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A Comparative Study of the Experimental Characteristics of a Group of Peptic Ulcer and Non-Ulcer Subjects

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To the Graduate Council:

I am submitting herewith a dissertation written by Frank George Mullen Jr. entitled "A Comparative Study of the Experimental Characteristics of a Group of Peptic Ulcer and Non-Ulcer Subjects." 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.

G. R. Pascal, Major Professor

We have read this dissertation and recommend its acceptance:

W. O. Jenkins, Donald D. Holloway, Kenneth R. Newton, Thomas E. Leder

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

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

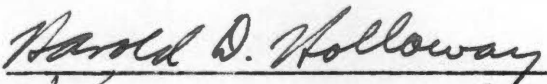
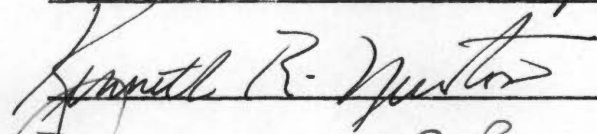
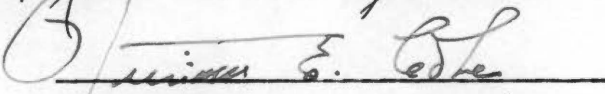
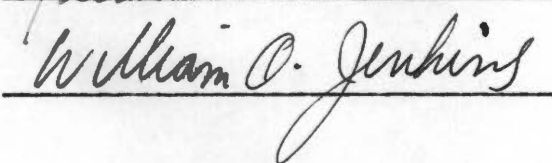
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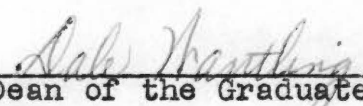
I am submitting herewith a thesis written by Frank George Mullen, Jr., entitled "A Comparative Study of the Experiential Characteristics of a Group of Peptic Ulcer and Non-Ulcer Subjects." I recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Psychology.


Major Professor

We have read this thesis and
recommend its acceptance;

Accepted for the Council;


Dean of the Graduate School

A COMPARATIVE STUDY OF THE EXPERIENTIAL CHARACTERISTICS
OF A GROUP OF PEPTIC ULCER AND NON-ULCER SUBJECTS

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

Frank George Mullen, Jr.

December 1959

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F.G.M., Jr.

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CHAPTER I

INTRODUCTION

The research about to be reported is one part of a larger research project being conducted at the Veterans Administration Hospital in Atlanta, Georgia.¹ The objective of this research program is to attempt to systematically study psychological factors related to peptic ulcer by means of a behaviorally-oriented approach.

The problem in this study is a comparison of duodenal ulcer patients and a matched control group of non-ulcer subjects on various measures of reported behaviors of important persons in the early lives of the subjects. The major purpose of these comparisons is to generate hypotheses concerning the etiology of peptic ulcer from the psychological approach.

History of the Problem

One of the earliest studies of the duodenal ulcer patient was conducted by Wolf and Wolff (24). These authors made a prolonged study of the changes in color of the gastric mucosa and changes in the amount of stomach acid secretion of their subject, Tom. They found that there was a darkening in

¹The author is indebted to Drs. Thoroughman and Crutcher for their assistance and cooperation in securing subjects for this study.

the color of the mucosa and an increase in acid secretion each time that Tom became angry, resentful, anxious or was in any way subjected to a stressful situation.

Middleman and Wolff (13) studied thirty ulcer patients and thirteen non-ulcer patients as controls. Each subject was given a lengthy psychiatric interview and also subjected to various laboratory tests, including the insertion of a tube into his stomach through which samples of gastric secretions were obtained. Also, each subject was given a stress interview which focused on emotional events of his past life. It was observed that the ulcer patient was anxious, insecure, resentful, guilt ridden and frustrated. It was also observed that the ulcer patients tended to bolster their self-esteem by independence and perfection. In all patients there was seen a relationship between onset, recrudence and course of symptoms and the occurrence of untoward emotional reactions. The authors were, moreover, able to bring about emotional and gastro-intestinal changes in the patients by stress interviews. It was found that as tension, anxiety, guilt, anger and obsequiousness became more evident in the patient there was a corresponding increase in the HCl, mucous and pepsin secretion.

In a study using twenty-five duodenal ulcer patients and one hundred flying instructors as controls, Moses (14) gave each subject a two hour psychiatric interview plus an electroencephalographic analysis. It was found that the

experimental group had strong passive, dependent, receptive needs and a significantly higher incidence of dominant alpha wave activity than did the control group. A high positive correlation between alpha wave activity and passivity was obtained.

In the medical profession, there has been for sometime the recognition that emotional factors tended to influence the course of symptoms in the peptic ulcer patient. In fact, over twenty-five years ago, Cushing (4) observed that most physicians of the day believed "high-strung" persons were more susceptible to nervous indigestion and peptic ulcer, that the ulcer symptoms tended to go away or heal when the patient became mentally and physically rested, and that there tended to be an exacerbation of these symptoms when the patient returned to his former tasks and responsibilities. In the field of psychiatry there has also been a long standing belief by certain physicians that certain personality factors are specific to the peptic ulcer patient. Franz Alexander (1) states that the ulcer patient possesses a strong unconscious desire to be dependent upon others, but this desire is unacceptable to him. He compensates for this unconscious need to be nurtured and taken care of by conscious strivings for success and independence. The general stereotype of the ulcer patient is the hard-driving, hard-working, independent businessman or politician. Dunbar (6) also postulates that the ulcer patient is in conflict

between his desire to remain dependent and fight these feelings or to become independent of love and affection from others. In order to either verify or refute this general hypothesis many experiments involving psychiatric interview and psychological testing have been carried out.

Poser (19) administered the Rorschach test to twenty-five, male, ulcer patients and twenty-five non-ulcer control patients; he found that the character structure of the ulcer personality is immature and that oftentimes the source of tension in these ulcer patients springs from strong uncontrolled drives for which there is no adequate outlet.

In another study where the Rorschach was administered to twenty-five ulcer patients and twenty-five control subjects without gastro-intestinal disorder, Brown, et al (3), found that the ulcer patient exhibited a conflict between an overtly active disposition and passive needs. The ulcer patients, as a group, tended to deal with their environment in an impulsive, emotionally immature level which lead to conflict in the area of interpersonal relations.

Marquis (12) gave a battery of psychological tests to sixteen ulcer patients who were matched with patients who had other psychosomatic disorders. The control group showed more marked regression and maladjustment not centered around one central area where the ulcer patients appeared to be orally fixated. The ulcer group as a whole had a marked oral fixation,

strong dependency needs, sexual maladjustment feelings of inferiority and nervous tension; however, two types of ulcer personality were found: primary and reactive. These two personality types are differentiated by their acceptance or denial of their dependency needs. The reactive group denies oral needs and fits Alexander's orally fixated individual who develops a reaction formation to them. The primary type accepts and recognizes his oral needs and sets about consciously to gratify them.

Winter (23) constructed a primary and reactive scale for the Blackie Test and administered it along with the Rorschach to sixty-eight ulcer patients. The author then compared the test results with Veterans Administration records. He concluded that ulcer patients vary considerably in the kind of problems they have and the degree to which they use certain defenses in handling their problems. However, he postulated at least two different personality patterns for the ulcer patient. The subjects who scored high on the primary scale possessed a demanding and immature personality, while the subjects who scored high on the reactive scale were characterized by a strong desire to achieve.

In another study, Blum and Kaufman (2), also using psychological tests, found that the primary ulcer type was very passive and dependent, seeking a nurturant mother figure. This group was orally fixated and not concerned with anality,

Oedipal feelings or castration anxiety. The reactive type, on the other hand, denied their passive tendencies and tended to repress their oral trends. This group also had unresolved Oedipal feelings, guilt feelings and tended to strive for success.

Kapp (9) reports finding three ulcer types after giving a psychiatric examination to each of twenty ulcer patients. Group one tended to be independent, hard driving and successful and over compensated for repressed receptive desires. Group two was meek, shy and effeminate with dependency needs that were at least partially conscious. They were overtly dependent, but made partial effort toward masculinity and independence. Group three was composed of severe character disorders who tended to be unemployed and who drank and gambled to excess. This group acted out their oral cravings. Each ulcer patient had strong dependency wishes and developed an ulcer when oral gratification was denied; however, each group had different defense mechanisms. Kapp agrees with Alexander that peptic ulcer is related to oral fixation, but says that there is not just one type of ulcer personality.

In the area of sub-human organisms, Sawrey (21) (22) has been able to produce peptic ulcers in the white rat by placing the animal in a very stressful, conflict situation. Porter, et al, (13) using somewhat similar laboratory methods managed to induce peptic ulcers in monkeys. The authors of

these animal studies believe that it is the conflict situation and tension that contributes heavily to the formation of ulcer rather than such factors as oral fixation or dependency strivings.

In a recent article reviewing the literature to date, Roth (20) points up the fact that there is a great deal of confusion concerning the exact cause of peptic ulcer and the exact role played by psychogenic factors in the etiology of peptic ulcer. Pascal and Jenkins state

. . . the confusion existing in this area make 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 (17,p.2).

Lothrop (10) (11) found the Bender-Gestalt test clearly discriminates the successful and unsuccessful ulcer patient post-operatively. There was non overlap within one group of sixteen ulcer patients, with the ulcer failures earning the higher scores. These results are very significant statistically and suggest that the medical failures are more disturbed psychiatrically than the medical successes. This conclusion is in agreement with other workers in the field (8).

Pascal and Jenkins (17) found that certain behavioral indices discriminated well between ulcer patients and controls. A two-point, forced choice behavior rating scale by Pascal and Jenkins was constructed, using the hypothesis that current psychological deprivation is the basic covariant of duodenal

ulcer, assuming that the ulcer can be classified as a behavioral deviation. This scale (the University of Tennessee Deprivation Scale) was tested against eleven ulcer subjects who were surgical successes and five ulcer subjects who were surgical failures, and non-overlapping distributions of Deprivation Scale scores were obtained. These statistically significant results indicate that behavioral deviation covaries with environmental deprivation.

CHAPTER II

PROCEDURE

The design of this research is a matched-pair comparison of nine duodenal ulcer subjects with nine non-ulcer control subjects. (Henceforth ulcer, non-ulcer, and subjects will be designated as U, NU and Ss.) The data to be compared are selected cross sectional behaviors emitted by the Ss and selected reported behaviors of important persons encountered by the Ss during their first decade of life.

Population

A total of eighteen white, male, human Ss were used in this study; nine Us and nine NUs. Both groups, U and NU, were matched by pairs on five different variables: age, education, intelligence, vocation and marital status. The Us were all patients at the Veterans Administration Hospital, Atlanta, Georgia. All Us had been diagnosed as having a duodenal ulcer and had been under medical treatment for their condition for at least two years. All Us failed to respond successfully to the medical regimen and were given an hemigastrectomy and vagotomy operation as a last resort to alleviate their symptoms. (The Us were labeled "intractables" by the hospital physicians.) All NUs were working in industry or at a state institution in

or around Knoxville, Tennessee.¹ It was ascertained that none of the Ss had ever received psychiatric treatment or been given a psychiatric diagnosis.

The groups were selected to be matched on the five aforementioned variables, but were to be different with respect to the dependent variable: peptic ulcer. The matching data on age, education, intelligence, vocation and marital status can be seen in Table I. The greatest age differential between pairs is five years. The range in age for the two groups is from twenty-eight years to fifty years, with an average age for both groups of 37.9 years. The overall average education for all Ss was 8.2 grades, with the NUs as a group having a little over one year more schooling than the Us. The range of grades in school for all Ss was four grades to twelve grades, and the largest discrepancy in matching between Ss was three grades. There was close matching for all Ss in regards to intelligence; the largest difference between pairs was nineteen I.Q. points. The range of I.Q.'s was 70-107. It can also be seen that the mean I.Q. for all Ss was 93.9 with only slightly over a point's difference between the Us and the NUs. With respect to marital status, all NUs were married; seven Us were married; one U was divorced, and one U is widowed. All Ss were matched as closely as possible on occupation. All semi-skilled Us were matched

¹The author wishes to express his thanks to Dr. Hugh Davis and Mr. Frank Horner who gathered and scored the data from the NUs.

TABLE I

MATCHING CHARACTERISTICS OF THE U AND NU Ss

Pairs	Age (Yrs.)		Education (Grades)		I.Q.		Marital Status		Occupation	
	U	NU	U	NU	U	NU	U	NU	U	NU
1	47	42	5	8	89	94	M	M	Unemp. Textile Worker	Janitor
2	34	35	12	12	102	106	M	M	Asst. Mgr. Gro. Store	Raw Material Expediter
3	47	50	10	12	96	105	W	M	Sheet Metal & Welding Foreman	Welder
4	40	37	8	10	96	87	M	M	Pipe Fitter for R. R.	Welder
5	39	38	8	12	93	94	M	M	Unemp. Elect. Helper	Electrician
6	37	36	9	7	86	96	D	M	Rural Paper Carrier	Operating Asst.
7	30	32	7	7	102	99	M	M	Unemp. Machine Op.	Janitor
8	39	40	4	6	99	88	M	M	Unemp. Mach. Op.	Janitor
9	32	28	4	5	89	70	M	M	Unemp. Wood Cutter	Laborer

X 38.3 37.6 7.4 8.8 94.7 93.2

Range 30-47 28-50 4-12 5-12 86-102 70-106

with semi-skilled NUs, and unskilled Ss were matched with unskilled Ss. For example, an unemployed textile mill worker was matched with a janitor; a pipe fitter was matched with a welder; an unemployed wood cutter was matched with a laborer, etc.

Case History

All Ss were given a standardized interview which lasted from six hours to fifteen hours. (These case histories are on file at the University of Tennessee Psychological Service Center.) The average length of each interview was about seven hours. The responses during the interview were written down almost verbatim by the Experimentor and were later rearranged and typed into a behavioral case history. The scales developed by Pascal and Jenkins were used for collecting, organizing and scoring the responses. (These scales are presented in Appendix A and Appendix B.) Only those portions of the Pascal-Jenkins Scales dealing with Grandparents, Parents, Siblings and Peers as stimulus categories were used.

There were two major divisions of the case histories. The current Cross-Sectional Behavior (dependent variables) was obtained, as were Longitudinal Behaviors (independent variables). In each division both quantitative and qualitative information were gathered. All Ss, had much more difficulty in giving behavioral incidents of their early lives. Infor-

mation concerning their current functioning was much easier for them to recall. Oftentimes, only small fragments or short memories of their early life could be recalled. The validity of the information obtained was not checked against another person's report, but it should be remembered that each point in the history was usually covered more than once during the interview, and for the most part different aspects of the area of inquiry were covered by several points of questioning. This facet of the interviewing technique offered a reliability and partial validity check for information received.

Scales

In order to compare both groups of Ss on various aspects of their behavior, two behavioral scales were used in this study. The data for both of these scales comes directly from the case histories gathered during the standardized behavioral interview. One of the scales used is designed to gather information about each S's current functioning, and the other scale is designed to elicit information about the longitudinal stimuli affecting each S during his first ten years of life.

Current Functioning

U-T Deprivation Scale. This scale, which was developed by Pascal and Jenkins (17), is composed of sixteen different

behavioral variables relating to each S's ability to receive gratification from the environment. This scale will be found in Appendix A.

This is a two-point, forced choice scale, with each of the sixteen items either being rated 0 or 1. A rating of 1 is considered to be "poor", and a rating of 0 is considered to be "good." The rating of each item was made from critical incidents gathered from each S during the clinical interview. The higher the score on this scale the fewer needs S is satisfying in his current environment. In assigning ratings for each variable of this scale the judges weighed all the information pertinent to one variable and decided whether or not S was receiving gratification of his needs from that source. For most of the sixteen variables there were several statements given by S that were related to that one item. For example, under the item Other Organizations, S was asked if he belonged to any clubs, teams or special interest groups. If S belonged to no groups or organizations he was clearly rated 1; however, if he did belong to an organization he was questioned about the frequency with which he attended meetings, his behavior at meetings of the organization, offices held, etc. From his behavioral incidents it could be judged whether or not S was receiving gratification of his needs of belongingness, status, group identification, etc. It can easily be seen that if S belonged to an organization such as the American Legion, but

never attended meetings or attended meetings infrequently and never engaged in conversation with his fellow members he should be rated 1 on this variable.

Longitudinal Stimuli - The First Decade

Pascal-Jenkins Behavioral Scale. Only that portion of the Pascal-Jenkins Behavioral Scales (15) dealing with grandparents, parents, siblings and peers was used in this study. These scales may be seen in Appendix B. There are a differing number of behavioral variables subsumed under each stimulus category: seven variables for each grandparent, fifteen variables for each parent, seven variables for each sibling and five variables for each peer. A listing of these variables is seen in Table II. As with the current functioning, these variables pertaining to the first decade of life are rated from the case history obtained from each S. These variables may be seen in Table II. Following the directions given by Pascal and Jenkins in their manual, a three point rating system is used: 3 = expectancy, 1 = marked deviation from expectancy and 2 = intermediate. The abbreviation ND signifies "no data", and the abbreviation DA stands for "does not apply." A rating of zero indicates that a particular stimulus was absent. As with the current functioning, a high rating for early stimulus categories indicates good, appropriate behavior while a high rating for current behavior indicates poor, inappropriate behavior. Pascal and Jenkins (15), in

TABLE II

VARIABLES AND STIMULUS CATEGORIES RATED

	Grand- parents	Mother	Father	Sibs	Peers
1. Frequency of Contact	X	X	X	X	X
2. Active Play with Subject	X	X	X	X	
3. Restraints on Subject	X	X	X	X	
4. Physical Punishment	X	X	X	X	
5. Displays of Affection	X	X	X	X	
6. Deviant Behavior	X	X	X	X	X
7. Physical Health		X	X		
8. Religiosity	X	X	X		
9. Gregariousness		X	X		
10. Intellectualism		X	X		
11. Variability of Habitat		X	X		
12. Parental Status		X	X		
13. Provider		X	X		
14. Compatibility with Spouse		X	X		
15. Compatibility with Sibs				X	
16. Compatibility with Peers					X
17. Appropriateness of Sexual Role		X	X		
18. Activities of Peers					X
19. Sexual Behavior					X

their manual, comment on the variables relating to the first ten years of life:

The variables used in these scales are, at present, necessarily loose and, in some instances ambiguous. They represent a first approximation of life history variables couched in behavioral terms. They are potentially, objectively measurable. However, it will be clear to the reader that their assessment in the present form of this scale involves a large dose of clinical judgement. Therefore, the scales should not be used by individuals without training and experience in clinical interviews.

Agreement of the judges. It can be seen in Table III that approximately four ratings out of five were complete agreement between the two judges. In less than one percent of the ratings was there disagreement by as much as two points. In rating the Us on the stimuli encountered during the first decade two raters were used.² They independently rated each variable for each U either zero, one, two, three, No Data or Does Not Apply. There are several factors which tend to mitigate the inevitable bias found in this type of study. For example, the rating of zero is by definition an absence of the stimulus, and on this category there was perfect agreement between the two judges. Also, the differentiation between a rating of one and a rating of three is fairly clear in that a rating of three is given if a stimulus occurs with expected frequency, and a rating of one is given when the stimulus occurs

²The author expresses thanks to Mr. Thomas Long for his assistance in rating the Us.

TABLE III

DIFFERENCES IN RATINGS OF FORTY-NINE
VARIABLES BY TWO JUDGES

Subject	Per Cent Complete Agreement	Per Cent Differing by One Point	Per Cent Differing by Two Points
1	80	20	0
2	85	15	0
3	75	25	0
4	70	30	0
5	80	19	1
6	84	16	0
7	65	35	0
8	78	20	2
9	87	13	0
Mean	78.2	21.4	.3

either too little or too frequently. A rating of one is given only when there is only a marked deviation from expectancy. The greatest difficulty was encountered with the rating of two. For example, if the mother showed U a consistent amount of affection the stimulus was rated three, but if there was some question about the consistency or amount the item was given a two rating. No Data categories were not used in the reliability study.

No data problem. There was complete data available from which to make ratings for all variables of the cross-sectional, current behavior; however, there were several instances where data were insufficient to make ratings of stimuli during the early lives of the Ss. Insufficient data was a minor problem for the experimental Ss, but it was a somewhat more prevalent problem for the control group. This can be accounted for by the fact that the control group was interviewed by different examiners. Also, the NUs were interviewed on the job and not as much time could be spent with them as with the Us. This problem of differing amounts of "no data" entries was managed by counting the number of Ss in the experimental group and control group who had "no data" entries and evaluating these frequencies statistically. The number of Ss in each group who had "no data" entries and a χ^2 probability indicating levels of significance are presented in Appendix E.

Statistics. Non-parametric statistics were used throughout this study. The most frequent statistic used was the Binomial Expansion and Arrangement Technique as supplied by Jenkins (7).

CHAPTER III

RESULTS

A total of 65 behavioral variables relating to S's experiences during the first ten years of life and to his current functioning behavior were rated. Of this total, 49 variables concern the first decade and 16 relate to his present functioning. The longitudinal and cross sectional variables will be discussed under Part A and Part B respectively. For each of the eighteen Ss 65 variables were rated, making a total of 1170 ratings.

Part A

The mean rating of significant stimuli during the first ten years of life for the U and NU Ss is seen in Table IV. The lower the score the poorer the rating. By inspection it is clear that there is no overlap between the two distributions with the Us receiving the lower scores. The Arrangement Technique was applied to these data and yielded a P-value of .00002 which is highly significant. Moreover, the mean rating for the Us is one point lower than the mean rating of the NUs.

The 49 different variables relating to the Ss' first decade of life were analyzed for consistent discrimination between the U and NU Ss by the Binomial Expansion. Table V

TABLE IV

MEAN RATINGS OF SIGNIFICANT STIMULI IN THE FIRST
TEN YEARS OF LIFE FOR U AND NU Ss

Pairs	U Mean Rating	NU Mean Rating
1.	2.69	2.80
2.	1.79	2.90
3.	1.97	2.90
4.	1.53	2.80
5.	1.80	2.50
6.	1.63	3.00
7.	2.03	2.60
8.	1.31	2.60
9.	1.77	2.40
Mean	1.72	2.72
Range	1.31 - 2.03	2.50 - 3.00
P -	.00002	

shows these results. Of these 49 variables tested, 6 were found to be significant at or beyond the .05 level of confidence. Six other variables were found to be significant between the .05 and .10 levels, and should be viewed as probably significant. There are 14 other variables that were found to be significant between .10 and .20 and should be kept in mind if replication or further experimentation in this area is undertaken.

Table V shows the variables which are significant for the stimulus category "Grandparents." Of the seven variables rated in this category only one, display of affection, is significant by the Binomial Expansion, $P = .02$. The Us' grandparents showed less affection than did the NUs'. The grandparents of the Us placed more restraints on them than did the grandparents of the NUs ($P = .055$). The Us had less frequent contact with their grandparents than did the NUs ($P = .09$). This absence of contact was due to the fact that the Us' grandparents tended to ignore them even though in close proximity. The Us' grandparents tended to show somewhat more deviant behavior than did the NUs' grandparents ($P = .09$). This deviant behavior usually manifested itself in the form of frequent loss of temper, querulousness and sullenness. The grandparents of the Us did not play with them as frequently as the grandparents of the NUs ($P = .09$). This variable ties in somewhat with the frequency of contact

TABLE V

P VALUES BY VARIABLES AND STIMULUS CATEGORIES
FOR THE FIRST DECADE OF U AND NU Ss

Variables	Grand- parents	Mother	Father	Sibs	Peers
1. Freq Cont	.09	.254	.254	.30	.144
2. Act Play	.09	.144	.011	.011	
3. Restraints	.055	.074	.02	.20	
4. Phys Pun	.172	.254	.02	.34	
5. Disp Aff	.02	.144	.004	.109	
6. Dev Beh	.09	.363	.092	.137	.188
7. Phys Health		.363	.363		
8. Relig	.171	.363	.23		
9. Greg		.363	.10		
10. Intell		.117	.188		
11. Var Hab		.363	.34		
12. Par Status		.20	.18		
13. Provider		.363	.363		
14. Comp Spouse		.23	.137		
15. Comp Sibs				.25	
16. Comp Peers					.109
17. Sex Role		.363	1.0		
18. Act					.109
19. Sex Beh					ND
Totals	.09	.02	.002	.055	.062

variable in that when the Us were visiting their grandparents the grandfather would busy himself with work or isolated activities and the grandmother would be engaged in housework and send the Us outside to play. There is a slight tendency for the Us' grandparents to be more overconcerned with religion than the NUs' grandparents ($P = .171$). Also, there is a tendency for the Us' grandparents to punish them more frequently and more harshly than the NUs' grandparents ($P = .172$). It should also be pointed out that when the Us' grandparents and the NUs' grandparents are compared as groups they are differentiated at the .09 level of significance.

Table V gives the levels of significance for fifteen variables relating to the stimulus category "Mother." Of these fifteen variables none are significant at the .05 level or greater; however, one variable, restraints, is fairly significant ($P = .074$). As in the case of the grandparents, there tended to be over domination rather than too little restraint. There is some tendency for the Us' mothers to be less interested in intellectual matters such as reading, music, etc. than the mothers of the NUs ($P = .117$). There is a tendency for the mothers of the Us to show less overt affection such as kissing, fondling, hugging, etc. than the mothers of the NUs ($P = .144$). There is also a tendency for the Us' mothers to punish them more frequently and more harshly than the mothers of the NUs ($P = .144$). Even though there are so few variables

that significantly differentiate the mothers of the Us from the mothers of the NUs, when they are contrasted as a group the mothers are differentiated at the .02 level of significance.

From Table V we clearly see that the most significant category of variables is that of "Father." There are four variables significant within the .05 level. The fathers of the Us showed much less affection than the fathers of the NUs ($P = .004$). The fathers of the Us rarely if ever kissed the Us good night, hugged them, fondled them, etc. The Us' fathers engaged in active play with the Us much less than the fathers of the NUs engaged in play with the NUs ($P = .011$). The fathers of the Us placed more restraints on the Us than the NUs' fathers on the NUs ($P = .02$). Us' fathers used physical punishment more frequently and more severely than did the fathers of the NUs ($P = .02$). The fathers of the Us displayed more deviant behavior than did the fathers of the NUs ($P = .092$). This deviant behavior was usually in the form of temper outbursts, withdrawal and occasional heavy drinking. There was a tendency for the fathers of the Us to be less compatible with their spouses than the fathers of the NUs ($P = .137$). There was also a tendency for the Us' fathers to show less interest in intellectual matters such as literature, music, etc. than the NUs' fathers ($P = .188$). Moreover, the fathers of the Us tended to have less status than the NUs' fathers ($P = .18$).

That is to say, the Us' fathers were for the most part rural farmers, and some were share croppers having little status in the eyes of the community. As one might expect, when the Us' fathers and the NUs' are contrasted as a group they are highly differentiated at the .002 level of significance.

Of the seven variables rated under the category "Siblings" in Table V we find that only one variable, active play, is significant ($P = .011$). The Us had little time to play with their siblings during the first decade because they spent most of their spare time working on the family farm or doing household chores. We also find that the Us and their siblings displayed somewhat less affection between themselves than did the NUs and their siblings ($P = .109$). The siblings of the Us tended to display more deviant behavior than did the NUs' siblings ($P = .137$). This deviant behavior was manifested in frequent fighting, temper tantrums and in one case psychotic behavior. The siblings of the Us and the NUs are differentiated from each other as a group at the .055 level of significance.

From Table V we find that none of the variables related to the stimulus category "Peers" are significant beyond the .10 level. Also, one of the five variables in this category, sexual behavior, had to be discarded because of insufficient data and is marked ND in Table V. Nevertheless, the Us were less compatible with their peers than were the NUs ($P = .109$).

The Us engaged in less childhood activities with their peers than did the NUs ($P = .109$). There was a tendency for the Us to have less contact with peers than the NUs ($P = .144$). There is a slight tendency for the peers of the Us to display more deviant behavior than the NUs' peers ($P = .188$). It should be noted, however, that the above P -values for the stimulus category "Peers" may be spuriously low because over half of the Us had no close friends or pals with whom to associate during their first decade, and were thus rated "0" for the whole stimulus category. Nevertheless, the stimulus category "Peer" differentiates the Us and the NUs at the .062 confidence level.

Part B

Table VI lists the scores obtained on the U-T Deprivation Scale by the U and NU Ss. The highest possible score is 16, with the higher scores indicating the greater degree of deprivation experienced in the present environment by the S. It is seen that there was only one reversal and one tie among the nine matched pairs of the Ss. The Binomial Expansion was applied to these data, and it yielded a probability of .055. Moreover, it is to be noted that the mean Deprivation Score for the Us is more than double the Score of the NUs.

An analysis of the individual items of the Deprivation Scale is seen in Table VII, and it was found that only two

TABLE VI

RATINGS ASSIGNED U AND NU Ss ON THE U-T DEPRIVATION SCALE

MAXIMUM SCORE IS 16

Pairs	U	NU
1	12	4
2	4	2
3	6	5
4	3	4
5	10	2
6	4	4
7	11	2
8	13	6
9	11	5
Mean	8.2	3.8
Range	3-13	2-6
P =	.055	

ITEM ANALYSIS OF THE DEPRIVATION SCALE
OF U AND NU Ss

Item	No. Reversals/N	P
1. Employment	2/9	.20
2. Income	3/9	.393
3. Debts	3.5/9	.363
4. Fear	0/9	.002
5. Wife	4.5/9	.363
6. Parents	5/6	.363
7. Children	1.5/6	.20
8. Other Relatives	4.5/9	.363
9. Church	6/9	.363
10. Other Organizations	2.5/9	.363
11. Friends	2.5/9	.20
12. Job Participation	4/9	.363
13. Job Status	2/9	.20
14. Status - Other	3.5/9	.20
15. Residence	1/9	.092
16. Education	4.5/9	.363

items significantly discriminated the Us from the NUs. Item Number 4, Fear, was significant at the .002 level of confidence. Also, Item Number 15, Residence, was significant at the .092 level, indicating that the Us had less pride in their home or dwelling than did the NUs. However, the same direction of effect was present in all but two of the items (Number 6, Parents and Number 9, Church.) That is to say, on every item, with the exception of Number 6 and Number 9, the Us received more "poor" one ratings than did the NUs. Nevertheless, the finding that only two of the items on the Deprivation Scale differentiate the Us from the NUs should not be too unexpected because the Us and the NUs were matched on occupation and education, and five of the sixteen Deprivation Scale items pertain to these areas. Moreover, the two point, forced choice, zero or one, scoring of the Deprivation Scale leads to many ties which possibly tend to lower the significance of the results.

Chance

It might be stated by some that because only 12 of these 49 stimulus variables are significant, chance might be operated to produce these data; even though chance is in some instances a "real" phenomenon, it should be noted that the direction of effect of each of these variables shows the same consistency.

CHAPTER IV

DISCUSSION

Of the 49 different variables used to compare the nine peptic ulcer subjects and the nine control subjects during their first decade of life, twelve were significant at the .10 level of confidence or better (six were .05 or better). It should be noted that these significant variables deal mostly with the more basic needs of man. For example, punishment and restraint are related to safety needs, and affection and play are related to needs of belongingness.

It appears that the Us in this study received much more environmental deprivation from important figures (Father, Mother, etc.) during their first decade than did the NUs. This was not an overall deprivation, in that the Us lived with their Mother and Father and had contact with them every day. The deprivation occurred in the amount of stimulation and kind of stimulation received from these important figures. These findings are somewhat different from the findings of Davis (5) who did similar research with a group of chronic alcoholics. The alcoholics were more severely deprived of environmental stimulation during their first decade than the Us. This deprivation was characterized by long or complete absence of the Mother and/or Father as a stimulus during the first ten years of the alcoholic's life. Moreover, the

alcoholic's behavioral deviations were greater than our experimental group.

The Us' fathers were consistently rejecting of and punitive toward their sons during the first decade of life. This is clearly illustrated by the experiences of one of the subjects in the experimental group. This subject's father was a farmer and worked in the fields every day, seeing his son at breakfast and evening meal and in the afternoon when the subject came home from school and did the farm chores. When the subject was in the father's company, the subject had to answer "Yes, sir," or "No, sir," to the father's questions or orders. It was understood by the subject that he must do his assigned farm chores before playing or leisure activities. If the chores were not done promptly or correctly, the subject received a whipping with a hickory switch from the father. These whippings were hard, even to the point of drawing blood. The father never kissed the subject good night, good-bye or hugged him or held him on his knee according to S. The only conversation between father and son was concerning chores or the subject's misconduct. Moreover, the father was certain to give the subject a whipping if the subject spoke out at the dinner table or argued back to either parent, or made a noise inside the home. From experiences like these, which were far from uncommon with the Us, we readily see that the subject under discussion received little gratification of needs

(outside of food and shelter) from his father. It can also be hypothesised that a person who was subjected to such experiences could develop certain negative attitudes and expectancies toward males and authority figures. These attitudes that men are punitive, rejecting and unsuccorant would affect relationships with peers and other males in the environment. This is somewhat the case with the Us; six of the nine Us had no close friends or pals during the first ten years of their life.

The aforelisted variables demonstrate that the ulcer subjects were subjected to great psychological deprivation during their first ten years of life than were their matched controls. This is strikingly true with respect to their relationship with their fathers. During this period of life, the Us also showed deviancy in respect to the formation of close relationships with male peers and female peers, thereby reducing the opportunity to learn appropriate patterns of behavior toward people outside the family constellation. This would increase the probability that the Us would learn deviant modes of getting along with others from an early age. It seems that the Us, even though they were subjected to much psychological deprivation during their first decade, managed to maintain at least a minimal level of adjustment in getting along with their parents. This adjustment was probably maintained by the performance of household chores and other odd

jobs around the home. Performing these tasks would tend to reduce the frequency of punishment, and also preserve a stable relationship with the parents. The time put in doing work at home would also tend to reduce the amount of time spent in the company of male and female peers. This finding is similar to that found by Davis (5) in his research with chronic alcoholics. The alcoholics tended to be dutiful children who readily accepted heavy responsibilities in the area of work. However, the major differences between the Us in the control group and the alcoholics studied by Davis were in greater amount of deprivation sustained by the alcoholics during the first decade as compared to the Us. Moreover, the mothers of the alcoholics were the more frustrating parent, where with the Us, the father was the more frustrating. The mothers of the alcoholics were absented from the home either by employment or desertion whereas the mothers of the Us remained in the home to give at least some succorance and support to their sons. Even though, the fathers of Davis' alcoholic subjects and fathers of the Us of the present study were nonsuccorant, the more important factor which appears to be operating to determine whether a person develops the deviant behavior of alcoholism or the deviant "behavior" of a peptic ulcer is the amount of frustration experienced by the subject from the mother figure. It can be assumed that chronic alcoholism is a more pervasive

and more severe form of deviant behavior than is peptic ulcer, and it seems that the greater the amount of psychological deprivation experienced from the mother the greater the deviant behavior exhibited by the child in later life.

Because of the early frustrations and deprivation of needs experienced by the Us in relationship with their fathers, we can hypothesize that the Us developed certain attitudes towards men in general and authority figures in particular. These attitudes, or deficit positive habits as Pascal (16) names them, are unacceptable to the subject and not brought to his awareness. These deficit positive habits might be "fear of males," "males are unsuccorant," "males are rejecting," etc. If attitudes of this nature were made conscious, they would be greatly disturbing to the Ss and would most likely interfere to a large extent with his normal, day-to-day activities so that he could not function properly in the environment. Therefore, in order to defend against these untoward attitudes, or mental habits, the Us learned other manifested patterns of behavior which defended them from the unacceptable deficit positive habits; Pascal (16) calls these behavior patterns "deficit negative habits." The deficit positive habits are learned from infancy and are engendered by the manner in which we are treated by others. The deficit negative habits are learned as we discover, probably by trial and error, which bits of behavior will make us

feel more comfortable in stressful situations. For example, if a child is repeatedly punished and reprimanded and not given succorance by his father, he would likely learn the deficit positive habits that men are punitive, nonsuccorant, and should be feared; so to counteract these attitudes, which would be almost intolerable if they were in awareness, behavior patterns, such as avoidance, compliance, withdrawal, etc., are learned to cope with these deficit positive habits whenever the individual is in close proximity of another male. (Deficit positive habits are so called because the nearer they are to awareness the greater the deviant behavior; the more effective the deficit negative habits are operating the less will be the deviant behavior.)

We see that our Us were subjected to a punitive and rejecting father; so we hypothesize that they developed the deficit positive habits, fear of males, males are unsuccorant, males are rejecting, during their first ten years of life. It follows that whenever the Us were near their fathers they were in a stressful situation; so in order to reduce this stress, the Us developed the deficit negative habits of withdrawal (the Us never kissed their fathers good night and rarely played with them), obedience (the Us promptly carried out any instructions or orders given them by their fathers), and deference (the Us addressed their fathers by saying "Yes, sir," or "No, sir." This is to name but a few of the possible

deficit negative habits developed by the Us; there are certainly others of which we are not aware.

While the Us were living at home with their families, their deficit negative habits worked probably adequately well because of the many years of practice and many reinforcements which these behavior patterns had given them. However, as the Us approached adulthood, and entered military service, their environment was changed drastically. They were thrown into a situation where they were forced to associate with and live in close proximity to many different males who were strangers to them. It will also be recalled that the Us had had little experience in associating with peers, and were thus denied the benefit of learning different behavior patterns with people outside their families. Thus, the Us may have had a difficult time in discriminating many of their army comrades from their fathers. With this difficulty in differentiation, the Us could have generalized their deficit positive attitudes about their father to the other soldiers; this would be especially true of the commissioned and non-commissioned officers.

It can be readily seen that when the Us were placed in this stressful military environment they might well resort to their old deficit negative habits of withdrawal, obedience, deference, etc., in order to relieve the immediate stress. However, withdrawal from male contact would be impossible at a

military training camp; obedience and deference might meet with some success, but would not be wholly effective in eliminating the curses, orders, maledictions, etc., administered by those in command. It would be here that the Us' deficit negative habits might fail to operate effectively and deviant behavior would manifest itself. Since the Us had little opportunity to develop a variety of deficit negative habits with peers, and being that they were so severely restrained during their first decade of life and not allowed to exhibit such behavior as arguing, temper tantrums, etc., the only form of deviant behavior open to the Us was an internal one. The Us were not severely enough deprived by their mother during their first decade to develop a severe form of deviancy (psychosis, for example); so it is hypothesized that for the above reasons they developed a peptic ulcer.

A peptic ulcer offered the Us a socially acceptable way of withdrawing from an extremely stressful situation, and thereby allowing their deficit negative habits to operate efficiently again, at least for the time being. It should also be noted that the Us' stress was not totally eradicated when they were discharged from military service. (All Us were given medical discharges from the military because of peptic ulcer.) The one item on the U-T Deprivation Scale which clearly differentiated the Us from the NUs concerned

fear or anxiety in the present environment.

Even though several findings were arrived at concerning the relationship between environmental deprivation and peptic ulcer, it is believed that a replication would certainly be in order because of the restricted experimental population used; all Us were patients at the Veterans Administration Hospital in Atlanta, Georgia, and were drawing government compensation for their service connected peptic ulcers. Moreover, further behaviorally oriented research in the area of peptic ulcer is suggested. In order to more rigidly define the behavioral variables which contribute to the formation of peptic ulcer, it is suggested that a comparison of the stimuli encountered by a group of hospitalized psychotic patients, chronic alcoholics, peptic ulcer patients and another group of psychosomatic patients (such as asthmatics) be made. In this way the exact variables relating to peptic ulcer could be more exactly defined and studied. Also, a more detailed analysis of the significant variables found in the present study might be of future benefit.

The following are tentative hypotheses developed from the present study;

- I. Peptic ulcer is a form of deviant behavior.
- II. Peptic ulcer is related to early environmental deprivation of a psychological nature.
- III. Peptic ulcer is a reaction to psychological stress.

- IV. Deprivation from the father figure is a contributory factor to peptic ulcer.
- V. Deprivation of male and female peers is a contributory factor to peptic ulcer.

CHAPTER V

SUMMARY

The purpose of this study was to develop hypotheses concerning variables related to the formation of peptic ulcer in man. The subjects used in this research were nine peptic ulcer patients hospitalized at the Atlanta, Georgia, Veterans Administration Hospital and nine controls matched on age, intelligence, education, occupation, sex and marital status. The controls did not have peptic ulcer. Each subject was given a standard psychological interview which was intensive in nature.

From the intensive psychological interviews, case histories for the eighteen subjects were prepared. Each case history was rated by two raters on a total of sixty-five behavioral variables. Forty-nine of these variables were gathered from the Pascal-Jenkins Behavioral Scales and pertained to the kind of stimuli encountered by the subjects during the first ten years of their life. The remaining sixteen variables composed the U-T Deprivation Scale which measures the amount of need gratification a subject is receiving from his present environment. Each variable was analyzed by non-parametric statistics to determine if the peptic ulcer group and the control group were significantly different on any variable.

Analysis of the cross-sectional variables of the U-T Deprivation Scale yielded a significant difference between groups. The ulcer group was receiving less gratification from the current environment than the control group. An item analysis of this Scale revealed that only two items, Fear and Residence, differentiated the experimental and control group. Analysis of the Pascal-Jenkins Behavioral Scales revealed that the ulcer subjects received more psychological deprivation during the first ten years of life than did the controls. Twelve of the forty-nine variables relating to the stimuli encountered during the first decade were significant at the .10 level of confidence or better (six were .05 or better). The greatest amount of deprivation for the experimental subjects was experienced from the Father, mostly in the form of harsh and frequent punishment, severe restraints and lack of affection. The ulcer subjects received more deprivation during their first ten years of life from the Father than any other adult figure. An attempt to relate psychological deprivation to the etiology of peptic ulcer was presented. Hypotheses from the data were also presented. The need for replication and further investigation of behavioral variables was mentioned.

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APPENDICES

APPENDIX A

APPENDIX A

SCORE SHEET

PASCAL-JENKINS BEHAVIORAL SCALES

(Other than ratings of the scale, use the following notations:

0 - totally absent or dead
ND - no data
DNA - does not apply)

S1.1 Paternal grandmother

Experimental Control

- S1.1-1 Frequency of contact
- 2 Active play with S
- 3 Restraints on S
- 4 Physical punishment
- 5 Displays of affection
- 6 Deviant behavior
- 7 Alcohol drinking behavior
- 8 Religiosity

S1.2 Paternal grandfather

- S1.2-1 Frequency of contact
- 2 Active play with S
- 3 Restraints on S
- 4 Physical punishment
- 5 Displays of affection
- 6 Deviant behavior
- 7 Alcohol drinking behavior
- 8 Religiosity

S1.3 Maternal grandmother

- S1.3-1 Frequency of contact
- 2 Active play with S
- 3 Restraints on S
- 4 Physical punishment
- 5 Displays of affection
- 6 Deviant behavior
- 7 Alcohol drinking behavior
- 8 Religiosity

S1.4 Maternal grandfather

- S1.4-1 Frequency of contact
- 2 Active play with S
- 3 Restraints on S

- 4 Physical punishment
- 5 Displays of affection
- 6 Deviant behavior
- 7 Alcohol drinking behavior
- 8 Religiosity

S2.1 Mother

Experimental Control

- S2.1-1 Frequency of contact
 - 2 Active play with S
 - 3 Restraints on S
 - 4 Physical punishment
 - 5 Displays of affection
 - 6 Deviant behavior
 - 7 Physical health
 - 8 Religiosity
 - 9 Gregariousness
 - 10 Intellectualism
 - 11 Variability of habitat
 - 12 Parental status
 - 13 Provider
 - 14 Compatibility with spouse
 - 15 Sexual role - appropriateness
 - 16 Alcohol drinking behavior

S2.2 Father

- S2.1-1 Frequency of contact
 - 2 Active play with S
 - 3 Restraints on S
 - 4 Physical punishment
 - 5 Displays of affection
 - 6 Deviant behavior
 - 7 Physical health
 - 8 Religiosity
 - 9 Gregariousness
 - 10 Intellectualism
 - 11 Variability of habitat
 - 12 Parental status
 - 13 Provider
 - 14 Compatibility with spouse
 - 15 Sexual role - appropriateness
 - 16 Alcohol drinking behavior

S3.0 Siblings

- S3.1-1 Frequency of contact
 - 2 Active play with S
 - 3 Restraints on S
 - 4 Physical punishment

- 5 Displays of affection
- 6 Deviant behavior
- 7 Compatibility with sibling

S4.0 Peers - same sex

- S4.1-1 Frequency of contact
- 2 Deviant behavior
- 3 Compatibility with peers
- 4 Activities with peers
- 5 Sexual behavior

S5.0 Peers - opposite sex

- S5.1-1 Frequency of contact
- 2 Deviant behavior
- 3 Compatibility with peers
- 4 Activities with peers
- 5 Sexual behavior

APPENDIX B

U.T. DEPRIVATION SCALE

G. R. Pascal and W. O. Jenkins

The 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 judgment. 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 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 two-point, forced-choice, the subject being judged either poor or good on each item. If the judgment is poor, the score is one (1). If the judgment 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 unemployed are employed less than half time.

2. Income. Give a rating of poor (1) if the subject's annual income is less than \$2600.

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 given 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 toward 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 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 for any sibling. If the subject has a close relationship with one sibling and no strong negative feelings towards others, 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 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 patient 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 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. The 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 the 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.

APPENDIX C

APPENDIX C

MEAN RATINGS OF Us' AND Nus' GRANDPARENTS ON SEVEN BEHAVIORAL VARIABLES

Subject Pairs	Freq of Contact		Active Play		Rstrnts		Phys Punish		Display Affect		Deviant Behav		Relig		Means	
	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>
1	3.0	0	1.0	0	2.0	0	2.0	0	2.0	0	3.0	0	3.0	0	2.4	0
2	1.0	2.0	.8	2.0	2.0	3.0	2.0	3.0	.8	2.0	2.0	3.0	1.3	3.0	1.4	2.7
3	2.0	2.0	.8	2.0	1.0	3.0	1.0	3.0	1.0	2.0	1.0	3.0	2.0	2.0	1.3	2.5
4	.8	2.0	.5	2.0	.5	2.0	.3	2.0	.3	2.0	1.8	2.0	.8	2.0	.6	2.0
5	1.0	1.5	.5	1.0	1.3	1.5	1.5	1.5	.8	0	1.3	1.5	1.5	1.5	1.1	1.2
6	0	.8	0	.8	0	.8	0	.8	0	.8	0	.8	0	.8	0	.8
7	2.3	1.5	1.2	1.0	1.5	1.5	1.8	1.5	1.0	1.3	2.3	1.5	1.7	1.5	1.7	1.4
8	0	1.3	0	1.3	0	1.3	0	1.5	0	1.5	0	1.5	0	1.5	0	1.4
9	1.5	2.0	.5	2.0	1.0	2.0	1.5	3.0	.8	2.0	1.3	3.0	.8	2.0	1.1	2.3
\bar{X} of Means															1.1	1.6

APPENDIX C

RATINGS OF US' AND NUS' MOTHERS ON FIFTEEN BEHAVIORAL VARIABLES

Subject Pairs	Freq of Contact		Active Play		Rstrnts		Phys Punish		Display Affect		Deviant Behav		Phys Health		Relig-iosity	
	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C
1	3	3	2	3	2	2	3	2	2	3	3	3	3	3	3	2
2	3	3	2	3	1	3	3	3	2	3	3	3	3	3	2	3
3	3	3	2	3	1	3	2	3	2	3	3	3	3	3	3	ND
4	3	3	2	2	1	3	2	3	3	2	3	3	3	3	3	3
5	3	3	1	3	2	3	2	3	1	3	3	3	1	2	3	3
6	3	3	2	3	1	3	1	2	2	3	3	3	3	3	2	3
7	3	2	2	ND	2	ND	1	ND	2	ND	3	ND	3	ND	3	3
8	3	3	1	ND	1	2	1	2	1	2	1	3	3	3	1	3
9	3	2	3	2	2	2	3	2	3	2	2	3	1	3	2	2

APPENDIX C

RATINGS OF Us' AND NUs' MOTHERS ON FIFTEEN BEHAVIORAL VARIABLES (cont'd)

Subject Pairs	Gregar- iousness		Intell		Variab Habitat		Parent Status		Provider		Compat Spouse		Sex Role Appro		Means	
	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>
1	2	3	2	2	3	2	2	ND	3	3	2	2	3	3	2.5	2.6
2	2	2	2	2	3	ND	3	2	3	3	3	3	3	3	2.5	2.8
3	1	3	2	3	3	3	2	3	3	3	2	ND	3	3	2.3	2.8
4	1	2	2	3	3	2	2	3	3	3	2	2	3	3	2.4	2.7
5	2	3	2	ND	3	3	2	ND	2	3	3	2	3	3	2.2	2.9
6	3	ND	2	3	2	3	2	ND	3	3	3	DA	3	3	2.3	2.9
7	3	3	2	ND	1	ND	2	ND	3	ND	2	3	3	ND	2.3	2.8
8	3	3	1	ND	1	3	2	ND	2	3	2	3	3	3	1.7	2.8
9	2	2	1	2	3	3	2	2	3	3	2	1	3	2	2.3	2.3
X of Means															2.3	2.7

APPENDIX C

RATINGS OF US' AND NUS' FATHERS ON FIFTEEN BEHAVIORAL VARIABLES

Subject Pairs	Freq of Contact		Active Play		Rstrnts		Phys Punish		Display Affect		Deviant Behav		Phys Health		Relig- iosity	
	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C
1	3	2	1	3	1	3	1	3	1	3	2	3	3	3	3	2
2	3	3	2	3	1	3	3	3	1	2	3	3	3	3	3	ND
3	3	3	2	3	2	3	1	3	1	3	2	3	3	3	3	3
4	3	3	1	3	1	3	1	3	2	3	3	3	3	3	3	3
5	3	3	1	3	1	3	2	3	1	2	3	3	3	3	3	3
6	3	3	2	3	1	ND	1	ND	2	ND	2	3	3	ND	2	ND
7	3	3	2	2	2	2	1	2	1	2	3	3	3	3	2	3
8	3	3	1	2	1	2	1	2	1	2	2	3	3	3	1	3
9	3	2	1	3	1	3	1	3	1	3	2	3	3	ND	2	3

APPENDIX C

RATINGS OF Us' AND NUs' FATHERS ON FIFTEEN BEHAVIORAL VARIABLES (cont'd)

Subject Pairs	Gregar- iousness		Intell		Variab Habitat		Parent Status		Provider		Compat Spouse		Sex Role Appro		Means	
	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>
1	2	ND	2	1	3	2	2	2	3	3	2	3	3	3	2.1	2.6
2	3	ND	2	ND	3	3	3	3	3	3	3	3	3	3	2.6	2.9
3	3	3	2	ND	3	3	2	3	3	3	2	3	3	3	2.7	3.0
4	2	ND	1	2	3	1	2	3	3	3	2	2	3	2	2.2	2.7
5	2	3	1	ND	3	3	3	3	2	3	3	3	3	3	2.3	3.0
6	3	ND	2	ND	2	ND	2	ND	1	ND	3	ND	3	ND	2.1	3.0
7	2	3	1	3	1	ND	2	3	2	3	2	3	3	3	2.0	2.7
8	1	ND	2	ND	1	3	2	ND	2	2	2	3	3	3	1.7	2.6
9	2	3	2	3	3	3	2	3	2	3	2	3	3	3	2.0	2.9
X of Means															2.2	2.8

APPENDIX C

MEAN RATINGS FOR Us' AND NUs' SIBS ON SEVEN BEHAVIORAL VARIABLES

Subject Pairs	Freq of Contact		Active Play		Rstrnts		Phys Punish		Display Affect		Deviant Behav		Compat-ibility		Means	
	E	C	E	C	E	C	E	C	E	C	E	C	E	C	E	C
1	2.0	3.0	1.7	3.0	2.2	3.0	2.2	3.0	1.0	3.0	1.8	3.0	2.0	3.0	1.8	3.0
2	3.0	ND	2.0	3.0	DA	3.0	DA	3.0	1.0	3.0	3.0	3.0	3.0	3.0	2.4	3.0
3	3.0	3.0	3.0	3.0	DA	3.0	DA	3.0	2.0	ND	3.0	3.0	3.0	2.0	2.8	2.9
4	3.0	3.0	2.5	3.0	2.0	2.0	3.0	3.0	1.0	ND	3.0	3.0	2.5	2.0	2.4	2.7
5	3.0	0.0	2.0	0.0	3.0	0.0	3.0	0.0	1.0	0.0	2.3	0.0	2.7	0.0	2.4	0.0
6	2.7	3.0	2.4	3.0	2.7	3.0	2.8	3.0	1.1	3.0	2.4	3.0	2.6	3.0	2.4	3.0
7	3.0	3.0	2.5	3.0	DA	3.0	DA	3.0	1.5	3.0	2.0	3.0	2.0	3.0	2.2	3.0
8	3.8	3.0	1.8	3.0	3.0	DA	3.0	DA	1.0	2.0	1.8	3.0	2.0	3.0	2.2	2.9
9	2.3	3.0	2.0	3.0	2.8	3.0	2.8	3.0	1.1	3.0	1.8	ND	2.3	3.0	2.2	3.0
X of Means															2.3	2.6

APPENDIX C

MEAN RATINGS FOR Us' AND NUs' PEERS ON FIVE BEHAVIORAL VARIABLES

Subject Pairs	Freq of Contact		Compat-ibility		Deviant Behav		Activities		Sex Behav		Mean	
	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>	<u>E</u>	<u>C</u>
1	3	0	3	0	3	0	3	0	3	0	3.0	0.0
2	0	3	0	3	0	ND	0	ND	0	3	0.0	3.0
3	2	3	3	3	3	3	3	3	3	3	2.8	3.0
4	0	2	0	3	0	3	0	ND	0	3	0.0	2.8
5	0	ND	0	ND	0	ND	0	ND	0	ND	0.0	-
6	0	ND	0	ND	0	ND	0	ND	0	ND	0.0	-
7	3	3	3	3	2	ND	3	ND	3	ND	2.8	3.0
8	0	3	0	3	0	ND	0	3	0	ND	0.0	3.0
9	0	2	0	3	0	3	0	3	0	3	0.0	2.8
\bar{X} of means											1.0	2.5

APPENDIX D

APPENDIX D

ITEMS OF THE DEPRIVATION SCALE

Pair	1	2	3	4	5	6	7	8	9
Item	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>	<u>E</u> <u>C</u>
1	1 0	0 0	0 0	0 0	1 0	0 0	1 0	1 0	1 0
2	1 1	0 0	0 0	0 0	1 0	0 0	1 0	1 1	1 0
3	1 1	0 0	0 0	0 0	0 0	0 0	0 0	1 0	1 0
4	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0	1 0
5	0 1	0 0	1 0	0 0	0 0	0 0	0 0	0 0	0 0
6	- 0	0 1	0 0	0 0	0 0	0 0	0 0	- 0	- 0
7	- 0	0 0	- 0	0 0	1 0	0 0	0 -	1 0	0 0
8	0 0	0 0	0 1	0 0	0 0	0 0	1 0	1 0	0 1
9	1 0	0 0	0 0	0 1	0 0	0 1	0 0	0 1	0 1
10	1 0	1 0	1 1	1 1	1 0	1 1	1 0	1 1	1 1
11	1 0	1 0	1 1	0 1	1 1	1 0	1 0	1 1	1 0
12	1 0	0 1	0 1	0 0	1 0	0 0	1 1	1 0	1 1
13	1 0	0 0	0 0	0 0	1 0	0 0	1 0	1 0	1 0
14	1 1	1 0	1 1	1 1	1 1	0 1	1 0	1 1	1 0
15	1 0	0 0	1 0	0 0	1 0	1 0	1 0	1 0	1 0
16	1 0	0 0	0 0	0 0	0 0	0 1	1 1	1 1	1 1

APPENDIX E

APPENDIX E

CHI SQUARES OBTAINED FOR NO DATA ENTRIES
ON EARLY STIMULUS VARIABLES

Variables	Ss With No Data Entries		χ^2 df = 1	P
	U	NU		
I Grandparents	0	0	0	.99
II Mother	0	7	11.45	.001
III Father	0	8	14.43	.001
IV Siblings	0	4	4.11	.05
V Peers	0	5	6.92	.01