AN EXPLORATORY STUDY OF PERSONALITY FACTORS WHICH DIFFERENTIATE BETWEEN QUITTERS, NORMALS AND PERSEVERATORS

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CHAPTER I

INTRODUCTION AND REVIEW OF LITERATURE

The field of psychology, from its earliest infancy, has been concerned with the process of learning. Previously this concern has been primarily focused on basic psychology and the development of learning principles. At the present time there is a strong movement to use precise and controlled laboratory techniques for the study of human learning within an educational setting. Educators have long been interested in both acquisition and extinction behavior in students and in the learning environment. This learning environment may consist of both the external world and factors within the learner himself. Such factors as motivational level, learning experience and internalized attitudes toward learning and the retention of learning are now being studied with considerable care.

The present study is an investigation of the relationship of certain personality factors to extinction behavior. A knowledge of this relationship and its application to learning situations might be of considerable aid to the teacher and the clinical psychologist in working with individuals who show maladaptive behavior in schools or in other life situations.

For example, a teacher might be instructing two children of equal ability in the correct method of dividing. One child tries, makes a mistake, is corrected by the teacher, notes the correction and changes his behavior so that he achieves the correct answer. In a short time, he will have mastered the art of dividing. The other child, however, makes a mistake, is corrected,

but finds it impossible to put the correction into practice. On problem after problem he will repeat the same errors, never seeming to correct his original mistake. The question here is why he does not extinguish the incorrect behavior and receive the rewards of approval and achievement. The answer may lie in some aspect of his personality.

A somewhat different example is that of the child who receives an M & M for every correct response he makes in a simple learning experiment but refuses to participate after the first three trials, even though he can see the candy in front of him. The difference between his experimental behavior and that of the other children in his groups may well be due to a difference in his perception of the situation. This perception may be influenced by personality factors.

Two questions then seem to arise: Why do some people extinguish response behavior when they are still being rewarded, while others persist when no gain is possible? How do these two sets of people differ in personality structure from the average subject who responds until he is sure there is no reward forthcoming and then gives up?

Recent laboratory research has investigated the general rationality (logical use of existing cues) of subject behavior in specific learning situations. Gladstone (1966a) reasoned that a rational use of available cues would facilitate extinction responses. In order to provide a cue which might be used rationally, Gladstone exposed the reward reservoir in an operant conditioning situation. He found that seventy percent of the subjects continued to respond after no more reinforcements were available. Hypothesizing that even greater control could be exercised over the extinction behavior of subjects Gladstone (1966b), using an exposed reservoir and penalized his subjects for each response, including the extinction responses. This increased the number of subjects who stopped

abruptly when the rewards ran out but, again, thirty-two percent of the subjects continued to respond.

Gladstone and Miller (1968) replicated this latter experiment changing only the amount of reward and penalty, and found that thirty percent of the subjects continued to respond without reinforcement. In an experiment currently being conducted by Miller with the use of an irrelevant stimulus at the beginning of extinction, the same results are being reported. Miller, in the current experiment, found that about fifty percent of her subjects did not complete the learning task when they were on a variable ratio schedule, i.e., they quit before they received all the potential rewards in the reservoir.

Gladstone (1968) added control of attention, i.e. lights at the beginning of extinction, to the controls inherent in the visual display and motivation to stop. This reduced the number of subjects who gave no extinction responses to sixty-five percent as well as severely limiting the number of extinction responses made. When a variable ratio reinforcement schedule was used, without control of attention, many of the subjects failed to complete the learning task although potential rewards were visible.

Gladstone and Miller (1968), Miller (in progress), and Gladstone (1968) all found that, when a penalty for responding was involved, subjects tended to quit more readily than under conditions where no punishment was involved. Subjects tend to perseverate when no punishment is involved. It seems logical, therefore, that by arranging experimental situations conducive to perseveration, to quitting, and to acting in a rational manner, some individuals will fall into each of these three behavioral categories.

Gladstone (1966b) felt that he may have been dealing with two separate populations, one responding rationally, (i.e., stopping when no more rewards were available) and the other perseverating in extinction, (i.e., responding

after they could see that all the rewards were gone). In his later experiments it does seem evident that more than one population was being dealt with. There are possibly three populations of subjects involved. These three might be described as: (1) a population which will fail to take full advantage of all the rewards available; (2) a population which will act in a rational manner; and (3) a population which will perseverate in extinction.

Many experiments have suggested that personality effects learning. Mandler (1952) studied the effects of anxiety on learning and found that the mean time scores on the Kohs Block Design were better for a low anxiety group than for a high anxiety group. Also, an intervening report (success or failure) elicited improved performance for the low anxiety group but depressed scores for the high anxiety group. Neal (1967) while studying the relationship of personality variables to reading ability found:

> "The inter-relationship of emotional factors and interest factors to the cognitive variables in reading tends to support the thesis of inter-relatedness of the human organism with regard to learning and personality." (Neal, 1967, p. 143)

Repression was found to be significantly and positively related to achievement for college males by Stix (1967).

Fink (1965) found that inadequate self-concept was related to low academic achievement for boys while adequate self concept was related to high academic achievement. Roth (1965) found that under-achievers suffered from both free floating anxiety and frequent depressions. This was part of what she termed the "None-achievement Syndrome."

Wellington (1965) in a review of literature concerning underachievement found that underachievers had the following characteristics: low motivation, low self-confidence, low capacity to function under pressure, low seriousness of purpose, low concern for others, low sense of responsibility and low dom-

inance. Shaw (1960) using the Sarbin Adjective Check-list found male underachievers tended to have ambivalent feelings toward themselves.

These studies suggest that the differences in response found by Gladstone (1966a; 1966b; 1968), Gladstone and Miller (1968), and Miller (in progress) could be a function of personality variability.

Personality, according to Cattell (1950), is "that which permits a prediction of what a person will do in a given situation," (i.e., a trait). For Cattell, a trait is an inference made from observed behavior to account for regularity and consistency in behavior. An individual's personality then is made up of traits which can be studied and used to predict his behavior.

Cattell (1950) suggests that the goal of psychological research in personality is to establish laws to predict what different people will do in all kinds of social and general environmental situations, including learning situations.

Using a factor analytic technique Cattell (1962) isolated sixteen traits which he feels give a complete measurement of the individual's personality. Using these traits he devised a test called the "Cattell Sixteen Personality Factor Questionnaire." These traits are listed and described in Table I. Cattell's Sixteen Personality Factor Questionnaire has been used by a number of investigators to uncover the differences between specific groups.

In the clinical setting this test was used by Karson (1959) to study differences between Air Force men with no history of psychiatric care or court martials, Air Force men who had been diagnosed as anxiety neurotics, and Air Force men who were psychosomatic. Twelve Factors, (3, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15 and 16) on the Sixteen Personality Factor Questionnaire discriminated between the normals and anxiety neurotics. These Factors indicated that anxiety neurotics are more emotional, more depressed, have lower superego strength, are more timid, are more tender-minded, are less

trustful and adaptable, are more imaginative, more insecure, more radical, less controlled and have more suppressed ergic tension than the normal group. Other factors (1, 2, 4, 11) were not significantly different.

TABLE I

SIXTEEN PERSONALITY FACTORS LISTED AND DESCRIBED

	Low Score Description	High Score Description
1.	Schizothyme Aloof, Cool, Reserved	Cyclothyme Warm, Easy going
2.	Dull, Low Capacity	Bright, Intelligent
3.	Low Ego Strength Emotional, Unstable	High Ego Strength Mature, Calm
4.	Submissive, Mild	Dominant, Aggressive
5.	Depressed Sober, Prudent	Elated Enthusiastic, Happy-go-lucky
6.	Low Superego Strength Expedient, Casual	Higher Superego Strength Conscientious
7.	Autonomically Over-reactive Shy, Timid	Adventurous, Thick Skinned
8.	Tough-minded, Realistic	Tender-minded, Over-protected
9.	Trustful, Adaptable	Jealous, Paranoid
10.	Conventional, Practical	Imaginative, Autistic
11.	Forthright, Artless	Shrewd, Polished
12.	Confident, Placid	Insecure, Guilt-prone
13.	Conservative, Cautious	Experimenting, Critical, Radical
14.	Group-dependent, Imitative	Self-sufficient, Resourceful
15.	Lax, Low Self-concept, Integration	Controlled
16.	Relaxed	Suppressed Ergic Tension

The psychosomatic group was significantly different from the normals on seven of the factors, (1, 2, 3, 8, 12, 14 and 16). Psychosomatic patients appeared to be less warm, more intelligent, less stable, more emotionally sensitive, suffered more from guilt feelings, were more self-sufficient and had a higher degree of ergic tension than the normal group. There were three factors which differed significantly between the two patient groups. There were Factors 5, 10, and 13. The neurotics tended to be more depressed, more radical and more creative than the psychosomatic group.

De Plama (1958) found that alcoholics differed from the general population on all but two factors; these factors being 11 and 14; awkward vs. sophisticated and dependent vs. self sufficient.

Karson (1960) gave the sixteen Personality Factor Questionnaire to the mothers of children brought to the Child Guidance Clinic. He compared these mothers to a random selection of mothers whose children were not being seen. Significant mean differences were found between the two groups on Factors 1, 5, 12, 15 and 16. The mothers of disturbed children could be described as more depressed, possessing stronger guilt feelings, being less able to control anxiety and having more free floating anxiety than mothers of children not being seen in the guidance clinic.

Anderson (1961) investigated the personality factors affecting the reading level of college students. A consistent relationship was found between scores made on the Cooperative Reading Test and Factors 2, 6, 8, 10, 13 and 14. A positive correlation existed with all these factors except 6, where there was a negative correlation between it and a high score on the reading test. Anderson described the good reader as being more intelligent (2), more sensitive (8), more introverted (10), more radical (13), more self-sufficient (14), and less conscientious (6). Overall, the personality of the good reader appears

to be, as measured by Cattell's test, emotionally sensitive, self-sufficient, introverted and to a lesser degree radical and evasive of rules.

Winborn (1967) studied the difference in personality variables of campus social-political leaders and four other groups of leaders: leaders of religious organizations; leaders of residence halls, i.e. elected officers; leaders of activities; and fraternal leaders. The social-political leaders varied significantly from all other groups on Factors 6, 10, and 13. They appear to have a lower frustration tolerance, to be more enthusiastic and aggressive, and to be more imaginative, more critical, and radical.

Cattell (1967) studied the differences between smokers and nonsmokers in the college population. He found that a positive correlation existed between smoking and high scores on Factors 1, 5, and 8. He also found that when the smokers profile was compared to those of clinical patients there was a resemblance to sociopathic and psychopathic personality types and a somewhat lesser resemblance to the general neurotic type.

It appears from these studies that the Sixteen Personality Factor Questionnaire is capable of differentiating both between normal and clinical groups and between normals who differ from one another in some trait or traits.

CHAPTER II

THE PROBLEM

The purpose of this study was to investigate the relationship between personality variables and differential behaviors in a normal operant conditioning situation using a five to one variable ratio schedule of reinforcement. Personality variables were assessed by the Cattell Sixteen Personality Factor Questionnaire.

Behavioral groups investigated are described below:

1. The group of individuals who failed to complete the learning task, i.e., those who quit before they had received all the available rewards. After the data was collected these individuals were divided into two groups; A, those who responded 25 or fewer times in the learning situation and B, those who responded 26 times but 50 or fewer times.

2. The group of normal individuals, i.e., those who appeared to act in a rational and typical manner by making use of existing cues. This group was called C. After inspection of the data this group was defined as those with 10 to 19 extinction responses.

3. The group of individuals who perseverated beyond a point felt to be reasonable, i.e., 20 or more extinction responses. This group was divided into two groups; D, early perseverators, and E, late perseverators, after inspection of the data. Group D had between 20 and 45 extinction responses and E over 45 extinction responses.

The subjects yielding 1 to 9 extinction responses were not used since

it was felt that their behavior was not clearly either that of quitting or acting normally.

The study was designed to allow a wide range of behavior in the learning situation. It was felt that by using a variable ratio schedule of ten to one and a closed reward reservoir, subjects would tend to cease responding at different times. Some subjects, knowing they were being penalized, would play it safe and stop when they were ahead. Others would respond as long as they thought there was a good chance of getting a reward but would stop responding when the penalty seemed to outweigh the reinforcement possibility. Still others, would as in past experiments, tend to perseverate and continue to respond even when the penalty seemed to outweigh the possible reinforcement. Since all subjects were faced with a similar experimental experience, differences in length of time to response cessation might be considered to be due, at least in large measure, to differences in personality traits.

The hypothesis is that the five groups will differ among themselves in personality scores on the Cattell Sixteen Personality Factor Questionnaire.

CHAPTER III

EXPERIMENTAL DESIGN AND RESULTS

Subjects:

Experimental subjects consisted of 150 freshman and sophomore students, 63 males and 87 females, at Oklahoma State University. These 150 experimental subjects were volunteers from a larger group of 400 introductory psychology students who had been given the Sixteen Personality Factor Questionnaire (Cattell), in large group sessions. PF scores were unknown to E at the time of the experimental task was administered.

Materials:

The "Sixteen Personality Factor Questionnaire" was used to assess the personality variables of Ss. It is an objectively scored test devised by Raymond Cattell (1962). The test consists of 184 items with 20-26 items to measure each of the 16 personality factors isolated by Cattell. The questions are arranged in a cyclical order to insure the interest of S and to maximize scoring convenience. Three alternative answers to each question are provided. The S may fall back to a 'middle of the road' choice if he finds either of the extreme answers aversive or inappropriate for him. An example of one item is: "I like to watch team games." The alternatives provided are: A. yes, B. occasionally, C. no.

The correlations between the sixteen factors are quite small indicating that the scales are essentially independent. Test scale consistencies are given in the form of reliabilities, homogeneities and equivalence coefficients.

Reliability's range from +.81 to +.61 (Cattell, 1963).

Equipment:

Equipment consisted of a standard laboratory rat feeder, operated by an on-off switch. In this study BBs were substituted for rat pellets.

An electronic programmer in an adjacent room, set on a 5 to 1 variable ratio reinforcement schedule, recorded all responses made and rewards received. Ten BBs were used for token rewards.

Procedure:

The investigation consisted of two phases which are separately described below.

Phase I: S was brought into the experimental room and asked to stand in front of the experimental equipment. The BB dispenser was covered with a cardboard concealing the BBs so the Ss did not know how many rewards were available.

S was given the following instructions:

> "This is a simple learning experiment. There are no tricks involved. Your task is to operate this machine. Flick this switch on and off several times and a BB will drop into the container; like this, (E demonstrates.) Later, for every BB you have, you will receive 2¢, but, for every time you have turned the switch on and off you will lose 1/5 of a cent. You now have a BB worth 2¢, but, the machine was turned on and off 5 times so you lose 1¢, this leaves you a profit of 1¢. Do you understand? You may begin operating the machine and tell me when you are finished."

S continued to respond until he decided to stop. No effort was made to influence him in continuing or stopping. Fifty responses had to be made to receive the ten token rewards. All responses in excess of fifty were considered extinction responses and will be referred to as such in the future.

Phase II: Subjects were divided into five groups according to the num-

ber of responses made on the experimental task. Ss who reached the level of 50 responses but who did not reach the criterion of ten extinction responses were dropped from the final experiment.

Thirty subjects for each subject group were used. These were chosen randomly. The total distribution of responses by group is shown in Table II.

Group A (early quitters) consists of Ss who made less than twenty-six responses.

Group B (later quitters) consists of Ss who made twenty-six or more responses to the learning task but who failed to get all the available rewards.

Group C (the low criterion or rational group) consists of Ss who received all 10 rewards and who made 10 to 19 extinction responses.

Group D (the early perseverators) consists of Ss making between twenty-two and forty-five extinction responses. This group was defined by the fact it was the lowest half of the sixty Ss making the greatest number of extinction responses.

Group E (the late perseverators) consists of Ss making the greatest number of extinction responses, i.e., 45 or more extinction responses.

TABLE II

DISTRIBUTION OF RESPONSES MADE BY ALL SUBJECTS

Group A		Group B		Group C	
Responses	Number of Subjects	Responses	Number of Subjects	Responses	Number of Subjects
5	2	26	14	10	12
6	0	27	3	11	13
7	0	28	10	12	7
8	1	29	1	13	5
9	2	30	2	14	6
10	2	31	4	15	7
11	0	32	1	16	6
12	1	33	11	17	5
13	0	34	1	18	4
14	3	35	0	19	4
15	9	36	0		
16	0	37	1		
17	0	38	1		
18	0	39	5		
19	0	40	18		
20	12	41	1		
21	1	42	0		
22	0	43	0		
23	0	44	0		
24	0	45	2		
25	2	46	18		
		47	2		
		48	0		
		49	0		
N = 35		N = 95		N = 69	

TABLE II (Continued)

Group D		Group E	
Responses	Number of Subjects	Responses	Number of Subjects
22	1	45	2
23	3	46	2
24	1	47	0
25	1	48	0
26	2	49	1
27	1	50	0
28	2	51	2
29	3	52	2
30	2	53	0
31	3	54	2
32	0	59	1
33	0	64	1
34	1	65	1
35	2	75	1
36	3	84	1
37	0	85	1
38	1	88	1
39	0	98	1
40	1	131	1
41	1	135	1
42	1	165	1
43	0	170	1
44	1	172	1
		175	1
		196	1
		251	1
		271	1
		285	1
		1741	1
N = 30		N = 30	

Responses for Groups C, D and E are extinction responses.

CHAPTER IV

ANALYSIS

The means and standard deviations of each of the five experimental groups were computed for each of the sixteen factors of the Cattell Questionnaire. An analysis of variance for any number of groups was then done to establish if any of the group means were significantly different from one another. The analysis of variance was completed by use of the IBM 360, Model 50, Computer at Oklahoma State University's Computer Center. The computational procedure was taken from Dixon (1957).

Table III represents the mean score of each of the experimental groups on the sixteen factors of the Cattell Sixteen Personality Factor Questionnaire.

Table IV gives the F ratio for each of the factors. F was significant (at the .05 level) only on Factor 11. Since this result could have occurred by chance when this number of factors are involved no further analysis was carried out on this factor.

An additional analysis was carried out to investigate the relationship of scores to sex of subject and degree of perseveration. The five original groups were divided by sex as was a new group composed of the fifteen most extreme perseverators. These divisions yielded two sets (male and female) of six groups each.

Comparison of these groups revealed five factors, (4, 8, 9, 11 and 13) differentiated between the sexes at a significant level. See Appendix A for this data.

TABLE III

MEAN SCORE OF EACH OF THE EXPERIMENTAL GROUPS ON THE SIXTEEN FACTORS OF THE CATTELL SIXTEEN PERSONALITY FACTOR QUESTIONNAIRE

Factor	Groups				
	A	B	C	D	E
1	11.23	10.93	11.40	10.40	10.53
2	7.50	8.06	8.16	8.40	8.03
3	14.03	15.06	15.56	14.53	16.86
4	12.90	12.70	11.86	13.76	12.76
5	16.63	16.66	17.33	17.70	16.50
6	11.50	12.76	12.80	12.73	12.30
7	12.13	11.16	12.90	13.36	11.96
8	9.80	11.36	10.70	10.10	9.93
9	8.43	8.20	7.36	9.10	9.13
10	11.60	13.06	13.03	11.93	11.90
11	10.53	10.56	11.13	9.16	10.96
12	11.20	10.56	10.50	10.06	8.73
13	8.50	9.06	9.26	9.46	10.00
14	11.06	10.43	10.80	10.20	10.30
15	9.66	10.00	10.76	9.76	11.20
16	14.70	14.00	11.83	13.66	12.40

Like sex groupings showed only Factor 11 for females as significant. This cannot be viewed as meaningful, however, because as noted above it might have occurred by chance alone. See Appendix B for F ratios of Factors 4, 8, 9, 11 and 13 by sex.

TABLE IV

F RATIOS OF GROUPS ON THE SIXTEEN FACTORS

Factor	F	Factor	F
1	0.5565	9	1.4034
2	0.8887	10	1.4377
3	1.9810	11	2.4904*
4	0.6344	12	1.6343
5	0.4178	13	1.2265
6	0.6674	14	0.2887
7	0.7199	15	1.4552
8	0.9206	16	1.5433

*Significant at the .05 level of confidence.

CHAPTER V

DISCUSSION

The null hypothesis that the groups involved in the experimental learning task would not differ among themselves in personality scores on the Cattell Sixteen Personality Factor Questionnaire was accepted, i.e., the experimental hypothesis was rejected. No differences between the quitters, normals and perseverators was found in any of the groups studied.

In the comparison of groups divided according to sex, males differ significantly from females on some personality factors as would be expected from the literature on sex differences. However, neither males nor females differed from experimental group to experimental group within the like sex populations.

It appears that if personality effects the individuals' behavior, it does so in a way not measured by the Cattell Sixteen Personality Factor Questionnaire. It may be that quitting, rational behavior and perseveration are not related to a specific personality trait as measured by the test used, but to combinations and degrees of traits. For example, investigation might be carried out to discover whether or not individual questions on the Cattell Questionnaire (or other tests) differentiate between the experimental groups; thus possibly providing perseveration and quitting scales.

Another line of investigation might deal with grade point average, expected grade point average as predicted by the A.C.T., and the group (normal, quitter or perseverator) that the individual falls into in an experimental learning task. It seems reasonable that perseverators might be found to be

overachievers while quitters may be underachievers.

In summary, then, the negative results obtained in the present study should not discourage further attempts to investigate and explain the differences so readily observable among the various groups in this type of experimental situation. It is felt that the employment of different methods or different tests might result in more positive findings in future research.

CHAPTER VI

SUMMARY

Many recent studies in the field of learning (Gladstone, 1966a, 1966b, 1968; Gladstone & Miller, 1968; Miller, in progress) have found that subjects react differently to the experimental situation; i.e., some subjects quit responding while rewards are still available, others act in a rational manner and still others perseverate when no rewards are forthcoming. Other studies have found that it is personality that effects learning in some situations (Mandler, 1952; Neal, 1967; Fink, 1965; Roth, 1965; Wellington, 1965; Shaw, 1960). The present study is an investigation of the relationship of personality factors to behavior in a learning situation.

It was found that the behavior of individuals drawn from a college population differed in an operant conditioning situation using a closed reward reservoir. Some subjects were found to quit responding before all rewards were received, others responded in a 'normal' manner, receiving the ten rewards available but quitting when it appeared logical that no further rewards would be received, and still others perseverated in extinction. These groups were divided into a total of five groups of 30 members each. It was hypothesized that the Cattell Sixteen Personality Factor Questionnaire would yield scores which differentiated among the five groups described.

The hypothesis was rejected, however, when it was found that the mean scores of the groups were not significantly different on the sixteen factors studied.

In order to explore the data further, the five original groups were divided by sex. The group of the 15 most extreme perseverators were also divided by sex yielding twelve groups in all. Again, the means of each group were compared to each other but were found not to be significantly different.

It is felt that differences do exist between these groups, but that these differences are probably not measurable by the test used.

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APPENDIX A

TABLE V

MEAN SCORES OF EACH GROUP OF MALES ON THE SIXTEEN FACTORS

Factor	Groups					
	A	B	C	D	E	F
1	9.46	10.42	11.33	9.12	10.55	10.42
2	7.69	8.14	7.88	8.50	8.05	7.28
3	14.23	16.85	14.22	15.12	17.16	16.14
4	13.76	15.00	16.11	15.75	14.38	13.00
5	15.30	15.28	16.66	18.00	17.50	17.28
6	11.53	12.85	11.33	13.12	12.33	11.14
7	13.23	12.57	12.77	14.56	13.27	13.28
8	8.61	8.00	8.77	7.75	8.55	7.85
9	9.76	7.42	10.00	10.37	10.11	10.71
10	11.92	10.57	13.33	10.75	11.88	10.57
11	10.53	11.14	10.66	9.56	10.22	9.71
12	10.30	10.57	9.44	10.25	9.11	10.28
13	9.23	9.71	10.55	10.50	10.72	10.00
14	11.38	8.57	10.66	9.31	9.83	9.71
15	9.92	11.28	8.55	9.12	11.27	10.57
16	13.30	11.14	12.55	14.12	12.38	15.14

TABLE VI

MEAN SCORES OF EACH GROUP OF FEMALES ON THE SIXTEEN FACTORS

Factor	Groups					
	A	B	C	D	E	F
1	12.58	11.08	11.42	11.85	10.50	9.75
2	7.35	8.04	8.28	8.28	8.00	7.87
3	13.88	14.52	16.14	13.85	16.41	16.37
4	12.23	12.00	10.04	11.50	10.33	11.25
5	17.64	17.08	17.61	17.35	15.00	15.37
6	11.47	12.73	13.42	12.28	12.25	11.62
7	11.29	10.73	12.95	12.00	10.00	10.75
8	10.70	12.39	11.52	12.78	12.00	12.62
9	7.41	8.43	6.23	7.64	7.66	7.75
10	11.35	13.82	12.90	13.28	11.91	12.37
11	10.52	10.39	11.33	8.71	12.08	13.12
12	11.88	10.56	10.95	9.85	8.16	7.25
13	7.94	8.86	8.71	8.28	8.91	9.37
14	10.82	11.00	10.85	11.21	11.00	10.62
15	9.47	9.60	11.71	10.50	11.03	11.00
16	15.76	14.86	11.52	13.14	12.41	11.87

TABLE VII

F RATIOS FOR ANALYSIS OF MALES AND FEMALES

Factor	F Ratio	Factor	F Ratio
1	1.5513	9	3.1743**
2	0.4602	10	1.6824
3	1.1657	11	2.1378**
4	3.2031**	12	1.1990
5	0.7267	13	1.8901*
6	0.5485	14	0.6018
7	0.8657	15	1.5302
8	5.0603**	16	1.1928

*Significant at the .05 level of confidence.
**Significant at the .01 level of confidence.

APPENDIX B

TABLE VIII

F RATIOS FOR MALES ON THE FIVE SIGNIFICANT FACTORS

Factor	F Ratio
4	1.0743
8	0.1930
9	0.9355
11	0.5236
13	0.8944

TABLE IX

F RATIOS FOR FEMALES ON THE FIVE SIGNIFICANT FACTORS

Factor	F Ratio
4	0.6685
8	0.9727
9	1.2748
11	3.6891**
13	0.4218

**Significant at the .01 level of significance.

VITA 2

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Candidate for the Degree of

Master of Science

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