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BY

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INTRODUCTION

Nature of Problem

The purpose of this study is to make a comparison of personality traits of siblings. This purpose, so stated, is very broad and would have no end of possibilities. To limit the field to a certain extent, the purpose can be better stated by saying; it is proposed:

- 1. To find if there is any relationship between tendencies toward maladjustment and neurotic disposition of siblings.
- 2. To determine whether there is a tendency for introversion or extraversion scores of siblings to be related.
- 3. To determine the relation between introversion or extraversion scores and scores made on tests for maladjustment.
- 4. To determine the relation between socioeconomic status of the individual and his personality traits
 as shown by the personality schedule tests and introversion
 and extraversion tests.
- 5. To find the relation between socio-economic status and intelligence.
- 6. To study the interrelationship between the foregoing alleged measures of personality.

Historical Summary

Much has been done in the way of testing introverts and extraverts; but little can be found which deals directly with this particular problem. Schwegler found in his study that by the use of the Multimental Test with junior and senior high school students that the extravert group is somewhat brighter than the introvert group.

According to other studies which have been carried out, there appears to be no relation between intelligence and introversion-extraversion scores. Guthrie³ reports a correlation of .01 between the Colgate Personal Inventory C-3 and intelligence. Hoitsma³ reports a correlation of .35 between the Colgate Personal Inventory and college scholarship, showing a small tendency for extraverts to excel in test performance. Using the same variables at the University of Washington, Guthrie gets a correlation of .11. With these results, we can say the introversion-extraversion scores show no more than a slight correlation with intelligence.

^{1.} Raymond Alfred Schwegler. A Study of Introvert-Extravert
Responses to Certain Test Situations. 1929 pp 33-38

^{2.} Percival M. Symonds. Diagnosing Personality and Conduct p 202

^{3.} Ibid

^{4.} Ibid

taken from Thurstone's Neurotic Inventory, Bernrenter Self-Sufficiency Test, Laird C-2 Introversion Test, and Allport Ascendance-Submission Reaction Study, a correlation of .93⁵ is obtained between neurotic tendencies and introversion-extraversion scores. This correlation appears to be exceptionally high, and may be partially accounted for by a statement from Symonds in a discussion of tests on introversion-extraversion. He explains that Laird, Marston and Heidbreder came out with the first introversion tests. And then Symonds adds *Perhaps all these are derivatives of the Woodworth Inventory, because certain of the questions asked in the introversion-extraversion questionairres were also used by Woodworth in his inventory.*

The correlation coefficients which have been computed between intelligence test scores of siblings vary from .27 to .68 with a central tendency around .50. We find correlations ranging from .62 to .75 for fraternal twins and some as high as .88 to .93 for identical twins.

^{5. &}lt;u>Ibid</u>. p 208

^{6,} Ibid. p 196

^{7.} Rudolph Pintner. Intelligence Testing. pp 508-512

It has been quite generally accepted that the tendency toward introversion or extraversion is inherited, but the writer could find no statistical data to that effect.

Nothing could be found that showed any relation that might exist between siblings in regard to neurotic tendencies as measured by a personality schedule test.

Much has been done by way of studying the correlation between social status and intelligence. The following table taken from Proctor⁸ shows one such study.

TABLE I
Showing Relation Between Social and Economic Status of Varying Mental Ability.

I. Q.	Rank of	Fathe:	r's Occu	pation		Totals
Groups	V	IV	III	II	Ī	
7	Cases	Cases	Cas es	Савев	Cases	Cases
135-over	0	0	0	3	1	4
125-134	0	1	0	7	6	14
115-124	0	0	6	8	10	34
105-114	0	0	10	8	3	81
95-104	0	1	14	11	3	28
85- 94	0	æ	9	7	0	18
75- 84	0	0	0	1	0	1
Totals	0	4	39	45	23	110

^{8.} William Martin Proctor. Educational and Vocational Guidance. p 46

The significant fact to be taken from this table is that from the three lower classifications of father's occupations, only 17 of 43 students listed, or 39.5%, have I.Q.'s of 105 or better; while in the two higher classifications of father's occupations, 46 of the 67 students, or 68.6%, have I.Q.'s of 105 or better.

In a survey of occupational groups of enlisted men in the United States Army during the world war, it was found that all labor groups had average ratings of C or less. For example the laborer, farmer, general miner, teamster, tailor and barber who was in the army made an Army Alpha score of C-, which is interpreted as a low average. The bricklayer, truck driver, cook, painter, shop mechanic, carpenter and general machinist had median scores that gave them ratings of C or an average I.Q. The ratings of A and B were made, as a rule, only by engineers, chaplains, medical officers, secretaries and accountants.

Some of the most recent information in this connection is given us by Pressey. His results tend to show that the children of professional men excel the children of laborers in intelligence test performance. The results follow. 10

^{9.} Paul L. Boynton. <u>Intelligence</u>. pp 441-43

10. S. L. Pressey. <u>Psychology and the New Education</u>. p 235

TABLE II

Group Comparison by Means of Intelligence Tests.

Per Cent of children in each classification, according to father's occupation, testing above the median for their age.

Ages 6, 7, 8 (non	verbal)	Ages 10 - 14 (verbal)		
Occupation	Per Cent	Occupation	Per Cent	
Professional men	79 .	Professional men	85	
Business men	60	Business men	68 /	
Artisans	54	Artisans	41	
Laborers	38	Laborers	39	

In Terman's group of one thousand gifted children whose intelligence was of 140 I.Q. or above, it was found
that nearly a third of the fathers belonged to the professional classes, a half to the semi-professional or
higher business classes, and less than 7% to the semiskilled or unskilled labor classes.

The history of this phase of the work can best l2 be summarized by quoting Pinter:

Indirectly the factor of heredity can be seen at work in the differences in intelligence found among children of different social status. In the long run those possessing superior intelligence will in general tend to occupy the

^{11.} Lewis M. Terman. Handbook of Child Psychology p 572

^{13.} Rudolph Pintner. Intelligence Testing pp 513-14

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^{11.} Lewis M. Terman. Handbook of Child Psychology p 573

^{12.} Rudolph Pintner. Intelligence Testing pp 513-14

higher types of positions in the world, and those possessing inferior intelligence will gravitate toward the lower occupations. Since children tend to inherit the same kind of intelligence as their parents, we ought to find differences in the intelligence of children as we proceed from the lower to the higher occupations of their parents. The results of many workers show this to be the case.

PROCEDURE

As stated earlier, this study is designed to fulfill a double purpose, namely: first, the determination of the interrelation between certain measures of personality, i.e. introversion-extraversion scores, neurotic disposition as measured by the personality schedule, intelligence tests and a related test of socio-economic status; and second, the correlation between the preformances of siblings on these respective measures.

- Subjects -

The subjects were chosen from college and senior high school students. The final list of siblings contained groups of students from 137 different families. Most of the groups contained only two subjects; but some families were represented by as many as three or four members. These subjects represented every class in the senior high school and college, and ranged in age from fourteen to thirty two years.

There were in all 324 individuals. Some of these 324 subjects are not paired as siblings because, in some cases, the brother or sister was absent from school the day of the testing. The records of these students have been used in that part of the study not involving correlations between siblings. In the 137 sets of siblings are 15 pairs

of twins. No attempt was made to determine how many of these were identical or how many were fraternal twins.

- Materials -

The materials for this study consisted of a battery of three tests and an intelligence rating obtained upon the students. The battery of tests was composed of the Neymann-Kohlstedt Diagnostic Test (purported to measure introversion-extraversion), the Beach Socio-Economic Status Test, and a personality rating test. The Beach Test and the personality rating schedule will be found in the appendix.

The items chosen to make up the personality rating schedule were the forty most differentiating items taken from Thurstones' Personality Schedule and thirty six items selected from the Woodworth Psychoneurotic Inventory.

The intelligence rating of the high school students is given in I.Q.'s obtained from results of testing with the Haggerty Delta 2. The intelligence rating of the college subjects is given in decile ranking obtained from results of Freshman entrance tests given at Kansas State Teachers' College of Emporia. This decile ranking is obtained from a battery of six tests consisting of the K.S.T.C. Entrance Test (intelligence), the Barrett-Ryan English Test, an arithmetic test, a reading test, a vocabulary test, and a spelling test. The Entrance Test is an adaptation of the

^{13.} Percival M. Symonds. Op Cit p 183

All testing, except for intelligence, was conducted solely by the writer. Each group of subjects was instructed as to the purpose of the testing, and the importance of the accuracy of the responses.

RESULTS AND DISCUSSIONS

Intelligence Relation of Siblings

This group of students forms a very near normal distribution as compared to other studies of group intelligence. A study, reported by Patterson, 13 of a school population of another Kansas town, shows a distribution very similar to the distribution obtained by the writer; likewise a study by Holly of another college town made upon 2030 school children.

Because of the different methods of measuring intelligence, it was necessary to divide them according to college and high school students. The college students were given decile ranking as already explained. The correlation between siblings of the college group was found to be .41 ± .145. For the high school group, which was measured by the I.Q. of the students, this correlation was found to be .63±.009.

These correlations fall well within the range obtained by other experimenters. According to Pintner's summary 15
correlations between the test scores of siblings

^{13.} Donald G. Patterson. SCHOOL AND SOCIETY. Vol.7,1918 p.86.

^{14.} Rudolph Pintner. Intelligence Testing. p. 248.

^{15. &}lt;u>Ibid.</u> pp 508-12

range from .37 to .68. The correlation of high school students of .63 is somewhat high, but can be partially explained by the fact that there were four sets of twins whose correlation coefficient was $.91\pm.054$. This correlation is about what is expected of identical twins.

Relation between Siblings on Introversion Traits.

The distribution of scores, for the 280 subjects used in the sibling correlation as well as for the 324 individuals, shows a very normal distribution, with about 65% of the scores falling between 10 and -10 on the introversion-extraversion tests. The mean score for the entire group was 6.02, indicating a slight tendency toward extraversion.

As has been quite generally accepted, this trait may be an inherited one; but to prove it would require a very thorough and intensive study through several generations. The correlation obtained in this study between siblings was .09 ± .056, which is negligible. For some siblings there was a very high plus correlation; while for others there was a very high minus correlation. An example of the latter, was a set of identical twins; the one of which had a + 36 score, the other a -38 on the Neymann-Kohlstedt test.

To the extent that the Neymann-Kohlstedt test
measures introversion-extraversion, Shese results would seemingly indicate that these traits are not inherited. While a
significant correlation between siblings does not prove heredity

the absence of such a relationship is presumptive evidence against its inheritance.

Personality Schedule Scores

On the personality schedule test of a list of 76 questions, the writer obtained a very nearly normal distribution with a slight skewness toward the top. The greatest number of neurotic answers received was 75, and the fewest was 10, with a mean score for the 334 individuals of 53.86. The correlation between siblings of neurotic scores was a negligible factor with $r = .10 \pm .056$.

TABLE III
Comparisons between Siblings

Nature of test	Mean score	Correlation	
		r.	P.E.
Introversion-Extraversion	6.02	•09	.056
Personality schedule	53.86	.10	.056
Intelligence high school	102.38	. 63	.009
Intelligence college	7.03	.41	.145

Table III shows a correlation between siblings on intelligence that is comparable to other studies. The correlations on the scores made on the personality schedule and the introversion-extraversion tests are negligible.

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Intercorrelations

The relation between socio-economic status and intelligence did not show as marked as was expected, but did show in both cases a plus cofrelation. For high school students where the I.Q. was used in correlation with the social status scores, the obtained r equals .13± .072. For the college students where the decile ranking was used as a measurement of intelligence, a correlation of .23±.069 was obtained.

Other correlations were computed as follows:

- 1, social status vs. introversion-extraversion scores;
- 2, social status vs. personality schedule scores;
- 3, introversion-extraversion vs. intelligence; 4, personality schedule vs. intelligence; and 5, personality schedule vs. introversion-extraversion traits.

TABLE IV

Intercorrelation Values in Coefficients

Test	A	В	G	D	£
A.		•10	.05	,13	.23
ъ В	.10		•08	05	03
C	.05	.08	*** * /	03	.13
D	.13	05	03		
E	. 23	02	.13		

Key to table: A represents socio-economic; B introversion-extraversion; C personality schedule; D high school intelligence; E college intelligence.

In the first of these correlations, that of socio-economic status vs. introversion-extraversion scores, a correlation of .10±.038 was obtained. For the second correlation, that of socio-economic status vs. personality scores the obtained r equals .05±.038. The correlation between introversion-extraversion traits and intelligence was divided according to college and high school students. For the high school students where the I.Q. was used, a correlation of -.05 ±.073 was obtained, whereas for college students where the decile ranking was used, the correlation was -.02 ± .073. In the fourth correlation, that of personality schedule scores and that of intelligence, the obtained correlation for high school students was -.03 ±.073 and for college students it was .12±.072.. For the fifth correlation between introversion traits and personality schedule scores, where correlations as high as .9316 have been obtained for siblings, the writer in this study obtained a correlation of .08± .036.

Relations at the Extremes

The foregoing correlations, based upon the entire distribution, show negligible relationships between the various traits intercorrelated. It has seemed desirable to investigate

^{16.} Percival M. Symonds. <u>Diagnosing Personality and Conduct.</u> p. 202

this point further by considering the extremes. Accordingly the upper and lower 25 per cent of cases in intelligence test performance were divided into four groups each, upon the basis of socio-economic status; and the scores upon the introversion-extraversion test and the personality schedule were computed for each of the four levels of socio-economic status. The results are given in Table V.

TABLE V
Average Scores of the Extremes

Intelligence		Socio- Economic	Introversion- Extraversion	Personality Schedule
Upper 25% divided into	1.	70	9	64.
4 levels of socio-econo-	а.	54.1	•9	50.4
mic status.	3.	43.7	•5	54.3
	4.	34	.67	54
Lower 25% divided into	1.	57.4	5,2	51
4 levels of	a.	46.3	3. <i>3</i>	51
socio-econo- mio status.	3.	39.8	10.1	60.3
	4.	31	2.4	55

The lower group of the lower 25% of intelligence rating had an average social status score of 31 points, whereas the average social status score for the total 324 students was 46.05 points. For the upper level of the upper

35% of intelligence rating had an average socio-economic score of 70 as compared to 46.05 for the average of the entire group.

The students of the upper level of social status in the upper 35% of intelligence, have a socio-economic score of 70 as compared to 57.4 for the same group in the lower 25% of intelligence. Those students in the lower group of social status in the upper 25% of intelligence have an average social status score of 34 as compared to an average score of 31 for the same group of the lower 25% of intelligence.

The lower level of students, according to social status, in the upper 25% of intelligence, have an average personality schedule score of 54 as compared to an average score of 55 for the same level of the lower 25% of intelligence; and a mean score of 53.86 for the entire group of 324 students. However, the upper level of the upper 25% of intelligence have an average personality schedule score of 64 as compared to a score of 51 for the same level of the lower 25% of intelligence.

The lower level of the upper 25% of intelligence have an average score of .67 on the introversion test as compared to 3.4 for the same group of the lower 25% of intelligence. The upper group of the upper 25% has an average score of 9 as compared to 5.1 for the same group in the lower 35% and a mean score of the entire group of

6.02. This would indicate a high correlation between social status and introversion tendencies. For the entire group a positive correlation was found, but only of $.10\pm.038$.

It will be noted from Table V that the scores on the personality schedule test are consistent regardless of social or intelligence levels. The introversion-extraversion scores are inconsistent with a high score for the upper level of the upper 25% and for the third level of the lower 35%. The mean scores for the socio-economic test are higher for each level in the upper 25% than for the corresponding level in the lower 35%...

As a final step in this direction, the highest and lowest 10 per cent of subjects in intelligence were compared as to socio-economic scores, personality schedule and introversion-extraversion test. Table VI contains the results.

TABLE VI

Average scores of the highest and lowest 10% of intelligence

Per cent of intelligence	Socio- Economic	Introversion- Extraversion	Personality Schedule
Highest 10%	55.6	3.1	55
Lowest 10%	41.4	.88	53

The upper 10% have a social status average of 55.6 as compared to 41.4 for the lower 10% and a mean score for all the 324 subjects of 46.05.

The upper group of 10% has an introversion test score average of 3.1 as compared to .88 for the lower 10%, and a grand average of 6.02. The coefficient of correlation obtained between introversion-extraversion scores and intelligence was slightly minus.

The upper 10% had an average score of 55 on the personality schedule test as compared to 53 for the lower 10% and a mean score of 53.86 for the entire 324 subjects.

Table VI shows about the same results for the upper and lower 10% of intelligence as Table V does for the 25%. There is a definite relation of intelligence to social status.

CONCLUSIONS

Within the limits of this study, the following conclusions are warranted.

(1) Sibling relationship.

The coefficients of .41 and .63 between siblings on intelligence is a significant factor.

The correlation coefficient of -.09 on introversion-extraversion scores is so nearly negligible we are warranted to assume this trait is not inherited.

A negligible correlation of .10 does not give a significant relationship between personality schedule scores.

(3) Interrelationships.

There is a definite relation between socio-economic status and intelligence.

There is a slight tendency for those of higher social-economic standing to tend toward extraversion rather than introversion.

The coefficient of .05 between socioeconomic scores and scores made on personality schedule test is negligible.

There is no relation between degrees of intelligence and personality schedule scores, as indicated by the coefficients of -.03 and .12.

The negligible coefficient of .08 would indicate there is no relation between scores made on introversion-extraversion tests and scores made on personality schedule tests.

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APPENDIX

Beach Socio-Economic Status Test Teachers College Emporia

U ption describes	
	(Last name) (First name) (Age) (Class)
1.	Do you live in the country? Town?
2.	No. Brothers (dead or living) No. sisters (dead or living)
3,	If you live in a town or city, what is its approximate population? Circle correct figure. Below 300, 300 to 600, 600 to 1000, 1000 to 5000, 5000 to 10 000, 10 000 to 20 000, 20 000 to 50 000, above 50 000.
4.	How many people live in your home? Does your family own the home?
5.	How many rooms are there in your home?
6.	Gircle any of the following appliances which are to be found in your home. Telephone, Radio, Victrola, Piano, Running Water, Bathtub, Sewerage, Wash bowl with hot and cold faucets, Toilet stool, Electric refrigerator, Furnace, Coal cook range, Gas cook range, Electric cook range, Gasoline or coal oil stove, Upholstered or overstuffed furniture.
7.	Is the floor of the living room of your home covered? If so, is it covered with carpeting or by a number of rugs? Linoleum, etc?
8.	If your family owns an automobile, what yearly model is it? (Answer in this manner: Model 1936, make Buick)
9.	Circle the approximate number of books found in your home. 35 or less, 50, 100, 300, 500, 1000, 5000.
10.	What daily or weekly newspapers are taken by your family?
11.	What magazines are regularly subscribed to by your family?

12.	Circle the grade attained by your parents in their schooling. Father Grade school: 1,2,3,4,5,6,7,8. High school: 1,2,3,4. College: 1,2,3,4. Lighting their schooling. Mother 1,2,3,4,5,6,7,8. 1,2,3,4. 1,2,3,4.
13.	Is your father living? Is your mother living?
14.	Are your parents paying all of your expenses while you are in school? Are they paying at least half of your expenses while you are at school? Are they contributing at all toward your expenses while you are here? Is anyone else helping you financially, and to what extent?
15.	Father's occupation?
16.	Mother's Occupation? (If she works)
	If your father farms, does he own his farm? Approximate number of Acres NO. tractors No. horses and mules
16.	Has either of your parents even held any office in any organization? If so, what office in what organization?

Personality Schedule Test Teachers College Emporia

1.	Do you get stage fright?	Yes	No
2.	Do you have difficulty in starting a conversa-		
77	tion with a stranger?	Yes	No
3.	Do you worry too long over humiliating	¥	Ma
4.	experiences?	Yes	No
" •	Do you often feel lonesome, even when you are with other people?	Yes	No
5.	Do you consider yourself a rather nervous	165	71.0
••	person?	Yes	и8
6.	Are your feelings easily hurt?	Yes	No
7.	Do you keep in the background on social		
	occasions?	Y өв	No
8.	Do ideas often run through your head so you		
^	cannot sleep?	Yes	ИО
9.	Are you frequently burdened by a sense of	97 a m	37 -
٦.	remorse?	Yes	No
	Do you worry over possible misfortunes?	Y es	ИО
TT 6	Do your feelings alternate between happiness	9£	11.
	and sadness without apparent reason?	Yes	No
	Are you troubled with shyness?	Yes	No
	Do you daydream frequently?	Yes	No
	Have you ever had spells of dizziness?	Yes	No
	Doyou get discouraged easily?	Yes	No
	Do your interests change quickly?	Yes	No
	Are you easily moved to tears?	Yes	No
18 *	Does it bother you to have people watch you at	30	37
7.0	work even when you can do it well?	Yes	No
19.	Can you stand criticism without feeling hurt?	Yes	No
21	Do you have difficulty in making friends? Are you troubled with the idea that people are	Yes	No
ಲ⊤ •	watching you on the street?	.Yes	No
22	Does your mind often wander badly so that you	* T. GS	.140
20.	lose track of what you are doing?	Yes	No
23.	Have you ever been depressed because of low		21 0
50.	marks in school?	Yes	No
24.	Are you touchy on various subjects?	Yes	No
	Are you often in a state of excitement?	Yes	No
	Do you frequently feel grouchy?	Yes	No
	Do you feel self-conscious when you recite in		
	class?	Yes	No
28.	Do you often feel just miserable?	Yes	No
	Does some particular useless thought keep		
	coming into your mind to bother you?	¥ es	No
30.	Do you hesitate to volunteer in a class		· •
	recitation?	Yes	No
31.	Are you frequently in low spirits?	Yes	No
	Do you often experience periods of loneliness?	Yes	No
	Do you often feel self-conscious because of	- '	
	your personal appearance?	Yes	No
		-	

ه ڏڙ			
	Do won look and a second of		
スピ	Do you lack self-confidence?	Yes	No
70	Do you find it difficult to speak in public?	Yes	No
20.	Do you giten feel self-conscious in the presence		
	or substicts!	Yes	No
37.	If you see an accident, are you quick to take		-10
	an active part in giving help?	Y es	No
38.	Do you feel you must do a thing over several	. 00	. XI Q
	times before you leave it?	Yes	XY
39.	Are you troubled with feelings of inferiority?		No
40.	Do you often find that you cannot make up your	Yes	No
	mind until the time for action is passed?		**
4.7	Do you have the time for action is passed!	Y es	No
27.	Do you have ups and downs in mood without		
40	apparent reason?	Y es	No
40+	Are you in general self-confident about your		
A 400	abilities?	Yes	No
43.	Do you usually sleep well?	Yes	No
44.	Do you usually feel well and strong?	Yes	No
45.	Are you frightened in the middle of the night?	Yes	No
46.	Do you have nightmares?	Yes	No
47.	Do you ever walk in your sleep?	Yes	No
	Do you feel well rested in the morning?	Yes	No
	Are you bothered much by blushing?	Yes	No
50 -	Are you bothered by fluttering of the heart?	Yes	No
	Do you feel tired most of the time?	Yes	
		TAR	No
ວລ.	Do you have queer unpleasant feelings in any	X7	W -
E77	part of the body?	Yes	No
	Do you have a great many bad headaches?	Yes	No
	Did you have a happy childhood?	Yes	No
	Were you happy when you were 14 to 18 years old?	Yes	No
	Were you considered a bad boy?	Yes	No
	Did the other children let you play with them?	Yes	No
	Has your family always treated you right?	Yes	No
59.	Did your teachers in school generally treat you		
	right?	Yes	No
60.	Do you know of any body who is trying to harm you?	Yes	No
	Do people find fault with you more than you deserve		No
	Have you ever seen a vision?	Yes	No
	Have you ever felt as if some one were		
	hypnotizing you and making you act against your		
	will?	Yes	No
64.		. 00	-1 -
O** •	person is reading your thoughts?	Yew	No
~~		160	MO
00.	Do you ever have a queer feeling as if you were	Van	No
0.0	not your old self?	Yes	TA 💍
66.	Does it make you uneasy to cross a bridge over	TF a. ~	M-
,	a river?	Yes	No
67.	Do you usually know just what you want to do?	Yes	No

68. Do	you worry too much about little things? you get rattled easily?	Yes Yes	No No
69. DO	you sit still without fidgeting?		No
yu. uan	you ever have the habit of biting your		
ብተው ከTM	ger nails?	Yes	No
20 84 TTT	night are you troubled with the idea that		
A COM	night are you violated with the ment are necessary and the ment are you?	Yes	No
Ha Diy	you ever have the habit of wetting the bed?	Yes	No
73. D'U	you syst may but has a see longh?	Yes	No
74. IB	it easy to make you laugh?	Yes	No
75. Is	it easy to make you angry?		
76. Hav	e you ever been afraid of going insane?	Yes	No