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A STUDY OF PERSONALITY FACTORS OF
COLLEGE WOMEN ATHLETES

by

Ruth E. Marks

An Abstract

Of a thesis submitted in partial fulfillment of the
requirements for the degree of Master of Science
in the School of Health, Physical
Education and Recreation
at Ithaca College

December, 1971

Thesis supervisor: Dr. Nancy L. Hicks

ABSTRACT

The purpose of this study was to explore the personality characteristics of women varsity players competing on women varsity athletic teams at Ithaca College during the 1970-1971 academic school year.

The subjects were a randomly selected group of 40 college women athletes participating on varsity athletic teams at Ithaca College. The population consisted of 102 women athletes who participated on 10 varsity teams.

Cattell's Sixteen Personality Factor Questionnaire was utilized as the personality measuring instrument. The investigator found that the athletes differed from the norm and that majors differed from non-majors on certain personality characteristics. It was also indicated that the individual and team sports participants did not differ on any of the personality characteristics measured.

The t-test was utilized to determine if there were any differences between the women athletes and the national norm established for Cattell's Sixteen Personality Factor Questionnaire. Multiple discriminant analysis was utilized to determine if there were any differences between women athletes who were majoring in physical education and those women athletes who were not majoring in physical education.

This investigator found that differences were shown when comparing the athletes to the national norm and when comparing the majors to the non-majors. No evidence was found to confirm a difference in personality characteristics between the women individual and team sports participants.

When measuring the 16 primary personality factors, the women athletes tended to be 1) assertive, aggressive, stubborn, competitive; 2) suspicious, self-opinionated, hard to fool; 3) experimenting, liberal, analytical, free-thinking; and 4) controlled, socially precise, following self-image. On the second-order personality factors the women athletes differed significantly higher on Factor IV((independent, aggressive, daring, incisive).

The majors on the primary traits tended to be tough-minded and group dependent. On the second-order factors the majors tended to be enterprising, decisive, resilient.

The non-majors, on the primary traits, tended to be tender-minded, imaginative and self-sufficient.

No evidence was found to confirm a difference in personality characteristics between the women individual and team sports participants.

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School of Health, Physical Education and Recreation
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Ithaca, New York

CERTIFICATE OF APPROVAL

MASTER OF SCIENCE THESIS

This is to certify that the Master of Science thesis of

Ruth E. Marks

with a major in Physical Education has been approved by the Examining Committee as satisfactory for the thesis requirement for the Master of Science degree at the convocation of December, 1971.

Thesis committee:

↓

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TABLE OF CONTENTS

Chapter		Page
	LIST OF TABLES	vi
	LIST OF FIGURES	vii
I	INTRODUCTION	1
	Statement of Problem	2
	Statement of Hypothesis	2
	Limitations of Study	3
	Significance of Study	3
	Scope of Study	4
	Definition of Terms for Study	4
II	REVIEW OF RELATED LITERATURE	7
	Introduction	7
	Measurement of Personality	7
	Personality of Male Athlete Versus Male Non-Athlete .	9
	Personality of Male Athlete of Various Sport	
	Groups	12
	Personality of Female Athletes	15
III	PROCEDURES FOR OBTAINING DATA	20
	Introduction	20
	Subjects	20
	Instrument for Obtaining Data	21
	Method of Data Collection	21
	Organization of Data for Treatment	22
IV	ANALYSIS OF DATA	23
	Introduction	23
	Scoring of Data	23
	Reliability of Data	24
	Level of Significance Selected	26
	Organization of Sample	27
	Analysis of Data: Athlete Versus Norm	27
	Discussion of Findings: Athlete Versus Norm	31

TABLE OF CONTENTS (Continued)

Chapter	Page
Multiple Discriminant Analysis: Majors Versus Non-Majors	35
Analysis of Data: Majors Versus Non-Majors	37
Discussion of Findings: Majors Versus Non-Majors	41
Multiple Discriminant Analysis: Individual Versus Team	45
Analysis of Data: Individual Versus Team	45
Discussion of Findings: Individual Versus Team	50
 V	
SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY	55
Conclusions	55
Summary of Findings	55
Recommendations for Further Study	57
 APPENDIX	58
Vita Sheet	59
Form B 1967 Edition Raw Scores	62
Form A 1967 Edition Raw Scores	64
Form B 1967 Edition Sten Scores	66
 BIBLIOGRAPHY	68

LIST OF TABLES

Table		Page
I	Sixteen Personality Factor Questionnaire Equivalence Coefficients for 1967 Forms <u>A</u> with <u>B</u>	25
II	Mean Raw Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Levels of Athletes Versus Norm for the Primary Factors	28
III	Mean Sten Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Level of Athletes Versus Norm for the Second-Order Factors	32
IV	Multiple Discriminant Function and Chi-Square Test Comparisons Between Majors and Non-Majors	36
V	Mean Raw Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Levels of Majors Versus Non-Majors for Primary Factors	38
VI	Mean Sten Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Levels of Majors Versus Non-Majors for the Second-Order Factors	42
VII	Multiple Discriminant Function and Chi-Square Test Comparisons Between Individual and Team	46
VIII	Mean Raw Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Levels of Individual Versus Team for Primary Factors	47
IX	Mean Sten Scores, Mean Differences, Standard Error of Means, <u>t</u> -Test Values, and Probability Levels of Individual Versus Team for Second-Order Factors	51

LIST OF FIGURES

Figure		Page
1 _x	16 PF Test Profile for Primary Factors for Athletes Versus Norm	30
2 _x	16 PF Test Profile for Second-Order Factors for Athletes Versus Norm	33
3 _x	16 PF Test Profile for Primary Factors for Majors Versus Non-Majors	40
4 _x	16 PF Test Profile for Second-Order Factors for Majors Versus Non-Majors	43
5 _x	16 PF Test Profile for Primary Factors for Individual Versus Team	49
6 _x	16 PF Test Profile for Second-Order Factors for Individual Versus Team	52

Chapter I
INTRODUCTION

Background of Study

For years there has been a great deal of controversy concerning the important traits of an athlete. It has been stated by Cratty^{15:46} that many coaches fail to realize how research in the area of psychology of sport will help their teams. According to many investigators^{6, 14, 15, 30, 45} many coaches and teachers believe that it is important to improve athletic programs because of the expansion in interscholastic and inter-collegiate athletic competition, but the problem is how to do it. Recently it was recognized by Ogilvie and Tutko^{37:12} that there have been no successful coaching programs or techniques that do not take into account the personality of the athlete.

Kroll^{22:350} claimed that "...although physical activity and personality are recognized as interacting components in all of man's movement experiences, it is in athletics where personality is accorded its most notable position as a factor of accentuated importance." Kroll²² believed that much of the research being done in the area of psychology of sport^{e.g. 12, 22, 35, 36, 37, 38} suggests that certain personality factors may be the only real differentiators between athletic success and failure.

Ogilvie and Tutko^{37:25} emphasized the following points:

1. Every athlete will exhibit character traits that are unique.
2. There are personal characteristics that distinguish the problem athlete from the good athlete.
3. There is an ideal method for bringing out the most effective performance if we can read objectively psychological needs of the athlete.

Kroll^{22:350} claimed that studying personality in athletics helps teachers and advisors understand the participants in physical education classes, intramural sports, and recreation. Only recently, with the expansion in size and scope of athletic programs, has the study of personality traits of athletes become so important. With the expansion in the athletic programs, coaches need to provide varied learning experiences to be able to meet the needs, interests, and abilities of the increasing number of participants. Like any other skill added to the coaching repertoire, knowledge and understanding of personality traits could provide necessary tools to enhance coaching and teaching skills.

Statement of Problem

The purpose of this study was to explore the personality characteristics of women varsity athletes competing on women varsity athletic teams at Ithaca College during the 1970-1971 academic school year.

Statement of Hypotheses

The investigator theorized the following hypotheses based upon the literature reviewed.

1. There are no significant differences in the personality characteristics of women varsity athletes at Ithaca College and those personality characteristics of the national sample norms (as measured by the Cattell Sixteen Personality Factor Questionnaire).
2. There are no significant differences in the personality characteristics of women varsity athletes who participated in individual sports at Ithaca College and those personality characteristics of women varsity

athletes who participated in team sports at Ithaca College (as measured by Cattell Sixteen Personality Factor Questionnaire).

3. There are no significant differences in the personality characteristics of women varsity athletes who were majoring in physical education at Ithaca College and those personality characteristics of women varsity athletes who were not majoring in physical education at Ithaca College (as measured by the Cattell Sixteen Personality Factor Questionnaire).

Limitation of Study

The study was limited to women who participated on the women's varsity athletic teams at Ithaca College during the 1970-1971 academic school year.

Significance of Study

It is important for coaches, because of the expanded athletic programs, to have insight into the athlete's individual personality factors and their affect on the set of traits with which each factor is operating. Cattell and Eber⁹, Kroll²², and Ogilvie and Tutko³⁷ believe that each trait is usually a complex resultant of the operation of several personality factors.

Malumphy³⁰ believed that because of much controversy^{2, 3, 6, 17, 29, 30, 39, 45, 50}, the study of personality traits of women athletes has come to the attention of many investigators. Until recently, it was not accepted for women to compete in athletic events^{15, 17, 30}; therefore, research could not be done with women athletes as subjects. Because few

studies have been completed investigating the personality traits of women athletes, research using these females as subjects is needed for clarification and understanding of their personality traits. Through the use of the results of this study it was hoped that the coach and teacher can be assisted in the interpretation and prediction of the behavior of the athlete.

Scope of Study

This study was designed (1) to provide data which may aid in the understanding of the personality traits of the woman athlete, (2) to provide information regarding the personality of the athlete in a form that will be readily interpreted, (3) to provide data that may enhance and compliment coaching and teaching and (4) to supplement research that has been completed.

Definition of Terms for Study

Cattell Sixteen Personality Factor Questionnaire (16PF).

"The 16PF is an objectively scorable test devised by basic research in psychology to give the most complete coverage of personality possible in a brief time."^{9:1} The 16 primary factors^{10:13-18} being measured are:

Factor A - Reserved, detached, critical, cool versus out-going, warmhearted, easy-going, participating.

Factor B - Less intelligent, concrete-thinking versus more intelligent, abstract-thinking, bright.

Factor C - Affected by feelings, emotionally less stable, easily upset versus emotionally stable, faces reality, calm, mature.

Factor E - Humble, mild, accomodating, conforming versus assertive, independent, aggressive, stubborn, competitive.

Factor F - Sober, prudent, serious, taciturn versus happy-go-lucky, impulsively lively, gay, enthusiastic.

Factor G - Expedient, evades rules, feels few obligations versus conscientious, persevering, staid, rule-bound.

Factor H - Shy, restrained, timid versus venturesome, socially-bold, uninhibited, spontaneous.

Factor I - Tough-minded, self-reliant, realistic, no-nonsense versus tender-minded, dependent, over-protected, sensitive.

Factor L - Trusting, adaptable, free of jealousy, easy to get on with versus suspicious, self-opinionated, hard to fool.

Factor M - Practical, careful, conventional versus imaginative, wrapped up in inner urgencies, careless of practical matters.

Factor N - Forthright, natural, artless versus shrewd, calculating, worldly, penetrating.

Factor O - Placid, self-assured, confident versus apprehensive, worrying, depressive, troubled.

Factor Q₁ - Conservative, respecting established ideas versus experimenting, critical, analytical, free-thinking.

Factor Q₂ - Group-dependent, a joiner and sound follower versus self-sufficient, prefers own decisions.

Factor Q₃ - Undisciplined self-conflict, follows own urges versus controlled, socially-precise, following self-image.

Factor Q₄ - Relaxed, unfrustrated versus tense, frustrated.

The second-order factors^{10:21-22} which are computed by combining specific primary factors are:

Factor I - Generally satisfied, low anxiety versus generally dissatisfied, high anxiety.

Factor II - Shy, self-sufficient, inhibited in interpersonal contacts, introvert versus socially outgoing, uninhibited, extravert.

Factor III - Discouraged, frustrated, artistic, rather gentle versus enterprising, decisive, resilient.

Factor IV - Group dependent, chastened, passive versus aggressive, independent, daring, incisive.

Factor. A factor is a combination of two or more personality traits.

Personality. "Personality is that which permits a prediction of what a person will do in a given situation. It is concerned with all the behavior of the individual both overt and under the skin."^{8:2-3}

Trait. A trait is any distinguishable, relatively enduring characteristic of personality in which one individual differs from others that, in principle at least, can be measured.

Varsity Team. A varsity team is a selected group of highly skilled players who are coached, who practice four to six hours a week for eight to twelve weeks, and who compete in five to eight athletic events a season.

Chapter II

REVIEW OF RELATED LITERATURE

Introduction

The review of related literature was divided into the following areas: (1) measurement of personality, (2) rationale for selection of measuring instrument, (3) personality of male athletes versus male nonathletes, (4) personality of male athletes of various sport groups, (5) personality of female athletes and (6) summary.

Measurement of Personality

It was believed by Kane²⁰ and Singer⁴² that until recently techniques of measuring personality were inadequate, being clinically-oriented traits. They advocate that it is now possible to utilize personality inventories that have been developed as the result of much work with modern factor analytic research. A number of investigators, including Cattell and Eber⁹, Kane²⁰, Singer⁴², and Vanek and Cratty⁴⁸, believe that the modern techniques of factor analysis allow a critical assessment of recent research hypothesizing relationships between personality traits and physical abilities. In addition, the investigators suggest that research utilizing the personality inventories has suggested that personality can be considered as a group of traits that can be measured along a continuum.

The most frequently used technique of measuring personality is the personality inventory, as indicated by the research reviewed in this section. There are many personality inventories currently being used.

The following inventories are the most frequently utilized, as the studies reviewed indicate, for current research purposes.

The Cattell Sixteen Personality Factor Questionnaire (16PF).

The 16PF has 187 multiple-choice-type questions that Cattell claims "insure the coverage of personality by the 16 functionally independent and psychologically meaningful dimensions⁹." It was planned for the ages of 17 through the mature adult. The test purports to give the most information in the shortest amount of time about most personality factors identifiable at this time. The 16PF covers all of the main dimensions of personality that have been found through modern factor analytic research.^{9, 20, 42}

The Minnesota Multiphasic Personality Inventory (MMPI). Singer⁴²

reported that the MMPI was designed to diagnose pathological conditions. He added that the MMPI is not for discriminating individuals from a normal population, yet it is amazing how often it is employed in the latter case in published research. It was planned for the ages of 16 to adult. According to Kane²⁰ and Singer⁴² one weakness of the MMPI is that it is saturated with pathological items to the exclusion or de-emphasis of some variables considered important in present day personality theories.

The California Psychological Inventory (CPI). Gough¹⁶ claims that the CPI scales are addressed primarily to personality characteristics important for social living and social interaction. The test has been designed for the elementary through college age groups. Singer⁴² stated that the CPI is a forced-choice test that demands that one of two extreme answers be chosen, with no allowance for neutral position.

The Edwards Personal Preference Schedule (EPPS). According to Kane²⁰ and Singer⁴², the EPPS is based on needs and is scored in such a way as to determine one's need to achieve, to be dominant, and to affiliate. The age range for the test is from college to adult. The EPPS employs the forced-choice technique. The subject is faced with paired descriptions (each unrelated) of himself for each question, and he must select the one that best represents him.

Rationale for Selection of Measuring Instrument

The Cattell Sixteen Personality Factor Questionnaire is the most comprehensive test of personality for this college age group and it is accepted by many investigators (e.g. Kane²⁰, Kroll²², Ogilvie³⁶, and Singer⁴²) as the most reliable, refined, and valid instrument yet developed.

Personality of Male Athletes Versus Male Nonathletes

Some investigators (e.g. 1, 4, 11, 18, 31, 41, 44, 49) have studied the personality traits of the athlete versus the nonathlete at all levels, high school through college, to find a contrast in their personality profile:

Studies Using Minnesota Multiphasic Personality Inventory

Booth study⁴. Booth⁴ compared the personality ratings of (1) freshman and upperclass athletes and nonathletes, (2) freshman and varsity athletes who participated in only team, individual, or team and individual sports, and (3) athletes who were rated as poor or good competitors. He found that varsity athletes and upperclass nonathletes

significantly ($P \leq .05$) differed from the freshman athletes and nonathletes on the dominance trait. He also found that the varsity athletes participating on individual sports scored significantly higher on the depression trait than those varsity athletes participating only in team sports.

Slusher study⁴⁴. Slusher^{44:539-45} compared 400 male high school junior and senior class lettermen and 100 male nonathletes relative to their personality profiles. He found that seven of the factors, hypochondriasis, depression, hysteria, psychopathic deviation, femininity, paranoia, and psychasthenia, on the MMPI distinguished ($P \leq .05$) between the athletic and nonathletic groups. Only two factors, hypomania and the validity scale, failed to differentiate between the athletic and nonathletic groups.

Studies Using California Psychological Inventory

Berger and Littlefield study¹. Using 30 outstanding college football athletes, 30 non-outstanding college football athletes, and 30 college nonathletes, after controlling for scholastic aptitude, the investigators^{1:663-65} found no significant differences ($P > .01$) between the groups or on any of the 18 items of the CPI, nor a composite score.

Merriman study³¹. In the Merriman study^{31:163-73} the CPI and the Phillips JCR Test were administered to 808 high school boys classified in the following groups: upper and lower motor ability groups, athletes and nonathletes matched according to motor ability scores, participants in team sports, participants in individual sports and participants in team-individual sports. Few significant differences were found between the mean scores on the CPI for participants in team, individual, and

team-individual sports. The results of this study indicated that motor ability may be related to personality traits.

Schendel study⁴¹. Schendel^{41:52-67} compared the personality characteristics of 334 ninth, twelfth, and college males in respect to levels of athletic participation. He found there were specific differences ($P \leq .05$) between the measures of the personal-social psychological characteristics of athletes and nonparticipants at the ninth, twelfth, and college levels.

Studies Using Gordon Personal Profile and Inventory

Chipman study¹¹. Chipman¹¹ found that with a sample of college males the team sports participants were more sociable and ascendent than the individual sports participants and nonparticipants. He also found that nonparticipants were more original in thinking than the team members and that the individual sport members were more original in thinking than team sports members.

Hunt study¹⁸. Hunt's study^{18:704-07} was designed to investigate personality differences of a sample of 111 college males. Results obtained from the profile suggested that the white varsity athletes ranked higher in ascendancy, emotional stability, and responsibility traits when compared to the Negro and white nonathletes. The Negro varsity athletes ranked higher on the responsibility trait when compared to Negro nonathletes. Hunt concluded that athletes, regardless of ethnic background, tend to differ ($P \leq .05$) in selected personality traits when compared to nonathletes.

Studies Using Cattell Sixteen Personality Factor Questionnaire

Werner and Gottheil study⁴⁹. The investigators^{49:126-31}, administering the questionnaire to 340 cadets entering the United States Military Academy who were considered the athletic group and another group of 116 who were considered the athletic nonparticipants, found no evidence ($P > .05$) to support the view that college athletics significantly influenced personality structure.

Personality of Male Athletes of Various Sport Groups

Some investigators (e.g. 5, 23, 24, 26, 27, 28, 34, 36, 43, 46) have studied the personality traits of various sport groups at all levels, high school through college, to find a contrast in their personality profiles.

Study Using Minnesota Multiphasic Personality Inventory

LaPlace study²⁸. LaPlace^{28:313-19} investigated the success in professional baseball using 49 major league players and 64 minor league players. Results indicated ($P \leq .05$) that major league players apply their strong drive towards a definite objective by exercising self-discipline, by adjusting to occupations requiring social contact, and by exercising initiative.

Studies Using Cattell Sixteen Personality Factor Questionnaire

Bosco study⁵. Bosco⁵ found ($P \leq .05$) that the 84 champion male gymnasts have a strong tendency toward brightness and intelligence, calmness and maturity, criticism and experimentation, and control and exactness.

Kroll²³, Kroll and Carlson²⁴, and Kroll and Petersen²⁶ studies.

In these three studies, Kroll^{23:49-57}, Kroll and Carlson^{24:405-11}, and Kroll and Petersen^{26:433-40} found no significant differences ($P > .05$) when looking at collegiate wrestlers, amateur karate participants, and winning and losing collegiate football teams. When making within-group comparisons the investigators were not able to distinguish between higher-and lesser-skilled athletes dealing with the personality profiles.

Straub and Davis study^{46:33-43}. Straub and Davis^{46:33-43}

administered the questionnaire to 246 college varsity football players, 50 of whom were attending a small private college, 69 attending an Ivy League University, 83 attending a Big-Ten University, and 44 attending a small state-supported college. The results indicated that the teams were found to be significantly different ($P \leq .01$) on factors I, tough-minded versus tender-minded; N, forthright versus shrewd; Q₁, conservative versus experimenting. The teams were found to differ ($P \leq .05$) in personality on factors: M, practical versus imaginative; O, self-assured versus apprehensive and Q₂, group dependent versus self-sufficient.

Ogilvie study³⁶. Ogilvie^{36:156-62} claims from his many studies that those who retain the motivation for competition will possess most of the following personality traits: (1) ambition, (2) organization, (3) deference, (4) dominance, (5) endurance and (6) aggressiveness. He claims that personality data does separate the outstanding athlete from the average athlete.

Study Using Omnibus Personality Inventory

Lakie study²⁷. Lakie^{27:566-73} compared the personality traits of 230 athletes from a state university, a private university, and two state

colleges and found significant differences ($P \leq .05$) in personality characteristics of intercollegiate athletes at different colleges, and also personality differences in athletes participating in different sports.

Study Using Thurstone Temperament Schedule

Newman study³⁴. Twenty-one male swimmers were ranked according to swimming ability as determined by actual time tests in events used in the National Collegiate Athletic Association high school dual meets. The investigator^{34:1049-53} found no set of personality traits ($P > .05$) that could be used to identify the better swimmers except the swimmers that ranked high in the 100 yard freestyle ranked high in dominance. Those swimmers that ranked high in the 100 yard breaststroke ranked low in both dominance and impulsiveness and in the sociable trait.

Study Using Edwards Personal Preference Schedule

Singer study⁴³. Singer^{43:582-88} found no significant difference ($P > .05$) among the 10 varsity collegiate tennis players and the 26 varsity and the 33 freshman baseball players. When making between- and within-athletic group comparisons with normative data, achievement, intraception, and dominance emerged as being significant ($P \leq .05$).

Summary

The conflicting views found with studying the personality traits of male athletes versus the male nonathletes and the personality traits of male athletes of various sport groups points to the need for further research. Until the personality inventories are more reliable and

until they all tend to measure the same or similar personality traits, few conclusions about the personality profile of the male athletes may be drawn among the various traits measured by the many investigators utilizing the many personality measuring instruments. Certain personality traits of the male athlete seem to be indicated as significant in most of the literature reviewed, but as to which exact traits are important, it is difficult to predict. In order to provide some clarity, further research utilizing the most reliable and refined personality measuring instruments is needed.

Personality of Female Athletes

Some investigators (e.g. 2, 3, 29, 32, 33, 36, 39, 50) have studied the personality traits of the female athlete at all levels, elementary through professional, to find a contrast in their personality profiles.

Studies Using Cattell Sixteen Personality Factor Questionnaire

Malumphy study²⁹. This study^{29:610-20} dealt with women participating in various intercollegiate sports competition. The Cattell Sixteen Personality Factor Questionnaire and a personal information questionnaire was administered to the subjects. The results indicated that the groups, 15 individual sports participants, 16 subjectively-judged sports participants, 28 team sports participants, 18 team-individual sports participants, and 42 nonparticipants, were similar on 14 of the dimensions of personality and significantly different ($P \leq .05$) on nine dimensions of personality. The investigator stated that a sport participant may select a competitive sport on the basis of her personality.

Mushier study³². Mushier³² studied junior high, senior high, college, association, and national level females in competitive lacrosse. The total competitive lacrosse group was characterized as significantly ($P \leq .05$) more reserved, intelligent, assertive, happy-go-lucky, tough-minded, and experimenting than the norms established for the Cattell Sixteen Personality Factor Questionnaire. No regular pattern of differences was found on the significant factors. The investigator concluded that personality development may be independent of competitive sport competition; that self selection of the individual into competitive sports may be determined by personality factors that the individual already possesses.

Ogilvie study³⁶. Ogilvie^{36:156-62} found young females, ages 10 to 14 to possess increased control, self assurance, self assertiveness, tough-minded, more individualistic, more self disciplined, and slightly less anxious and tense.

Petersen, Weber, and Trousdale study³⁹. The investigators^{39:686-90} studied 156 women AAU athletes and the women on the 1964 United States Olympic team. The women who were engaged in individual competition were found to be significantly ($P \leq .05$) more dominant, aggressive, adventurous, sensitive, imaginative, radical, and self-sufficient and resourceful than women engaged in team sports. The team sportswomen were significantly ($P \leq .05$) more realistic, steady, sophisticated, practical, dependable, and interested in immediate issues than the individual sport competitors.

Williams, Moody, Hoepner, and Ogilvie study⁵⁰. Three psychological tests, Jackson's Personality Research Form, Edwards Personal Preference Schedule, and Cattell Sixteen Personality Factor Questionnaire, were used to measure the 30 female champion level competitors who were in the 1968 National Fencing Championships. On the basis of the findings of this study^{50:446-53}, the investigators concluded that it may be possible to identify a fencing sport type by means of personality trait assessments. They also stated that at a high level of skill only the personality trait known as dominance distinguishes ($P \leq .05$) between the achievement levels in fencing.

Study Using Edwards Personal Preference Schedule

Neal study³³. Neal³³ investigated the personality traits of women athletes who participated in the 1959 Pan-American Games. She found that women athletes scored significantly higher ($P \leq .05$) on the variables of achievement, autonomy, affiliation, aggression, order, and nurturance* than did a control group of non-athletes. Of the 15 variables measured, six resulted in a significant difference ($P \leq .05$) between the Pan-American athletes with some college training, and the norm group.

*Nurturance refers to a person who helps friends when they are in trouble, is understanding of others, and shows a great deal of affection toward others.

Study Using California Psychological Inventory

Bird study². Bird² investigated the personality traits of 14 basketball players and 13 modern dancers. She found that the basketball group scored significantly ($P \leq .05$) higher on the communality scale and the modern dance group scored significantly ($P \leq .05$) higher on the flexibility and femininity scales.

Study Using Ogilvie-Tutko Battery of Four Personality Tests

Bird study³. Bird^{3:149-56} investigated 54 Canadian college women ice hockey players who volunteered to take the Ogilvie-Tutko battery of four personality tests which consisted of the Cattell Sixteen Personality Factor Questionnaire, the Jackson's Personality Research Form, Edwards Personal Preference Schedule, and Osgood's Semantic Differential. The women athletes on the Cattell Questionnaire rated very high in general ability, were somewhat reserved, self-sufficient, and liberal in thought. On the Jackson's Form they rated very high in autonomy and in endurance and abasement. The Edwards Schedule also indicated the subjects rating high in the autonomy trait. The investigator concluded that the results of the study may have shown trends toward a consistency of personality characteristics which may support a personality type for female competitors in team sports.

Summary

There are relatively few studies dealing with the personality of the woman athlete, as compared to the male athlete. Until recently, it was not accepted for women to compete in athletic events³⁰, therefore, research using women athletes as subjects could not be done. Interest

in doing research in the area of the personality traits of women athletes has been shown as a result of the expansion in size and scope of the athletic programs for women.

The research findings of the studies reviewed about the woman athlete seem to indicate that personality differences possibly exist between the subjects and the national norms established for the personality measuring instruments, and between various comparisons within the samples. Until the personality measuring instruments tend to measure the same or similar personality traits, few conclusions can be drawn. All of the studies reviewed recommended that further research be completed investigating the personality traits of the woman athlete.

Chapter III

PROCEDURES FOR OBTAINING DATA

Introduction

This chapter was divided into the following areas: (1) subjects, (2) instrument for obtaining data, (3) method of data collection, and (4) organization of data for treatment.

Subjects

Population Sampled

The sample was a randomly selected group of subjects from a population of women athletes on the women's varsity basketball, bowling, field hockey, golf, gymnastics, lacrosse, softball, swimming, tennis, and volleyball teams at Ithaca College during the 1970-71 academic school year. A random sample of 40 women was selected from the 102 women who participated on the women's varsity athletic teams. The sample ranged in age from 17 to 22; consisted of 19 physical education majors and 21 non-majors; and 19 of the women participated in individual sports, 16 of the women participated in team sports, and 5 of the women participated in both individual and team sports.

Selection of Subjects

The names of the 102 subjects were alphabetized and numbered from 1 to 102. Using three columns from a table of random numbers^{40:286-87} the investigator selected a sample of 40 subjects from the original group of 102 subjects.

Instrument for Obtaining Information

The Cattell Sixteen Personality Factor Questionnaire was utilized to measure the personality characteristics of the subjects'. According to Cattell⁹, "coverage of personality is insured by the sixteen functionally-independent and psychologically meaningful dimension isolated over 20 years of factor analytic research on normal and clinical groups." The major portion of the 187 items are indirect, asking about related interests. Forms A and B (1967 Edition) were utilized in this investigation.

Method of Data Collection

In April, 1971 the Cattell Sixteen Personality Factor Questionnaire was administered to a randomly selected group of 40 volunteer women athletes to describe the personality of college women participating on a varsity athletic team. The 40 subjects took Form B within a two day period. Form A was given one week later to 27 of the subjects to establish the reliability of the Cattell Sixteen Personality Factor Questionnaire. The subjects were instructed to answer all of the questions honestly, and they were asked not to discuss the questions on the test until further notice. The test was administered to the subjects in a classroom at Ithaca College.

Organization of Data for Treatment

Statistics

The t-test for independent groups was used to determine the difference between the sample and the national norms established for the Cattell Sixteen Personality Factor Questionnaire.

A multiple discriminant analysis was utilized for comparisons between the personality factors of the majors and the non-majors within the sample and between the personality factors of the individual and team sport participants within the sample. Multiple discriminant analysis was used for between group comparisons for the four second-order personality factor. A t-test was also used to determine if differences existed between groups.

Chapter IV

ANALYSIS OF DATA

Introduction

This chapter is divided into the following sections: (1) scoring of data, (2) reliability of data, (3) level of significance selected, (4) organization of data, and (5) analysis of data and discussion of findings: athlete versus the norm, majors versus non-majors, and individual versus team sport participants.

Scoring of Data

Cattell's Sixteen Personality Factor Questionnaire was administered to each of 40 subjects. The answer sheets were manually scored and the raw scores were converted to standardized scores (sten scores) for each of the personality factors. A sten score is a standard score utilized to indicate the direction and degree of relationship of a score to other scores. On Cattell's inventory a sten score of one to four indicates that the person tends to exhibit the personality characteristics described as the low score description. A sten score of seven to ten indicates that the person tends to exhibit the personality characteristics described as the high score description. A sten score between five and six is considered the neutral position where the person does not tend to exhibit either of the characteristics described.

The raw scores obtained from Cattell's Sixteen Personality Factor Questionnaire were used to compute all of the statistical analyses

except when making the second-order factor calculations. The formula for the second-order factors required the utilization of sten scores. Sten scores were also utilized when plotting the tables and figures which are provided with the questionnaire.

Reliability of Data

Twenty-seven of the 40 subjects utilized in this study took Form A and Form B (1967 Edition) of Cattell's Sixteen Personality Factor Questionnaire. The reliability coefficients obtained for this study ranged from .05 to .72 for the 16 factors (see Table I). Cattell's reliability coefficients obtained for one of his study's on Form A with Form B with a group of 230 college males ranged from .34 to .76.

Cattell and Eber¹⁰ stated that some of the low coefficients may be due to the fact that responses may change under varying circumstances. It may be possible that the personality inventory may not reveal differences in responses when indeed differences do exist. It is also possible that the personality inventory may reveal differences in responses when in actuality differences do not exist.

This investigator believes that some possible reasons for the low correlation coefficients could be as follows. First, Form A and Form B were administered just previous to final examination time. The subjects may react to the questions differently when they are under stress as past research has shown with situations causing stress and others not causing stress. They may have had tests on the mind, and, therefore, may not have given the questionnaire their full attention. Second, Forms A and B were administered at the end and in some cases after the

TABLE I
 Sixteen Personality Factor Questionnaire Equivalence
 Coefficients for 1967 Forms A with B

Factors	Marks' Coefficients (N=27) College Females	Cattell's Coefficients (N=230) College Males
A	.63	.59
B	.05	.38
C	.45	.50
E	.16	.44
F	.42	.56
G	.59	.40
H	.72	.76
I	.48	.50
L	.13	.40
M	.59	.34
N	.21	.35
O	.64	.56
Q ₁	.26	.44
Q ₂	.36	.38
Q ₃	.55	.34
Q ₄	.57	.57

competitive season. Possibly the subjects responses to situations may not be consistent over any duration of time. They may react differently during and after a competitive season. They may be aggressive during the season but not after the season. Third, possibly there was too short a span of time between the administration of the two forms. Cattell and Eber¹⁰ stated that the intelligence part of the questionnaire cannot be meaningfully repeated after a short interval. This may also apply to the rest of the questionnaire. Fourth, Form A with B was utilized to determine the correlation coefficients rather than Form A plus Form B or test-retest for the same forms which would possibly provide higher coefficients. The method utilized to obtain reliability coefficients may not be the best method to use. Fifth, the subjects may not have completed both forms with the same amount of seriousness. The first time the subjects took the test no comments were made as to their being bored. Many stated they were bored the second time and many finished faster the second time.

Level of Significance Selected

The .05 level of significance was selected as the region of rejection for all hypotheses. The investigator believed that in reporting the findings of the investigation it would be more serious to commit a Type I error (rejecting a hypothesis of no change when in fact there was no real change, but a change due to chance) than it would be to commit a Type II error (accepting a hypothesis of no change when in fact there has been a change). The .05 level was found most frequently in the literature reviewed regarding personality (2,3,4,5,18,23,24,26,27, 28,29,32,33,39,41,43,44,46,50).

Organization of Sample

The sample was a randomly selected group of 40 women athletes. The investigator made comparisons between the 40 women athletes and the national norm established for Cattell's Sixteen Personality Factor Questionnaire. The sample was then divided into two categories for further comparisons: (1) physical education majors versus non-majors, and (2) individual sports participants versus team sports participants.

Analysis of Data: Athletes Versus Norm

Primary Factors (Table II, Figure 1)

The personality characteristics of the women athletes were compared to the national norm established for Cattell's Sixteen Personality Factor Questionnaire. The women athletes significantly differed from the national norm on four of the 16 primary personality factors (see Table II). The investigator found that the athletes tended to be more assertive, aggressive, stubborn, and competitive (Factor E); more suspicious, self-opinionated, and hard to fool (Factor L); more experimenting, liberal, analytical, and free-thinking (Factor Q₁); and more controlled, socially precise, and following self-image (Factor Q₃) than the national norm. (See Table II and Figure 1).

Although there was no significant difference between the athletes and the norm on the other 12 factors, the women athletes tended to be more imaginative, wrapped up in inner urgencies, careless of practical matters and bohemian (Factor M) than the norm (See Figure 1).

TABLE II

Mean Raw Scores, Mean Differences, Standard Error of Means,
t-Test Values, and Probability Levels of Athletes
 Versus Norm for the Primary Factors

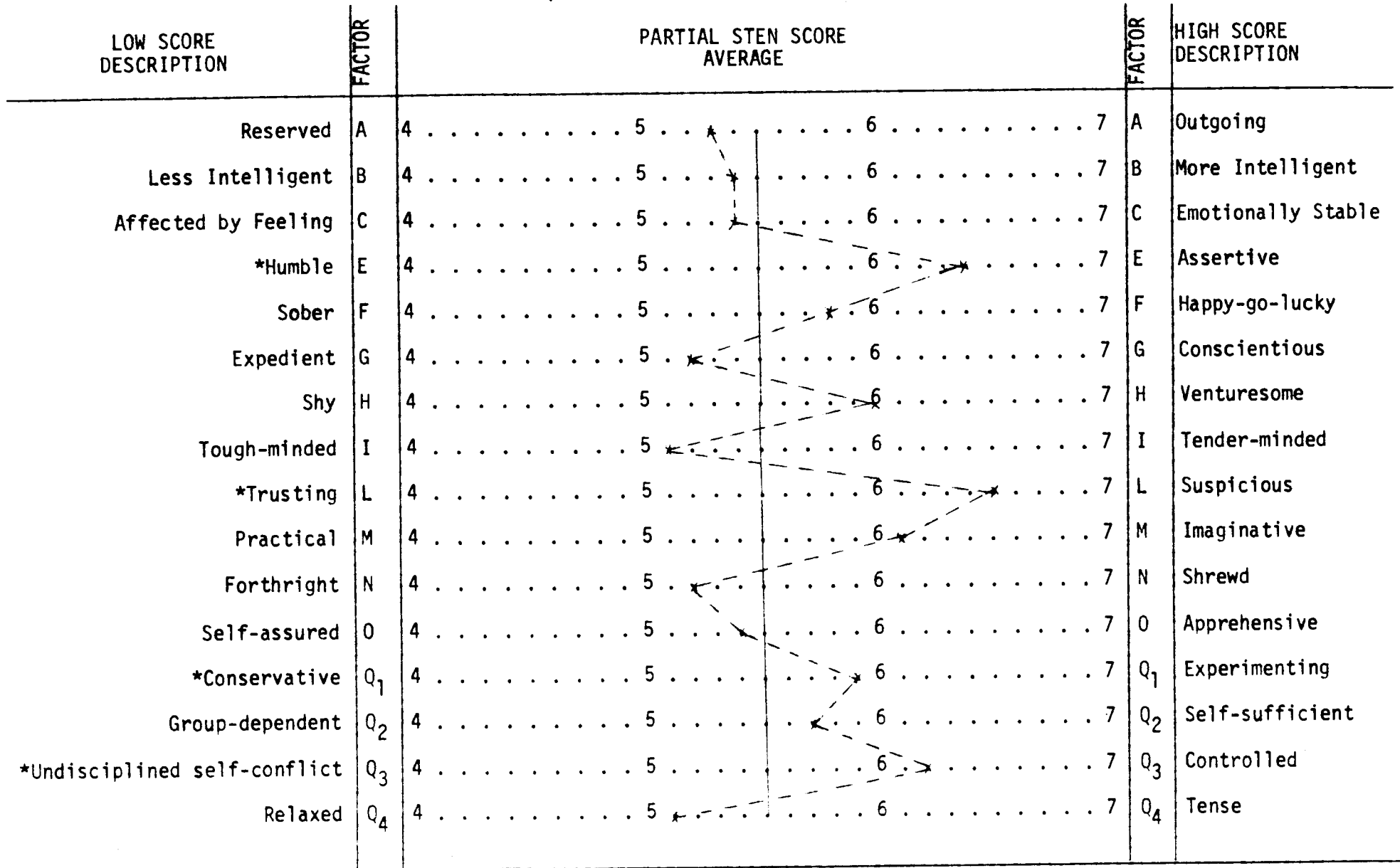
Factors	Group	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
A	Athletes Norm	10.30 10.50	.20	.42	.47	.62
B	Athletes Norm	8.63 8.50	.13	.26	.49	.62
C	Athletes Norm	15.60 15.50	.10	.66	.15	.84
E	Athletes Norm	12.38 10.50	1.88	.48	3.94	.01*
F	Athletes Norm	17.10 16.50	.60	.50	1.21	.24
G	Athletes Norm	13.25 13.50	.25	.47	.53	.62
H	Athletes Norm	13.85 12.50	1.35	.89	1.52	.14
I	Athletes Norm	12.08 12.50	.42	.48	.87	.37
L	Athletes Norm	9.10 7.50	1.60	.48	3.36	.01*
M	Athletes Norm	13.53 12.50	1.03	.68	1.52	.14
N	Athletes Norm	9.68 10.50	.82	.56	1.46	.14
O	Athletes Norm	12.08 12.50	.42	.78	.54	.62

TABLE II (Continued)

Factors	Group	\bar{X}	Mean Diff.	S.E.	t	P
Q ₁	Athletes	9.40	.90	.43	2.10	.04*
	Norm	8.50				
Q ₂	Athletes	7.63	.13	.61	.21	.84
	Norm	7.50				
Q ₃	Athletes	11.63	1.13	.51	2.21	.03*
	Norm	10.50				
Q ₄	Athletes	13.45	1.05	.64	1.65	.11
	Norm	14.50				

*Significant at .05 level

Athletes Versus Norm
(dotted line) (solid line)



*Significant at .05 level

Figure 1
16PF Test Profile for Primary Factors

Second-Order Factors (Table III, Figure 2)

The women athletes differed significantly from the national norm established for Cattell's Sixteen Personality Factor Questionnaire on one of the four second-order personality factors. The investigator found the athletes to be more independent, aggressive, daring and incisive (Factor IV) than the national norm (See Table III). Although there was no significant difference between the athletes and the norm on the other three factors, the athletes tended to be more extraverted, socially outgoing, and uninhibited (Factor II) than the national norm (see Table III and Figure 2).

Discussion of Findings: Athletes Versus Norm

The findings of the study are generally in agreement with the findings of the studies reviewed in Chapter II (3, 32, 33, 36, 50) in that the athletes differed from the national norm on certain personality characteristics. The investigator believes that the results obtained may be due to the fact that the sample may have been an extremely homogeneous group from a small geographic section, and from a high economic background. The athletes may exhibit certain personality traits due to the type of experiences with which they are exposed and the people with which they interact (i.e., their peers and/or the coach).

(Appendix, Vita Sheet)

There may be many possible reasons why the athletes tend to possess the personality traits found in this investigation. The fact that the athletes tended to be more controlled than the norm may be due to the intense, formal training schedule, the adult controlled

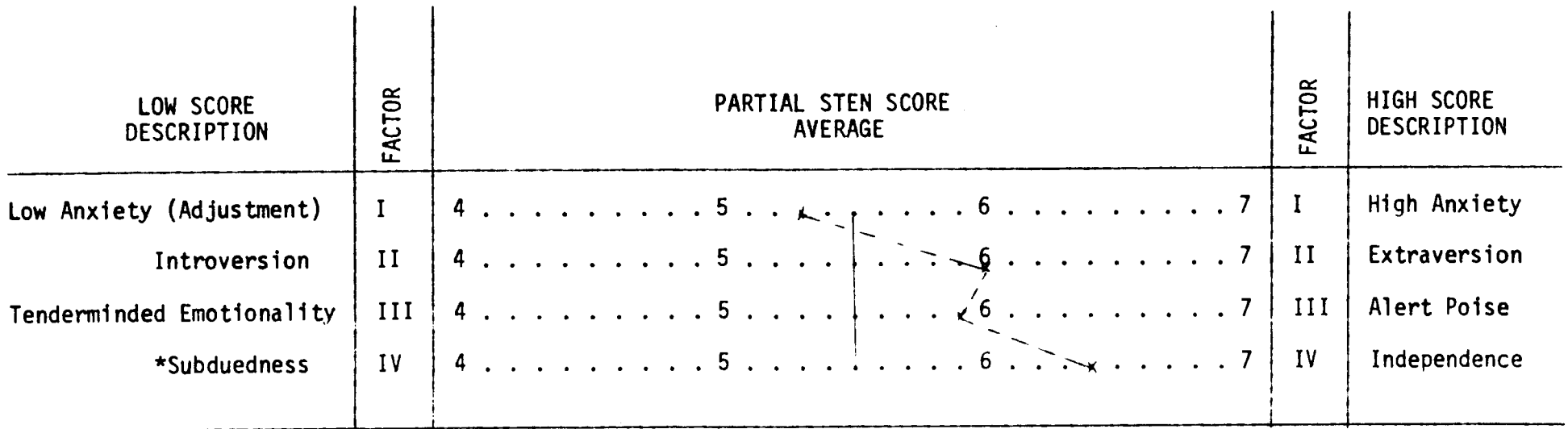
TABLE III

Mean Sten Scores, Mean Differences, Standard Error of Means,
t-Test Values, and Probability Levels of Athletes
 Versus Norm for the Second-Order Factors

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
I	Athletes Norm	5.30 5.50	.20	.32	.63	.51
II	Athletes Norm	5.95 5.50	.45	.26	1.73	.10
III	Athletes Norm	5.85 5.50	.35	.27	1.30	.20
IV	Athletes Norm	6.89 5.50	.89	.34	2.62	.01*

*Significant at .05 level

Athletes Versus Norm
(dotted line) (solid line)



*Significant of .05 level

Figure 2
16PF Test Profile for Second-Order Factors

experience, and the constant abiding of rules that the players are exposed to before and during the competitive season. During the training program, the player adjust to the patterns of other team members and practice set patterns and skills. This may help develop or encourage self-discipline as well as control. Much of the effort put forth in training is determined by the individual's self-discipline. The coach, the team, members, the spectators, the opponents, and the officials may tend to make the athletes conform to controlled behavioral situations. The coach may be an authoritarian-type person who may expect the players to react in specific ways. The players are a part of a team and, therefore, adjust to the specific patterns of others around them. The individual is expected to make these adjustments herself and within a relatively short period of time. During the game the players need to concentrate on the game and not to be distracted by opponents, coaches, or spectators. The players may also need to show control and self-discipline when the officials make calls. This may be shown through the immediate preparation for the next play and the respect given to the officials authority.

The athletes may tend to be suspicious because of numerous unexpected situations that may come about. The players practice different strategies to deceive their opponents. The players may question the way the coach selects the team and also why certain members are the starters in most of the games. It is usually kept a secret as to who will start until just before the game. The officials are usually rated. Many of the calls made by the officials are a matter of individual interpretation. In some instances, as in a close game, the manner in which a game is

officialated could determine whether a team wins or loses.

The athletes may tend to be experimenting because they are provided with many situations where they must readjust or experiment. An example of this would be in playing basketball. Each time a team receives the ball they must set up plays in order to try to score. Throughout a game the players are required to experiment, to readjust to each new play.

The experience of being a team member, having scheduled competition with other schools, and being goal-oriented may be some of the reasons why the athletes tended to be assertive and competitive. The players are continually striving to be superior to their opponents. Again, as a member of a team, there is usually constant competition for being on the team as well as achieving a starting position. On the other hand, the athletes may already possess the characteristics and thus compete in sports to be able to satisfy those personality characteristics described as assertive or competitive, suspicious, controlled, and experimenting.

Multiple Discriminant Analysis: Majors Versus Non-Majors

The multiple discriminant analysis method was utilized to determine differences between the majors and non-majors on the 16 primary personality factors and the four second-order personality factors. A significant difference was found between the majors and the non-majors (see Table IV).

TABLE IV
Multiple Discriminant Function and Chi-Square Test
Comparisons Between Majors and Non-Majors

Subjects	Lambda	Df	F	χ^2	Df
<u>Primary Factors</u>					
Majors vs. Non-Majors	.327	16 & 23	2.96*	34.665*	16
<u>Second-Order Factors</u>					
Majors vs. Non-Majors	.686	4 & 35	4.014*	13.969*	4

*Significant at the .05 level

Analysis of Data: Majors Versus Non-Majors

Primary Factors (Table V, Figure 3)

The personality characteristics of the women athletes who were majoring in physical education were compared to the women athletes who were not majoring in physical education. The majors differed significantly from the non-majors on three of the 16 primary personality factors (see Table V and Figure 3). The investigator found that the majors tended to be tough-minded, self-reliant, realistic, and no-nonsense (Factor I) as compared to the non-majors who tended to be tender-minded, clinging, over-protected, and sensitive. The non-majors tended to be imaginative, wrapped up in inner urgencies, careless of practical matters, and bohemian (Factor M) as compared to the majors who appeared to be near the national norm. The majors tended to be group dependent, a joiner, and sound follower (Factor Q₂) as compared to the non-majors who tended to be self-sufficient, preferred own decisions, and resourceful.

Although there was no significant difference between majors and non-majors on the other 13 factors the groups differed from the norm (See Figure 3) in the following areas: the majors tended to be less intelligent and concrete in thinking (Factor B); assertive, aggressive, stubborn, and competitive (Factor E); suspicious, self-opinionated, and hard to fool (Factor L); controlled, socially precise, and following self-image (Factor Q₃) and relaxed, tranquil, and unfrustrated (Factor Q₄) while the non-majors tended to be more intelligent and abstract in thinking (Factor B); assertive, aggressive, stubborn, and competitive

TABLE V

Mean Raw Scores, Mean Differences, Standard Error of Means,
t-Test Values and Probability Levels of Majors Versus
 Non-Majors for Primary Factors

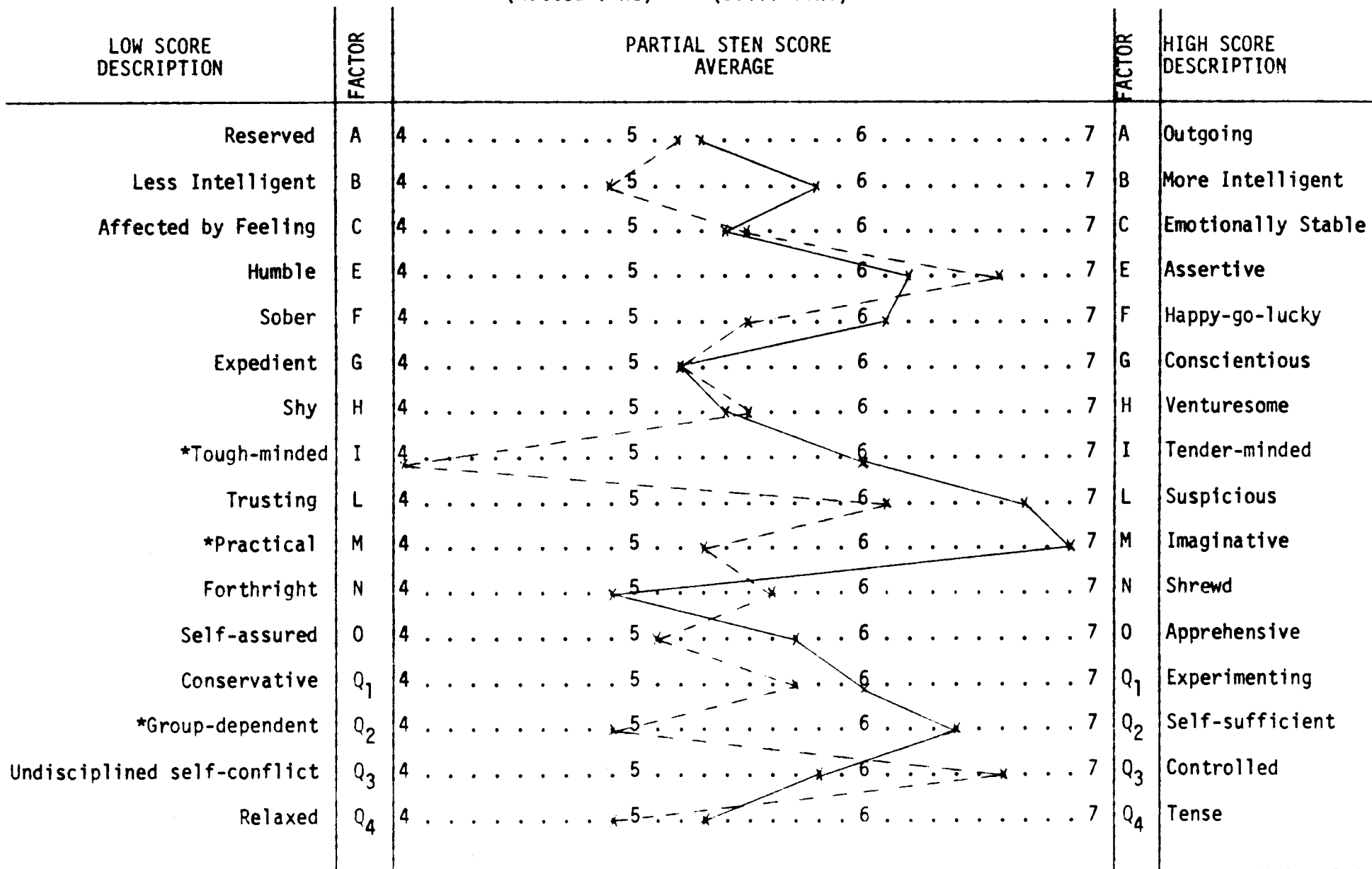
Factors	Subjects	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
A	Majors Non-Majors	10.32 10.29	.03	.75	.04	.97
B	Majors Non-Majors	8.26 8.95	.69	.53	1.31	.19
C	Majors Non-Majors	15.68 15.52	.16	1.32	.12	.90
E	Majors Non-Majors	13.11 11.71	1.40	.95	1.48	.14
F	Majors Non-Majors	16.47 17.67	1.20	.99	1.21	.23
G	Majors Non-Majors	13.26 13.24	.02	1.00	.02	.98
H	Majors Non-Majors	14.95 12.86	2.09	1.77	1.18	.24
I	Majors Non-Majors	10.47 13.52	3.05	.84	3.61	.01*
L	Majors Non-Majors	8.68 9.48	.80	.96	.83	.58
M	Majors Non-Majors	11.79 15.10	3.31	1.27	2.61	.01*
N	Majors Non-Majors	10.37 9.52	.85	1.02	.83	.59
O	Majors Non-Majors	11.21 12.86	1.65	1.57	1.05	.30

TABLE V (Continued)

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	t	P
Q ₁	Majors	9.26	.26	.86	.30	.76
	Non-Majors	9.52				
Q ₂	Majors	6.26	2.60	1.16	2.24	.03*
	Non-Majors	8.86				
Q ₃	Majors	12.42	1.52	1.01	1.51	.14
	Non-Majors	10.90				
Q ₄	Majors	12.58	1.66	1.27	1.31	.19
	Non-Majors	14.24				

*Significant at .05 level

Majors Versus Non-Majors
(dotted line) (solid line)



*Significant at .05 level

Figure 3

16PF Profile Test for Primary Factors

(Factor E); happy-go-lucky, gay, and enthusiastic (Factor F); expedient, disregards rules, and feels few obligations (Factor G); suspicious, self-opinionated, and hard to fool (Factor L), experimenting, liberal, analytical, and free-thinking (Factor Q); controlled, socially precise, and following self-image (Factor Q₃); and relaxed, tranquil, and unfrustrated (Factor Q₄).

Second-Order Factors (Table VI and Figure 4)

The women athletes who were majoring in physical education differed significantly from the women athletes who were not majoring in physical education on one of the four second-order personality factors (see Table VI). The investigator found that the non-majors tended to be enterprising, decisive, and resilient as compared to the majors who tended to be discouraged, frustrated, artistic, and rather gentle (Factor III). Although there were no other significant differences in second-order factors the majors tended to be generally satisfied with a low anxiety level (Factor I) and socially outgoing, extraverted, and uninhibited (Factor II) while the non-majors tended to remain within the norm (see Figure 4).

Discussion of Findings: Majors Versus Non-Majors

The investigator found that differences may exist between majors and non-majors. No other studies reviewed by this investigator compared majors and non-majors. The differences found may be due to the fact that physical education majors may have a rigidly structured and professionally-oriented educational program whereas the non-majors programs may have a flexible and liberally-oriented educational program.

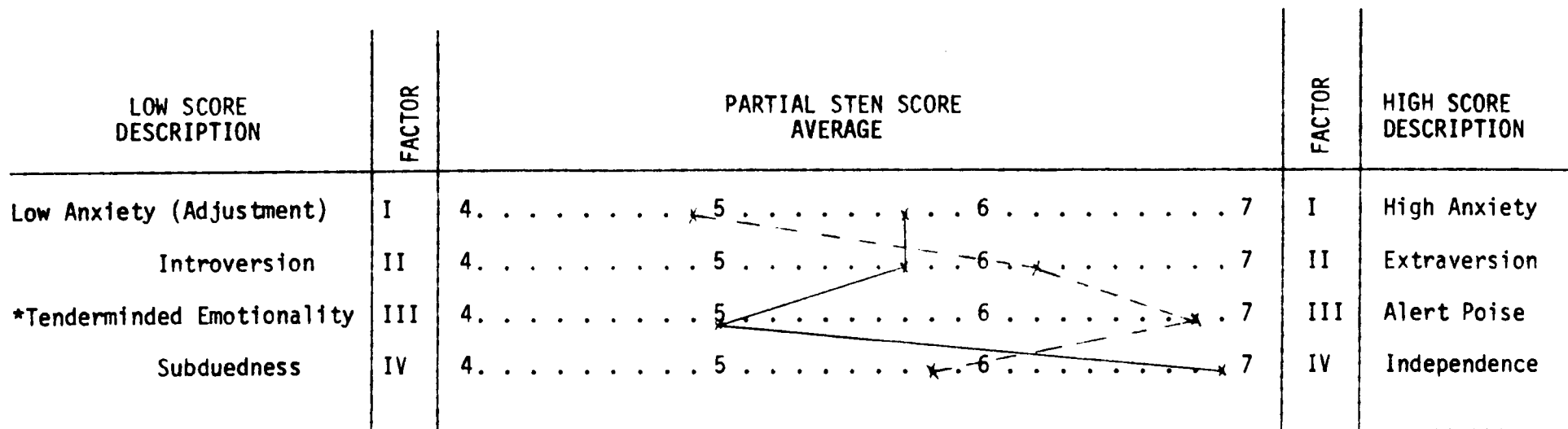
TABLE VI

Mean Sten Scores, Mean Differences, Standard Error of Means,
 t-Test Values, and Probability Levels of Majors
 Versus Non-Majors for the Second-Order Factors

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
I	Majors	4.86	.83	.65	1.28	.20
	Non-Majors	5.69				
II	Majors	6.17	.43	.52	.82	.58
	Non-Majors	5.74				
III	Majors	6.79	1.79	.46	3.92	.01*
	Non-Majors	5.00				
IV	Majors	5.84	1.05	.68	1.55	.13
	Non-Majors	6.89				

*Significant at .05 level

Majors Versus Non-Majors
(dotted line) (solid line)



*Significant of .05 level

Figure 4
16PF Test Profile for Second-Order Factors

The majors may have tended to be practical, tough-minded, realistic, and group-dependent because of their physical education experiences. The physical education majors are usually enrolled in a program in which they are required to take a majority of required courses, leaving little time for elective courses. The four-year schedule is usually pre-determined for them. The courses are usually structured with specific content and frequently the solution to problems stress only one answer. An example of this would be the specific procedures to follow when an injury occurs in class. The physical education majors are all required to participate in rigid physical and mental training. They must learn the basic skills in all sports such as tennis, basketball, soccer, and lacrosse and also take courses such as history and principles of physical education, health, anatomy, and methods of teaching physical education. The majors are often placed in practical situations whereby they learn by doing. They are placed in teaching situations where leadership opportunities exist and where they are involved with providing activity for groups of people.

The non-majors tended to be tender-minded, imaginative, and self-sufficient. Some of these personality characteristics may be due to the flexible atmosphere by which they are surrounded. Their educational program requires few courses, which allows them to choose many of their classes and obtain a broad liberal program. With the liberally-oriented program the non-majors learn to work independently on self-study projects in which they are individually interested. Music students practice their major instruments. Art students work on individual

paintings. They often work with objects rather than people.

Physical education majors may already possess personality characteristics which have led them to select the area of physical education as their major. The possession of certain personality characteristics may also have influenced non-majors to pursue the areas of their choice. This investigator found significant differences between the two groups.

Multiple Discriminant Analysis: Individual Versus Team

The multiple discriminant analysis method was utilized to determine differences between the individual and team sports participants on the 16 primary personality factors. No significant difference was found between the individual and team sports participants (see Table VII).

Analysis of Data: Individual Versus Team

Primary Factors (Table VIII and Figure 5)

The personality characteristics of the women athletes who participated in individual sports were compared to the women athletes who participated in team sports. No significant differences were found between the two groups (see Table VIII and Figure 5).

Although there were no significant differences between the individual and team sports participants, the individual sports participants tended to be assertive, aggressive, stubborn, and competitive (Factor E); tough-minded, self-reliant, realistic, and no-nonsense (Factor I); suspicious, self-opinionated, and hard to fool (Factor L); and controlled, socially precise; and following self-image (Factor Q₃). The team sports

TABLE VII
 Multiple Discriminant Function and Chi-Square Test
 Comparisons Between Individual and Team

Subjects	Lambda	Df	F	χ^2	Df
<u>Primary Factors</u> Individual vs. Team	.660	16 & 18	.581	10.822	16
<u>Second-Order Factors</u> Individual vs. Team	.973	4 & 30	.212	.891	4

TABLE VIII

Mean Raw Scores, Mean Differences, Standard Error of Means,
t-Test Values, and Probability Levels of Individual
 Versus Team for Primary Factors

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
A	Ind. Team	10.79 9.75	1.04	.93	1.11	.27
B	Ind. Team	8.68 8.50	.18	.56	.32	.75
C	Ind. Team	15.74 15.50	.24	1.48	.16	.87
E	Ind. Team	12.26 12.63	.37	1.09	.34	.74
F	Ind. Team	16.74 16.56	.18	1.00	.18	.85
G	Ind. Team	13.68 12.75	.93	1.02	.91	.63
H	Ind. Team	13.74 15.06	1.32	1.82	.73	.52
I	Ind. Team	11.95 11.50	.45	1.06	.43	.68
L	Ind. Team	9.16 8.31	.85	.98	.87	.61
M	Ind. Team	13.21 13.38	.17	1.52	.11	.91
N	Ind. Team	10.26 9.44	.82	1.09	.75	.54
O	Ind. Team	12.05 11.81	.24	1.66	.14	.88

TABLE VIII (Continued)

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	t	P
Q ₁	Ind. Team	9.16 9.25	.09	.91	.09	.92
Q ₂	Ind. Team	7.37 7.31	.06	1.42	.04	.97
Q ₃	Ind. Team	11.68 11.81	.13	1.12	.12	.91
Q ₄	Ind. Team	13.16 13.19	.03	.91	.03	.97

Individual Versus Team
(dotted line) (solid line)

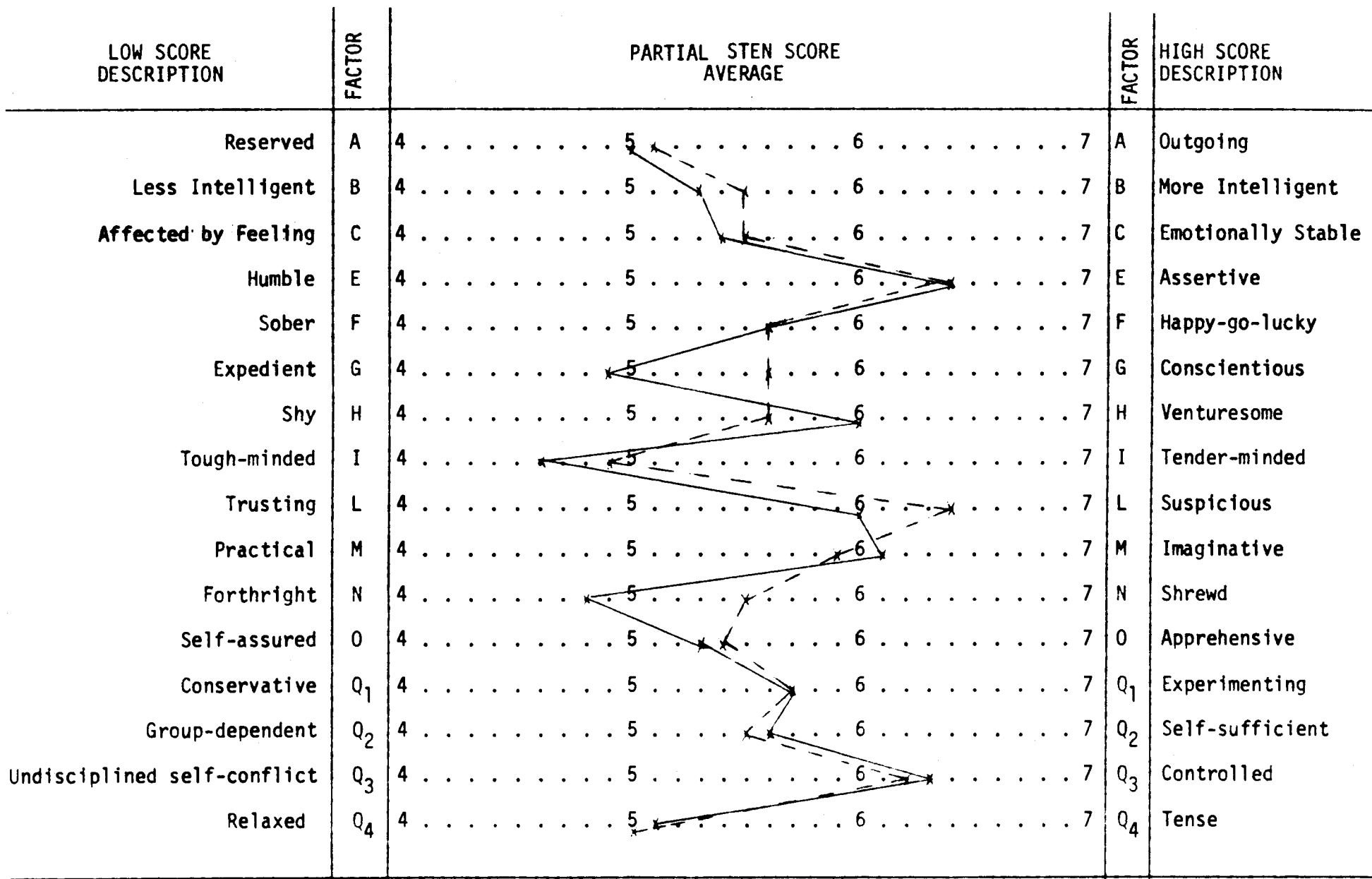


Figure 5
16PF Test Profile for Primary Factors

Participants tended to be assertive, aggressive, stubborn, and competitive (Factor E); expedient, disregards rules, and feels few obligations (Factor G); tough-minded, self-reliant, realistic, and nonsense (Factor I); imaginative, wrapped up in inner urgencies, careless of practical matters, and bohemian (Factor M); forthright, natural, artless, and unpretentious (Factor N); and controlled, socially precise, and following self-image (Factor Q₃). (see Figure 5.)

Second-Order Factors (Table IX and Figure 6)

No significant differences were found between the women athletes who participated in individual sports and the women athletes who participated in team sports (see Table VIII and Figure 6). Although there were no significant differences between individual and team sports participants, the individual sports participants differed from the norm in that they tended to be aggressive, independent, daring, and incisive (Factor IV) while the team sports participants tended to be an enterprising, decisive, resilient, aggressive, independent, daring and incisive group (see Figure 6).

Discussion of Findings: Individual Versus Team

The findings of this study differed from other studies in which the personality characteristics of women athletes who participated in individual sports as compared to team sports were investigated. Bird², Malumphy²⁹, and Petersen, Weber, and Trousdale³⁹ found significant differences between the individual and team sports participants.

TABLE IX

Mean Sten Scores, Mean Differences, Standard Error of Means,
t-Test Values, and Probability Levels of Individual
 Versus Team for Second-Order Factors

Factors	Subjects	\bar{X}	Mean Diff.	S.E.	<u>t</u>	<u>P</u>
I	Ind. Team	5.22	.18	.68	.27	.79
		5.04				
II	Ind. Team	5.86	.11	.61	.18	.85
		5.97				
III	Ind. Team	5.77	.45	.59	.76	.54
		6.22				
IV	Ind. Team	6.12	.23	.77	.30	.76
		6.35				

Individual Versus Team
(dotted line) (solid line)

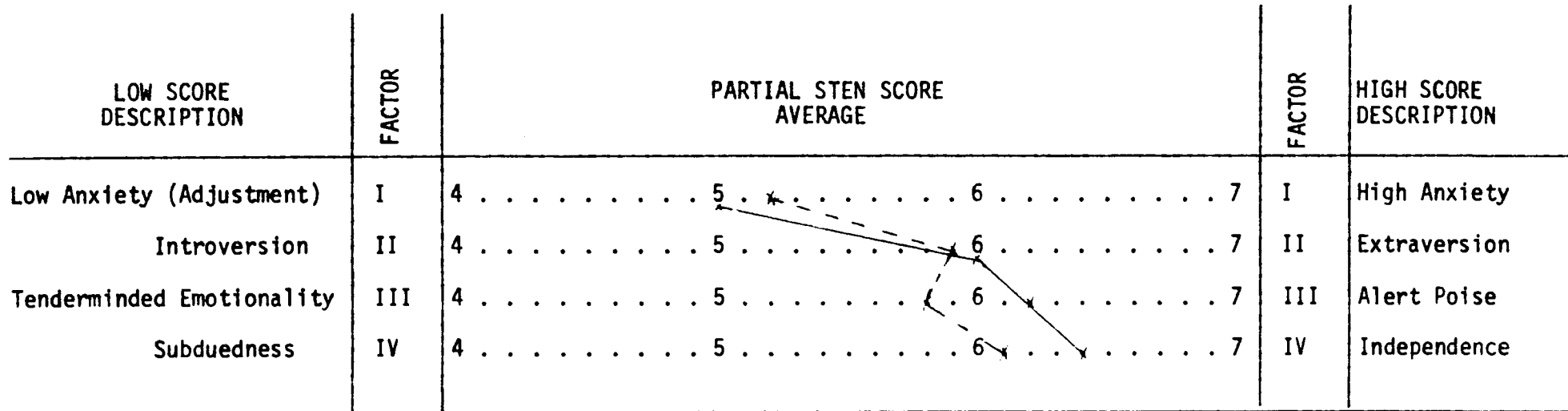


Figure 6
16PF Test Profile for Second-Order Factors

The investigator believes that the results obtained may indicate that there are possibly many more similarities than differences that exist between the experiences provided for the individual and team sports participants. The individual sports as well as the team sports participants are team-oriented. The individuals on the tennis, golf, gymnastics, and swimming teams participate in individual events, but each person gains points for the team. In a triangular swimming meet, a first place is worth seven points. It is a combination of points from all of the events that will make a team a winning or losing team.

Both groups may have been exposed to many similar experiences training programs, various types of strategies; goal-oriented activities; officials; and rules. The training programs are similar in that they stress the development of the areas of the body needed for that sport. Strength and endurance are stressed for both individual and team sport participants. Various types of strategies are planned for individual and team participation. The tennis players must cover the space on the tennis court in the same manner as the volleyball team must cover the space on the volleyball court. Both tennis and volleyball players are required to use defensive and offensive strategies. A specific goal is set for all sports participants whether it is getting the ball in a goal or winning points for a team. Officials are trained for many individual and team sports competition. An example is the use of rated officials for swimming and gymnastic competition as well as for basketball, volleyball and field hockey. Rules are set up for all sports events. Boundaries, safety regulations, and basic knowledge is explained in all areas.

Another reason why the individual and team sports participants may not differ significantly could be due to the fact that the sample for this investigation was representative of a high economic group from a small geographic area. It was also found that some of the athletes participated on individual and team sports during the same academic year. Even though a person may participate in a varsity individual sports event or on a team, many participants may also participate in intramural activities on team and/or individual events. It has been stated that an athlete may select a certain sport because of personality characteristics already possessed by the person. It may be that an athlete possesses certain personality characteristics, but as to whether an individual sports participant differs from a team sports participant still has not been answered. This investigator found no difference between the two groups.

Chapter V

SUMMARY OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS FOR FURTHER STUDY

Summary of Findings

Cattell's Sixteen Personality Factor Questionnaire was utilized to measure all of the personality factors for the subjects for this study.

Primary Factors

- (1) The women athletes differed significantly from the national norm on Factor E (assertive, aggressive, stubborn, competitive).
- (2) The women athletes differed significantly from the national norm on Factor L (suspicious, self-opinionated, hard to fool).
- (3) The women athletes differed significantly from the national norm on Factor Q₁ (experimenting, liberal, analytical, free-thinking).
- (4) The women athletes differed significantly from the national norm on Factor Q₃ (controlled, socially precise, following self-image).
- (5) The majors differed significantly from the non-majors on Factor I (tough-minded as compared to tender-minded).
- (6) The majors differed significantly from the non-majors on Factor M (practical as compared to imaginative).
- (7) The majors differed significantly from the non-majors on Factor Q₂ (group dependent as compared to self-sufficient).
- (8) The individual sports participants did not differ significantly from the team sports participants on any of the 16 personality factors.

Second-Order Factors

(1) The women athletes differed significantly from the national norm on Factor IV (independent, aggressive, daring, incisive).

(2) The majors differed significantly from the non-majors on Factor III (enterprising, decisive, resilient).

(3) The individual sports participants did not differ significantly from the team sports participants on any of the four second-order personality factors.

Conclusions

Within the limits of this study the following conclusions were made:

(1) Women athletes possess personality characteristics that are different from those of the norm.

(2) Physical education majors who participate on athletic teams possess personality characteristics that are different from those who are not majoring in physical education and who are participants on athletic teams.

(3) No evidence was found to confirm a difference in personality characteristics between women individual and team sports participants.

Recommendations for Further Study

Upon the completion of this investigation, it is recommended that future studies should

- (1) determine the reliability of the personality inventory administered for the sample utilized
- (2) use the 1967 edition of Cattell's Sixteen Personality Factor Questionnaire Form A plus Form B in order to make comparisons with this and other studies
- (3) investigate the personality characteristics of majors versus non-majors in various situations as well as in athletics
- (4) investigate the personality characteristics of college women individual versus team sports participants.
- (5) investigate the personality characteristics of college women athletes versus college women non-athletes
- (6) investigate the personality characteristics of college women athletes during the competitive season as well as prior and after the competitive season.

APPENDIX

VITA SHEET

Subject	Age	Major	State	Year in School	Sport
1	21	Physical Education	New York	Senior	Individual
2	21	Physical Education	New York	Junior	Individual
3	19	Physical Education	New York	Freshman	Individual
4	18	Physical Education	New Jersey	Freshman	Team
5	18	English	Virginia	Freshman	Both
6	20	History	New York	Sophomore	Individual
7	18	Physical Education	Connecticut	Freshman	Team
8	20	Physical Education	New York	Junior	Individual
9	20	Physical Education	Pennsylvania	Sophomore	Individual
10	18	English	New York	Freshman	Individual
11	20	Physical Education	New York	Junior	Team
12	19	Undecided	New York	Freshman	Team
13	19	Undecided	New Jersey	Freshman	Team
14	19	Undecided	Illinois	Freshman	Individual
15	20	Physical Education	New York	Sophomore	Individual
16	19	English	New York	Sophomore	Team
17	18	Physical Education	Maryland	Freshman	Individual

VITA SHEET (Continued)

Subject	Age	Major	State	Year in School	Sport
18	19	Physical Education	New Jersey	Freshman	Team
19	21	Physical Therapy	Massachusetts	Junior	Individual
20	21	International Relations	New Jersey	Senior	Team
21	18	Physical Education	New Jersey	Freshman	Team
22	21	Physical Education	Delaware	Senior	Team
23	18	Physical Education	New Jersey	Freshman	Team
24	19	Physical Therapy	New York	Freshman	Team
25	20	Speech-Drama	New York	Sophomore	Both
26	21	History	New York	Senior	Individual
27	21	Business Admin.	New York	Junior	Individual
28	21	General Studies	New York	Senior	Both
29	21	Physical Education	New York	Senior	Team
30	18	Sociology	Pennsylvania	Freshman	Individual
31	18	Undecided	New York	Freshman	Both
32	18	Political Science	New Jersey	Freshman	Both
33	18	History	New York	Freshman	Individual
34	19	Physical Education	Florida	Sophomore	Individual

VITA SHEET (Continued)

Subject	Age	Major	State	Year in School	Sport
35	21	General Studies	Pennsylvania	Senior	Individual
36	18	Undecided	Pennsylvania	Freshman	Team
37	17	Music	New Jersey	Freshman	Individual
38	18	Physical Education	Vermont	Freshman	Individual
39	22	Physical Education	New Jersey	Senior	Team
40	20	Physical Education	New Jersey	Junior	Team

FORM B 1967 EDITION

Raw Scores

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
1	12	10	17	14	15	19	24	13	11	12	13	15	10	1	16	11
2	12	11	16	12	17	16	17	10	5	13	10	10	10	5	11	15
3	11	6	7	14	18	10	13	11	14	13	6	18	9	11	13	15
4	13	9	16	10	22	9	14	12	7	6	6	14	8	2	12	16
5	9	10	13	11	16	13	0	16	15	14	7	18	11	14	10	17
6	14	7	17	15	18	8	19	14	9	20	9	7	11	6	10	14
7	9	10	16	14	15	7	16	14	4	16	10	11	8	10	6	16
8	8	12	19	15	14	11	12	15	9	14	9	9	8	6	11	15
9	12	9	16	13	18	19	18	11	4	13	14	5	10	4	16	5
10	12	10	9	11	21	12	12	14	11	15	10	22	7	6	9	17
11	10	8	17	8	16	14	18	8	13	13	12	6	5	3	13	10
12	9	9	18	13	12	14	16	11	5	15	15	8	8	9	13	9
13	8	11	8	13	18	9	12	17	7	20	10	17	12	12	7	17
14	10	9	21	9	16	16	19	17	6	13	12	6	12	7	15	9
15	12	7	13	12	14	16	5	9	10	9	9	14	10	4	12	14
16	11	11	13	14	19	12	19	20	7	22	6	19	12	7	6	18
17	7	7	17	18	18	13	8	13	4	20	8	13	12	10	11	15
18	10	8	18	12	12	16	18	10	7	10	12	8	6	5	16	12
19	7	11	19	7	17	15	12	12	13	15	8	10	5	6	10	10
20	10	9	14	12	18	16	16	10	8	17	6	10	7	9	15	13
21	7	4	10	11	14	12	12	12	11	15	10	14	9	4	13	12

FORM B 1967 EDITION (Continued)

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
22	8	6	15	17	17	10	9	12	6	11	8	18	9	10	17	16
23	10	8	9	12	17	13	11	8	13	10	6	16	8	13	12	18
24	14	9	21	13	18	19	14	12	11	9	10	13	10	2	16	14
25	13	11	15	13	23	18	16	13	11	13	14	7	12	10	16	8
26	14	9	17	17	18	13	19	11	13	21	5	11	6	17	13	15
27	18	8	24	13	20	10	24	10	11	10	10	5	14	6	14	8
28	10	6	14	13	17	12	7	12	13	10	7	15	8	9	10	20
29	12	7	22	16	12	15	21	11	10	9	16	5	13	9	16	2
30	9	9	19	11	21	14	14	10	8	15	10	9	7	6	12	13
31	8	9	13	15	23	12	13	15	12	19	13	19	12	8	10	21
32	11	8	22	8	22	11	16	16	6	20	10	6	11	7	8	11
33	7	9	12	11	13	14	3	14	10	12	11	19	10	13	7	16
34	12	8	15	10	18	12	19	9	9	6	18	12	9	4	6	11
35	7	7	11	11	9	11	2	12	8	16	12	17	11	16	8	15
36	9	8	17	6	17	14	11	16	5	13	7	11	6	6	7	13
37	6	8	9	10	15	15	6	12	10	8	8	21	8	10	13	21
38	15	8	21	10	18	16	15	10	9	6	13	6	5	2	15	11
39	9	10	15	21	20	12	16	5	11	18	4	11	18	10	10	13
40	7	9	19	10	18	12	18	6	8	10	13	8	9	6	10	12

FORM A 1967 EDITION

Raw Scores

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
1	16	11	17	16	18	18	20	9	2	16	10	12	10	5	14	15
2	14	8	13	16	19	8	20	17	11	17	7	10	6	5	15	17
3	10	10	11	13	12	13	12	13	7	16	8	13	12	13	13	16
4	17	9	20	14	22	10	18	14	7	9	9	12	8	6	10	18
5	9	11	11	19	11	15	4	18	12	19	8	20	6	16	15	22
6	17	9	13	15	22	9	21	16	8	21	7	10	12	8	12	10
7	12	9	16	14	17	11	12	10	7	13	9	10	12	7	10	21
8	9	11	18	12	20	13	6	13	4	14	9	12	10	5	14	12
9	12	10	19	8	23	17	17	15	4	11	10	4	8	7	19	6
10	13	12	18	12	22	11	15	16	8	13	10	12	8	11	14	21
11	12	5	18	11	18	12	13	14	9	15	11	11	5	11	16	9
12	15	10	18	9	14	11	10	16	6	13	9	10	8	9	13	9
13	4	9	14	13	13	3	7	13	12	16	6	16	13	14	8	19
14	11	8	20	16	12	9	19	17	3	14	4	8	6	4	17	9
15	11	8	16	7	12	18	13	10	10	10	12	14	14	15	11	12
16	11	10	12	22	14	4	19	18	7	16	6	20	8	14	6	15
17	5	10	18	18	22	5	16	13	6	19	6	9	11	10	10	8
18	15	7	16	15	15	18	20	9	8	10	8	9	3	9	19	10
19	7	7	18	15	18	19	12	11	6	14	6	11	7	8	15	15
20	12	9	21	18	18	16	20	13	10	12	4	6	5	12	14	8
21	10	10	12	15	21	12	13	11	11	10	6	11	7	11	11	14

FORM A 1967 EDITION (Continued)

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
22	11	10	14	11	16	7	10	13	12	12	9	9	7	10	16	14
23	14	11	13	13	20	12	11	10	6	11	9	8	9	5	16	13
24	14	10	13	13	18	16	19	12	6	9	5	14	5	2	12	18
25	15	9	17	11	20	14	22	16	5	11	9	7	7	9	12	13
26	11	7	18	21	16	13	25	10	13	12	9	13	10	9	7	16
27	14	8	17	15	24	10	26	12	4	12	14	6	8	9	19	11

FORM B 1967 EDITION

Sten Scores

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
1	6	7	6	7	5	9	9	6	8	5	8	7	6	1	9	4
2	6	8	6	6	6	7	7	4	4	6	5	5	6	4	6	6
3	6	2	1	7	6	3	6	4	9	6	2	8	6	8	7	6
4	7	6	6	5	8	3	6	5	5	2	2	6	5	2	6	6
5	5	7	4	6	5	5	5	8	10	6	3	8	7	9	5	6
6	7	3	6	8	6	2	7	6	6	9	5	3	7	5	5	5
7	5	7	6	7	5	2	6	6	3	7	5	5	5	7	3	6
8	4	10	7	8	4	4	5	7	6	6	5	4	5	5	6	6
9	6	6	6	7	6	9	7	4	3	6	8	2	6	4	9	2
10	6	7	2	6	8	4	5	6	8	7	5	10	4	5	5	6
11	5	5	6	4	5	6	7	2	9	6	7	3	3	3	7	4
12	5	6	7	7	4	6	6	4	4	7	9	4	5	7	7	3
13	4	8	2	7	6	3	5	8	5	9	5	7	8	8	4	6
14	5	6	8	5	5	7	7	8	4	6	7	3	8	5	8	3
15	6	3	4	6	4	7	3	3	7	4	5	6	6	4	6	5
16	6	8	4	7	7	4	7	10	5	10	2	8	8	5	3	7
17	3	3	6	9	6	5	4	6	3	9	4	6	8	7	6	6
18	5	5	7	6	4	7	7	4	5	5	7	4	3	4	9	5
19	3	8	7	4	6	6	5	5	9	7	4	5	3	5	5	4
20	5	6	5	6	6	7	6	4	6	8	2	5	4	7	8	5
21	3	1	3	6	4	4	5	5	8	7	5	6	6	4	7	5

FORM B 1967 EDITION (Continued)

Subjects	A	B	C	E	F	G	H	I	L	M	N	O	Q ₁	Q ₂	Q ₃	Q ₄
22	4	2	5	9	6	3	4	5	4	5	4	8	6	7	9	6
23	5	5	2	6	6	5	5	2	9	5	2	7	5	9	6	7
24	7	6	8	7	6	9	6	5	8	4	5	6	6	2	9	5
25	7	8	5	7	9	8	6	6	8	6	8	3	8	7	9	3
26	7	6	6	9	6	5	7	4	9	10	2	5	3	10	7	6
27	10	5	10	7	7	3	9	4	8	5	5	2	9	5	7	3
28	5	2	5	7	6	4	4	5	9	5	3	7	5	7	5	8
29	6	3	8	8	4	6	8	4	7	4	10	2	8	7	9	1
30	5	6	7	6	8	6	6	4	6	7	5	4	4	5	6	5
31	4	6	4	8	9	4	6	7	8	9	8	8	8	6	5	8
32	6	5	8	4	8	4	6	8	4	9	5	3	7	5	4	4
33	3	6	4	6	4	6	2	6	7	5	6	8	6	9	4	6
34	6	5	5	5	6	4	7	3	6	2	10	5	6	4	3	4
35	3	3	3	6	2	4	1	5	6	7	7	7	7	10	4	6
36	5	5	6	3	6	6	5	8	4	6	3	5	3	5	4	5
37	3	5	2	5	5	6	3	5	7	3	4	9	5	7	7	8
38	8	5	8	5	6	7	6	4	6	2	8	3	3	2	8	4
39	5	5	5	10	7	4	6	1	8	8	1	5	10	7	5	5
40	3	6	7	5	6	4	7	1	6	5	8	4	6	5	5	5

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