

A PERSONALITY STUDY OF THE MALE ATHLETES
OF THE INTERNATIONAL TRACK ASSOCIATION

by

JEROME E. HOWE

B. S., Kansas State University, 1972

A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Health, Physical Education and Recreation

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1975

Approved by:


Major Professor

**THIS BOOK
CONTAINS
NUMEROUS PAGES
THAT WERE
BOUND WITHOUT
PAGE NUMBERS.**

**THIS IS AS
RECEIVED FROM
CUSTOMER.**

LD
2668
T4
1975
H69
c-2
Document

ACKNOWLEDGEMENTS

I would like to extend my sincerest thanks and deepest appreciation to several people without whose cooperation, constant guidance, and encouragement this thesis could not have been written. I greatly appreciated the assistance I received from Dr. Michael Holen and Dr. David Lineback. A special thanks is extended to Dr. John Merriman, chairman of my committee, and Dr. Charles Corbin whose assistance and moral support were invaluable to me. Finally, I would like to thank the people who volunteered to serve as subjects for this investigation. It was through their interest, cooperation, and enthusiasm that I was able to gather the needed information that made this study possible.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS.....	ii
LIST OF TABLES.....	v
Chapter	
I. INTRODUCTION.....	1
Problem Statement.....	1
The Need for the Study.....	2
Assumptions.....	3
Limitations.....	3
Delimitations.....	4
Definition of Terms.....	4
II. REVIEW OF LITERATURE.....	7
Personality Differences Between Athletes and Nonathletes.....	7
Personality Differences Between Athletes.....	15
Personality Traits of Highly Skilled, Superior, or Outstanding Athletes.....	19
III. PROCEDURES.....	24
Subjects.....	24
Personality Instrument.....	25
Collection of Data.....	26
Statistical Treatment of Data.....	26

Chapter	Page
IV. RESULTS AND DISCUSSION.....	28
Personal Data.....	28
Discussion of Personal Data.....	32
Personality Data.....	39
Discussion of Personality Data.....	39
16 PF Profile Comparisons.....	55
Discussion of 16 PF Profiles.....	63
ANOVA for Race, Events, Section of Country, Sibling Position, and Type of Community with 16 Factor of 16 PF.....	65
Discussion of Analysis of Variance.....	66
V. SUMMARY AND CONCLUSIONS.....	69
BIBLIOGRAPHY.....	73
APPENDIX A.....	78
APPENDIX B.....	83

LIST OF TABLES

Table	Page
1. Personal Data of Subjects.....	29
2. Personality Data.....	40
3. T-Test Results Comparing Mean Raw Scores for I.T.A. Sample Group and General Population on Factor A-Q4.....	41
4. T-Test Results Comparing Mean Sten Values for I.T.A. Sample Group and Olympic Champions (N=41) on Factors A-Q4.....	60
5. T-Test Results Comparing Mean Sten Values for I.T.A. Sample Group and Football Players (N=67) on Factors A-Q4.....	61
6. T-Test Results Comparing Mean Sten Values for I.T.A. Sample Group and Male Swimmers (N=57) on Factors A-Q4.....	62
7. Analysis of Variance of Factor A with Events, Section of Country, Position Among Siblings, Race, and Type of Community.....	66
8. Analysis of Variance of Factor B with Events, Section of Country, Position Among Siblings, Race, and Type of Community.....	84
9. Analysis of Variance of Factor C with Events, Section of Country, Position Among Siblings, Race, and Type of Community.....	84

Table	Page
10. Analysis of Variance of Factor E with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	85
11. Analysis of Variance of Factor F with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	85
12. Analysis of Variance of Factor G with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	86
13. Analysis of Variance of Factor H with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	86
14. Analysis of Variance of Factor I with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	87
15. Analysis of Variance of Factor L with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	87
16. Analysis of Variance of Factor M with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	88
17. Analysis of Variance of Factor N with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	88

Table	Page
18. Analysis of Variance of Factor O with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	89
19. Analysis of Variance of Factor Q1 with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	89
20. Analysis of Variance of Factor Q2 with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	90
21. Analysis of Variance of Factor Q3 with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	90
22. Analysis of Variance of Factor Q4 with Race, Events, Section of Country, Position Among Siblings, and Type of Community.....	91
23. Mean Raw Scores and Mean Sten Values for I.T.A. Sample Group on 16 Factors Measured by the 16 PF.....	91
24. The Primary Source Traits Covered by the 16 PF Test.....	92

CHAPTER I

INTRODUCTION

Our society today is saturated with athletics and athletes. Perhaps no other culture places more emphasis on or interest in sports than the United States. This interest in sports carries over to a preoccupation with the exceptional athlete. People, regardless of sex and age, follow closely the careers and lives of successful and famous athletes who receive national recognition. Yet with all the attention and interest focused on the exceptional athlete, he is one of the least understood individuals within our society today. Society has created a surrealistic stereotype of the exceptional athlete, placing its beliefs on myths and carelessly preconceived opinions. While a great deal of research has been done concerning the athlete, the exceptional athlete is seldom isolated for study. Even people who participate in sports do not know or fully understand why they participate in sports, or what motivates them to seek excellence. It is crucial to a total understanding of athletes and athletics that extensive investigation be undertaken into the area of the athletes' personalities.

PROBLEM STATEMENT

The purpose of this study was to investigate the personality of male athletes competing for the I.T.A. (International Track Association). More specifically, this study was designed to (1) identify the

personalities of the I.T.A. sample group with the Cattell 16 PF, (2) to compare and contrast the 16 PF results of the I.T.A. sample group with established 16 PF norms for the general population, (3) to compare certain biographical data with scores on the 16 PF, and (4) to compare 16 PF personality profiles of specific groups of competitors.

THE NEED FOR THE STUDY

Considering this society's preoccupation with excellence in sports, it seems logical that we fully investigate the athlete's personality, and how it might be a factor in his success or failure in sports. Results from studies conducted by Cooper (30) indicated that the psychological process that produces the personality of the exceptional athlete is an overlooked and highly valuable area for research. In an article by Brown (29), Dr. William Beausay stated that knowledge concerning the personality of the exceptional athlete could help change an average athlete into a superior one. Research by the American Psychological Association (62) indicated that once the personality of the exceptional athlete is understood, coaching and training methods can be directed to facilitating and developing personality traits that will enhance superior performance.

Brown (29) pointed out that there are already enough believers concerning the importance of personality to superior performance in athletics to have hired Dr. William Beausay, a researcher in this area, to study the personalities of more than 300 National Football League players, 100 race car drivers, a wide assortment of college basketball

and football players, hockey players, sky divers, and a women's semi-pro tackle-football team.

For years Ogilvie and Tuko have conducted and analyzed hundreds of personality tests of athletes for coaches and prospective schools interested in these athletes. Cooper (30) concluded that at this point more research needs to be done to add to the growing body of knowledge in this area and eventually allow researchers to transform theories into useful and applicable knowledge. Cooper perhaps stated it best when he said, "An understanding of the exceptional athlete is crucial to our entire understanding of sports and its full impact upon our society."

ASSUMPTIONS

The information volunteered by the subjects was assumed to be correct and true. The test employed was valid to assess the personality traits of the sample group selected in this investigation.

LIMITATIONS

Because participation in the study was limited to volunteers, it was quite possible that the subjects who volunteered represented a distinctly different group from those who failed to participate in the study. The limited sample number ($N=32$) was only representative of half of the total members of the International Track Association. Also, while Blacks comprised nearly 50 percent of the members of the

International Track Association, only 31 percent of the sample group was Black.

The times and environments of administration of the 16 PF to the sample group (see Chapter III-Procedures) were not ideal for this type of research. Although not ideal, the conditions were the best that could be achieved for this group of subjects.

DELIMITATIONS

The sample group used for this investigation was limited to those members of the I.T.A. who volunteered to participate. Personality traits were limited to those defined by the 16 PF.

DEFINITION OF TERMS

Sixteen Personality Factor Questionnaire (16 PF)--The 16 PF test was a multidimensional set of sixteen questionnaire scales. It was designed to make available, in a practicable testing time, information about an individual's standing on the majority of personality factors.

Factors on the 16 PF--These factors measured 16 functionally independent and psychologically meaningful dimensions of personality. A description of each factor is presented in Table 24 in the Appendix.

I.T.A. athlete--Any athlete who was a regular participating member of the tour.

Sprinters--Subjects who competed in the 60-yard dash, 100-yard dash, 220- and 440-yard runs, and the high hurdles.

Distance runners--Subjects who competed in the 880, mile, or two mile events.

Field events--Pole vault, shot put, long jump, and high jump.

Jumping events--Long jump and high jump.

East Coast--Those states which bordered the eastern seaboard north of Virginia.

Midwest--Those states north of the Mason-Dixon Line which were between the eastern seaboard states and the Rocky Mountain states.

Mountain-Desert--Those states from Colorado to the states which bordered the West Coast, including the southwest desert regions of the U.S.

West Coast--Those states which bordered the west coast.

South--Those states which were below the Mason-Dixon Line and which comprised the "old" south.

Type of community--This was the subject's interpretation of the type of community in which he was reared.

High school's emphasis on sports--This referred to the subject's interpretation of the emphasis his high school placed on sports. Categories included none, some, one of the most important activities, most important activity.

General population--The general population used in this investigation was limited to 30 year old males who were representative of the adult American male. The established norms for this general population were obtained from 2255 30-year-old males, and

represented a stratified sample group according to social status, geographical area, age, and urban and rural areas in proportion to U.S. census statistics.

CHAPTER II

REVIEW OF LITERATURE

This chapter presents a review of literature pertinent to this study. For a better understanding of research in this area, the studies reviewed were divided into three categories: (1) studies of personality differences between athletes and nonathletes, (2) studies measuring personality differences between athletes, and (3) studies pertaining to personality traits of highly skilled, superior, or outstanding athletes.

PERSONALITY DIFFERENCES BETWEEN ATHLETES AND NONATHLETES

A great deal of research concerning the personality of athletes has been done by comparing them to nonathletes. Only by studying the athlete in relationship to nonathletes, can researchers hope to obtain a clear concise picture of the athlete's personality.

Sperling (59) in 1942 conducted a study indicating significant differences between athletes and nonathletes. He found in personality adjustment scores, ascendance and extroversion that varsity athletes and intramural groups proved to be reliably superior to the nonathletic group. The nonathletes were found to possess a more liberal minded attitude than the two athlete groups. Varsity and intramural athletes were motivated more by a desire for power and, to a lesser degree, by a social love of people. The nonathlete group was shown to be more aesthetically and theoretically minded.

Another early study conducted by Milverton (49) in 1943 investigated the effects of physical training on personality. He found that there was no significant difference in personality traits before and after boys participated in a program of physical activity.

Thune (60) studied the personality of weightlifters and non-weightlifters and found the weightlifters to be shy, lacking in self-confidence, and more concerned with body build than the non-weightlifters. The weightlifters desired to be strong and dominant and sought to emulate other strong men.

In 1950 Johnson (12), using the Minnesota Multiphasic Personality Inventory (MMPI), found significant differences between athletes and nonathletes. On the interest (MF) variable, nonathletes scored significantly higher than athletes. Varsity athletes scored significantly lower on the anxiety (A) variable than nonathletes and freshman athletes. On the dominance (DO) variable, varsity athletes and upper-class nonathletes scored significantly higher than freshman athletes and nonathletes.

In a similar study conducted by Booth (6) using the MMPI, the results were strikingly similar to that of Johnson's study (12). On the interest (MF) variable nonathletes again scored significantly higher than athletes. On the anxiety (A) variable, varsity athletes scored significantly lower than upper-class nonathletes, freshman athletes, and freshman nonathletes. On the dominance (DO) variable, varsity athletes and upper-class nonathletes scored significantly higher than freshman athletes and nonathletes. Contrary to Johnson's study, Booth found that on the social responsibility (RE) variable, upper-class nonathletes scored significantly higher than freshman athletes, nonathletes and varsity athletes.

Shirley (19), doing a study of the academic achievements, interests, and personality traits of athletes and nonathletes, found strikingly different results from those studies conducted by Johnson (12) and Booth (6). Four personality and interest tests were administered to 23 full-scholarship athletes and 23 nonathletes. The tests were: (1) the Allport-Vernon Study of Values, (2) the Guilford-Zimmerman Temperament Survey, (3) the MMPI, and (4) the Strong Vocational Interest Blank for Men. The results, based upon academic records and the battery of personality and interest tests, indicated that no significant differences existed between the athletic and nonathletic groups on total grade-point averages. The nonathletic group earned a significantly higher number of course-credit hours for three years of college than did the athletes. With the theoretical values of the Allport-Vernon Study of Values, the nonathletic group scored significantly higher than the athletes. On the other five values of the test, no significant differences were found. With the Guilford-Zimmerman Temperament Survey, no significant differences were found to exist between the athletic and nonathletic groups on any of the ten personality traits. Directly counter to Johnson's (12) and Booth's (6) study, the MMPI showed only a slight difference on the Psychopathic scale and indicated insignificant differences on the other nine scales. No significant differences were found between the nonathletic and athletic groups on any of the seven occupational scales on the Strong Vocational Interest Blank for Men.

Berger and Littlefield (25) reported results similar to those of Shirley (19). The California Personality Inventory (CPI) was

administered to 30 outstanding football players, 30 nonoutstanding football players and 30 nonathletes. An analysis of variance showed that none of the 18 items of the CPI was able to discriminate significantly at the .01 level.

Slusher (58), using the MMPI with high school athletes and nonathletes, found that personality characteristics of hypochondriasis (Hs), depression (D), hysteria (hy), psychopathic deviation (pd), femininity (MF), paranoia (Pa), and psychosthenia (Pt) differed between athletes and nonathletes. Femininity and intelligence were significantly lower for all athletic groups when compared with nonathletes. With the exception of swimmers, athletes scored significantly higher on hypochondriasis. Only hypomania (Ma) and the validity scale (K) failed to distinguish between the athletic and nonathletic groups.

Merriman (48) conducted a study in 1960 comparing personality traits to motor ability. In this study the Phillips JCR test and California Personality Inventory (CPI) were administered to 808 high school boys. Upper motor-ability groups scored significantly higher than the lowest motor-ability groups on measures of poise, ascendancy, self-assurance, intellect and interest. When comparing athletes and nonathletes who were matched according to motor ability, few significant differences were found between the mean CPI scores.

Keogh (41) conducted a study similar to Merriman (48) with similar findings. Keogh's study also compared the relationship of motor ability and athletic participation to certain personality measures. Like Merriman, Keogh found that athletic participation did not affect any of the personality traits studied.

Schendel (55) administered the CPI to 334 ninth grade, twelfth grade, and college team sport athletes and nonparticipants in athletics. Statistical differences were found to exist between the means of the athletes and nonparticipants on eight of the CPI scales of the ninth grade subjects, on four scales of the twelfth grade subjects, and on nine scales of the college subjects. All significant differences for the ninth and twelfth grade subjects involved scales on which the athletes had the higher means. The same was true at the twelfth grade level, with the exception of two scales.

A study conducted by Tillman (61) investigated the relationship between physical fitness and selected personality traits. A physical fitness test was administered to 386 high school junior and senior boys. The boys who finished in the upper 15 percent and lower 15 percent were then administered the Cattell Sixteen Personality Factor test (16 PF) and the A-S Reaction Study test. The upper physical fitness group had a significantly higher ascendance rating on the A-S Reaction Study test than did the lower group. With the 16 PF the upper group appeared more surgent on factor F and exhibited greater social dependence on Q₂. Factor Q₄ indicated the upper group was less tense than the lower group. The upper group proved to be more dominant, extroverted, socially oriented, and were more interested in people and group interaction.

Davidson (10) conducted a study also using high school athletes and nonathletes to determine differences between personality traits and value systems. To determine these differences, he administered to 215 nonathletes and 169 athletes the California Test of

Personality and the Pictorial Study of Values. Between certain groups of high school athletes and nonathletes, significant differences were found on the value classifications and the selected traits of personality. The upperclass athletes achieved significantly greater scores than the upperclass nonathletes on seven categories of the test used in this study. They scored significantly lower on one component. When the female athletes were compared to the nonathletes, all components of the California Test of Personality except one were in favor of the female athletes. Based on the results of his study, Davidson concluded that high school students who participate in interscholastic athletics do possess personality traits which are significantly different from those students who are nonparticipants in interscholastic athletics.

Ruperts (18) also studied personality traits of high school athletes and nonathletes. He found that athletes were somewhat more oriented toward conventional norms and valued achievement more highly than nonathletes. Athletes were also found to be less humanistic than nonathletes.

A unique study investigating personality differences between athletes and nonathletes was done by Gotheil and Werner (34). A group of 116 cadets entering West Point were designated as athletic nonparticipants and another group of 340 cadets as athletes. The Cattell 16 PF was administered shortly after entrance and again shortly prior to graduation. This notable study concluded that entering cadet athletes were significantly different from nonathletes on Factors A, F, H, Q₁, Q₂, Q₃, and Q₄ of the 16 PF scales, and upon graduation significant

differences were again found on five of the same variables (A, F, Q₁, Q₂, Q₃). A significant difference was found on factor E that had not been noted at entrance. At entrance the product-moment correlation between the mean scores for both groups was .987. At graduation a product-moment correlation of .983 was found. This study indicates that despite four years of mandatory athletic participation, the designated nonathletes did not change in personality structure. This study showed that participation in college athletics does not significantly influence personality structure.

Another study utilizing the 16 PF was conducted by Morgan (16) to investigate personality and motivational traits of professional women athletes. From this study, it was concluded that women athletes, when compared to general population norms, were more assertive and competitive, more forthright, more self-sufficient, more experimenting, more controlled, less anxious, possessed more tough poise, and were more independent.

A study involving women athletes using the 16 PF was also done by Chadwick (8). A part of the study involved comparing personality traits between women nonathletes and athletes. The scores derived from the 16 PF revealed that the athletes were significantly more tough-minded (I), practical (M), group-dependent (Q₂), extroverted (Q₁), subdued (Q₄), and they also possessed more tough poise (Q₃) than the nonathletes.

The 16 PF was used by Kroll (42) to establish personality factor profiles of 94 collegiate wrestlers. When compared to norms, the wrestlers were found to be significantly different on factor (I) indicating tough-mindedness, self-reliance, and masculinity.

Mendell (15) used the 16 PF to measure personality differences between college male intramural participants and nonparticipants. The study revealed that participants in the college intramural program had high school intramural and interscholastic background while the non-participant usually did not participate in either intramural or interscholastic sports. The findings indicated that there was a significant difference in personality between participants and nonparticipants on seven of the 16 PF factors.

Using Cattell's Children Personality Questionnaire (CPQ), Sevier (56) compared personality traits of a boys' championship soccer team to a group of boys who were nonathletes. In this study the boys' championship soccer team was significantly different from the nonathletes in emotional stability, intelligence, aggression, expedience, venturesomeness, and control.

Ibrahim (37), in a study using the Guilford-Martin inventory of factors (GAMIN), examined temperament traits among intercollegiate athletes and physical education majors. The test was administered to 96 male and 40 female students. Football players scored favorably in three of the five traits, while the rest of the athletes and majors scored favorably in one or two traits only.

In a study to determine personality differences between swimmers and nonswimmers, Behrman (23) found significant differences between swimmers and nonswimmers. He also noted significant differences between learners and nonlearners.

Hunt (36), in a cross racial comparison of personality traits between athletes and nonathletes, concluded that athletes, regardless

of ethnic background, tend to have selected personality traits different than nonathletes. Hunt also found that White varsity and Black varsity athletes tend to have similar selected personality traits, as do Black nonathletes and White nonathletes.

In a review of the literature conducted by Cooper (30), the personality of the athlete and nonathlete was summarized. Cooper found no intellectual differences between athletes and nonathletes. Cooper maintained that, from the current literature, the athlete is more outgoing and socially confident, more socially aggressive, dominant and leading. Athletes also had a higher social adjustment as rated by both peers and teachers, and they were also higher in social status and self-confidence. Athletes were stronger competitors, less anxious, more emotionally stable, less compulsive, had a greater tolerance for pain, and had lower feminine interests and higher masculine ones.

PERSONALITY DIFFERENCES BETWEEN ATHLETES

Wright (21), using the 16 PF, compared personality traits of athletes in selected field events. The findings indicated that the five groups of athletes were not significantly different from one another on the personality traits measured with one notable exception. Long jump athletes were more outgoing than pole vault athletes. This study also found significant differences in personality between American and foreign athletes. The foreign athletes were more tender-minded, suspicious, shrewd, apprehensive, and self-sufficient than the American athletes.

Also utilizing the 16 PF, Kroll and Peterson (44) determined personality factor profiles for five collegiate football teams. Significant differences between the five teams existed with factor B (intelligence), factor H (shy versus bold), factor O (confident versus worrying), and factor Q₃ (casual versus controlled).

Flanagan (32), using a personality inventory measuring ascendance-submission, masculinity-femininity, extroversion-introversion, and emotional stability-emotional instability found significant differences in personality between fencers, badminton players, basketball players, volleyball players, boxers, and swimmers. This study seemed to indicate that personality is a factor in selecting specific physical activities.

Sevier (56) conducted a study which also suggested, as Flanagan did, that a sports-type does exist in terms of personality characteristics. In this study a boys championship soccer team was compared through use of Cattell's Children Personality Questionnaire (CPQ) to Kanas British soccer champions. The two teams were similar in all traits except aggression, venturesomeness, and confidence. On these scores the boys tended to excel the British team. This study gives support to the idea that one's personality traits lead an individual into certain sports.

A study was conducted by Ruperts (18) which tends to support the findings of Sevier (56) and Flanagan (32). Ruperts' study indicated more differences in personality traits existed among various subgroups of athletes than between athletes and nonathletes.

Johnson (38) further supported the premise that personality traits lead an individual into certain sports when he tested women athletes in basketball, bowling, field hockey, and golf using the California Personality Inventory (CPI). The study indicated that personality traits did vary within the four groups on 12 of the 18 items.

A study conducted by Lakie (45) comparing personality characteristics of certain groups of intercollegiate athletes using the Omnibus Personality Inventory produced results strikingly different from the previous studies reviewed. Lakie, using 230 college athletes grouped by sports, found no significant differences in personality traits among any of the groups compared.

Singer (57), using the Edwards Personality Preference Schedule, compared personality differences between baseball and tennis players at Ohio University and found results very similar to Lakie's study. Singer found no significant differences in personality traits between the baseball and tennis players.

Peterson et al. (54) employed the 16 PF to determine personality traits of women in team sports versus women in individual sports. Women athletes in individual sports rated higher on dominance, adventuresome, sensitivity, introversion, radicalism, and self-sufficiency, and lower on sophistication than the women team athletes. No significant differences were noted in sociability, intelligence, stability, surgency, conscientiousness, suspecting, guilt-proneness, high self sentiment or high ergic tension.

Booth (6) used the MMPI to find some significant personality differences between college athletes in team and individual sports.

He found that on the depression (D) variable varsity athletes who participated in individual sports, but not in team sports, scored significantly higher than athletes who participated only in team sports. On the same variable, varsity athletes who participated in only individual sports scored significantly higher than varsity athletes who participated in both individual and team sports. On the psychostenia (Pt) variable, varsity participants in individual sports scored significantly higher than varsity athletes in team-individual sports.

The MMPI in a study by Johnson (12) resulted in similar findings to those of Booth (6). Johnson's study concluded that, on the depression (D) variable and psychostenia variable, the varsity athletes who participated in individual sports, but not in team sports, scored significantly higher than athletes who participated in team sports.

Coffman (9) tested 137 college males who were members of different athletic teams using the Welsh Figure Preference Test and the Welsh Model. The results indicated that the teams were of different personality types as defined by that model.

Newman (51), using the Thurston Temperament schedule, compared personality traits of faster and slower competitive swimmers. His study disclosed a tendency for rank of swimming performance to correspond with rank of personality variable.

Cooper (30) conducted a review of the literature concerning athletes and personality and concluded that the psychology of team membership may be different in important ways from the influence of individual physical activities.

PERSONALITY TRAITS OF HIGHLY SKILLED, SUPERIOR,
OR OUTSTANDING ATHLETES

In 1954 Biddulph (26) found that high school boys ranking high in athletic achievement demonstrated a significantly greater degree of personal and social adjustment than did students ranking low in athletic achievement.

Bentson and Summerskill (24) investigated the relation of personal success in intercollegiate athletics to certain aspects of social adjustment. They concluded that letter winners participated in fewer college activities but expressed greater satisfaction with their college careers than non-letter winners. Also, letter winners while sustaining more injuries than the non-letter winners had a history of less serious injuries.

In a study by Coffman (9) freshman intercollegiate athletes were rated by coaches on their physical abilities and their potential for future athletic success. Analyses of the data indicated that significant relationships tended to exist between within-sport ratings and scores on the Welsh Figure Preference Test and the Welsh Model for football, gymnastics, swimming and lacrosse.

Booth (6), using the MMPI, found 22 items which discriminated between poor and good varsity competitors. A coach's ranking of 22 track men on competitive behavior correlated .63 on the 22 items.

LaPlace (46) also used the MMPI to study the relationship of personality and success in professional baseball. Subjects for the study were 49 major league and 64 minor league players. Results indicated that major league players were better able to apply their strong

drive toward a definite objective by exercising self-discipline. Also the major league players were better able to adjust to occupations requiring social contact, and the ability to get along well with others. Major league players also exercised more initiative.

Schendel (55) found that athletes with lower athletic ratings generally possessed desirable personal-social psychological traits to a greater extent than athletes with a higher athletic rating. Athletes rated as "substitute" have traits more like nonathletes than the outstanding players.

A study measuring personality traits of highly skilled basketball and softball women athletes was conducted by Foster (11) using Cattell's 16 PF. The findings of the study indicated personality was a significant factor in the success of women basketball and softball athletes. Successful women athletes were more relaxed than were non-successful athletes. Starters proved to be more relaxed than non-starters. Starters tended to be more imaginative, venturesome, and less intellectual than non-starters. Performers at lower levels of accomplishment did not have lower views of "self" than did performers at higher levels of accomplishment. Although there were many distinguishing differences between successful and non-successful athletes, performance levels were not significantly different on any of the 16 personality factors.

Nelson (50), also using the 16 PF, compared leaders and non-leaders in athletics. The study found that leaders differed significantly from nonleaders on five of the 16 factors (A, C, F, H, N). All leaders rated high on questions reflecting physical ability.

The 16 PF was utilized by Kroll (42) to study 94 wrestlers divided into three groups; superior, excellent, and average to below average. Contrary to other studies, Kroll failed to establish any profile differences between the groups.

Another study done by Kroll and Carlson (43) supports the findings of Kroll's previous study (42). The 16 PF failed to determine any significant differences between groups of advanced, intermediate and novice karate participants.

Huesner (35), using the 16 PF, found 41 former British and American Olympic champions to be significantly different from the general population on four factors. The former Olympic champions were more emotionally stable (factor C, sten = 7.6), more venturesome and bold (factor H, sten = 7.5), more assertive and independent (factor E, sten = 7.8), and more confident and self-assured (factor O, sten = 3.3).

One of the earlier studies concerning the personality of the outstanding athlete was conducted by Johnson et al. (39) in 1954. The study utilized the Rorschach and the Chromatic H-T-P (House-Tree-Person) test to measure personality traits of national champions or All-Americans. The subjects were four football players, two lacrosse players, two wrestlers, two boxers, one track man (middle distance) and one rifle marksman. The results of the study found that the champions were readily distinguishable as an exceptional group in comparison with both test norms and the personal experience of the evaluators. The most outstanding characteristics of the groups were extreme aggression, uncontrolled affect (emotions lacking strict controls), high and generalized anxiety, high level of intellectual aspiration, and exceptional feelings

of self-assurance. The H-T-P indicated that these subjects were exceptionally able to concentrate personality resources upon the desired objectives. This test also indicated an unusual concern of the subjects for physical power and perfection. This study also concluded that the subjects possessed a strong need for competitive achievement and that being a champion was a matter of psychological necessity.

Alderman (22) examined attitudes towards physical activities in champion athletes in ten different athletic events. He found male athletes showed a surprisingly strong attitude toward physical activity as an aesthetic experience, and a very weak response toward physical activity as an ascetic activity. This indicated that, though long strenuous training is probably necessary, there is not necessarily a strongly positive attitude toward it.

In an article by Ogilvie (52), the male athlete was described as being an emotionally healthy person who tends to be extroverted. He is usually a dominant type person, but does not seek leadership. He is tough-minded, self-assertive, self-confident, with a high capacity to endure the stress of high level competition. Ogilvie further indicated that athletes operate at a very low level of anxiety and are persons who set high goals for themselves and others. The athlete does not tend to act impulsively and is basically an orderly, organized person. The article noted that, as the male competitor moves up the success ladder, these traits become intensified. The pro athlete was described as being less autonomous and more deferential.

Ogilvie (53) in another article described the personality of high-level competitors. He concluded that high-level competitors will

have personality traits of ambition, organization, deference, dominance, endurance, and aggression. He indicated that there would be fewer introverted types by adult-level competition, and emotional maturity would range from average to high average. Also high-level competitors would possess self-control, self-confidence, tough-mindedness, trustfulness, intelligence, high conscience development, and low levels of tension. He found such traits as autonomy, exhibitionism, and affiliation to be less general.

In an article describing the characteristics of a champion athlete, Mackenzie (47) described the individual as being determined, optimistic, patient, stable, possessing adaptability and highly skilled. He indicated the will to win was stronger in champion athletes than other people. He further described champion athletes as being positive thinkers.

In summarizing the literature reviewed, certain conclusions seem warranted:

- 1) There does exist significant differences between the personalities of athletes and nonathletes.
- 2) Personality traits do differ between athletes depending upon the activity or the skill level of the individual participating.
- 3) The outstanding athlete does possess traits different from other athletes and nonathletes.
- 4) More research is needed to clarify the many ambiguities that have arisen from previous research and to answer still more questions concerning the personality of athletes.

CHAPTER III

PROCEDURES

This chapter contains the following subdivisions: 1) Subjects, 2) Personality Questionnaire, 3) Collection of Data, and 4) Statistical Treatment of Data.

SUBJECTS

The subjects participating in this study were male track and field athletes competing for the International Track Association. The group used for this study were selected for the following reasons: 1) the I.T.A. athletes represented a unique population for research in the area of personality, 2) the investigator was an I.T.A. athlete and was very familiar with the group, and 3) the investigator had easy access to the group.

Each athlete who was a member of I.T.A. was interviewed by the investigator before the collection of data. During the interview, the athletes were informed as to the nature of the investigation and their role as subjects. Sixty athletes were interviewed, and 32 subjects were finally used in this study. The 28 other I.T.A. athletes were not used as subjects. Eight athletes were not used because they failed to adequately complete the 16 PF questionnaire or the biographical data sheet. The other 20 athletes declined to participate. The sample group finally selected for use in this study consisted of 14 distance

runners, six sprinters, and twelve who were in the field events. Ten subjects were Black, and 22 subjects were White. The subjects ranged in age from 23 to 29 years with the average age of 25.4 years. With the exception of one athlete from Australia, all subjects were citizens of the United States.

PERSONALITY INSTRUMENT

The personality instrument used in this study was the Cattell Sixteen Personality Factor Questionnaire (Form A). The 16 PF was designed to measure the major dimensions of human personality. The 16 PF was based on 15 years of research where every item was subjected to factor analytic investigation. This provided sound proof that the 16 personality scales were valid and independent (3). Split-half reliabilities for each of the 16 factor scales ranged from +.71 to +.93, averaging about +.84. Internal validities ranged from +.73 to +.96, averaging approximately +.88 (3). Its wide use over a number of years has yielded an impressive amount of research data and has established the 16 PF as one of the most valid means of assessing personality.

The 16 PF was chosen for this particular study for the following reasons: 1) evidence indicated the 16 PF was a reliable and valid instrument for the measurement of personality traits; 2) the 16 PF was one of the shortest inventories available (187 questions); 3) the 16 PF was easy to administer and required a minimum of supervision and instruction; 4) the 16 PF had been previously used in research concerning the

personality of athletes; and 5) the sten scores and profile norms provided a means for group comparisons with other sample populations.

COLLECTION OF DATA

The 16 PF was administered to the athletes prior to international competition and was supervised by the investigator. The investigator was available to answer any questions the subjects had concerning the 16 PF. Each subject received the following materials: 1) an introductory statement explaining the study being undertaken, the nature of the 16 PF, and their role as subjects; 2) step-by-step instructions; 3) a biographical data sheet; 4) an informed-consent form; and 5) the 16 PF questionnaire and answer sheet (See Appendix A). The answer sheets and biographical data sheets were coded with corresponding numbers to safeguard the subjects' identities. The investigator believed that coded answer sheets and biographical sheets prompted more valid and reliable results. The subjects were given ample time to complete the questionnaire; however, most of the athletes completed the research material in one hour. After completion of the questionnaire, all materials were collected by the investigator.

STATISTICAL TREATMENT OF DATA

The investigator scored and tabulated the 16 PF answer sheets, and compiled the results from the biographical data sheets submitted by the subjects. Statistical analysis of the tabulated raw scores was programmed at the Kansas State University Computer Center through use

of an integrated package for social sciences. This descriptive analysis provided frequencies, mean, standard error, variance, and standard deviation for all raw scores on the 16 PF.

A least squares analysis of variance was run using unequal subclasses with the biographical data and mean raw scores from the 16 PF. Because of the limited number of subjects, several categories of biographical data were collapsed into the following groups: 1) field events were combined into one group; 2) the East and West Coasts were combined, and the South, Midwest, and Mountain-Desert regions were combined; 3) the youngest and oldest siblings were combined; and 4) the rural, suburban, and urban categories were combined. The .05 level of significance was established to determine any significant differences between biographical data and mean raw scores on the 16 PF. A least significant difference test (LSD) was conducted by the investigator to determine the nature and direction of the significant differences obtained from the analysis of variance.

A two tailed t-test at .01 level was used to compare mean raw scores of the I.T.A. sample with the mean raw scores of the 30 year old males sample. The same test was used to compare the mean sten values of the I.T.A. group to the corresponding values for Olympic champions, football players and swimmers. The .01 level of confidence was used for all t-test comparisons. A ± 2.750 t-ratio was significant with the samples used.

CHAPTER IV

RESULTS AND DISCUSSION

This investigation was concerned with the personality traits of male members of the International Track Association (I.T.A.) as measured by the Cattell Sixteen Personality Factor Questionnaire, Form A (16 PF). This chapter presents results and discussion pertinent to this study.

PERSONAL DATA

Personal data used for this study were obtained from 32 male professional track and field athletes (Table 1). The mean age for this sample group was 25.5 years with the range being 23 to 29 years. The sample group included 10 who were Black, and 22 who were White. The subjects included four shot putters, four pole vaulters, four high jumpers and long jumpers (combined), six sprinters, and fourteen distance runners. Analysis of marital status indicated 11 single athletes and 18 married athletes. One athlete was separated from his wife, and two athletes were divorced. None of the athletes were widowed. There were two athletes from the East Coast, six were from the Midwest, three were from the Mountain-Desert region, twelve were from the West Coast, seven were from the South, and one athlete was from Australia. There was one missing response.

TABLE 1
PERSONAL DATA OF SUBJECTS

	N	%
Race		
Black	10	32
White	22	68
Events		
Pole vault	4	13
Shot put	4	13
Long jump and High jump	4	13
Sprints	6	19
Distance races	14	44
Marital Status		
Single	11	34
Married	18	56
Divorced or Separated	3	9
Neighborhood		
Rural	5	17
Suburban	18	60
Inner City	5	17
Urban	2	7
Geographic Location		
East Coast	2	7
Midwest	6	20
Mountain-Desert	3	10
West Coast	12	40
South	7	23
Foreign	1	3
Broken Homes	4	13
Number of Siblings		
1	5	17
2-3	14	47
4-5	5	16
6-7	5	16
8-9	1	3

TABLE 1 (Con't.)

	N	%
Sibling Position		
Youngest	6	20
Middle	17	57
Oldest	7	23
High School Enrollment		
100-500	5	16
1,000-2,000	19	61
3,000 or above	7	23
High School's Emphasis on Sports		
Little emphasis	11	35
High emphasis	15	48
Very high emphasis	5	16

Analysis of the number of family siblings indicated five athletes having one sibling, six athletes with two siblings, eight athletes with three siblings, four athletes with four siblings, one athlete with five siblings, four athletes with six siblings, one athlete with seven siblings, and one athlete with nine siblings. There were two missing responses. Six athletes were the youngest in their family, seventeen were in the middle, and seven were the oldest. There were two missing responses. The sample group included four who came from broken homes. There was one missing response recorded in this category.

Three athletes came from a high school with an enrollment of 100 or less. Two athletes came from a high school with an enrollment of approximately 500. Six athletes were from high schools with an enrollment of approximately 1,000. Thirteen athletes were from high schools with an enrollment of approximately 2,000, and seven were from schools with an enrollment of 3,000 or above. Eleven athletes indicated their high school to have little emphasis on sports. Fifteen athletes (Table 1) indicated that sports were one of the most important activities at their high school, and five athletes indicated that sports were the most important activities at their high school.

Data for type of community in which reared showed five athletes being from rural areas, eighteen from suburban areas, five from the inner city, and two from urban areas. There were two missing responses.

DISCUSSION OF PERSONAL DATA

Personal data compiled for this sample group offered a relatively broad view of the subject's background and personal history. It was important to this study to analyze the sample group's personal data with established figures and norms for the U.S. population. This section compares and contrasts the subjects' backgrounds and personal histories with comparable background and history for the general population. These comparisons provide some insight into how the sample group compares with the general population, and how these similarities and differences contribute to personality and scores on the 16 PF.

Sixty-nine percent of the sample group were White, and 31 percent were Black. The proportion of Blacks in the sample group was 21 percent more than the national values for race (5) which indicate that Blacks comprise 10 percent of the total population for the U.S.

Analysis of marital status indicated 34 percent of the subjects were single and 56 percent were married. Nine percent of the subjects were either divorced or separated. The percent of single males in the sample group (34 percent) was slightly lower than the national figures of 38.7 percent (4) for single males between 20 and 29 years of age. National figures indicated 60 percent of males between the ages of 20 and 29 were married. This was slightly higher than the 56 percent of married males in the sample group. National figures (5) indicated 5.2 percent of males between the ages of 20 and 29 were divorced or separated, a lower value than the nine percent of divorced or separated subjects in the sample group. Although some variation was

evident between the sample group and the general population, the sample group was still typical of the U.S. population in many respects.

Analysis of the region of the country where the subjects lived indicated that the West Coast was the area where the greatest number of subjects lived (40 percent). Besides the fact that the West Coast is a large population center, this area has long facilitated track and field athletes. In terms of climate, facilities, and overall general training conditions, this has been the best region in the U.S. for a track athlete to locate. To support this claim, one only had to compare the East and West Coast. While the East Coast also represented a large population center, this region only had two athletes (seven percent) residing there. The East Coast traditionally has not been an area which facilitated track and field athletes, and this data supported that idea. Twenty percent of the athletes were from the Midwest, 23 percent were from the South and 10 percent were from the Mountain-Desert regions. These figures generally paralleled the population figures for these regions.

The sample group had an average of 3.4 siblings. Adding the subjects to these figures resulted in an average of 4.4 children for each family. This compared (5) to an average of 3.13 children born in 1950 to women of all races. The racial composition of the sample group might have accounted for the larger family size of this group. Thirty-one percent of the sample group was Black and 69 percent was White. Only 10 percent of the general population is Black. In 1947 birthrates of Blacks (5) exceeded Whites; Whites had 26.1 births per thousand while Blacks had 31.2 births per thousand. By 1959 the White population had a birth rate of 23.1 per thousand, and Blacks had 34.0 births

per thousand for a national composite of 24.1. These values indicated that the sample group came from larger families than the national average. After accounting for the difference in racial composition between the sample group and the general population and the corresponding differences in birth rates for Blacks and Whites, one was impressed with the similarity in family size between the sample group and the general population.

According to Winch (5) polls conducted in 1941, 1945, and 1955 reported the number of children desired per family. Over this period, the size of the family generally preferred was in the range of two to four children, but the modal number desired moved up from two in 1941 to three in 1951 to four in 1955. Winch (5) also noted that during this period Americans were becoming more uniform with respect to average family size. The upper class families increased in family size, and lower class families decreased in family size. These figures indicated that the sample group was very similar to the general population in regard to size of family.

Analysis of position among family siblings indicated 57 percent were in the middle, 20 percent were the youngest and 23 percent were the oldest. It was highly significant to this researcher that 57 percent of the sample group were in the middle position and that a total of 80 percent were either the oldest or in the middle position.

Sibling rivalry between the oldest child and the middle child within a family according to psychological research (5) indicated rather intense competition. The middle child competed with the oldest for the love, affection, and attention of his parents. Also the middle

child physically competed with the oldest child in trying to imitate many of the skills and abilities that the oldest child possessed. Because of the superior physical skills and abilities of the oldest child, the middle child was constantly striving to improve his skills to match those of the older sibling. Since the oldest sibling was generally physically superior (size, strength, etc.) to the middle sibling, the oldest sibling did not have to compete as intensely to maintain his status or position.

While both the oldest and middle siblings were competitive and aggressive, it was the middle sibling who became most competitive due to his lack of physical ability. Since the sample group was a group of highly accomplished athletes, the fact that a large percentage of the subjects were in the middle position indicated that being a sibling in the middle position might have created the competitive attitude and physical skills necessary for success in athletics. These data supported previous claims concerning sibling rivalry.

Thirteen percent of the sample group came from broken homes. Figures for 1955 (4) showed that 13.1 percent of children were from broken homes. The I.T.A. sample group compared almost identically with the national figures for 1955, a time when the subject group would have ranged from three to nine years of age. Studies (5) have shown that the families that have fathers present resulted in male children who showed more masculine tendencies, strong father identification, and more aggressive behavior. Boys from families with the father absent showed behavior very similar to that of girls. This suggested that husband-wife families were more likely to foster the environment

necessary to develop personalities that were more likely to succeed in athletics than personalities from broken homes.

Analysis of high school enrollment showed that 84 percent of the sample group were from a high school of 1,000 or more. Only 16 percent of the subjects came from high schools of 500 or less. It is quite possible that the larger high schools with generally better coaching, facilities and competition produced the best athletes.

Sixteen percent of the sample group indicated that their high school placed a very high emphasis on sports. Forty-eight percent indicated that their high school placed a high emphasis on sports, and 35 percent indicated that their high school placed little emphasis on sports. The important point noted here was that a total of 64 percent of the subjects felt their high schools placed a high or very high emphasis on sports. The values taught by schools are usually middle class values, and the subculture of the middle class confronts the adolescent with a variety of difficult goals and with a strong pressure to succeed (5). The two most important goals are success and upward mobility. The school represents a middle class status system of upward mobility for high school adolescents.

For high school students, it is very difficult to attain similar status and recognition than that afforded by athletics. People with middle class standards or those who have these middle class standards imposed on them by the school will seek out athletics as a means of obtaining status and success. Athletics has represented one of the few avenues available to the adolescent where he could change his status. Data from the sample group supported these ideas.

The attitudes towards athletics of the sample group's high schools probably determined the subjects' eventual success in athletics. These data supported the idea that our high schools produce an environment that is conducive to participation and success in athletics.

An analysis of the background of the sample group showed 67 percent were from suburban or urban areas. Subjects with a rural background accounted for 17 percent of the sample group and another 17 percent were from the inner city. A total of 84 percent of the subjects were from backgrounds that in broad terms were considered middle class. With the high percentage of subjects from a middle class background, this indicated that the middle class might have encouraged success in athletics.

Winch (5) stated that a conspicuous characteristic of the middle class is the striving for upward mobility and the conception of occupation as a means of fulfilling that aspiration. Kane (4) stated that it was one of the norms of the middle class to encourage the child to rise in the economic and social scale. Kane further stated that middle class parents wanted their sons to be responsible, show initiative, be competitive and aggressive, perform adequately in school, show athletic prowess, and manifest emotional stability and heterosexual interests. Winch (5) viewed socialization as a process in which the child learned the cultural expectation related to his age, sex, and other roles and sought to conform to those expectations. In American culture (5) some of the most marked expectations concerned the expression of aggressive impulses and their correlates in competition and achievement, the expression of sexual impulses, and the integration of

the child into his peer group. Winch went on to say that it was not surprising that the subculture of the middle class, which largely interdicted physical aggression, encouraged competitive achievement.

Evidence (5) that middle class adolescents differed from lower class adolescents in valuing achievement for its own sake came from a study in which the subjects established a level of performance on being rewarded; middle class subjects tended to carry out a high level of performance when the reward was withdrawn, whereas, lower class subjects did not. In a study cited by Winch (5), McArthur found that Harvard freshmen who had attended public high schools showed a higher level of achievement-orientation in response to a projective test than did freshmen who had attended prep schools.

The middle class family is child centered. The wishes and the welfare of the children loom relatively large in the family life of the middle class. There is no such attitude in the families of the lower and upper classes (4). Parents of the middle class tended to have higher expectations for the child than do parents of lower status.

The information presented in this study indicated that the middle class produced personalities which were competitive, aggressive, and possessed a high need to achieve. Besides having stressed athletics, the middle class also produced personality traits which were important to success in athletics. The data from this sample group supported quite strongly the notion that the middle class produced personalities who were competitive, aggressive, and motivated to success in athletics.

PERSONALITY DATA

Table 2 contains data from the 16 PF, including mean scores, sten values, range for mean scores and sten values, and standard deviations.

Table 3 contains the results of a t-test comparing I.T.A. athletes with the general population using mean raw scores from the 16 PF. This was a two-tailed test at the .01 level of confidence. The t-test compared the means of the population under study with the hypothesized means of the general population to determine if any significant differences existed between the two sets of means. The two-tailed test indicated the direction of the differences between the means.

DISCUSSION OF PERSONALITY DATA

Discussion of the results of the 16 PF begins with some general comments concerning group-to-group comparisons, and their affect on the resulting information. With group scores, variations are smaller, and profiles are flatter and nearer the mean. This followed the statistical principle that the standard deviation of a set of means of random (or near random) groups is much less than that among the individuals comprising any population analyzed with a common denominator of occupation, background, special abilities, etc., does not represent a totally random group. These populations have a smaller standard deviation characteristic of more homogenous psychologically selected groups. If there is not enough empirical evidence for a population under study to

TABLE 2
PERSONALITY DATA

Factor	Range	Mean	S.D.	Sten Range	Mean Sten
A Reserved-Outgoing	4-14	8.7	2.901	2-8	4.7
B Dull-Bright	4-11	8.2	1.834	3-9	6.3
C Affected by feelings- Emotionally Stable	5-23	16.0	4.044	1-9	5.3
E Humble-Assertive	7-21	13.5	3.565	3-10	6.0
F Sober-Happy-go-lucky	6-26	15.2	4.714	2-10	6.3
G Expedient- Conscientious	4-18	11.6	3.712	1-8	4.7
H Shy-Venturesome	3-23	14.8	5.351	1-9	5.6
I Tough-minded- Tender-minded	3-17	9.8	3.496	2-10	6.1
L Trusting-Suspicious	4-16	9.1	2.951	4-10	6.6
M Practical-Imaginative	5-20	13.0	3.596	1-9	5.6
N Forthright-Shrewd	3-13	7.5	2.639	1-8	4.7
O Self-assured- Apprehensive	4-15	9.4	3.290	3-8	5.5
Q ₁ Conservative- Experimenting	3-16	10.6	2.961	1-10	6.6
Q ₂ Group dependent- Self-sufficient	3-16	10.4	3.510	1-9	5.8
Q ₃ Undisciplined- Controlled	6-18	11.8	3.240	1-8	4.5
Q ₄ Relaxed-Tense	3-22	12.0	4.635	3-10	6.1

TABLE 3

T-TEST RESULTS COMPARING MEAN RAW SCORES FOR I.T.A. SAMPLE
GROUP AND GENERAL POPULATION ON FACTOR A-Q₄

Factor	Sample Pop. Mean	General Pop. Mean	S.D.	t-ratio
A	8.80	10.22	3.0	-2.65
B	8.23	7.04	1.7	3.97*
C	15.97	16.56	4.2	-.76
E	13.43	12.90	3.7	.82
F	15.13	14.17	4.9	1.10
G	11.90	13.35	3.6	-3.83*
H	14.83	14.78	5.5	.05
I	9.93	9.00	3.6	1.45
L	9.07	7.38	3.1	3.07*
M	13.23	13.04	3.5	.31
N	7.47	9.23	2.7	-3.67*
O	9.33	9.43	3.4	-.17
Q1	10.63	9.48	3.0	2.17
Q2	10.60	10.29	3.5	.50
Q3	11.97	13.32	3.3	-2.33
Q4	11.83	10.70	4.8	1.33

* Significant at the .01 level if smaller than -2.750 or larger than +2.750.

show what the sigma of the group means is one has to fall back upon the sigma of random groups as a first approximation.

A high score, sten 10, always corresponds to the description at the left. Table 24 (Appendix B) lists the 16 factors and gives a high-low description for each factor. These descriptions were given in popular as well as clinical terms so psychologists and persons not trained in psychology could interpret them. The popular terms were everyday adjectives that refer to overt behavior and were rather broad in nature while the psychological terms were by necessity more narrow in definition and more precise.

This discussion utilizes the results of the t-test from Table 3 along with the average sten values for each of the 16 factors from Table 2. The results of the I.T.A. sample group were compared and contrasted with corresponding data for general population 30 year old males, and the results of the t-test were used to compare the mean raw scores for the two populations.

Results from Factor A showed the I.T.A. sample group with a mean raw score of 8.7 and an average sten value of 4.7. The norms for the general population showed a mean raw score of 10.22. A high score on Factor A measures a warmhearted, outgoing, easygoing, and participating personality. The psychological term for a high A score was affectothymia. A low score on Factor A indicates a reserved, detached, and critical personality. The psychological term for a low A score was sizothymia.

Along with Factor H, Factor A provided a measure of ascendance, extroversion, and introversion. Persons with a low score had a temperamental inclination to be cautious in emotional expression, uncompromising,

and critical in outlook and awkwardly aloof in manner. Persons with a low A score liked working alone, hardheaded intellectual approaches, and rejection of compromise. Persons with a high score on Factor A enjoyed occupations dealing with people, social recognition, were natural joiners, and were more generous in personal relationships, less afraid of criticism, and tended to be more casual in meeting obligations.

Research (59, 48, 61, 34, 52) indicated that athletes, upper motor ability groups, and upper physical fitness groups were higher in ascendance and tended to be more extroverted than nonathletes, lower motor ability groups, and lower physical fitness groups. The results of the I.T.A. sample group were strikingly dissimilar to previous research. The sample group scored relatively low (4.7 sten) but were not significantly different from established norms for the general population (see Table 3). This lack of a significant difference between the mean raw scores of the two populations indicated that the I.T.A. sample population was not significantly more reserved, critical, and detached than the general population. More significant was the fact that the sample population scored relatively low on Factor A when research indicates that the sample should have scored high on Factor A.

A possible explanation for this difference between the sample group and other research with athletes was seen by examining research done between varying groups of athletes. Cooper (30) concluded in a review of the literature concerning athletes and personality that the psychology of team membership was different in important ways from the influence of individual physical activities. Research (9, 54, 27)

indicated differences between team athletes and individual sport athletes. Other studies (18, 32, 56) indicated that personality traits lead an individual into certain sports. One of the traditional views of track and field athletes, particularly distance runners which comprised 44 percent of the total sample group, had been that they are shy, timid, and reserved. Considering the individuality and nongroup aspects of track and field, it was quite possible that it was just these very aspects of track and field that attracted the more reserved individual to this particular sport.

Factor B measured intelligence. A high B score indicated high intelligence, and a low B score indicated low intelligence. The I.T.A. sample group obtained a mean raw score of 8.23 and was compared to a mean raw score of 7.04 for the general population. A t-test (see Table 3) indicated that the I.T.A. sample group was significantly more intelligent than the general population. Research had produced conflicting results concerning the intelligence of athletes. Sevier (56) found athletes significantly more intelligent than nonathletes using the 16 PF. Slusher (58) used the MMPI and found athletes significantly less intelligent than nonathletes, while Shirley (19) found no significant difference in grade-point average between college athletes and college nonathletes.

The 16 PF personality profiles (see Figures 2 and 4) for Olympic champions and swimmers indicated results similar to the results on Factor B for the I.T.A. sample group. The Olympic champions and swimmers had sten values of 7.8 and 6.2, respectively, as compared to the 6.3 sten value on Factor B for the sample group. The 16 PF personality

profile for football players (see Figure 3) showed a low sten score of 4.9. The research concerning Factor B indicated that intelligence may have varied according to the activity of the athlete. These results support previous research which indicated that certain types of personalities are drawn to certain sports.

Factor C measured dynamic integration and maturity as opposed to uncontrolled, disorganized, general emotionality. A high C score indicated an emotionally stable, mature, calm personality with high ego strength as opposed to a low C score which indicated ego weakness, emotional instability, and a personality which was easily upset and changeable. A person with a low C score was easily annoyed by people and things, showed generalized neurotic responses in the form of phobias, psychosomatic disturbances, sleep disturbances, and hysterical and obsessional disturbances. A person with a high C score maintained better group morale, was emotionally mature, stable, constant in interest, and faced reality.

The I.T.A. sample group recorded a mean raw score of 15.97 and a sten value of 5.3 as compared with a mean raw score of 16.56 for the general population. The t-test indicated no significant difference between the two populations. These results did not support previous research concerning emotional maturity and athletes by Merriman (48), Sevier (56), and Huesner (35). Business executives have shown a wide range of scores on Factor C; some were quite low (3). Cattell (3) accounted for this by suggesting that the low scores showed a fatigue-worry response to situational stresses. At the time data was collected from the I.T.A. sample group, the athletes were enroute by plane to an

international meet and were in the middle of their competitive season. The added stress and pressure of traveling with one's competitors could have produced the fatigue-worry response mentioned by Cattell which might account for the lower mean sten value for the I.T.A. sample group.

Factor E measured dominance versus submissiveness. A high E score indicated a personality that was assertive, aggressive, competitive, and stubborn, while a low E score indicated a personality that was submissive, dependent, humble, conforming, and docile. The I.T.A. sample group obtained a mean raw score of 13.43 and a mean sten value of 6.0. The general population had a mean raw score of 12.90. A t-test between the two mean raw scores indicated no significant differences between the two populations on Factor E. Previous research (6, 12, 35, 48, 56, 59, 60, 34) had shown athletes were higher on ascendance, aggression, self-assurance, and dominance than nonathletes. Ogilvie (52) in a review of the literature stated that athletes generally were more assertive than nonathletes. While the I.T.A. sample group wasn't statistically higher in ascendance than the norms, their sten value of 6.0 was slightly above the mean in the direction of the ascendance variable.

Factor F compared surgency versus desurgency. A high F score indicated a personality that was surgent, enthusiastic, happy-go-lucky, and this was an important component in extroversion. A low F score indicated a personality that was silent, introspective, cautious, and reflective. The I.T.A. sample group obtained a mean raw score of 15.13 and a sten value of 6.3 as compared to a mean raw score of 14.17 for the general population. There was no significant difference between the two raw score means, but the sten value of 6.3 was in the direction of the

surgent variable. Previous research by Tillman (61) showed an upper physical fitness group being more surgent on Factor F than a lower physical fitness group. Gotheil and Werner (34) found athletes significantly more surgent than nonathletes as measured by Factor F.

Factor G measured superego strength versus low superego strength. A personality with a high G score was determined, responsible, conscientious, dominated by a sense of duty, and concerned about moral standards and rules. A personality with a low G score was expedient, self-indulgent, undependable, and disregarded rules. The mean raw score for the I.T.A. sample group was 11.90 with a mean sten value of 4.7, as compared to a 13.35 mean raw score for the general population. A significant difference was recorded between the two mean raw scores in the direction of the expedient variable. Sevier (56) found athletes significantly more expedient on Factor G than nonathletes. Factor G for Olympic champions (sten=3.9, Figure 2) indicated they were significantly more expedient than the general population.

Factor H measured parmia versus threctia. A high H score indicated a personality that was adventurous, socially bold, carefree, and friendly, as compared to a low H score which indicated a personality that was shy, withdrawn, emotionally cautious, and restrained. Comparison of the mean raw score 14.83 for the I.T.A. sample group with a 14.78 mean raw score for the general population indicated a neutral score (sten 5.6) and showed no significant difference between the two populations. Research using the 16 PF (56, 34, 35) found athletes significantly more venturesome on Factor H than nonathletes and the general population. A current hypothesis (3) states that a person

with a low H score has an over-responsive sympathetic nervous system which makes him especially "threat-reactive" (threctic). A person with a high H score has a low physiological reactivity to threat (par-mia).

Factor I measured tender-minded versus tough-minded. An individual with a high I score tended to be sensitive, clinging, over protected, impractical, and feminine with a dislike of crude people and rough occupations. A low I score indicated an individual who tended to be self-reliant, realistic, independent, masculine, and sometimes hard and cynical. Cattell (3) stated that low I score (tough-minded) individuals had a history of fewer illnesses and operations, more aggressiveness, and a significantly greater participation in athletics and sports. A sten value of 6.1 for the I.T.A. sample group indicated a tendency towards being tender-minded though a comparison of mean raw scores indicated no significant between the two means.

Research (8, 42) using the 16 PF indicated that athletes were more tough-minded on Factor I than nonathletes and population norms. Ogilvie (53) stated athletes were generally more tough-minded than non-athletes. Contrary to the results just mentioned, examination of Figures 1 through 4 showed that mean sten scores for Factor I varied considerably depending on the group of athletes being analyzed. The I.T.A. sample group and former Olympic champions obtained relative high mean sten values on Factor I of 6.1 and 6.5, respectively. Football players, on the other hand, scored low on Factor I with 4.7 for a mean sten value. The male swimmers recorded 5.2 for a mean sten value on Factor I. These results indicated that tough-minded versus tender-

minded scores on Factor I were dependent upon the activity, and generalizations about athletes being tough-minded did not necessarily apply to all groups of athletes. While scores were different for the two samples, neither group varied significantly from the norms. Also, it indicated that different personalities were attracted to different activities due to the nature of the activity.

Factor L measured suspicious behavior versus trusting behavior. A high L score indicated a personality that was suspicious, self-opinionated, irritable, and jealous. A low L score indicated a personality who was trusting, friendly, relaxed, understanding, tolerant, and permissive. A sten value of 6.6 on Factor L was obtained by the I.T.A. sample group. Comparison of mean raw scores, 9.07 for the sample group and 7.38 for population norms, indicated a significant difference in a positive direction between the two means. This meant that the I.T.A. sample group was significantly more suspicious and self-opinionated than the general population. The results for Factor L in Figures 2, 3, and 4 showed sten scores of 4.7, 6.6, and 5.9, respectively, for Olympic champions, football players, and swimmers. A sten value of 6.6 was recorded for the I.T.A. sample population. According to Cattell (63), a person who scored high on Factor L was usually deliberate in his actions, unconcerned about other people, and a poor team member. Also (3) a low score might have indicated a lack of ambition and striving.

A person who scored high on Factor M had a personality that tended to be imaginative, unconventional, and absent-minded. A person with a high M score had an intense subjectivity and inner mental life.

A person with a low M score was practical, had "down to earth concerns", and was conventional. Research by Chadwick (8) showed athletes to be significantly more practical on Factor M than nonathletes. However, other research which used the 16 PF (34, 56, 35, 61, 42) indicated no significant differences between athletes, nonathletes, and other populations. The I.T.A. sample group obtained a mean raw score on Factor M of 13.23 as compared to 13.04 for the general population. A t-test indicated no significant differences between the two populations. The results of this study supported most of the research concerned with Factor M.

Factor N measured shrewdness versus naivete. A high N score indicated a personality that was astute, polished, socially aware, and had a calculating mind. This type of pattern represented some form of intellectual-educational development in term of shrewd tactical skills. A personality with a low N score was forthright, unpretentious, warm, friendly, had simple tastes, and lacked self-insight. The I.T.A. sample group obtained a 4.7 sten value for Factor N. Comparison of mean raw scores of 7.47 for the sample group and 9.23 for the general population indicated a significant difference between the two raw scores. The lower value for the I.T.A. sample group indicated that they were significantly more forthright, natural, and socially awkward. Research with athletes using the 16 PF (34, 56, 35, 61, 42) indicated that, on Factor N, no significant differences existed between athletes, nonathletes, and population norms. Also Figures 2, 3, and 4 indicated that sten values for Factor N (Olympic champions=5.0, football players=5.1, swimmers=5.2) were strikingly similar to mean sten values for population

norms. This study did not support previous research concerning Factor N that athletes were not significantly different from population norms.

Factor O measured an apprehensive personality versus a placid personality. An individual with a high O score tended to be apprehensive, self-reproaching, insecure, anxious, depressed, with guilt proneness. An individual with a low O score tended to be self-assured, placid, secure, self-confident, and cheerful. The I.T.A. sample group obtained a mean raw score of 9.33 as compared to a mean raw score of 9.43 for the general population. A t-test revealed no significant difference between the two populations for Factor O. This indicated that the I.T.A. sample group was not significantly more placid, self-assured, and self-confident than the general population. The I.T.A. sample group obtained a 5.5 sten value for Factor O.

Huesner (35) found former British and U.S. Olympic champions significantly more confident and self-assured than population norms with a sten value of 3.3 for Factor O. Results on Factor O obtained from the 16 PF personality profiles in Figures 3 and 4 showed similar results to this research with a sten value of 5.7 for swimmers and football players. Ogilvie (52) stated athletes were more self-confident than nonathletes. Cattell (3) stated professional athletes scored conspicuously low on Factor O. The Olympic champions were the only group mentioned with a conspicuously low score (sten=3.3) on Factor O. A low score on Factor O probably indicates that this is a trait or tendency shared by the majority of athletes accustomed to performing at very high levels in competition. The I.T.A. sample group with generally high performance levels did not perform consistently at the

very high level of Olympic champions and other professional athletes, and their sten value of 5.5 was correspondingly higher than the Olympic champions. It was possible that, when compared to Olympic champions, the relative high anxiety and lack of self confidence of the I.T.A. sample group was an inhibiting factor in producing high level performances in competition. While the I.T.A. sample group was comparable on Factor 0 to the general population, their sten value (5.5) was considerably higher than the sten value (3.3) obtained by the Olympic champions on Factor 0.

Factor Q_1 measured radicalism versus conservation of temperament. A high Q_1 score indicated a personality that was experimenting, liberal, analytical, and free-thinking, as compared to a low Q_1 score which indicated a personality that was conservative, respected established ideas, and was tolerant of traditional difficulties. High Q_1 individuals (3) expressed more interest in science than religion, were more interested in analytical thought, in modern essays, in reading as opposed to class instruction, tended to break with tradition, and were interested in leading and persuading people. The I.T.A. sample group recorded a mean raw score of 10.63 as compared to a mean raw score of 9.48 for the general population. A t-test indicated no significant difference between the two populations, but a sten value of 6.6 for the I.T.A. sample group indicated that they tended to be more experimental and liberal in their thinking than conservative and traditional. Research (3, 4, 8) which supported the results of this study indicated athletes were more experimental on Factor Q_1 than nonathletes. Other research (59, 35), however, indicated athletes scored lower on Q_1 than nonathletes and the

general population. It was quite possible that personality differences between groups of athletes according to their particular activity (team versus individual sports) accounted for the differences in various research concerning Q_1 . Researchers (32, 27, 38, 12, 54, 56) have noted significant personality differences between athletes in individual sports and athletes in team sports.

Factor Q_2 measured self-sufficiency versus group dependency. A high Q_2 score was indicative of a person who was self-sufficient, resourceful, and preferred his own decisions. A low Q_2 score was indicative of a person who was a joiner, sound follower, and liked and depended on social approval and admiration. The I.T.A. sample group obtained a mean raw score of 10.60 which compared to a mean raw score of 10.29 of the general population. Comparison of the mean raw scores indicated no significant difference between the two samples. A mean sten value of 5.8 was recorded for the I.T.A. sample group.

Ogilvie (53) stated that athletes tended to be self-sufficient, but the personality profiles (Figures 2, 3, and 4) did not agree with his statement. The scores for Q_2 in Figures 2, 3, and 4 showed Olympic champions with a sten value of 5.1, football players with a sten of 4.5, and swimmers with a sten of 5.5. None of these groups had a sten value that could have been considered high. Chadwick (8) found athletes significantly more group dependent on Q_2 than nonathletes. Research (61, 34) in contrast to Chadwick's study indicated that athletes and an upper physical fitness group were significantly more self-sufficient than nonathletes and a lower physical fitness group.

Factor Q_3 measured high self-sentiment versus low self-sentiment. Q_3 measured the strength of the individual's concern about his self-concept and social image. A person with a high Q_3 score (3) showed socially approved character responses, self-control, persistence, foresight, consideration for others, conscientiousness, and regard for etiquette and social reputation. These types of personalities were most often chosen as leaders and were effective leaders. A person who scored low on Q_3 was undisciplined, careless of protocol, and tended to follow his own urges. A mean raw score of 11.97 was obtained by the I.T.A. sample group and a mean raw score of 13.32 was obtained by the general population. The I.T.A. sample group scored a 4.5 mean sten value. A comparison of mean raw scores showed no significant difference between the two populations, but the low sten value of 4.5 indicated that the I.T.A. sample group tended to be more undisciplined and socially less precise. These results did not support previous research (34, 8, 56) which indicated athletes scored high on Q_3 and were significantly more controlled than nonathletes and the general population.

Factor Q_4 measured high ergic tension versus low ergic tension. A person with a high Q_4 score was tense, driven, frustrated, and overwrought. A person with a low Q_4 score was relaxed, unfrustrated, and composed. The I.T.A. sample group obtained a mean raw score of 11.83 as compared to a mean raw score of 10.70 for the general population. Comparison of mean raw scores indicated no significant differences between population norms and the sample group, but a mean sten value of 6.1 for the I.T.A. sample group indicated a tendency towards anxiety. Research was somewhat divided concerning anxiety levels for athletes.

Some research (6, 8, 34, 38, 61) indicated athletes, and an upper physical fitness group were lower on anxiety than nonathletes, a lower physical fitness group, and population norms. On the other hand, the results on Q_4 for the personality profiles in Figures 2, 3, and 4 indicated that swimmers (sten=5.8), football players (sten=6.2), and Olympic champions (sten=6.1) were somewhat anxious. The sten value of 6.1 for the I.T.A. sample group compared very closely to the sten values for Q_4 in Figures 2, 3, and 4. Johnson (39) indicated that athletes had high and generalized anxiety. A person with high ergic tension (3) was irrationally worried, tense, irritable, anxious, and in turmoil.

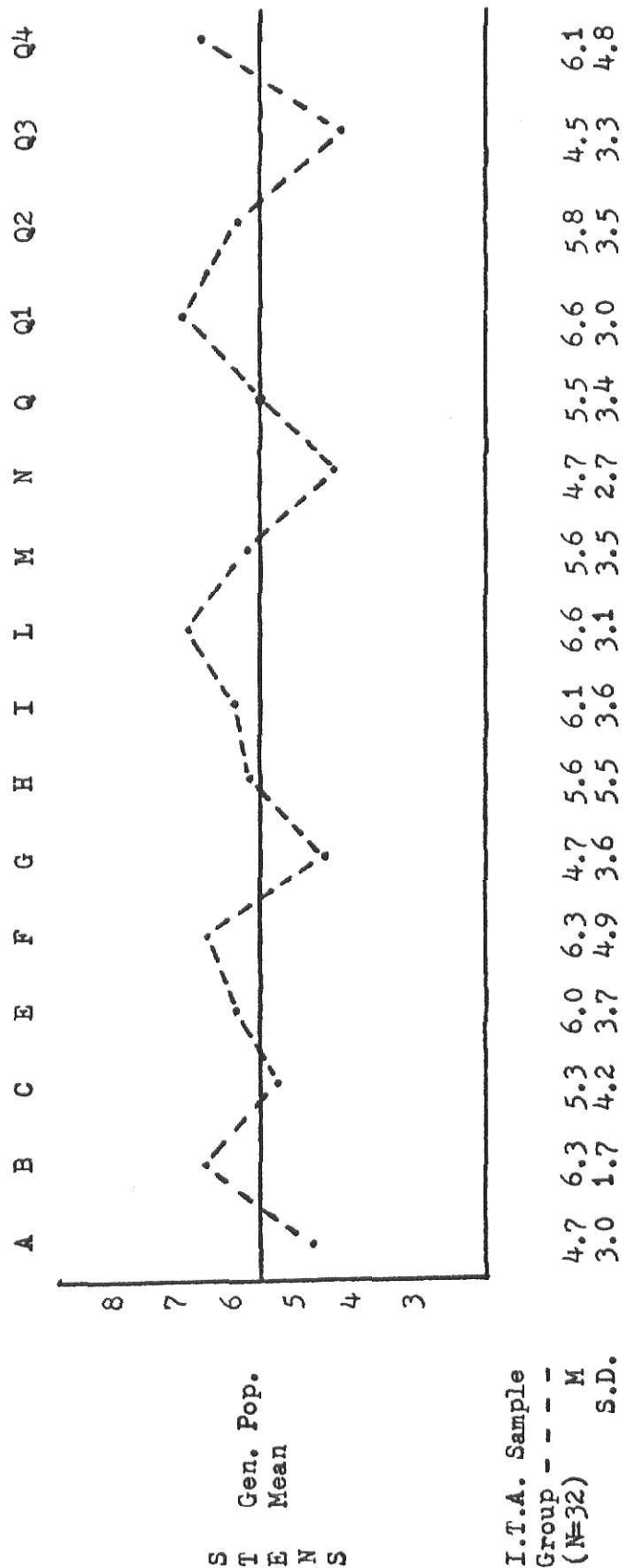
16 PF PROFILE COMPARISONS

The following 16 PF test profiles (Figures 1-4) compared mean sten values for the sample group with mean sten values for the general population 30 year old males, Olympic champions, football players, and swimmers. The mean for the general population encompasses an area of one standard deviation on either side of the 5.5 sten value of the general population.

Tables 4, 5, and 6 compare mean sten values for the 16 PF between the I.T.A. sample group and Olympic champions, football players, and swimmers. A two-tailed t-test at the .01 level of significance was used to determine if any significant differences existed between the mean sten values for the various sample groups.

Figure 1

Sixteen Personality Factor Test Profile Comparing
Mean Sten Values for I.T.A. Sample Group and
General Population Norms (Age 30 Males)



S
T
E
N
S

Gen. Pop.
Mean

I.T.A. Sample
Group - - - M
(N=32) S.D.

Figure 2

Sixteen Personality Factor Test Profile Comparing
Mean Sten Values for I.T.A. Sample Group
and Olympic Champions (N=41)

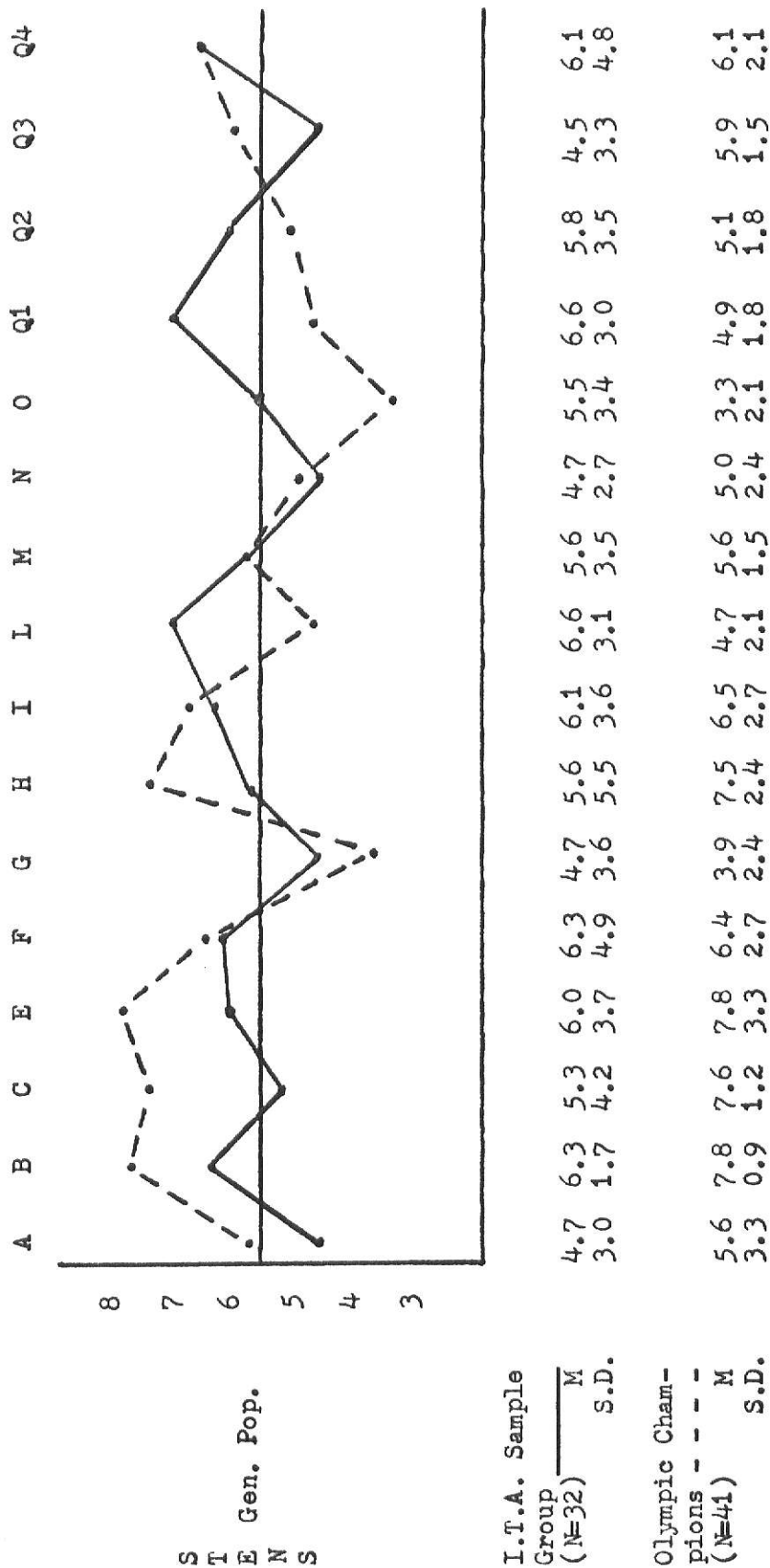


Figure 3

Sixteen Personality Test Profile Comparing
Mean Sten Values for I.T.A. Sample
Group and Football Players

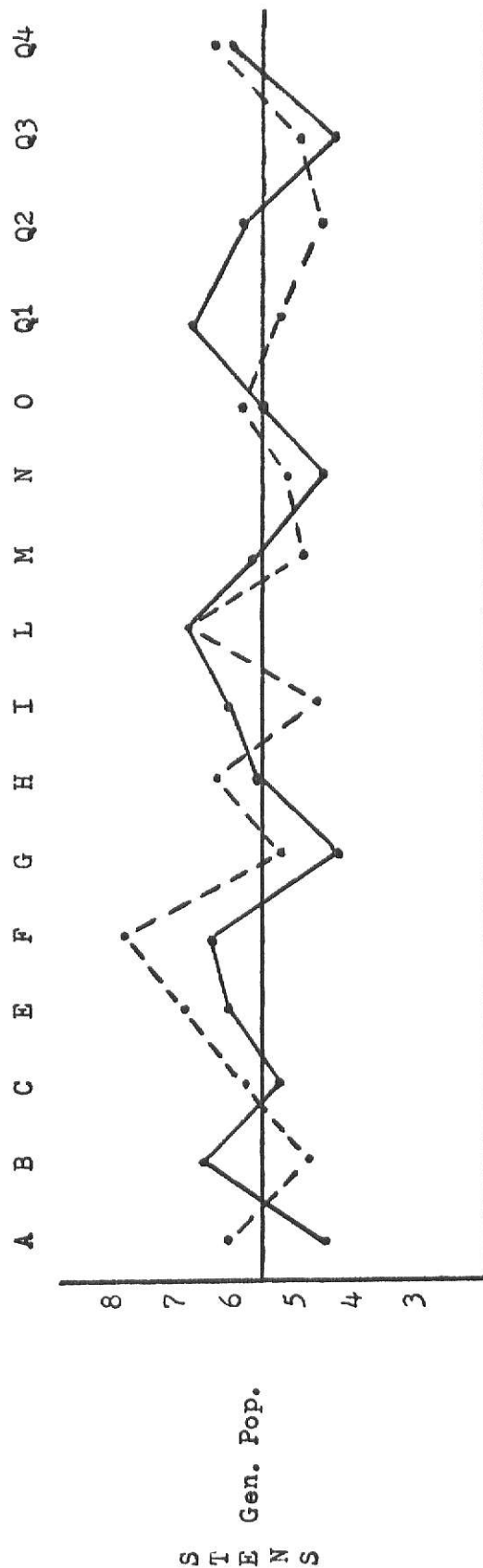
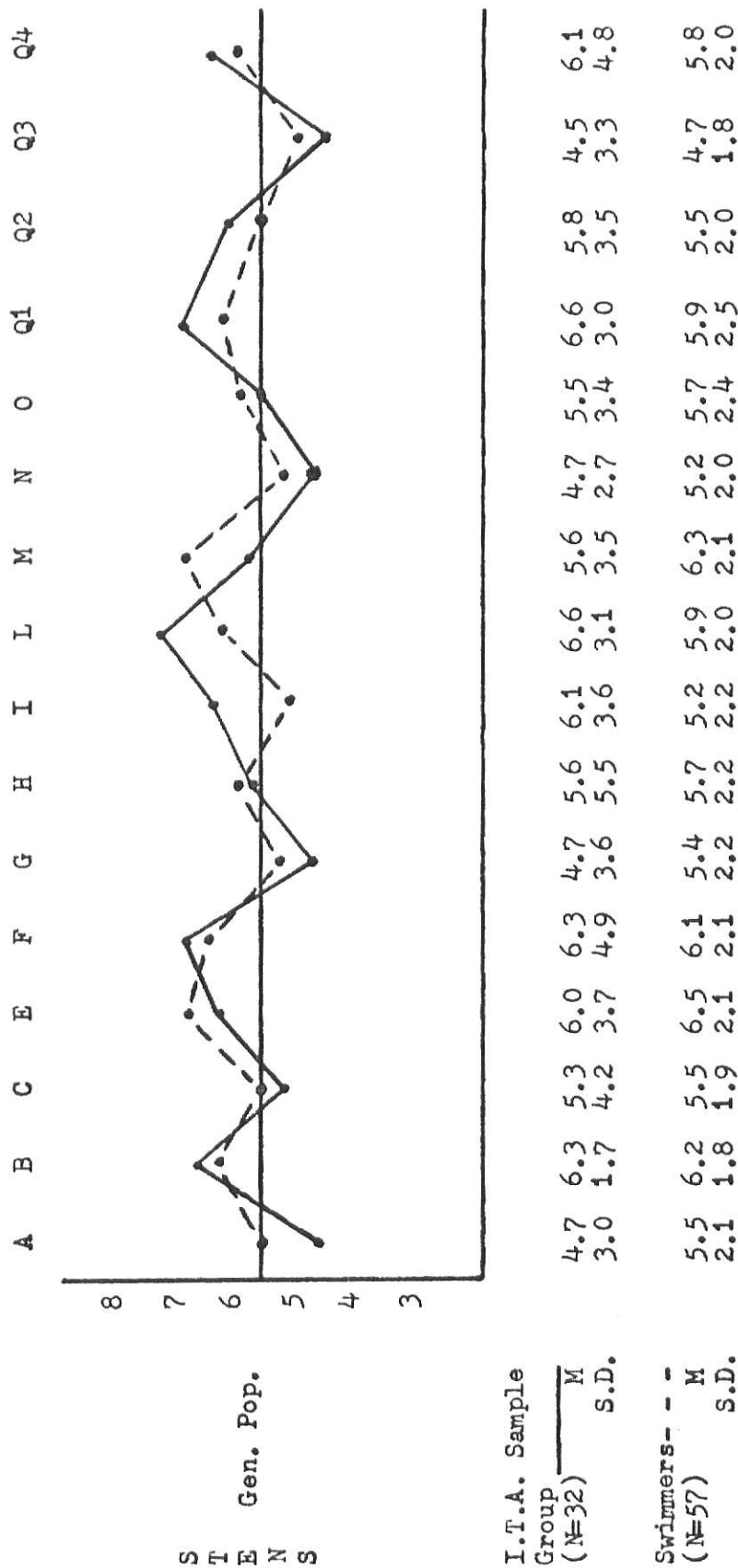


Figure 4

Sixteen Personality Test Profile Comparing
Mean Sten Values for I.T.A. Sample
Group and Swimmers (N=57)



I.T.A. Sample
Group (N=32)

Swimmers- (N=57)

TABLE 4

T-TEST RESULTS COMPARING MEAN STEN VALUES FOR I.T.A.
 SAMPLE GROUP AND OLYMPIC CHAMPIONS
 (N=41) ON FACTORS A-Q4

Factor	Mean Sten Sample Pop.	Mean Sten Olympic Champions	S.D.	t-ratio
A	4.7	5.6	3.0	-1.70
B	6.3	7.8	1.7	-5.00*
C	5.3	7.6	4.2	-3.11*
E	6.0	7.8	3.7	-2.77*
F	6.3	6.4	4.9	-.11
G	4.7	3.9	3.6	1.25
H	5.6	7.5	5.5	-1.96
I	6.1	6.5	3.6	-.63
L	6.6	4.7	3.1	3.45*
M	5.6	5.6	3.5	0.00
N	4.7	5.0	2.7	-.63
O	5.5	3.3	3.4	3.67*
Q1	6.6	4.9	3.0	3.21*
Q2	5.8	5.1	3.5	1.13
Q3	4.5	5.9	3.3	-2.41
Q4	6.1	6.1	4.8	0.00

* Significant at the .01 level if smaller than -2.750 or larger than +2.750

TABLE 5
T-TEST RESULTS COMPARING MEAN STEN VALUES FOR
I.T.A. SAMPLE GROUP AND FOOTBALL PLAYERS
(N=67) ON FACTORS A-Q4

Factor	Mean Sten Sample Pop.	Mean Sten Football Players	S.D.	t-ratio
A	4.7	6.1	3.0	-2.64
B	6.3	4.9	1.7	4.67*
C	5.3	5.6	4.2	-.41
E	6.0	6.7	3.7	-1.08
F	6.3	7.4	4.9	-1.26
G	4.7	5.4	3.6	-1.09
H	5.6	6.2	5.5	-.62
I	6.1	4.7	3.6	2.19
L	6.6	6.6	3.1	0.00
M	5.6	4.9	3.5	1.13
N	4.7	5.1	2.7	-.63
O	5.5	5.7	3.4	-.33
Q1	6.6	5.2	3.0	2.64
Q2	5.8	4.5	3.5	2.10
Q3	4.5	5.0	3.3	-.86
Q4	6.1	6.2	4.8	-.12

* Significant at the .01 level if smaller than -2.750 or larger than +2.750

TABLE 6

T-TEST RESULTS COMPARING MEAN STEN VALUES FOR
I.T.A. SAMPLE GROUP AND MALE SWIMMERS
(N=57) ON FACTORS A-Q4

Factor	Mean Sten Sample Pop.	Mean Sten Swimmers	S.D.	t-ratio
A	4.7	5.5	3.0	-1.51
B	6.3	6.2	1.7	.33
C	5.3	5.5	4.2	-.27
E	6.0	6.5	3.7	-.76
F	6.3	6.1	4.9	.23
G	4.7	5.4	3.6	-1.09
H	5.6	5.7	5.5	-.10
I	6.1	5.2	3.6	1.41
L	6.6	5.9	3.1	1.27
M	5.6	6.3	3.5	-1.13
N	4.7	5.2	2.7	-1.04
O	5.5	5.7	3.4	-.33
Q1	6.6	5.9	3.0	-1.32
Q2	5.8	5.5	3.5	.48
Q3	4.5	4.7	3.3	-.34
Q4	6.1	5.8	4.8	.35

* Significant at the .01 level if smaller than -2.750 or larger than +2.750

DISCUSSION OF 16 PF PROFILES

Figure 1 presents a comparison of mean sten values for the I.T.A. sample group and the general population (30 year old males). This profile showed how the I.T.A. sample group fluctuated from the mean for the general population. Table 3 indicated significant differences from the mean on Factors B, G, L, and N. While there was considerable variation from the mean on several of the other factors (A, E, F, I, Q₁, Q₃, Q₄), none of these factors were statistically significant at the .01 level of significance.

Figure 2 presents a comparison of mean sten values for the I.T.A. sample group and the Olympic champions (N=41) (63) on the factors measured by the 16 PF. Generally speaking, the 16 PF profile for the Olympic champions varied more from the mean than did the 16 PF profile for the I.T.A. sample group. Results of the t-test (Table 4) indicated significant differences between the I.T.A. sample group and the Olympic champions on Factors B, C, E, L, O, and Q₁. On Factor B, the Olympic champions (sten=7.8) were significantly more intelligent than the I.T.A. sample group (sten=6.3). On Factor C, the Olympic champions (sten=7.6) were significantly more emotionally stable than the I.T.A. sample group (sten=5.3). On Factor E, the Olympic champions (sten=7.8) were significantly more assertive and aggressive than the I.T.A. sample group (sten=6.0). Results for Factor L indicated the Olympic champions (sten=4.7) were significantly more trusting as compared to the I.T.A. sample group (sten=6.6) whose sten score indicated they tended to be suspicious. On Factor O, the Olympic champions were significantly more self-assured and confident with an exceptionally

low sten value of 3.3 as compared to the I.T.A. sample group (sten=5.5). For Factor Q₁, the Olympic champions obtained a relatively low sten of 4.9 as compared to a sten value of 6.6 for the I.T.A. sample group. The significant difference between these two sample groups indicated the Olympic champions were significantly more conservative as compared to the I.T.A. sample group which tended to be experimental and liberal. No significant differences were recorded between the two sample groups on Factors A, F, G, H, I, O, N, Q₂, Q₃, and Q₄. Significant differences between the two populations for Factors O, E, and C, indicated the Olympic champions were significantly more confident, aggressive, and emotionally stable than the I.T.A. sample group. It was possible that the more confident, aggressive, and emotionally stable sample group of Olympic champions was emotionally better equipped to perform at the level required of Olympic champions than a less accomplished group of athletes. It was possible that these differences contributed to the Olympic champions' ability to perform at a higher level.

Figure 3 compares the mean sten values of the I.T.A. sample group with mean sten values of 67 football players (63) on 16 factors measured by the 16 PF. Table 5 which used a t-test to compare the mean sten values for the two populations indicated only one significant difference between the two groups. The I.T.A. sample group was significantly more intelligent as measured by Factor B than the football players. While no significant differences occurred on the other factors, considerable variance was noted for Factors A, I, Q₁, and Q₂.

Figure 4 presents the 16 PF profiles for the I.T.A. sample group and 57 male swimmers (63). These profiles indicated that the

two sample groups compared quite closely on most of the factors. Of the 16 PF profile comparisons considered in this study (Figures 2, 3, and 4) the swimmers' profile most closely resembled that of the I.T.A. sample group. Results of a t-test (Table 6) which compared the mean sten values of the I.T.A. sample group and swimmers indicated no significant differences between the two populations on any of the 16 PF factors.

Results of the 16 PF profile comparisons indicated that differences between the various groups' ability to perform at high levels contributed more to 16 PF scores than did the groups' various activities. These results also indicated that the I.T.A. sample group performed at levels more consistent with the performance levels of the football players and swimmers as compared to the performance level of Olympic champions.

ANOVA FOR RACE, EVENTS, SECTION OF COUNTRY,
SIBLING POSITION, AND TYPE OF COMMUNITY
WITH 16 FACTOR OF 16 PF

An analysis of variance was conducted and determined if race, events, section of country, position among siblings, and type of community were significantly different on scores for the 16 PF.

Comparisons of mean values for Factor A (reserved-outgoing) with mean values for events was significant at the .05 level (Table 7). Distance runners were compared to people in the field events and sprints combined. When mean values of Factor A were compared to mean values of race, section of country, sibling position, and type of community there was no significant difference.

TABLE 7

ANALYSIS OF VARIANCE OF FACTOR A WITH EVENTS, SECTION
OF COUNTRY, POSITION AMONG SIBLINGS, RACE,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	21.657	21.657	3.200	.0868
Events	2	68.765	34.382	5.080	.0149*
Section	1	9.150	9.150	1.352	.2568
Position	1	.657	.657	.097	.7581
Community	1	.374	.374	.055	.8161

* Significant at the .05 level

Tables 8-23 (see Appendix B) indicated the results of comparison of mean values of the remaining 14 factors with race, events, section of country, sibling position, and type of community. There was no significant differences at the .05 level for any of these comparisons.

DISCUSSION OF ANALYSIS OF VARIANCE

The analysis of variance which compared personal data of subjects (race, event, section of country, position among siblings, and type of community) with Factors A-Q₄ measured by the 16 PF indicated only one significant difference at the .05 level. Analysis of variance (Table 7) of Factor A indicated a significant difference between scores

for Factor A and 16 PF scores for the different events (distance events, sprint events, and field events). A least squares difference test indicated the distance runners were significantly more reserved than the sprinters or people in the field events.

Analysis of variance of Factors B-Q₄ (see Appendix C, Tables 8-22) indicated no significant differences between 16 PF scores and race, events, section of the country, position among siblings, and type of community. While one significant difference was noted, the lack of any other significant differences indicated that ethnic background and personal data for the sample group had little influence on scores for the 16 PF. Hunt (36) in a cross racial comparison of personality traits between athletes and nonathletes concluded that athletes regardless of ethnic background had selected personality traits different than nonathletes. More specifically, Hunt found that White and Black varsity athletes had similar personality traits, as did Black and White nonathletes. Hunt's study supported the results of this study. The results of analysis of variance for Factor A which indicated people in the distance events were significantly more reserved than people in the sprints and field events supported the traditional belief (29) that distance runners were shy and reserved.

In summarizing Chapter IV these findings should be noted:

1. A least squares analysis of variance at the .05 level indicated significant differences between events and Factor A.
2. A least significant difference test indicated that distance runners scored significantly lower on Factor A than did sprinters and people in the field events.

3. Results of a t-test at the .01 level indicated significant differences between the I.T.A. sample and the 30 year old males sample on Factors B, G, L, and N.

4. The t-test indicated significant differences between the I.T.A. sample and Olympic champions on Factors B, C, E, L, O, and Q₁ and with football players on Factor B.

5. The t-test indicated no significant differences between the I.T.A. sample and swimmers.

6. The I.T.A. sample was typical of the general population in regard to marital status, size of family, and broken homes.

7. Ethnic background, race, and other biographical data did not significantly affect scores on the 16 PF.

CHAPTER V

SUMMARY AND CONCLUSIONS

The purpose of this study was to investigate the personalities of male athletes competing for the International Track Association (I.T.A.). The study was designed to (1) identify the personalities of the I.T.A. sample group, (2) to compare and contrast the 16 PF results of the I.T.A. group with established norms for the general population, (3) to compare certain biographical data with scores on the 16 PF, and (4) to compare the 16 PF personality profiles of specific groups of competitors.

The personality instrument used in this study was the Cattell Sixteen Personality Factor Questionnaire, Form A. The 16 PF was administered to 32 I.T.A. athletes, and the results scored and tabulated by the investigator. The subjects also submitted a biographical data sheet. A descriptive analysis of the tabulated raw scores of the 16 PF provided frequencies, mean, standard error, variance, and standard deviation. A least squares analysis of variance for unequal subclasses was made with the biographical data and mean raw scores from the 16 PF. The .05 level of significance was established to determine any significant differences between the biographical data and mean raw scores on the 16 PF. A least significant difference test (LSD) was conducted by the investigator to determine the nature and direction of any significant differences obtained from the analysis of variance. A two-tailed

t-test was used to compare mean raw scores of the I.T.A. sample with mean raw scores of the general population (30 year old males) sample. The same t-test was used to compare mean sten values of the I.T.A. group to the corresponding sten values of Olympic champions, football players, and swimmers. The .01 level of significance was used for all t-test comparisons.

Results from the biographical data indicated that the I.T.A. sample group was typical of the general population in regard to marital status, size of family, and broken homes. Ethnic background, race, and other biographical data did not significantly affect scores on the 16 PF.

Results of a two-tailed t-test comparing the I.T.A. sample group with the general population using mean raw scores from the 16 PF indicated statistically significant differences between the two groups of means at the .01 level on Factors B, G, L, and N. The same t-test indicated statistically significant differences between the mean sten values for the sample group and mean sten values for the Olympic champions on Factors B, C, E, L, O, and Q₁. A t-test comparing mean sten values of the sample group and football players indicated a statistically significant difference on Factor B. A t-test comparing the mean sten values for the sample group with mean sten values for swimmers indicated no statistically significant differences between the two populations.

An analysis of variance of the I.T.A. sample group's 16 PF scores with events, section of country, position among siblings, race, and type of community indicated statistically significant differences at the .05 level between Factor A and events. A least square difference

test indicated that on Factor A the distance runners scored significantly lower than the sprinters and people in the field events. The analysis of variance on the rest of the 16 PF scores and biographical data indicated no statistically significant differences.

It was concluded on the basis of data collected that: (1) Development of certain personality traits to above average levels enhances success in highly skilled track competition. (2) Olympians running for country, status, and pride develop greater amounts of personality traits that enhance performance than do professionals running for money. (3) More reserved individuals are more inclined to find success in distance running than in other track events. (4) Certain personality traits and performance level are so closely linked that they rise and fall together over a period of years. (5) The personality differences between the I.T.A. sample group and the general population did not create social behavior and social relationships that would distinguish the I.T.A. sample group. Therefore, it seems reasonable for coaches, teachers, and parents to attempt to develop these traits to high levels of acceptance by aspiring athletes.

The following recommendations are suggested for further study:

- 1) Further study needs to be done with exceptional groups of athletes and at various stages in their careers.
- 2) More research needs to be done concerning personality differences between people in team sports and people in individual sports.
- 3) More research needs to be done in comparing the personality of the exceptional athlete with the personality of the average athlete.

4) Research needs to be done comparing the personalities of exceptional professional athletes with the personalities of exceptional amateur athletes.

5) Research needs to be done to determine what size high school produces the best athletes.

BIBLIOGRAPHY

Books

1. Beisser, Arnold R. The Madness in Sports. New York: Appelton-Century-Crofts, 1968, pp. 155-156.
2. Buros, Krisen, and Oscar. The Seventh Mental Measurements Yearbook. Highland Park, New Jersey: Cryphon Press, 1972, pp. 323-333.
3. Cattell, Raymond B., Herbert W. Eber, and Maruice M. Tatsuka. Handbook for the Sixteen Personality Factor Questionnaire (16 PF). Printed in the United States of America: Institute for Personality and Ability Testing, Champaign, Illinois, 1970.
4. Kane, John J. Marriage and Family. New York: The Dryden Press, 1952, pp. 237-289.
5. Winch, Robert F. The Modern Family. Holt, Rinehart, and Winston Inc., 1963, pp. 17-497.

Dissertations

6. Booth, E. G. Jr. "Personality Traits of Athletes," Dissertation Abstracts, 26:925, 1957.
7. Brown, Edward Albert. "A Comparative Study of Personality Traits of Varsity Skiers, Varsity Wrestlers, Varsity Swimmers, and Collegiate Non-Athletes at Selected Institutions of Higher Learning in the Intermountain Area," Dissertation Abstracts, 30:2826, 1969.
8. Chadwick, Ida Frances. "A Comparison of the Personality Traits and Kinesthetic Augmentation and Reduction of College Female Athletes and Non-Athletes," Dissertation Abstracts, 32:1005, 1972.
9. Coffman, David M. "Exploratory Use of the Welsh Figure Preference Test and the Welsh Model for Personality Assessment Research in Athletics," Dissertation Abstracts, 30:130, 1973.
10. Davidson, Richard Allen. "A Study of Personality Traits and Value Systems of High School Athletes and Nonathletes," Dissertation Abstracts, 28:3777, 1967.
11. Foster, Evie Gooch. "Personality Traits of Highly Skilled Basketball and Softball Women Athletes," Dissertation Abstracts, 29:5055, 1972.

12. Johnson, Warren R. "A Study of College Athletes," Dissertation Abstracts, 20:111, 1950.
13. Lakie, William Loren. "Personality Characteristics and Competitive Attitudes of Certain Groups of Intercollegiate Athletes," (Ph.D. 1961 University of California, Berkeley), p. 72.
14. Malumphy, Theresa Mary. "The Personality and General Characteristics of Women Athletes in Intercollegiate Competition," Dissertation Abstracts, 27:2854, 1966.
15. Mendell, Edward Ronald. "Differences Between College Male Intramural Participants and Non-Participants with Regard to Personality, Athletic Background and Certain Scholastic Indices," Dissertation Abstracts, 32:794, 1973.
16. Morgan, Marcia Ruth. "A Comparison of Selected Personality, Biographical and Motivational Traits Among Women Athletes, Physicians, and Attorneys," Dissertation Abstracts, 33:4843, 1973.
17. Reeves, Ray Allen. "Personality Differences Between Athletic and Non-Athletic Inmates at the State Prison in Utah," Dissertation Abstracts, 34:3213, 1974.
18. Ruperts, Liga Zirnitis. "Exploration of Some Personality and Moral Character Differences Between High School Athletes and Non-Athletes and Among Subgroups of Athletes," Dissertation Abstracts, 30:1629, 1973.
19. Shirley, Jack Harold. "A Comparative Study of the Academic Achievements, Interests, and Personality Traits of Athletes and Non-Athletes," Dissertation Abstracts, 25:4005, 1960.
20. Vernacchia, Ralph Anthony. "Case Profiles of Track Athletes," Dissertation Abstracts, 29:3718, 1973.
21. Wright, Paul Thomas. "Personality Traits of Athletes in Selected Field Events," Dissertation Abstracts, 29:6438, 1973.

Periodicals

22. Alderman, R. B. "A Sociopsychological Assessment of Attitude Toward Physical Activity in Champion Athletes," Research Quarterly, 41:1-9, March, 1970.
23. Behrman, Robert M. "Personality Differences Between Non-swimmers and Swimmers," Research Quarterly, 38:163-71, 1967.

24. Bentson, T. B., and John Summerskill. "Relation of Personal Success in Intercollegiate Athletics to Certain Aspects of Personal Adjustment," Research Quarterly, 26:8-14, March, 1955.
25. Berger, R. A., and D. H. Littlefield. "Comparison Between Football Athletes and Nonathletes on Personality," Research Quarterly, 40:663-5, December, 1969.
26. Biddulph, L. G. "Athletic Achievement and the Personal and Social Adjustment of High School Boys," Research Quarterly, 25:1-7, 1954.
27. Booth, E. G. "Personality Traits of Athletes as Measured by the MMPI: A Rebuttal," Research Quarterly, 32:421-3, October, 1961.
28. Brown, S. R. "Competitive Athletics and Character: A Jaundiced Point of View," Journal of Secondary Education, 43:60-2, February, 1968.
29. Brown, Gwilym S. "Winning One for the Ripper," Sports Illustrated, Vol. 39, No. 22, November, 1973.
30. Cooper, L. "Athletics, Activity and Personality: A Review of the Literature," Research Quarterly, 40:17-22, March, 1969.
31. Dorder, E. "Personality Characteristics of Weightlifters," Journal of Physical Education, 69:225-7, July, 1972.
32. Flanagan, L. "A Study of Some Personality Traits of Different Physical Activity Groups," Research Quarterly, 22:312-23, 1951.
33. Gorr, E. "What Is a Track Man," Scholastic Coach, 26:38, March, 1957.
34. Gotheil, E., and A. C. Werner. "Personality Development and Participation in College Athletics," Research Quarterly, 37:126-31, March, 1966.
35. Huesner, William. "Personality Traits of Champion and Former Champion Athletes," unpublished research study, Physical Fitness Research Laboratory, University of Illinois, 1952, cited by W. Kroll and K. H. Peterson, "Personality Factor Profiles of Collegiate Football Teams," Research Quarterly, 36:433-44, December, 1965.
36. Hunt, D. H. "A Cross Racial Comparison of Personality Traits Between Athletes and Nonathletes," Research Quarterly, 40:704-7, December, 1969.
37. Ibrahim, H. "Comparison of Temperament Among Intercollegiate Athletes and Physical Education Majors," Research Quarterly, 38:615-22, December, 1967.

38. Johnson, P. A. "Comparison of Personality Traits of Superior Skilled Women Athletes in Basketball, Bowling, Field Hockey, and Golf," Research Quarterly, 43:409-15, December, 1973.
39. Johnson, W. R., and others. "Personality Traits of Some Champion Athletes as Measured by Two Projective Tests: Rorschach and H-T-P," Research Quarterly, 25:485-6, December, 1954.
40. Jokl, E., and others. "Research on Olympic Athletes," Journal of Health, Physical Education, and Recreation, 27:61-2, September, 1956.
41. Keogh, Jack. "Relationship of Motor Ability and Athletic Participation in Certain Standardized Personality Measures," Research Quarterly, 30:438-45, 1959.
42. Kroll, Walter. "Sixteen Personality Factor Profiles of Collegiate Wrestlers," Research Quarterly, 38:49-57, March, 1967.
43. _____, and B. R. Carlson. "Discriminant Function and Heirarchal Grouping Analysis of Karate Participants' Personality Profiles," Research Quarterly, 38:405-11, October, 1967.
44. _____, and K. H. Peterson. "Personality Factor Profiles of Collegiate Football Teams," Research Quarterly, 36:433-44, December, 1965.
45. Lakie, W. L. "Personality Characteristics of Certain Groups of Intercollegiate Athletes," Research Quarterly, 25:313-20, 1954.
46. La Place, J. P. "Personality and Its Relationship to Success in Professional Baseball," Research Quarterly, 25:313-20, 1954.
47. Mackenzie, M. M. "Characteristics of a Champion," Athletic Journal, 39:58-60, May, 1959.
48. Merriman, J. B. "Relationship of Personality Traits to Motor Ability," Research Quarterly, 31:163-73, 1960.
49. Milverton, F. J. "An Experimental Investigation into the Effects of Physical Training on Personality," British Journal of Educational Psychology, 13:30-39, 1943.
50. Nelson, D. "Leadership in Sports," Research Quarterly, 37:268-75, May, 1966.
51. Newman, E. N. "Personality Traits of Faster and Slower Competitive Swimmers," Research Quarterly, 39:1049-53, December, 1968.
52. Ogilvie, B. C. "What Is an Athlete?" Journal of Health, Physical Education, and Recreation, 38:48, June, 1967.

53. _____. "Psychological Consistencies Within the Personality of High-Level Competitors," Journal of American Medical Association, 205:156-58, 1968.
54. Peterson, S. L., and others. "Personality Traits of Women in Team Sports vs. Women in Individual Sports," Research Quarterly, 38:686-90, December, 1967.
55. Schendel, Jack. "Psychological Differences Between Athletes and Nonparticipants in Athletics at Three Educational Levels," Research Quarterly, 36:52-67, March, 1965.
56. Sevier, V. A. "A Comparative Study of Aggression and Related Personality Characteristics," Journal of Physical Education, 38:38-41, November, 1973.
57. Singer, R. N. "Personality Differences Between and Within Baseball and Tennis Players," Research Quarterly, 40:582-8, October, 1969.
58. Slusher, Howard S. "Personality and Intelligence Characteristics of Selected High School Athletes and Nonathletes," Research Quarterly, 35:539-45, December, 1964.
59. Sperling, A. "The Relationship Between Personality Adjustment and Achievement in Physical Education Activities," Research Quarterly, 13:351-63, October, 1942.
60. Thune, John B. "Personality of Weightlifters," Research Quarterly, 20:296-306, 1949.
61. Tillman, K. "Relationship Between Physical Fitness and Selected Personality Traits," Research Quarterly, 36:483-89, 1965.

Other Sources

62. American Psychological Association, Council of Editors. "Publication Manual of the American Psychological Association," (Rev. ed.) Washington D. C. APA, 1967.
63. Cattell, R. B. "Manual for the 16 PF," Printed in the United States: Institute for Personality and Ability Testing, 1972.
64. _____. "Tabular Supplement No. 1 to the 16 PF Handbook," Printed in the United States: Institute for Personality and Ability Testing, 1973.

APPENDIX A

IMPORTANT: ALL SUBJECTS PLEASE READ THE FOLLOWING:

For the spring and summer sessions of 1974 and as a requirement for the completion of a Master of Science degree in Physical Education, this researcher would like to conduct a program of research which will be ultimately incorporated into a Master Thesis.

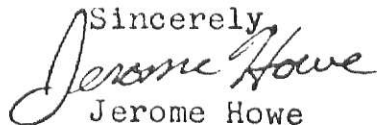
The research desired is a personality study of the male athletes in the International Track Association. The instrument selected for use in this study is the Cattell Sixteen Personality Factor Questionnaire (16 PF). The 16 PF is a highly acclaimed and widely used instrument for investigation into the area of personality research. Its wide use over a number of years has yielded an impressive amount of empirical data and has established the 16 PF as one of the most valid means of assessing personality traits.

The research and the collection of data will follow the accepted and established guidelines of investigation. The privacy and rights of the subjects will be protected and honored at all times. This questionnaire does not constitute an invasion of privacy nor in any way will the results be made to bear either directly or indirectly upon any one subject or subjects. The results of this study are important only as they apply to the entire group. The statistical analysis of the data is concerned only with the results when considered as a whole.

So that your identity will remain unknown and to insure confidentiality, your name will not be required on the answer sheet or on the information sheet. In place of your name, there will appear a code number on both answer sheet and information sheet. This makes it possible for the researcher to adequately interpret the test results. The code number makes it impossible for anyone to determine your identity.

It is extremely important to the results and validity of this research that all participating subjects answer the questions on the questionnaire and information sheet as truly and exactly as possible. Only with your sincere cooperation can this research study be successful. The results of this research will prove beneficial not only to yourself but also to athletics and other athletes.

Your cooperation and help in this research study is greatly appreciated. All subjects participating in the study will receive results of the research once it has been completed.

Sincerely

Jerome Howe

FOLLOW THESE INSTRUCTION STEP BY STEP BEFORE ANSWERING ANY QUESTIONS ON THE 16 PF.

- 1) Read carefully the following introductory statement.
- 2) Read and sign the Inform-Consent Form.
- 3) Open envelope and fill out to the best of your ability the Information Sheet.
- 4) Read carefully the instructions on the cover of the 16 PF.
- 5) Answer all questions in the 16 PF and place your answers on the answer sheet. DO NOT DISCUSS THIS TEST WITH ANYONE UNTIL FINISHED.
- 6) Turn in the completed 16 PF, and Information Sheet to Jerome Howe.

Code Number _____

INFORMATION SHEET

The following questions are general information that may help interpret the information of the questionnaire.

Answer only those questions you feel free to answer. All information will be held in strict confidence and known only to this research.

Age _____ Height _____ Weight _____ lbs.

Event or events: (Circle) Shotput, Pole Vault, Long Jump, High Jump, Sprints, 440 yd. Dash, Middle Distance (880), Distance (Mile, Two Mile).

Marital status: (Circle) Single, Married, Separated, Divorced, Widowed.

If any children: Number _____, Ages _____.

Ethnic group: (Circle) Black, White, Specify Other _____.

Citizen of U.S.A.: (Circle) Yes, No.

If not citizen of U.S.A. state Nationality: _____.

If citizen of U.S.A. name state reared in: _____.

Type of community reared in: (Circle) Rural, Suburban, Inner City, Urban.

Number of brothers and sisters: _____

Your position among brothers and sisters: (Circle) Youngest, Middle, Oldest.

Did you come from a broken home: (Circle) Yes, No.

Size of high school: (Circle) 100, 250, 500, 1,000, 2,000, 3,000 or above.

High school's emphasis on sports: (Circle) None, Some, One of most important activities, Most important activity.

College or colleges attended: _____.

INFORM-CONSENT FORM
Department of Health, Physical
Education and Recreation
Kansas State University
Manhattan, Kansas

I hereby acknowledge and give my willful consent to volunteer as a subject for a research study of the personality traits of male athletes competing for the International Track Association. I understand that this study requires me to participate in the following:

- 1) Completion of the Cattell Sixteen Personality Factor Questionnaire.

I understand completely that this questionnaire is being administered in strictest confidence and my identity will not be known through participation in this research study.

In consideration of the instructions furnished to me, I hold harmless any and all personnel conducting this research study for claims and demands resulting from participation in the questionnaire described above. I fully understand the nature of the testing procedures and desire to participate.

Subject's Signature

Date _____

Mailing Address: _____

APPENDIX B

TABLE 8

ANALYSIS OF VARIANCE OF FACTOR B WITH EVENTS, SECTION
OF COUNTRY, POSITION AMONG SIBLINGS, RACE,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	21.492	21.492	8.572	.4637
Events	2	.438	.219	.087	.9167
Section	1	.714	.714	.285	.5986
Position	1	2.342	2.342	.934	.3439
Community	1	.620	.620	.248	.6235

TABLE 9

ANALYSIS OF VARIANCE OF FACTOR C WITH EVENTS, SECTION
OF COUNTRY, POSITION AMONG SIBLINGS, RACE,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	9.820	9.820	.480	.4953
Events	2	11.842	11.842	.290	.7513
Section	1	14.804	14.804	.724	.4036
Position	1	2.286	2.286	.112	.7412
Community	1	4.949	4.949	.242	.6274

TABLE 10

ANALYSIS OF VARIANCE OF FACTOR E WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	10.532	10.542	.718	.4056
Events	2	1.644	.822	.056	.9457
Section	1	1.568	1.568	.107	.7468
Position	1	10.340	10.340	.704	.4101
Community	1	12.340	12.340	.840	.3688

TABLE 11

ANALYSIS OF VARIANCE OF FACTOR F WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	.555	.555	.021	.8857
Events	2	13.423	6.711	.256	.7767
Section	1	.033	.033	.001	.9719
Position	1	.008	.008	.000	.9861
Community	1	21.305	21.305	.811	.3771

TABLE 12

ANALYSIS OF VARIANCE OF FACTOR G WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	22.017	22.017	1.975	.1732
Events	2	36.884	18.442	1.655	.2131
Section	1	.012	.012	.001	.9736
Position	1	19.612	19.612	1.760	.1977
Community	1	5.808	5.808	.521	.4777

TABLE 13

ANALYSIS OF VARIANCE OF FACTOR H WITH RACE, EVENTS,
SECTION OF COUNTRY, POSIBION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	21.039	21.039	.608	.4434
Events	2	17.575	8.788	.254	.7778
Section	1	.650	.650	.019	.8922
Position	1	14.667	14.667	.424	.5214
Community	1	11.797	11.797	.341	.5649

TABLE 14

ANALYSIS OF VARIANCE OF FACTOR I WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	4.640	4.640	.302	.5881
Events	2	2.508	1.254	.082	.9219
Section	1	6.612	6.612	.430	.5185
Position	1	.109	.109	.007	.9337
Community	1	6.676	6.676	.434	.5165

TABLE 15

ANALYSIS OF VARIANCE OF FACTOR L WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	19.038	19.038	1.868	.1849
Events	2	3.751	1.876	.184	.8331
Section	1	9.470	9.470	.929	.3451
Position	1	8.237	8.237	.808	.3780
Community	1	.814	.814	.080	.7800

TABLE 16

ANALYSIS OF VARIANCE OF FACTOR M WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	5.938	5.938	.418	.5243
Events	2	15.091	7.546	.531	.5949
Section	1	8.910	8.910	.627	.4364
Position	1	4.419	4.419	.311	.5824
Community	1	1.204	1.204	.085	.7736

TABLE 17

ANALYSIS OF VARIANCE OF FACTOR N WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	2.260	2.260	.276	.6045
Events	2	6.794	3.397	.414	.6656
Section	1	.082	.082	.010	.9212
Position	1	2.942	2.942	.359	.5550
Community	1	.599	.599	.073	.7893

TABLE 18

ANALYSIS OF VARIANCE OF FACTOR O WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	5.028	5.028	.423	.5220
Events	2	9.562	4.781	.402	.6736
Section	1	1.665	1.665	.140	.7117
Position	1	2.355	2.355	.198	.6605
Community	1	15.951	15.951	1.341	.2587

TABLE 19

ANALYSIS OF VARIANCE OF FACTOR Q1 WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	4.688	4.688	.461	.5040
Events	2	15.802	7.901	.777	.4715
Section	1	1.122	1.122	.110	.7428
Position	1	4.494	4.494	.442	.5128
Community	1	7.421	7.421	.730	.4018

TABLE 20

ANALYSIS OF VARIANCE OF FACTOR Q2 WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	21.636	21.636	2.131	.1579
Events	2	57.154	28.577	2.814	.0807
Section	1	3.350	3.350	.330	.5713
Position	1	8.911	8.911	.878	.3586
Community	1	15.967	15.967	1.572	.2224

TABLE 21

ANALYSIS OF VARIANCE OF FACTOR Q3 WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	.452	.452	.040	.8439
Events	2	25.293	12.646	1.110	.3465
Section	1	7.940	7.940	.697	.4124
Position	1	.747	.747	.066	.8002
Community	1	.284	.284	.025	.8760

TABLE 22

ANALYSIS OF VARIANCE OF FACTOR Q4 WITH RACE, EVENTS,
SECTION OF COUNTRY, POSITION AMONG SIBLINGS,
AND TYPE OF COMMUNITY

Source	D.F.	Sum of Squares	Mean Squares	F-ratio	Prob.
Race	1	43.798	43.798	1.664	.2099
Events	2	24.426	12.213	.464	.6446
Section	1	.006	.006	.000	.9880
Position	1	.004	.004	.000	.9908
Community	1	.034	.034	.001	.9715

TABLE 23

MEAN RAW SCORES AND MEAN STEN VALUES FOR I.T.A.
SAMPLE GROUP ON 16 FACTORS MEASURED
BY THE 16 PF

Factor	Mean Raw Score	Mean Sten Value	Factor	Mean Raw Score	Mean Sten Value
A	8.7	4.7	L	9.1	6.6
B	8.2	6.3	M	13.0	5.6
C	16.0	5.3	N	7.5	4.7
E	13.5	6.0	O	9.4	5.5
F	15.2	6.3	Q1	10.6	6.6
G	11.6	4.7	Q2	10.4	5.8
H	14.8	5.6	Q3	11.8	4.5
I	9.8	6.1	Q4	12.0	6.1

TABLE 24

THE PRIMARY SOURCE TRAITS COVERED BY THE 16 PF TEST

Factor	Low Sten Score Description (1-3)	High Sten Score Description (8-10)
A	<u>Reserved</u> , detached, critical, aloof, stiff, (Sizothymia)	<u>Outgoing</u> , warmhearted, easygoing, (Affectothymia)
B	<u>Dull</u> , (Low Intelligence)	<u>Bright</u> , (High Intelligence)
C	<u>Affected by feelings</u> , emotion- ally less stable, (Lower Ego Strength)	<u>Emotionally stable</u> , mature, faces reality, calm, (Higher Ego Strength)
E	<u>Humble</u> , docile, mild, (Submissiveness)	<u>Assertive</u> , aggressive, stub- born, competitive, (Dominance)
F	<u>Sober</u> , taciturn, serious, (Desurgency)	<u>Happy-go-lucky</u> , enthusiastic, (Surgency)
G	<u>Expedient</u> , disregards rules, (Weaker Ego Strength)	<u>Conscientious</u> , moralistic, (Stronger Ego Strength)
H	<u>Shy</u> , timid, threat-sensitive, (Threctia)	<u>Venturesome</u> , uninhibited, socially bold, (Parmia)
I	<u>Tough-minded</u> , self-reliant, realistic, (Harria)	<u>Tender-minded</u> , sensitive, clinging, (Premesia)
L	<u>Trusting</u> , accepting condi- tions, (Alaxia)	<u>Suspicious</u> , hard to fool, (Protension)
M	<u>Practical</u> , "down-to-earth" concerns, (Praxernia)	<u>Imaginative</u> , absent-minded, bohemian, (Autia)

TABLE 24 (Con't.)

Factor	Low Sten Score Description (1-3)	High Sten Score Description (8-10)
N	<u>Forthright</u> , unpretentious, (Artlessness)	<u>Astute</u> , polished, socially aware, (Shrewdness)
O	<u>Self-assured</u> , placid, secure, (Untroubled adequacy)	<u>Apprehensive</u> , insecure, worrying, troubled, (Guilt Proneness)
Q1	<u>Conservative</u> , (Conservation of Temperament)	<u>Experimenting</u> , liberal, free-thinking (Radicalism)
Q2	<u>Group dependent</u> , a "joiner", (Group Adherence)	<u>Self-sufficient</u> , resource- ful, (Self-Sufficiency)
Q3	<u>Undisciplined self-conflict</u> , (Low Self-Sentiment Inte- gration)	<u>Controlled</u> , socially pre- cise, (High Strength of Self-Sentiment)
Q4	<u>Relaxed</u> , tranquil, composed, (Low Ergic Tension)	<u>Tense</u> , frustrated, driven, (High Ergic Tension)

A PERSONALITY STUDY OF THE MALE ATHLETES
OF THE INTERNATIONAL TRACK ASSOCIATION

by

JEROME E. HOWE

B. S., Kansas State University, 1972

AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Health, Physical Education and Recreation

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1975

PURPOSE

The purpose of this study was to (1) identify the personalities of the I.T.A. sample group, (2) to compare and contrast the 16 PF results of the I.T.A. group with established norms for the general population, (3) to compare various sub-groups within the I.T.A. sample group, (4) to compare the personality profiles of specific groups of competitors.

PROCEDURE

The Cattell Sixteen Personality Factor Questionnaire was administered to 32 athletes. A least squares analysis of variance was conducted with 16 PF scores from the 16 PF. A least significant difference test determined the nature and direction of significant differences obtained from the analysis of variance. A two-tailed t-test was used to compare mean raw scores of the I.T.A. sample group with mean raw scores of the 30 year old males sample, and to compare sten values of the I.T.A. sample group to corresponding sten values of Olympic champions, football players, and swimmers.

RESULTS

A least squares analysis of variance at the .05 level indicated significant differences between event sub-groups on Factor A. Appropriate analysis indicated that distance runners scored significantly lower on Factor A than did sprinters, and people in the field events.

Results of a t-test at the .01 level indicated significant differences between the I.T.A. sample and the 30 year old males sample on Factors B, G, L, and N. Significant differences were also found between the sample group and Olympic champions on Factors B, C, E, L, O, and Q1 and with football players on Factor B. Analysis indicated no differences between the I.T.A. sample group and swimmers.

Results from the biographical data indicated that the I.T.A. sample group was typical of the general population in regard to marital status, size of family, and broken homes. Ethnic background, race, and other biographical data did not significantly affect scores on the 16 PF.

CONCLUSIONS

It was concluded on the basis of data collected that: (1) Development of certain personality traits to above average levels enhances success in highly skilled track competition. (2) More reserved individuals are more inclined to find success in distance running than in other track events. (3) Olympians running for country, status, and pride develop greater amounts of personality traits that enhance performance than do professionals running for money. (4) Certain personality traits and performance levels are so closely linked that they rise and fall together over a period of years. (5) The personality differences between the I.T.A. sample group and the general population did not create social behavior and social relationships that would distinguish the I.T.A. sample group. Therefore, it seems reason-

able for coaches, teachers, and parents to attempt to develop these traits to high levels of acceptance by aspiring athletes.