and kinds of their activities, displays of affection, and so on—may be more meaningful and certainly is more objective. The S's attitudes and opinions are important and also to be obtained, but the primary emphasis is on the collection of specific behavioral descriptions.

It is thought that, by insisting on specific behavioral descriptions, the S's biases and defensiveness may be circumvented to some extent, although in the last analysis this method is still dependent on the S's willingness and ability to give the information desired. Specific behavioral descriptions do not necessarily insure

reliability. It was felt, for example, that many Ss tended to be evasive or defensive when asked about such things as frequency of intercourse, amount of alcohol consumed, and so on. (By accepting only volunteers for this study it was hoped that such defensiveness would be minimized.) Some time was spent with each S in trying to obtain rapport, but defensiveness was not completely eliminated. The possible distortion of memory in the reporting of past events was also considered, but no expedient solution to this problem was apparent.

It is obvious that this method is so comprehensive that it could easily reach the point of diminishing returns in terms of time consumed, since there is practically an infinite amount of behavior in the S's life history which could be elicited. For practical purposes some cutbacks are necessary, to say nothing of the S's tolerance for this sort of thing. The general rule of thumb was that E should obtain sufficient data to feel confident that another qualified judge would rate the same data similarly. In actual practice these interviews ranged in length from six to fifteen hours, usually spread over a number of days. Naturally the amount of data obtained from each S varies with his loquacity and the nature of his experiences and environmental stimuli.

At the end of the history-taking interview, each S was given a short test battery consisting of selected verbal subtests from the Wechsler-Bellevue Intelligence Scale, Form I, the Rorschach and the Bender-Gestalt test. The test data have not been included in this

study, however, because one ulcer patient left the hospital against medical advice before the testing was completed. Moreover, one of the controls was receiving cortisone, and its influence on his test performance could not be measured. It was felt that too few cases were left for any definitive analysis of the test data.

At the conclusion of the interview and testing the S was thanked for his cooperation and told that he had been of great service to the ulcer research program. Once the data had been collected, it was typed in the same format as the Behavioral Scales, using the same headings and code numbers. This made for some lack of continuity, but did provide easy reference to any particular area of behavior. These case histories range in length from eleven to sixteen single-spaced, type-written pages. Their length made it prohibitive to include them in this paper, but they are available for reference from the research files of the University of Tennessee Psychological Service Center.

The first step in the analysis of the data was to be primarily inspectional. The discrete behavioral variables were to be examined for consistent discrimination between the duodenal ulcer patients and the controls throughout the five matched pairs. In a small sample study such as this, almost perfect discrimination is needed to obtain statistical significance. For all quantified data (given in terms of amount, frequency, rate, and so on), the Binomial Expansion was to be used since it is appropriate to matched-pair data and can easily be computed. For all dichotomized data (such as rural vs. urban place



of residence), the Fisher-Yates Exact Test was to be used (9).

The second part of the analysis was left fairly open-ended, with the general aim of grouping these discrete behaviors into some kind of "psychologically meaningful categories" from which to generate tentative hypotheses for future research. The model from which these psychologically meaningful categories or hypothetical constructs were derived is Pascal's formula for psychological deficit (17). The three major construct areas which were to receive attention in this research were (1) environmental deprivation, (2) attitudes and expectancies learned in reaction to deprivation, and (3) defensive habits learned to reduce the deviant behavior potentially arising from these attitudes and expectancies. Having derived these hypothetical constructs, they would then be tested against the five matched pairs to determine if consistent discrimination could be obtained. Because of the practical difficulties involved in obtaining the services of some other qualified person or persons to rate the data, however, no thorough-going attempt was made to evaluate past environmental deprivation. Instead, the Pascal-Jenkins Deprivation Scale, constructed from earlier work in the research program, was used to obtain some estimate of the amount of deprivation currently experienced by the ulcer patients and the controls.

The main focus of interest was the construct of learned attitudes and expectancies which, it was assumed, were developed in reaction to environmental stimuli, and from which inferences might be made about deprivation. Taking the data relating to the behavior

of parents, siblings, peers, and so on in the individual's childhood (arbitrarily through age twelve), which can be considered as the stimuli, an attempt was made to predict what attitudes and expectancies should have been learned in response to these stimuli. Whether these attitudes and expectancies were in fact learned is, of course, problematical. Judgements were to be made on the basis of the pertinent literature and clinical experience. For greater reliability in making these judgements, another advanced graduate student in clinical psychology was asked to volunteer his services.<sup>2</sup> To provide a more definite framework in which to make these judgements, the following questionnaire was developed, after some revisions by E and the other judge, on an a priori basis:

1. What kind(s) of attention does this individual expect to receive from mother or, by generalization, from females (succorant, non-succorant, dominating, frustrating, etc.)?
2. What do you infer this individual's attitude(s) towards mother or females in general should be in reaction to the above expectancies (fear, resentment, obedience, etc.)?
3. What conceptions do you infer this individual should have learned regarding mother and females in general (females are submissive, authoritarian, unpredictable, etc.)?
4. Do the same for father as in 1, 2 and 3 above.

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<sup>2</sup>The author is greatly indebted to Hugh C. Davis, Jr., for his help and unselfish cooperation in analyzing these data.

5. What expectancies do you infer this individual should have learned regarding the relationship between husband and wife, or between adult males and females (females are submissive to males, males do not express hostility towards females, etc.)?
6. What attitudes do you infer this individual should have learned regarding himself, his adequacy in comparison with other males, in coping with male or female authority figures, in coping with his environment, and so on?
7. What expectations do you infer this individual should have learned regarding his total environment (the world is a dangerous place, permissive, frustrating, etc.)?
8. What other important attitudes or expectancies might the individual have learned not included by the above?

The history data pertaining to the behavior of parents, siblings, peers and so on was abstracted and typed separately for each S. To increase impartiality, at least as far as the other judge was concerned, these protocols did not reveal whether the S was an ulcer patient or a control, but each was identified for age, education, occupation and marital status. E and the other judge worked independently to answer the above questions. Those hypothesized attitudes and expectancies on which there was no agreement were to be discarded, and the remaining constructs tested against the five pairs to determine if any consistent discrimination could be obtained.

The area of defensive habits was not systematically analyzed, but speculations about this construct are reported in Chapter IV.

## CHAPTER III

### RESULTS

#### Part A

A total of 94 discrete behavioral variables relating to the S's behavior immediately preceding hospitalization were analyzed for consistent discrimination between the duodenal ulcer patients and their matched controls throughout the five pairs. Those variables quantified in terms of frequency or amount were tested by the Binomial Expansion. Dichotomized variables were tested by the Fisher-Yates Exact Test. Of the 94 variables tested, nine were found to be significant at or beyond the .05 level of confidence. Five other variables were found to be significant between the .05 and .10 levels, and are given consideration as being "probably" significant. Another seven variables, ranging in probability from the .10 to .20 levels of confidence are presented as possibly meriting consideration in a replication with a larger sample. The complete list of these variables relating to the S's present behavior and environment is given in Table III. It is obvious from an inspection of this list that some variables overlap or duplicate others.

A total of 169 variables derived from the S's accounts of his past behavior and environment were then analyzed for consistent differentiation throughout the five matched pairs. Of these, only two were found to be significant at or beyond the .05 level of confidence.

TABLE III

SUMMARY OF THE SIGNIFICANT DIFFERENCES BETWEEN DUODENAL ULCER PATIENTS AND CONTROLS IN PRESENT BEHAVIOR AND ENVIRONMENT BY THE BINOMIAL EXPANSION ( $P_b$ ) AND THE FISHER-YATES EXACT TEST ( $P_f$ )

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Variables significant at or beyond the .05 level of confidence

1. Five of five ulcer patients report some difficulty sleeping vs. none of five controls ( $P_f = .004$ ).
2. Five of five ulcer patients are unemployed or losing time from work vs. one of five controls ( $P_f = .024$ ).
3. Five of five ulcer patients live in rural areas vs. one of five controls ( $P_f = .024$ ).
4. Four of five ulcer patients report nausea, vomiting or digestive difficulty vs. none of five controls ( $P_f = .024$ ).
5. Four of five ulcer patients estimate their health, exclusive of their primary symptoms, to be poor or fair vs. none of five controls ( $P_f = .024$ ).
6. Four of five ulcer patients estimate themselves to be more nervous than the average person vs. none of five controls ( $P_f = .024$ ).
7. Five of five controls have a greater possible income from their work than the ulcer patients ( $P_b = .031$ ).
8. Five of five controls earned more money from their work last year than the ulcer patients ( $P_b = .031$ ).
9. Five of five ulcer patients report more psychiatric symptoms than the controls ( $P_b = .031$ ).

Variables significant between the .05 and .10 levels of confidence

1. In four of four pairs (one ulcer patient was separated from his wife) the ulcer patients report less frequent intercourse with their wives than the controls ( $P_b = .062$ ).
-

TABLE III (continued)

SUMMARY OF THE SIGNIFICANT DIFFERENCES BETWEEN DUODENAL ULCER PATIENTS AND CONTROLS IN PRESENT BEHAVIOR AND ENVIRONMENT BY THE BINOMIAL EXPANSION ( $P_b$ ) AND THE FISHER-YATES EXACT TEST ( $P_f$ )

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2. In four of four pairs (one ulcer patient did not own a car) the ulcer patients have newer model cars than the controls ( $P_b = .062$ ).
  3. Three of five ulcer patients take naps during the day vs. none of five controls ( $P_f = .083$ ).
  4. Three of five ulcer patients regularly help their wives with her chores, none of five controls ( $P_f = .083$ ).
  5. Five of five ulcer patients do not specify the number of their friends except as "many" or "everybody" vs. two of five controls ( $P_f = .083$ ).

Variables significant between the .10 and .20 levels of confidence

1. Four of five ulcer patients report difficulty with elimination vs. one of five controls ( $P_f = .123$ ).
  2. In four of five pairs the ulcer patients receive income from sources other than their work ( $P_b = .188$ ).
  3. In four of five pairs the ulcer patients have more debts (time payments) per month than the controls ( $P_b = .188$ ).
  4. In four of five pairs the ulcer patients have less net income (gross income minus debts) than the controls ( $P_b = .188$ ).
  5. In four of five pairs the ulcer patients eat between meals more frequently than the controls ( $P_b = .188$ ).
  6. In four of five pairs the ulcer patients engage in less total sexual activity than the controls ( $P_b = .188$ ).
  7. In four of five pairs the ulcer patients report more frequent social contact with others than the controls ( $P_b = .188$ ).
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Another six variables were found to be significant between the .05 and .10 levels, while seven variables fell between the .10 and .20 levels of confidence. Since 169 variables in all were tested, the eight found to be significant at or beyond the .10 level could have occurred by chance and must be regarded with caution. These variables relating to past behavior and environment are presented in Table IV. The complete data elicited by the Behavioral Scales are given in Appendix C.

## Part B

### Deprivation

Scores obtained on the Deprivation Scale by the five matched pairs are given in Table V. The highest possible score on the scale is sixteen. The higher the score, the greater the degree of deprivation experienced by the individual in his current environment. By inspection it is clear that there is no overlap between these two distributions, the duodenal ulcer patients receiving the higher scores in each pair. Applying the t-test to this data yields a probability of .005, and a permutation analysis yields a P-value of .004.

An analysis of the individual items in the scale reveals that the following items discriminate between the duodenal ulcer patients and the controls at the indicated levels of significance by the Fisher-Yates Exact Test. The complete analysis of the scale is presented in Appendix D.

1. Employment: The ulcer patients were more frequently unemployed or employed less than half the time ( $P = .083$ ).



TABLE IV

SUMMARY OF THE SIGNIFICANT DIFFERENCES BETWEEN DUODENAL ULCER PATIENTS AND CONTROLS IN PAST BEHAVIOR AND ENVIRONMENT BY THE BINOMIAL EXPANSION ( $P_b$ ) AND THE FISHER-YATES EXACT TEST ( $P_f$ )

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Variables significant at or beyond the .05 level of confidence

1. Four out of five controls moved from a rural area to an urban area since childhood vs. none of five ulcer patients ( $P_f = .024$ ).
2. In five of five pairs, the ulcer patients left home to work regularly at earlier ages than the controls ( $P_b = .031$ ).

Variables significant between the .05 and .10 levels of confidence

1. Three of five ulcer patients estimate their parents' financial condition to have been relatively poor vs. none of five controls ( $P_f = .083$ ).
2. Three of five controls claim to know their weight at birth vs. none of five ulcer patients ( $P_f = .083$ ).
3. Two of five ulcer patients worked with their fathers as children vs. five of five controls ( $P_f = .083$ ).
4. Drinking by the father was reported by two of five ulcer patients vs. five of five controls ( $P_f = .083$ ).
5. Three of five ulcer patients have been arrested for drunkenness vs. none of five controls ( $P_f = .083$ ).
6. Two of five fathers of the ulcer patients were farmers during the SS' childhood vs. five of five fathers of the controls ( $P_f = .083$ ).

Variables significant between the .10 and .20 levels of confidence

1. Four of five ulcer patients have a history of working twelve or more hours a day vs. one of five controls ( $P_f = .123$ ).
  2. Four of five ulcer patients admit masturbation during childhood vs. one of five controls ( $P_f = .123$ ).
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TABLE IV (continued)

SUMMARY OF THE SIGNIFICANT DIFFERENCES BETWEEN DUODENAL ULCER PATIENTS AND CONTROLS IN PAST BEHAVIOR AND ENVIRONMENT BY THE BINOMIAL EXPANSION ( $P_b$ ) AND THE FISHER-YATES EXACT TEST ( $P_f$ )

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3. Four of five controls spent time overseas in the service vs. one of five ulcer patients ( $P_f = .123$ ).
  4. Four of five ulcer patients received a medical discharge from the service vs. one of five controls ( $P_f = .123$ ).
  5. In four of five pairs the controls report more details of their birth and early infancy than the ulcer patients ( $P_b = .188$ ).
  6. In four of five pairs the ulcer patients started smoking at an earlier age than the controls ( $P_b = .188$ ).
  7. In four of five pairs the ulcer patients had shorter courtships with their present wives than the controls ( $P_b = .188$ ).
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TABLE V

## SCORES ON THE PASCAL-JENKINS DEPRIVATION SCALE

	<u>Ulcer Patient</u>	<u>Control Patient</u>
Pair #1	7	3
Pair #2	8	2
Pair #3	8	5
Pair #4	10	3
Pair #5	7	3
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Median	8	3
Mean	8.0	3.2

2. Income: Five out of five ulcer patients had an annual income from their work of less than \$2500, compared with none of the controls ( $P = .004$ ).
4. Fear: The ulcer patients express more behavior indicative of anxiety and/or depression than the controls ( $P = .024$ ).
13. Job status: Although this variable was statistically significant, the item is scored when S is completely unemployed, and thus overlaps with the first item. It cannot be taken to indicate dissatisfaction with job status per se.

#### Attitudes and Expectancies

The questionnaire constructed for this study covers ten areas for each S in which hypotheses were to be made about the S's learned attitudes and expectancies. Since there were five pairs of Ss used in this study, E and the other judge were required to develop a minimum of 100 constructs in all. The actual number of constructs is greater than 100, since more than one attitude, for example, could be postulated in any area. In only 18 of the 100 or more construct areas was there complete disagreement between E and the other judge. Lack of agreement was more frequent in making judgements about the controls, due largely to the fact that for one control no agreement was reached in any of the ten construct areas measured.

In addition, there were a larger number of instances where either E or the other judge derived a construct that the other did not. In order to keep the work independent, these constructs were discarded even though agreement was reached between E and the judge

on reinspection of the data.

Those hypothetical constructs on which there was agreement between E and the other judge, working independently, are listed for each S in Appendix D. Of these, none discriminated consistently between the ulcer patients and the controls throughout the five matched pairs at or beyond the .10 level of confidence. Consistency among the ulcer patients was found in five out of five cases on two constructs, however, a datum which is significant at the .03 level of confidence by the Binomial Expansion. It was independently hypothesized by both E and the other judge that all five ulcer patients should have learned to perceive mother as non-succorant and to expect little or no succorant attention from her or possibly, by generalization, from females in general. In other words, they should have learned to expect to be deprived of succorance from mother. Secondly, it was hypothesized that all five ulcer patients should have learned to perceive themselves as inadequate and to expect to fail in some important aspect of the masculine role—to be deprived of status, in other words. No consistent attitudes or expectancies were developed in regards to father, siblings or the general environment.

## CHAPTER IV

### DISCUSSION

#### Discussion of the Results of Part A

Fourteen variables relating to the S's pre-hospitalization behavior were found to discriminate consistently between the duodenal ulcer patients and the controls at or beyond the .10 level of confidence. By inspection of Table III, however, it will be seen that there is some overlap between these variables. Furthermore, it is obvious that some of these variables cannot be considered independent covariants of the duodenal ulcer, particularly those variables which pertain to the S's physical condition. The item "reports nausea, vomiting or digestive difficulty" is a case in point. This behavior is a symptom of the ulcer itself, not an independent covariant of it; without the ulcer this behavior probably would not occur. On the other hand, rural or urban residence, for example, would seem to be independent of the ulcer symptoms.

Similarly, though perhaps not quite so obviously, those items relating to the S's pre-hospitalization work behavior may be largely dependent on the presence of the ulcer itself. The ulcer patients in this study are differentiated from the controls by being unemployed or losing time from work, thus decreasing their net annual income, often causing them to have to take lower-paying jobs, increasing their debts, and so forth. The ulcer patients themselves attribute their inability

to work to their ulcer symptoms. Previous work in the research program has suggested, however, that this behavior is not characteristic of the medical and surgical successes, whose work behavior is usually not affected to such a degree. This difference might seem reasonable if it could be demonstrated that the intractable patients used in this study experience more severe symptoms than the medical or surgical successes. However, the medical difference between the intractable and successfully-treated patients seems to be a matter of chronicity rather than severity. Further investigation is needed to determine if the deviant work behavior of the intractable patients is entirely justified by the severity of their symptoms, or if this behavior reflects a differential response to the same symptoms experienced by the medical and surgical successes. Research has indicated that the greater the degree of anxiety, the greater the tendency to over-react to painful stimuli (14). Thus it may be that the intractable patients, who show more symptoms of anxiety than the medical or surgical successes, are over-reacting to the same ulcer symptoms experienced by the successes. Secondly, the expectation of failure in the masculine role, a construct hypothesized in Part B of this study, and the consequent attempts of some patients to overcompensate via their work, may result in greater willingness not to work when a socially acceptable excuse occurs. This hypothesis would seem to be in agreement with that of Alexander (2).

It is also problematical whether the finding that the ulcer patients in this study report less frequent intercourse with their wives than do the controls is an independent covariant of duodenal

ulcer. The intractable patients attribute their decrease in sexual relations to the ulcer symptoms, but here again this behavior does not hold true for the medical and surgical successes. It may be that this decrease is more a function of marital difficulties than of the duodenal ulcer (26). Since these problems cannot be resolved in the present study because data are not available regarding severity of symptoms, the variables pertaining to work and sexual behavior will not be considered independent covariants of duodenal ulcer in general, recognizing, however, that they may be covariants of intractable ulcer symptoms.

After discarding those variables which, on an a priori basis, appear to be dependent on the presence of the ulcer itself rather than independent covariants of it, and combining overlapping variables, the following remain to be considered as possible covariants of duodenal ulcer. Since this was a small-sample study, these are not to be considered normative data and must be interpreted with caution.

1. Significantly more ulcer patients than controls live in rural areas (defined according to the 1950 Georgia census report). All 10 SS were born in rural areas. The ulcer patients in this study have continued to live in rural areas, while all but one of the controls had moved to an urban area by the time of hospitalization. A tendency, not statistically significant, for the medical successes to live in urban areas was found in Phase I of the research program. Assuming that duodenal ulcer can be considered

a behavioral deviation, these results might be taken to suggest that being born and continuing to live in a rural area is a basic covariant of deviant behavior for this target population. Some support for this conclusion may be found in research currently being done with neuropsychiatric patients by Dr. William Morris of the V. A. Hospital, Salisbury, N. C. His data indicate that being born and raised in a rural area is negatively correlated with being discharged from the hospital.<sup>3</sup>

2. The ulcer patients in this study estimate themselves to be more nervous than the average person, in contrast to the controls, and report more symptoms indicative of anxiety, such as tension, tremulousness, irritability, and so on. This finding would seem to be in agreement with the generally accepted notion that ulcer patients show more psychiatric disturbance than normals. That these patients had all undergone surgery may have had some bearing on their emotional equilibrium. Research has been done which indicates that, following surgery, the ulcer patients experience an increase in anxiety and other psychosomatic symptoms (4).
3. Four out of five ulcer patients in this study estimate their health, exclusive of the ulcer and its symptoms, to be only fair or poor, in contrast to the controls, who uniformly describe their health as good. The complaints most frequently mentioned were headaches and shortness of breath or "smothering spells."

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<sup>3</sup>Personal communication from Dr. William E. Morris, 10/2/58.



Asthma, various muscular aches and pains, and vague references to heart trouble were also elicited. This variable also was found to differentiate between the medical successes and medical failures in Phase I of the research program. It is thought that these physical complaints are not direct manifestations of the duodenal ulcer but, rather, are symptomatic of anxiety and/or somatic preoccupation.

4. The ulcer patients have newer model cars than the controls in four out of four pairs (one ulcer patient did not own a car). At first glance it might seem that this variable does not make good psychological sense, but it should be considered within the financial context of these patients. The ulcer patients have less income than the controls in all five pairs, and they have more debts (monthly time payments). None of them, moreover, had been able to work full time prior to hospitalization. In this context, then, having newer model cars would seem to be something of an extravagance, and suggests that this behavior might be considered as a compensatory mechanism.
5. The ulcer patients report they help their wives with her chores more often than the controls. The implications of this finding are not completely clear, but perhaps this behavior is what might be expected of the passive, femininely-identified type of ulcer patient described by other authors (15, 27).
6. The ulcer patients tend not to specify the number of their close friends, saying only that "everybody" is their friend or that

they have "many" friends. Attempts to get them to be more specific usually met with little success. In contrast, the controls usually specified how many close friends they had. The frequency with which the ulcer patients claim to visit other people is slightly higher than that for the controls ( $P = .188$ ).

In addition to the above, eight variables pertaining to past behavior and environment were found which discriminated consistently between the ulcer patients and the controls at or beyond the .10 level of confidence. After combining overlapping variables, the following remain to be tested out in future research as possible covariants of duodenal ulcer.

1. Significantly more controls than ulcer patients claim to know their weight at birth. There was a general, though statistically insignificant, tendency for the controls to be more conversant with the details of their birth and early infancy. It seems logical to suppose they must have learned these facts from the mother or some other close relative. Whether the ulcer patients were not told these facts is not known, but their lack of knowledge might suggest that these patients were less "close" to their mothers or families, which would be in agreement with the tentative hypothesis that the ulcer patients should have learned to perceive their mothers as non-succorant.
2. The ulcer patients more frequently estimated that the financial condition of their family during their childhood was poorer than the average for that section of the state in which they were

raised. In this respect, the ulcer patients might be said to have been more deprived than the controls.

3. Possibly related to the preceding variable is the finding that the ulcer patients left home to seek regular employment at earlier ages than the controls (a median of 15 years of age for the ulcer patients, 18 years for the controls). The reason most frequently given was the family's financial circumstances.
4. The fathers of the controls were more frequently farmers than the fathers of the ulcer patients, and as a result the controls claim more time spent working with their fathers during childhood than the ulcer patients. (No differences in the amount of leisure time shared together were found.) Although mere physical proximity such as this does not necessarily insure a good relationship between the controls and their fathers, the controls at least had more opportunity to receive succorance from father than did the ulcer patients.
5. Drinking by the father was more frequently admitted by the controls than by the ulcer patients. The significance of this finding is not clear.
6. More ulcer patients have a history of arrest(s) for drinking than the controls. To the extent that this variable reflects deviant behavior, the ulcer patients may be considered as demonstrating more psychological deficit than the controls.

As noted previously, the above six variables relating to past behavior and environment should be interpreted with caution. Since

a total of 196 such variables in all were examined, these six could well have occurred by chance. In general, few discrete behavioral variables were found which consistently differentiated between the duodenal ulcer patients and their matched controls. With the exception of the fact that five of these patients had an ulcer and five did not, striking differences between the two groups are the exception rather than the rule. More extensive or intensive data might well have produced greater differentiation, but it should be noted that, despite the attempts to pull the two groups apart by selecting the most intractable ulcer patients and the most "normal" controls, definite similarities between the two groups do exist. All Ss live in the same geographical and, supposedly, cultural area (north Georgia), and all were raised in rural environments. They were all patients in a V. A. Hospital, which frequently means that their financial resources are limited since they must plead indigence to obtain admission if they are not service-connected for their illness (except as an emergency). Ideally the controls should have been selected from a non-VA population. (By the same token it should be noted that this is a very "narrow" sample of ulcer patients culturally and economically, which places some limits on the generality of these results. The classic ulcer type, the successful businessman or politician, is not found in this sample.) Further speculations regarding the relative lack of significant findings at the level of discrete behavioral variables are reported in the discussion of the results of Part B.

### Discussion of the Results of Part B

No significant differences between the duodenal ulcer patients and their matched controls were obtained among the attitudes and expectancies investigated in this study. However, consistency among the ulcer patients themselves was found on two constructs in five out of five cases, which is significant at the .03 level of confidence by the Binomial Expansion. Both E and the other judge independently hypothesized from the early environmental stimuli reported by each ulcer patient that they should have developed feelings of inadequacy and, consequently, to expect failure in some aspect of the masculine role. Secondly, it was hypothesized that these ulcer patients should have learned to perceive mother as non-succorant, and to expect to receive little or no succorant attention from her or possibly, through generalization, from females in general.

By inference these constructs imply some degree of deprivation. Feelings of inadequacy in the masculine role would seem to be related to deprivation of the need for status. The conception of mother as non-succorant more obviously suggests deprivation of the need for succorance, which would seem to be in agreement with the theory that frustrated dependency needs are a basic covariant of duodenal ulcer. Alexander's theory is interpreted as suggesting that deprivation of the need for succorance should result in an increase in the strength of this need (2). Other things being equal, this might result in an increase in the frequency and intensity of dependent behavior, that is, behavior "designed" to elicit succorance

from others. However, the existence of the second construct, the feelings of inadequacy, must also be considered. It might be speculated that the greater the frequency of dependent behavior, the greater the likelihood that feelings of inadequacy will be thus "reinforced," since, by definition, dependent behavior is opposed to assertiveness and successful coping with the masculine role. If it can be assumed that feelings of inadequacy should produce anxiety, it would seem that the coexistence of these two constructs, feelings of inadequacy and deprivation of succorance, sets up a potential approach-avoidance conflict situation. The greater the frequency of dependent behavior, the less able is the individual to successfully fulfill the masculine role, and the greater his anxiety since his feelings of inadequacy are reinforced. This is a very speculative hypothesis, and much additional research is needed to determine its usefulness. This hypothesis would seem to be in close agreement with that put forth by Alexander, who states, "It was observed that the wish to remain in the dependent infantile situation--to be loved and cared for--was in conflict with the adult ego's pride and aspiration for independence, accomplishment, and self-sufficiency. These two conflicting tendencies reinforce each other in a characteristic way (2, p. 102)." It is not meant to be implied, however, that the hypothesized conflict situation developed from this study is typical of all ulcer patients.

Both of the constructs described above might be called deficit-positive habits, following Pascal (18). That is to say, they would,

by themselves, produce deviant behavior, such as overly frequent dependent behavior. Defensive habits may be learned to reduce this potential psychological deficit. With regard to the duodenal ulcer patient, Alexander has suggested that one characteristic defensive habit involves a denial or repression of dependency needs and a conscious striving for independence, activity and success. As other authors have indicated, however, this may not be the only solution attempted by the duodenal ulcer patient, nor even the most frequent one.

From the author's subjective analysis of the data obtained in this research, it would appear that different patients have attempted different defensive habits at different periods of life, or have attempted more than one type of defensive habit at the same time. An example may help to clarify this point. Feelings of inadequacy were hypothesized for one ulcer patient on the basis of data such as the following. The veteran stated that he had always been the "runt" of the family. His seven brothers and his father all are larger than he by as much as 11 inches and 120 pounds. From an early age the veteran was supposed to work with his father and brothers on their farm. Since they were physically larger and stronger than he, it might be assumed that he was at a definite disadvantage in this type of work, and may well have learned to feel inadequate as regards competing successfully in the masculine role. He candidly admitted that he is not the man his father was, and eulogizes his father's ability to work hard for long hours. When asked who he would most

like to be if he could be someone else, the veteran replied that he would like most to be his older brother, who is 6'8" tall and weighs 280 pounds (the veteran is 5'9" tall and weighs 165 pounds).

Feelings of inadequacy were also derived from the fact that, in the relations between his father and mother, the mother was judged to have been perceived by the veteran as the more dominant of the two by both E and the other judge. The veteran claimed, for example, that the father never expressed hostility towards the mother. The mother was judged to have been perceived as more strict and more stable than the father. If females are perceived as more dominant than males, the veteran, being a male, may learn to perceive himself as relatively inferior and inadequate.

The perception of mother as being non-succorant was judged to have been learned by this veteran in the light of data such as the following. There were 17 children in the family, which in itself would seem to preclude much individual attention. With the task of raising such a large family and the work required to run the farm, the veteran stated his mother had little or no time for play with the children. It could not be established that she regularly spent any leisure time with the children, although the veteran claimed that the father spent an hour or more each day playing with them. The mother was also perceived to be the more strict of the two. Lastly, there was a division of responsibility and labor within the family, by which the boys were supposed to work with the father, while the girls were the mother's property. Thus the veteran learned to feel that



the mother was, in his own words, more "partial" to his sisters.

Having derived these tentative hypothetical constructs, feelings of inadequacy and the perception of mother as non-succorant, it is suggested that the following behaviors "make sense" when interpreted as defensive habits (responses) which were learned to reduce deprivation of succorance and status. For example, it is interesting to note that the veteran reported he spent a great deal of time doing the household chores when he was a boy, rather than working in the fields with his father and brothers. He boasted that by the time he was twelve years old he could make a cake or pie as well or better than his mother. This behavior is viewed as (1) relieving him of competing with his brothers in more masculine activity, at which he expects to fail, (2) offering him some compensatory status for his ability as a cook, and (3) bringing him in more frequent contact with his mother, so that he at least would have more opportunity to obtain succorance if it were available.

In later life it would appear that the veteran learned and tried a number of other defensive habits. He gives a history of having premarital and extramarital sexual relations as often as once a night. At one point in his life he was holding down two different jobs at once, working sixteen hours a day. Though having only a ninth grade education, he attempted to study veterinary medicine on his own to become something of a "lay" veterinarian. In each case, it is suggested that the behaviors above can be regarded as compensatory defensive habits which have been learned in reaction to the

underlying deficit-positive attitudes, the anticipated deprivation of status and succorance needs. The veteran's behavior is somewhat reminiscent of that attributed to the ulcer stereotype, the ambitious businessman or politician who seeks to deny his dependency needs (and his inadequacy?) by striving for success and independence. The only difference is that the veteran is operating at a lower socio-economic level.

The development of a duodenal ulcer, or perhaps it might be better said the maintenance of a duodenal ulcer, might also be interpreted as a defensive habit. Thus, as research (4) has shown, anxiety is increased when this defense, the ulcer, is surgically removed. In the case of the veteran cited above, the ulcer would seem to serve the "purpose" of (1) relieving him of the necessity of competing in the masculine role, which is strenuous for him because of his need to compensate for feelings of inadequacy, and (2) affording him some gratification of his dependency needs through hospital care, the possible attentions of family and friends, and so on. More simply stated, the ulcer might be considered a socially acceptable means of "saving face." In the process, however, the original conflict, as hypothesized here, is reintegrated. The more dependent the veteran becomes--through hospitalization, inability to work regularly, dependence on the wife for financial support, and so on--the greater the likelihood that he will feel more inadequate.

To reduce the additional psychological deficit resulting from hospitalization, the defensive habits must be further taxed. It is

hypothesized, however, that the duodenal ulcer itself may limit the range of defensive habits which can potentially be used by the ulcer patient. In the case cited above, it became impossible for the veteran to overcompensate by working sixteen hours a day, because this exacerbated his ulcer symptoms. Similarly, sexual overcompensation was denied him as the ulcer took its course. Thus the ulcer itself may come more and more to be the major defensive habit by a process of elimination. As this happens, it might be speculated that a vicious circle is established. The more dependent the individual becomes as a result of his ulcer, the more are feelings of inadequacy reinforced, and the more the defensive habits must be taxed to allay anxiety and reduce psychological deficit. But the ulcer itself gradually becomes the major defensive habit, and to rely on it further would put the individual in an even more dependent position, further reinforcing feelings of inadequacy, and so on. The result may be that the ulcer becomes intractable to either medical or surgical treatment.

The question then becomes: Why do some patients develop such intractable symptoms while others respond successfully to medical or surgical treatment? Previous work in this research program has suggested that environmental deprivation may be a basic parameter of response to surgery. From this it might be hypothesized that the greater the deprivation, the greater the probability of intractable symptoms. Stated in another way, it may be that the magnitude of the hypothesized feelings of inadequacy and dependency needs is

greater in patients who develop intractable symptoms than in those who respond successfully to medical or surgical treatment. However, it still remains to be demonstrated that these two constructs are applicable to the successfully treated patients as well as the intractable patients.

Another hypothesis, suggested by the present data, is that the intractability of the ulcer symptoms varies directly with (1) the effectiveness of the defensive habits other than the ulcer in reducing psychological deficit, and (2) the range of defensive habits available to the patient. It has been noted that one apparent characteristic of this sample of intractable patients is that they have all attempted different defensive habits at different periods of life, or have attempted to use more than one defensive habit at the same time. This might suggest that these patients have not met with satisfactory success in reducing psychological deficit by these defenses, thus trying one defensive habit after another. Why these defensive habits were unsuccessful may be related to the previous hypothesis that the magnitude of deprivation may be greater in these patients, which presumably would require more extensive defensive habits to maintain equilibrium. Another possibility is that these patients had fewer defensive habits in their repertoires to start with. In general they all came from rural areas, had only a grammar school education and worked at unskilled or semi-skilled jobs. Thus it might be more difficult for these patients to use intellectualization as a defense, for example, or to compensate for

inadequacy and dependency needs through the status of social position or the security of wealth and high-level jobs. These are areas of speculation which remain to be investigated in future research.

It should perhaps be stressed at this point that what have been postulated as overcompensatory defensive habits are not the only types of defensive habit described in the literature, nor the only type or class of defensive habit apparent among the patients in this sample, from a subjective point of view. In the example of the veteran cited previously, it was suggested that his behavior could have been described as an attempt at overcompensation by ambitiousness and success strivings at the time when he was trying to hold down two jobs at once, and so on. There was also a period in his life, however, when he drank to the extent that he was given the diagnosis of acute alcoholism with delirium tremens. This behavior would seem to resemble in part the description by Kapp and his coworkers of the individual who attempts to handle his dependency needs by socially unacceptable means (12). Similarly, a case could be made for describing some of the patients in this sample as passive, femininely-identified individuals, the third ulcer "type" mentioned by Kapp, Rosenbaum and Romano. If therefore, as is suggested, different ulcer patients may try different classes of defenses at different periods of life, the concept of personality "patterns" or ulcer "types" as used to describe a particular individual would seem to lose some value. Instead, the importance of the longitudinal approach in this area of research is emphasized.

The hypothesis that these ulcer patients have utilized different defensive habits at different times has at least one other important implication for future behavioral research in this area. It implies a decreased probability of finding consistent differences between ulcer patients and normal controls, or within the duodenal ulcer population itself, at the level of specific, behavioral descriptions. Different patients would show different behaviors with the type of defensive habit they were using at the time. This perhaps explains in part why so relatively few discrete variables were found which showed consistent and significant discrimination in Part A of this study. Similarity among the ulcer patients became more apparent at higher levels of conceptualization, such as the constructs of deprivation, attitudes and expectancies, and defensive habits. For example, it was consistently hypothesized that the ulcer patients in this sample should have learned to perceive mother as non-succorant. The specific behaviors of the mothers from which this construct was derived, however, are not necessarily the same in each case. The mother may have been absent much of the time, she may have been sick, she may not have had time to show attention, and so on.

It would seem to follow that significant differences between duodenal ulcer patients and "normal" controls will also become more apparent when discrete behaviors are grouped into classes or other abstract categories. That significant differences at this level could not be demonstrated in the present study was thought to have been due in part to the fact that the method of analysis used in

Part B was actually conceived after the data had been collected, when it began to appear that relatively few significant differences were going to be found at the level of concrete behavior. As a result, sufficient data were lacking in many instances to enable E and the other judge to make reliable estimates of the magnitude of the attitude or expectancy being investigated. For the most part, only presence or absence of a given construct could be judged, which proved to be not sufficiently discriminating. This is perhaps one of the liabilities of the "shotgun technique" used in this study: it attempts to measure as many different areas of behavior as possible, and the amount of information which can be obtained in any one area is often too limited by practical consideration of time. Future research in this area may be able to focus more of its attention on the problem areas hypothesized from this study, particularly early childhood experiences. With a greater amount of data in this area, the strength or magnitude of a given construct may be judged.

Knowledge of the magnitude of the attitudes and expectancies evaluated in this study might also have made possible judgements about the degree to which these attitudes are generalized. Previous research has suggested that the greater the amount of deprivation, the greater the degree of generalization (10). However, it cannot be reliably judged from the data available in this study whether, for example, the perception of mother as non-succorant generalizes to other female authority figures or to females as a whole because the strength of this attitude is not known.



The method of analysis used in Part B of this study could be refined by making the questionnaire used to determine attitudes and expectancies less open-ended. A rating scale would have been more appropriate, and would have eliminated the difficulty of reconciling differences in terminology between judges, by providing a more specific framework from which to make judgements. Secondly, it often happened that one judge failed to derive a construct where the other did, but agreed he should have done so when it was pointed out to him. With the restriction of keeping the work independent, this construct had to be thrown out. A comprehensive rating scale would also have handled this event. Such a scale is presently being developed by Pascal and Jenkins, with the hope that it will be applicable to all classes of deviant behavior (21).

In summary, the following are some very tentative hypotheses and speculations suggested by the results of this study, and by previous work in the ulcer research program, which are offered as possible subjects for future research.

1. The results obtained thus far in the research program suggest that a systematic, behaviorally-oriented approach is feasible in the study of duodenal ulcer, and that such an approach lends itself well to communication between researchers because of its emphasis on specific, first-order behavioral variables.
2. Significant differences within the ulcer population, or between the ulcer and the "normal" population, may be more apparent at



the level of second-order variables, such as the constructs of deprivation, attitudes and expectancies, defensive habits, and so on. The behaviorally-oriented approach helps make more public the steps involved in deriving these constructs.

3. Two hypothetical constructs were consistently developed for the ulcer patients in the study: feelings of inadequacy and the expectation of obtaining little or no succorant attention from the mother. These two constructs were thought to imply deprivation of status and succorance or dependency needs, respectively.
4. It is speculated that these two constructs may give rise to an approach-avoidance conflict situation, since attempts to obtain gratification of dependency (succorance) needs may deprive the individual of status, thus reintegrating or reinforcing feelings of inadequacy and arousing anxiety.
5. To reduce the potential psychological deficit generated by the deprivation of succorance and status needs, various defensive habits may be learned, which in some cases may attempt to deny dependency needs and compensate for inadequacy feelings.
6. Different defensive habits may be attempted at different periods of life, depending on the amount of deprivation, the success of the defensive habits in reducing psychological deficit, and the range of defensive habits available to the individual.
7. The development of a duodenal ulcer may restrict the range of the

defensive habits available to the individual by producing physical debilitation.

8. The ulcer itself may come to serve the same function as a defensive habit, in that it affords the individual a socially accepted means of obtaining gratification of his dependency needs. At the same time, however, this may reinforce feelings of inadequacy by the very fact that he now is dependent, further taxing the defensive habits, of which the ulcer may become prepotent.
9. In certain cases, possibly depending on the amount of deprivation and the range and success of available defensive habits, intractable symptoms may develop. The ulcer reinforces feelings of inadequacy by preventing the individual from successfully coping with the masculine role, thus generating anxiety and requiring further defensive measures, of which the ulcer is now prepotent, further reinforcing inadequacy feelings, and so on.

## CHAPTER V

### SUMMARY

This study represents part of a larger research program with duodenal ulcer patients carried out at the Veterans Administration Hospital in Atlanta, Georgia. The purpose of the study was to investigate behavioral and environmental differences between duodenal ulcer patients and matched controls, and to derive tentative hypotheses regarding the relationship of these variables to the presence or absence of duodenal ulcer. Five hospitalized ulcer patients with histories of medical and surgical intractability and five hospitalized veterans without ulcer, matched by pairs on age and education, served as Ss. In view of the confusion existing in this area of research, this study attempted to stay as close as possible to a systematic, behaviorally-oriented approach, using a behavior rating scale devised by Pascal and Jenkins.

A total of 263 variables relating to past or present behavior and environment were examined for consistent differentiation between ulcer patients and controls throughout the five matched pairs. Of these discrete behavioral variables, 22 were found to be significant at or beyond the .10 level of confidence, some of which overlapped others and some of which were of questionable validity, so that caution is advised in drawing inferences about their relationship to duodenal ulcer. However, scores on a Deprivation Scale constructed by Pascal and Jenkins from earlier work in the research program gave

non-overlapping distributions, with the ulcer patients obtaining the higher scores. This finding is significant at the .005 level of confidence by the t-test, and is interpreted as suggesting that the ulcer patients in this sample are experiencing more deprivation in their current environments than the controls.

An attempt was made by E and another judge to derive learned attitudes and expectancies from the data pertaining to the Ss' early childhood environments. No significant differences between the ulcer patients and their controls were found, but consistency among the ulcer patients themselves was found on two such constructs, a datum which is significant at the .03 level by the Binomial Expansion. It has been hypothesized that the ulcer patients in this sample should have learned feelings of inadequacy and to expect to fail in some aspect of the masculine role. Secondly, it has been hypothesized that the ulcer patients should have learned to perceive mother as non-succorant, and to expect to obtain little or no gratification of succorance or dependency needs from her. The relationship of these findings to other research literature was discussed, and several very tentative hypotheses were offered as possible subjects for further research. Suggestions for refining the methods of collecting and analysing the data were also made.

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## APPENDICES

## APPENDIX A

## PRESCRIPTIVE SCALE FOR DUODENAL ULCER

G. R. Pascal and W. O. Jenkins

University of Tennessee

TO THE EXAMINER: This scale has been constructed as a result of research on the psychological factors related to duodenal ulcer. Man has needs which have to do with feeling safe and secure in his environment. Satisfaction of these needs is deemed important for a sense of well-being. The scale is an attempt to assess the extent to which these needs are being met in the environment.

The scale is to be used in conjunction with an interview of the subject concerning his current status. The examiner's task is to obtain sufficient information from the patient to rate with confidence. In each case, specific instances of behavior should be obtained as a basis for judgement. Do not confuse the subject's opinion with your rating of his actual behavior. For instance, in rating Item 5, "wife", do not accept the subject's statements at face value but, rather, inquire concerning time and activities together, displays of affection or other behaviors indicative of love or lack of it from the wife. It is from these behaviors that your rating is made.

The scale is a two-point, forced-choice, the subject being judged either poor or good on each item. If the judgement is poor, the score is one (1). If the judgement is good, the score is zero (0). A high score on the total scale is indicative of a poor prognosis. For each item, in the space provided write in either a zero (0) or one (1).

- \_\_\_\_\_ 1. Employment. Give a rating of poor (1) if the subject is unemployed or employed less than half time.
- \_\_\_\_\_ 2. Income. Give a rating of poor (1) if the subject's annual income is less than \$2500.00.
- \_\_\_\_\_ 3. Debts. Give a rating of poor (1) if the subject complains of a number of unpaid debts which he is unable to meet.
- \_\_\_\_\_ 4. Fear. Give a rating of poor (1) if the subject expresses anxiety about his job, apprehension about himself and his capacity to meet the demands of his environment, nervousness and irritability in social situations, withdrawal symptoms, or other behaviors indicative of anxiety and depression.

- \_\_\_\_\_ 5. Wife. Give a rating of poor (1) if the wife behaves in such a manner as to imply a general disinterest and lack of affection for the subject. This attitude of the wife can be inferred from specific pieces of behavior, such as meal preparation, inability of the subject to talk to her about his illness, lack of concrete evidences of affections, such as kissing, sexual relations at least once a week, etc. Give a rating of poor (1) if the subject is adult, unmarried or divorced or separated, and gives no evidence of succorant relationships with contemporary females.
- \_\_\_\_\_ 6. Parents. Give a rating of poor (1) if the subject's relationship with mother and/or father (or parental surrogates) is such as to imply a lack of affection and interest on his or her part. This item can be judged by frequency of visits, ability to communicate with them, concern for him, etc. If the subject has a close relationship with either parent and no strong negative feelings towards the other, score the item zero (0). Give a rating of poor (1) if the subject is still grieving about the recent death of a parent to whom he was closely attached.
- \_\_\_\_\_ 7. Children. Give a rating of poor (1) if the subject expresses little interest in his children; if he gives indications of not being especially loved by them or important to them. This item can be judged by the amount of time spent with them, nature of activities together, displays of affection and concern by the subject for the children's welfare. If there are no children, do not score this item.
- \_\_\_\_\_ 8. Other Relatives. Give a rating of poor (1) if the subject expresses a strong negative relationship with any sibling. If the subject has a close relationship with one sibling and no strong negative feelings towards others, rate the item zero (0). If the subject has no siblings or is neutral towards his siblings and has strong, warm relationships with in-laws or close cousins, rate the item zero (0). This item can be judged by the behaviors specified in Item 6.
- \_\_\_\_\_ 9. Church. Give a rating of poor (1) if the subject attends church (or Sunday school) less than once a month.
- \_\_\_\_\_ 10. Other Organizations. Give a rating of poor (1) if the subject does not belong to any clubs, church groups, or other organizations, or if the subject belongs but does not attend meetings except very infrequently, or implies a lack of interest or feeling of being an intimate member of the group. This item can be judged by frequency of attendance, time spent in organizational activities, expressed feeling of identification with the goals and purposes of the organization, etc.

- \_\_\_\_ 11. Friends. Give a rating of poor (1) if the subject is essentially an isolate, if he has no intimate friends outside his family, if he has no one outside his family who he feels is concerned about him, etc. This item can be judged from such behaviors as time spent and nature of activities with a person or persons outside his family, expressed feelings of being an object of affection and concern by a peer outside his family, expressed feelings that there are persons (or a person) outside his family with whom he can communicate, and in whom he has confidence.
- \_\_\_\_ 12. Job Participation. Give a rating of poor (1) if the subject shows little interest in his job other than as a means to earn a living. This item can be judged by such behaviors as lack of any time spent on the job other than that absolutely required, failure to spend any time in preparation for advancement, lack of identification with the organization and its problems, expressed negative feelings towards the organization, its personnel and working conditions, etc. If the subject is completely unemployed, give a rating of poor (1).
- \_\_\_\_ 13. Job Status. Give a rating of poor (1) if the subject feels his position is lowly in relation to his peers, if he has no pride in his work and feels unnecessary on his job. Do not confuse this item with Item 12. The item can be judged by expressed satisfaction with job performance, expressed feelings of competency and importance to job accomplishment, etc. If the subject is completely unemployed, give a rating of poor (1).
- \_\_\_\_ 14. Status - Other. Give a rating of poor (1) if the subject has no status outside of church, job and organizations. This item can be judged by the subject's sense of pride in almost any activity, such as being an expert or having pride in knowledge of hunting and fishing, pride in being a useful member of a softball team, extensive knowledge of sports, pride in a stamp collection, etc.
- \_\_\_\_ 15. Residence. Give a rating of poor (1) if the subject has no pride in his house, grounds or neighborhood, if he feels he is living "on the wrong side of the tracks" relative to his peers, etc. This item can be judged by time spent in taking care of the house, interior decorating, maintenance and development of grounds, expressed satisfaction with his neighbors, etc.
- \_\_\_\_ 16. Education. Give a rating of poor (1) if the subject has less than an eighth grade education.

CRANES & CRIST

APPENDIX B

CRANES & CRIST

## PASCAL - JENKINS BEHAVIORAL SCALES

University of Tennessee

## Scale A - Cross-sectional Behavior

(To the Examiner. You must constantly be on guard lest you substitute second-order variables such as "hostility", "passive", etc., for actual behavior descriptions in obtaining this estimate of the dependent variable. You must constantly ask for critical incidents of behavior from which to assess the subject's responses to environmental stimuli. Bear in mind that each response should be scaled along a continuum, dichotomized or counted. Although you usually will, and should, obtain information about the independent variables of Scale B when you inquire concerning Scale A, you should not be misled and accept these in lieu of the behavior, the reactions to environmental stimuli, which constitute this scale.)

1.0 Occupational Behavior

- 1.1 Descriptions of duties
- 1.2 Number of hours per week
- 1.3 Number of hours per week beyond job requirements
- 1.4 Income - starting, present
- 1.5 Efficiency (get critical incidents)
- 1.6 Secondary occupations or part-time jobs (use same code)

2.0 Present Home Environment - place of residence, size of home, number in family, conveniences, income, savings, debts, etc.3.0 Physical Behavior

- 3.1 Sleep - number of hours; deep, light or average; disturbed or undisturbed; dreams - amount, frequency, nature of; naps - amount, frequency, conditions of; sleeping aids; active or sluggish on awakening

- 3.2 Cleanliness - baths per week; care of teeth; hand washings; clothing care; room tidiness
- 3.3 Eating - amount and type of foods; frequency and conditions (social or otherwise); speed
- 3.4 Elimination - frequency; disturbed or undisturbed; regularity; conditions
- 3.5 Drinking - amount; type; frequency (alcohol, coffee, tea, etc.)
- 3.6 Smoking - type; frequency
- 3.7 Sex - frequency; type; conditions; with whom
- 3.8 Physical health - number of illnesses; type; frequency of visits to doctors; medication
- 3.9 Mental health - number of complaints; type; conditions
- 3.10 Exercise - type; frequency; amount; conditions

#### 4.0 Non-occupational Activities

- 4.1 Hobbies - types; amount of time with; conditions (alone or social)
- 4.2 Sports - types; conditions; observer or participant
- 4.3 Other - (reading, television, hiking, movies, etc.) amount of time; conditions
- 4.4 Household chores - type; time; conditions
- 4.5 Church - times per month; activities
- 4.6 Driving habits - type of car; average speed; arrests, etc.

#### 5.0 Interpersonal - Family

- 5.1 Mother - status of mother; hours per week with her in companionship activity; nature of activities
- 5.2 Father - (same as with mother)
- 5.3 Sibs -       "       "       "       "



5.4 Wife - (same as with mother)

5.5 Children - " " " "

6.0 Interpersonal - Other

6.1 Same sex - peers: hours per week in companionship activity; nature of activities; number of different people contacted in such activities; time spent with each

6.2 Opposite sex - peers: same as 6.1; dating behavior; petting, heterosexual play, etc.; conditions

6.3 Younger age - same sex: same as 6.1

6.4 Younger age - opposite sex: same as 6.1

6.5 Older age - same sex: same as 6.1

6.6 Older age - opposite sex: same as 6.1

6.7 Superiors - same as 6.1

6.8 Inferiors - same as 6.1

7.0 Other - Social

7.1 Club activities - amount; frequency; nature; with whom

7.2 Other organizations - politics, etc.

8.0 Non-social - time spent alone; activities, etc.

## Scale B - Independent Variables

(To the Examiner. In assessing cultural and experiential variables, try to avoid the subject's opinion of his experiences. Get his behavior, critical incidents, from which you can make a judgement. Differentiate between the subject's attitudes and experiences. You want both, but be clear about what you are getting.)

## 1.0 Physical Appearance (attach photographs)

- 1.1 Height, weight
- 1.2 Constitutional type
- 1.3 Heterosexual attractiveness

2.0 Ancestry

- 2.1 Grandparents - socio-economic status; education; nationality; residence; marital status; medical history; mental history
- 2.2 Parents or parental surrogates - socio-economic status; education; nationality; residence; marital status; medical history; mental history

3.0 Birth and Infancy

- 3.1 Birth - pregnancy; method of delivery; mother's post-partum behavior; father's post-partum behavior; weight at birth
- 3.2 Infancy (1st 6 months) - feeding habits; breast or bottle; reaction to eating; time spent (and behavior) by parents with infant; illnesses and accidents; reactions to others; unusual events
- 3.3 Later infancy and childhood - toilet training; walking; eating; talking; dressing; washing; play; companions; performing for others; siblings; writing; money; sex; time spent with parents; unusual events; unusual habits

4.0 Family and Social Activities

- 4.1 Mother - earliest event remembered; description of mother; activities throughout life with mother

- 4.2 Father - earliest event remembered; description of father; activities throughout life with father
- 4.3 Siblings - earliest event remembered; description of sibs; activities throughout life with siblings
- 4.4 Early socialization (companions) - earliest event remembered; sex of early playmates; kinds of early activities
- 4.5 Adolescent socialization - sex of companions; types of activity
- 4.6 Adult socialization - sex of companions; nature of activity

#### 5.0 Developmental Activities

- 5.1 Educational history and intellectual maturation - attitude toward school throughout
- 5.2 History of athletics and physical maturation
- 5.3 History of hobbies and leisure activities
- 5.4 History of religious activities
- 5.5 Work history
- 5.6 History of political interests and activities
- 5.7 History of driving habits

#### 6.0 History of Physical Habits from Childhood to Present

- 6.1 Feeding
- 6.2 Sleep
- 6.3 Elimination
- 6.4 Personal care
- 6.5 Drinking and smoking
- 6.6 Sex

7.0 Marital History

7.1 Courtship

7.2 Marriage - history of relations with wife

7.3 Children - number, sex, ages, relations with them

8.0 Medical, Mental and Dental History

9.0 Unusual Events of Life

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## APPENDIX C

BEHAVIORAL DATA FOR THE FIVE MATCHED PAIRS ELICITED BY  
THE PASCAL - JENKINS BEHAVIORAL SCALES

Explanation of Symbols Used

\* Item does not apply

ND Data not obtained

? Data unknown to patient

Y Yes, present

N No, absent









	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
<u>3.5 Drinking</u>										
Cups of coffee/ day	6	5-6	1	2	2	2	0	2-3	1	1
Glasses of milk/ day	9	ND	0	4-5	0-2	3	0	4-5	6-7	2
Cans of beer/ week	0	0	0	0	0	0-1	0	0	0	0
Alcohol/ week	0	0	0	0	0	0	0	0	0	0
Years since last alcohol	1	3	1	2	2	*	2	5	18	3
<u>3.6 Smoking</u>										
Packs per day	1	2/3	2/3	1	$\frac{1}{2}$	1 $\frac{1}{2}$	1	1	$\frac{1}{2}$	0
<u>3.7 Sex</u>										
Sex with wife/ week	0-1	2	1-2	3	1	2-3	*	1	1-2	2
Extramarital sex/ week	1	0	0	0	0	0	2	0	0	0
Masturbation/ week	0	0	0	0	0	0	0	0	0	0
Homosexual acts/ week	0	0	0	0	0	0	0	0	0	0
Total sex/ week	1-2	2	1-2	3	1	2-3	2	1	1-2	2
<u>3.8 Physical Health</u>										
Estimated health other than present illness: fair, poor or good	F	G	P	G	F	G	G	G	P	G
Secondary complaints	5	0	5	0	4	2	0	0	0	0
<u>3.9 Mental Health</u>										
Rates self more nervous than the average	Y	N	Y	N	N	N	Y	N	Y	N

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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Total number of symptoms elicited	3	1	4	0	1	0	6	0	2	0

#### 4.0 Non-occupational Activities

##### 4.1 Hobbies

Number of hobbies	3	1	1	0	1	1	0	1	0	1
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##### 4.2 Sports

Hunting per month	0	2	4	4	10	4	0-1	4	0	0-1
Fishing per month	0	2	4	4	30	0-1	30	1	0	4
Games attended/ week	0	1	0	1-2	0-1	0	0	0-1	0	0

##### 4.3 Other

Hours watch TV per day	1	2	1-2	1	2	2-3	2-3	2-3	1-2	0
Movies per month	0	2	0	1	0	0	12	0-1	0	0
Dances per month	1	0	0	0	0	0	4	0	0	0
Reads more than paper, Bible, magazines	Y	N	N	N	N	N	N	N	N	N

##### 4.4 Household chores

Regularly helps wife	Y	N	Y	N	Y	N	N	N	N	N
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##### 4.5 Church

Attendance per month	1-2	1-2	2-3	4	0-1	4	0-1	4	4	0-1
Grace before meals	Y	Y	Y	Y	Y	Y	N	Y	Y	N

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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Family prayers	Y	N	N	N	N	Y	N	Y	Y	N
Reads Bible per month	1	0	8	0-1	0	30	0	30	30	0

#### 4.6 Driving Habits

Average highway speed	*	60	60	60	60	60	60	50	ND	50
Likes mechanical work	ND	ND	Y	N	N	ND	N	Y	N	Y
Year of car	*	'50	'53	'51	'52	'40	'51	'50	'56	'49
Hot-rod equipment	*	N	N	N	N	N	N	N	N	N

### 5.0 Interpersonal - Family

#### 5.1 Mother

Distance from (miles)	10	100	2	12	0	60	0	*	0	0
Visits per week	0-1	0-1	7	0-1	7	0-1	7	*	7	3-4

#### 5.2 Father

Distance from (miles)	500	100	2	*	0	*	*	*	*	0
Visits per week	0	0-1	7	*	7	*	*	*	*	3-4

#### 5.3 Sibs

Visits per week	0-4	0-1	1-7	7	7	0-1	7	0-1	7	1
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#### 5.4 Wife

Hours spent with wife on weekdays	5	5	7	5½	1	5½	*	0-8	6	5½
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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Wife works	N	N	Y	N	Y	N	*	N	N	N
Reports critical incidents of affection	N	Y	Y	Y	Y	Y	*	Y	Y	Y-N

### 5.5 Children

Hours per day spent with in play	3	1	1	0-1	6	1-2	*	2	1	1
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### 6.0 Interpersonal - Other

Visits friends per week	7	1-2	7	0-1	2-3	2-3	7	2	1-2	0-1
Will not specify how many close friends	Y	N	Y	N	Y	Y	Y	N	Y	Y

### 7.0 Other - Social

#### 7.1 Clubs

Number clubs belong to	1	0	1	0	0	1	1	1	0	0
Attendance per month	1	*	1-2	*	*	2	1	1	*	*

#### 7.2 Political Activities

Democrat	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Active in politics	N	N	N	N	N	N	N	N	N	N

### 8.0 Non-social

Hours per day alone	2	1	2-3	0-1	0	1	0	2-9	0	7
Likes to be alone when feeling badly	ND	ND	Y	ND	Y	N	N	Y	N	Y

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## Scale B - Independent Variables

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
<u>1.0 Physical Appearance</u>										
Veteran's height	69"	74"	70"	69"	69"	66"	67"	69"	65"	72"
Father's height	76"	72"	73"	69"	70"	68"	67"	70"	72"	72"
Vet's usual weight	165	160	150	140	125	125	116	136	119	170
Father's weight	250	155	180	150	160	150	150	185	185	200
<u>2.0 Ancestry</u>										
<u>2.1 Grandparents - Maternal Grandfather</u>										
Nationality	US	US	US	US	US	US	US	US	US	US
Education	0	0	?	?	?	?	?	?	?	?
Rural (R) or urban (U)	R	R	R	R	R	R	R	R	R	R
Farmer (F), carpenter (C), railroad hand (R)	F	F	F	R	C	F	F	F	?	F
History of major illness	N	N	Y	N	N	?	?	N	?	?
Divorced or separated	N	N	N	N	N	?	N	N	?	?
<u>Maternal Grandmother</u>										
Nationality	US	US	US	US	US	US	US	US	US	US
Education	4	8	8	6	?	?	?	?	?	?
Major illnesses	N	N	N	Y	Y	?	?	N	?	?
<u>Paternal Grandfather</u>										
Nationality	US	US	US	?	US	US	US	?	?	US

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Education	O	?	8	?	?	?	?	?	?	?
Rural (R) or urban (U)	R	R	R	?	R	R	R	?	R	R
Occupation: farmer (F), preacher (P)	F	F	P	?	F	F	F	?	?	F
Major illnesses	Y	N	N	?	?	?	?	?	?	?
Divorced or separated	N	N	N	?	?	?	?	Y	?	?
<u>Paternal Grandmother</u>										
Nationality	US	US	US	?	US	US	US	US	US	?
Education	O	?	?	?	?	?	?	?	?	?
Major illnesses	N	N	?	?	?	?	?	N	?	?

## 2.2 Parents - Father

Nationality	US	US	US	US	US	US	US	US	US	US
Education	16	5-6	8	6	O	?	?	11	3-4	4-5
Rural (R) or urban (U)	R	R	R	R	R	R	R	R	R	R
Farmer (F), textile worker (T), night watchman (W)	F	F	W	F	T	F	T	F	F	F
Financial condition: poor (P), average (A)	P	A	A	A	A	A	P	A	P	A
Major illnesses	N	N	N	Y	Y	N	N	N	N	N
Divorced or separated	Y	N	N	N	N	N	N	N	N	N

## Mother

Education	7	5-6	8-9	6	3	3	?	11	5-6	?
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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Worked outside home in veteran's childhood	N	N	N	N	Y	N	N	N	N	N
Major illnesses	N	N	N	N	N	N	N	Y	N	N

### 3.0 Birth and Infancy

#### 3.1 Birth

Weight at birth	?	?	?	12'	?	8'	?	7'	?	?
Born at home	?	Y	?	?	Y	Y	Y	Y	Y	Y
Mother's age	38	26	17	20	15	23	37	24	28	19
Father's age	40	30	18	?	17	30	42	47	37	25

#### 3.2 Infancy

Breast-fed	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Age weaned (months)	?	12	12	?	?	12	?	?	?	?
History of illness	N	N	N	N	N	N	N	N	N	N

#### 3.3 Early Childhood

Age walked (months)	?	12	10	13	?	?	?	?	?	9
Age talked ( " )	?	16	10	?	?	24	?	?	?	?
Age toilet-trained ( " )	?	?	13	?	?	?	?	12	?	?
History of enuresis	N	N	N	N	N	N	N	N	Y	Y
Total "memories"	2	5	5	3	2	5	2	4	3	4

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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
<u>4.0 Family and Social</u>										
<u>4.1 Mother</u>										
Whippings by per week 3-4		0	1	0	0	0	0	0	0	0-1
Regular active play	N	Y	N	Y	Y	N	N	Y	Y	N
Helped mother with her chores regularly	Y	Y	N	Y	?	N	ND	Y	N	Y
Mother drank	N	N	N	N	N	N	N	N	N	N
Mother smoked	N	N	N	N	N	N	N	N	N	N
Regular church-goer	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Described as strict	Y	Y	Y	Y	Y	Y	N	N	Y	N
Set limits on the veteran's activities	N	Y	Y	Y	Y	Y	N	N	N	Y
Temper outbursts	ND	N	N	N	Y	N	N	N	ND	N
Described as nervous	ND	ND	N	N	N	N	N	N	N	N
<u>4.2 Father</u>										
Whippings per month	15	0	0	1	1	0	0	0	0	0
Total whippings per month, both parents	30	0	4	1	1	0	0	0	0	1
Whipped more often by	=	=	M	F	F	M	F	F	=	M
Described as strict	Y	Y	Y	Y	Y	N	Y	N	N	N
Stricter parent	F	F	M	F	F	M	F	F	M	M
Active play per week with veteran	7	0-1	2	2	1	2	0	7	2	7

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Parent spent most time in play with	F	M	F	M	M	F	M	=	F	F
Hours worked per day	12	12	12	12	12	12	12	12	12	12
Said to value hard work	Y	Y	N	N	N	Y	Y	Y	N	N
Veteran worked with father as a boy	Y	Y	N	Y	N	Y	N	Y	Y	Y
Father drank	Y	Y	N	Y	Y	Y	N	Y	N	Y
Used to drink, turned against it	N	Y	*	Y	Y	N	*	N	*	N
Father smoked	Y	Y	N	Y	Y	Y	Y	Y	N	N
Regular church-goer	Y	ND	Y	Y	N	Y	Y	N	Y	Y
"Never" fought with mother	Y	Y	Y	N	N	N	Y	Y	Y	N
Preferred parent	F	?	?	?	M	M	?	?	?	F
Described as nervous	ND	ND	N	Y	Y	N	Y	N	N	N
Temper outbursts	ND	ND	Y	Y	Y	ND	ND	ND	N	N

#### 4.3 Siblings

Number of sibs	16	2	2	2	2	9	5	6	6	3
Veteran's position	11	2	1	1	1	5	6	3	4	2
Expresses resentment to one or more sibs	N	Y	N	N	N	N	N	N	N	Y

#### 4.4 Early Socialization

Many (M) or few (F) playmates	M	M	M	M	M	F	M	M	F	F
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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Reports much time alone in childhood	N	N	N	N	N	N	N	N	N	N

#### 4.5 Adolescent Socialization

Age began dating	14	18	16	13	14	16	15	15	20	17
Alone (A) or double- dated (D) usually	A	A	A	D	D	D	D	D	A	A
Age had own car	ND	ND	17	ND	21	ND	21	17	24	20
Limits on activities	N	ND	N	Y	Y	Y	N	Y	N	N
Sex spent more time with	F	M	F	ND	M	=	M	M	M	=
Dates per week	5-6	1	4-5	1-2	1-2	2-3	1-2	1-2	0-1	1-2

#### 5.0 Developmental Activities

##### 5.1 Education

Liked school	Y	N	Y	N	Y	Y	N	Y	Y	Y
Additional formal schooling since	N	N	Y	N	Y	Y	Y	N	Y	N

##### 5.2 Athletics

In organized sports since left school	Y	N	N	N	Y	Y	Y	Y	Y	N
Hunting per week in adolescence	1	0-1	1	7	2-3	1	0	ND	1	0
Fishing per week in childhood and teens	1	0-1	1	1	7	1	7	ND	1	7

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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
History of arrests	N	N	Y	N	Y	N	N	N	N	Y
History of hot-rod activities	N	N	Y	N	N	N	N	N	N	N

## 6.0 History of Physical Habits

### 6.1 Feeding

History of childhood feeding difficulties	ND	N	N	N	N	N	N	Y	N	N
Poor appetite in childhood	ND	N	N	N	N	N	N	N	N	N
Appetite change since present illness began	ND	N	Y	N	Y	N	Y	N	Y	N

### 6.2 Sleeping

History of difficulty in childhood	ND	N	N	N	N	N	N	N	N	N
Frequency of dreaming in childhood per week	ND	?	0	?	?	0	?	7	1	0-1

### 6.3 Elimination

History of difficulty in childhood	ND	N	N	N	N	N	N	Y	Y	Y
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### 6.5 Drinking and Smoking

Age began drinking	27	10	15	17	17	23	17	18	*	24
Arrests for drinking	0	0	2	0	1	0	1	0	*	0
Maximum beers per day	0-1	1	2	2-3	0-1	12	2-3	0	*	0-1

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Maximum alcohol per week (pints)	1	ND	2	ND	0	0	0	1	*	0
Usually drinks alone (A) or socially (S)	A	S	S	S	S	S	S	S	*	S
Age began smoking	14	16	14	17	15	16	14	19	18	16
Maximum number of packs per day	1	1	2	1	1	2	1	2	$\frac{1}{2}$	$\frac{1}{2}$
Father whipped for or disapproved of smoking	Y	Y	Y	ND	Y	N	Y	Y	N	N

#### 6.6 Sex

Age at first inter-course	15	30	13	15	18	16	16	13	26	17
Sexual relations per week before marriage	7	0-1	4	1	1	0-1	1	1	0	1
Sexual relations per week after marriage	7	3-4	4	3	4	4	4	3	1-2	3
History of extramarital sexual relations	Y	N	Y	N	Y	Y	Y	N	N	Y
Premarital relations with wife	N	N	N	N	N	N	N	N	N	N
History of masturbation	Y	N	Y	Y	Y	N	Y	N	N	N
Told about sex by father	Y	N	N	N	N	N	N	Y	Y	N

#### 7.0 Marital History

Age at first marriage	22	27	19	21	18	25	26	22	26	20
Divorced or separated	Y	N	Y	Y	N	N	Y	N	N	N

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Veteran remarried	Y	*	Y	Y	*	*	N	*	*	*
<u>Present Wife</u>										
Years of courtship	2½	5½	½	2	1	2	1	½	1	3
Years known before marriage (C = since childhood)	2½	5½	½	7½	C	C	1	½	C	C
Age difference: vet's age minus wife's age	3	6	10	7	-2	10	7	3	11	5
Number of grades education	4	12	12	10	5	8	8	11	8	5
Vet's education minus wife's education	5	-2	-6	-1	7	4	0	-2	-3	-2
Wife drinks	ND	N	N	N	N	N	Y	N	N	N
Wife smokes	ND	Y	Y	N	N	Y	Y	N	N	N
Regular church-goer	ND	N	ND	Y	N	Y	N	Y	Y	Y
Described as nervous	Y	ND	N	N	ND	Y	N	Y	N	N
Denies serious arguments with wife	N	Y	N	N	N	Y	N	N	Y	Y
Reports satisfactory sexual adjustment	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Temper outbursts	Y	ND	Y	Y	ND	Y	ND	N	N	Y
<u>Children</u>										
Number of children by present wife	1	1	2	2	4	4	1	1	2	5
Planned?	ND	Y	ND	Y	N	Y	ND	Y	Y	Y

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	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
Frequency whipped by veteran per week	ND	ND	ND	0-1	ND	0	ND	0	0	ND

### 8.0 Military History

Age entered service	27	23	22	21	25	25	17	18	24	24
Drafted (D) or enlisted (E)	ND	E	E	ND	ND	E	ND	D	ND	ND
Branch of service: army (A), air force (AF)	A	A	A	A	A	A	AF	AF	A	A
Years in service	1	4	$\frac{1}{2}$	2	$\frac{1}{4}$	3	4	3	3	$1\frac{1}{2}$
Overseas experience	N	Y	N	N	N	Y	N	Y	Y	Y
Combat experience	N	Y	N	N	N	Y	N	N	Y	Y
Medical discharge	Y	N	Y	Y	Y	N	Y	N	N	N
Rank at discharge	Pvt	Cpl	Pfc	Cpl	Pvt	Pfc	Sgt	Pfc	Pfc	Pfc
Liked service	Y	N	Y	Y	Y	N	Y	Y	Y	Y

### 9.0 Medical History

Number of major illnesses other than present illness	1	1	1	2	2	4	1	0	0	1
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## APPENDIX D

INDIVIDUAL SCORES ON THE DEPRIVATION SCALE FOR THE  
DUODENAL ULCER PATIENTS (U) AND CONTROLS (C)

	<u>Pair #1</u>		<u>Pair #2</u>		<u>Pair #3</u>		<u>Pair #4</u>		<u>Pair #5</u>	
	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>	<u>U</u>	<u>C</u>
1. Employment	1	0	1	0	0	0	1	0	0	0
2. Income	1	0	1	0	1	0	1	0	1	0
3. Debts	1	0	1	0	0	1	1	1	0	0
4. Fear	1	1	1	0	1	0	1	0	1	0
5. Wife	1	0	0	0	1	1	0	0	0	0
6. Parents	1	0	0	0	0	0	1	*	0	0
7. Children	0	0	0	0	0	0	*	0	1	0
8. Other relatives	0	0	0	0	0	0	0	0	0	1
9. Church	0	0	0	0	1	0	1	0	0	0
10. Other organizations	1	1	0	1	1	0	0	0	1	0
11. Friends	0	0	0	0	0	0	0	0	0	0
12. Job participation	0	0	1	0	1	1	1	1	1	0
13. Job status	0	0	1	0	1	0	1	0	0	0
14. Status - other	0	1	0	1	1	1	1	1	1	1
15. Residence	0	0	1	0	0	1	1	0	0	0
16. Education	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>1</u>
Totals	7	3	8	2	8	5	10	3	7	3

## APPENDIX E

HYPOTHEZIZED ATTITUDES, EXPECTANCIES AND CONCEPTIONS  
EVOLVED INDEPENDENTLY BY BOTH JUDGES

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<u>Attention expected from mother</u>	<u>Ulcer Patients</u>	<u>Control Patients</u>
1. authoritarian, punitive	2 of 5	2 of 3*
2. overprotective, frustrating	0 of 5	1 of 3
3. little or no succorant attention	5 of 5	1 of 3
 <u>Attitudes towards mother</u>		
1. fear	3 of 5	1 of 3
2. resentment	4 of 5	4 of 4
3. affection	0 of 5	0 of 5
 <u>Conceptions of mother</u>		
1. non-succorant	5 of 5	1 of 3
2. authoritarian	3 of 5	1 of 3
3. frustrating	0 of 5	2 of 3
4. threatening	1 of 5	0 of 3
5. non-threatening	1 of 5	1 of 3
6. unpredictable	1 of 5	0 of 3
7. treated better than men	1 of 5	0 of 3
 <u>Attention expected from father</u>		
1. authoritarian, punitive	2 of 5	0 of 4

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\*When the N in either group is less than five, no agreement could be reached between judges on the construct in one or more cases.

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	<u>Ulcer Patients</u>	<u>Control Patients</u>
2. succorant	1 of 5	1 of 4
3. little or no succorant attention	4 of 5	3 of 4
<u>Attitudes towards father</u>		
1. fear	2 of 5	1 of 4
2. resentment	4 of 5	2 of 4
3. affection	0 of 5	1 of 4
<u>Conceptions of father</u>		
1. hard-working	3 of 5	3 of 4
2. authoritarian	2 of 5	1 of 4
3. punitive	1 of 5	0 of 4
4. non-threatening	2 of 5	1 of 4
5. succorant	1 of 5	1 of 4
6. non-succorant	2 of 5	0 of 4
7. unpredictable	2 of 5	0 of 4
<u>Conceptions of husband - wife relationship</u>		
1. females more dominant	3 of 4	3 of 4
2. males more dominant	0 of 3	1 of 4
3. males do not express hostility towards females	2 of 3	1 of 4

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<u>Conceptions of self</u>	<u>Ulcer Patients</u>	<u>Control Patients</u>
1. conceives self as inadequate	5 of 5	1 of 2
2. conceives self as adequate	0 of 5	1 of 2
 <u>Conceptions of others</u>		
1. other people are supportive	0 of 5	1 of 3
2. other people are not supportive	0 of 5	0 of 3
 <u>Conceptions of the environment</u>		
1. environment seen as restrictive	0 of 3	1 of 3
2. environment seen as permissive	1 of 3	0 of 3
3. environment seen as demanding	1 of 3	0 of 3

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