METHODOLOGY

The purpose of this study is to find out and differentiate the Personality traits among sportsmen of Kho-kho, Athletics and Badminton of the Junior College students in the age group of 16 to 19 using Cattell's 16 Personality Factors questionnaire.

For achieving this purpose three groups, as mentioned above, were selected from various Junior Colleges in Andhra Pradesh. This chapter describes the sample, the criterion measure, the reason for selecting the criterion measure, tool used, the sixteen factors, orientation, experimental control, randomisation, administration of the questionnaire, scoring of the questionnaire and the design of the study.

3.1 THE SAMPLE

Thirty Badminton sportsmen from various Junior Colleges were selected randomly who are participating in various tournaments in Andhra Pradesh. Another 30 sports men from the Athletics discipline also randomly selected to serve as subjects of this study among the sportsmen of Junior College in Andhra Pradesh. Randomly selected 30 Kho kho players of the Junior Colleges in Andhra Pradesh is assigned as subjects of the study, which is treated another group for group comparisons. The age group of the subjects were from 16 to 19.
Care was taken so that the sample selected for this study represents that particular set of population.

The selected subjects has participated various sports and games right from district level to National level competitions. Apart from their participation of games and sports in open competitions, they do specialise and practice in their particular interested areas daily. The subjects were also encouraged by inter-collegiate competitions. Thus, the subjects are all active participants of sports and games in their disciplines.

3.2 THE CRITERION MEASURE

The criterion measure chosen for this study was the sten scores achieved by each subject on each of the personality dimensions as measured by 16 PF questionnaire.

3.3 THE REASON TO SELECT THE 16 PF QUESTIONNAIRE

1. 16 PF consists of scales carefully oriented and grouped to basic concepts in human personality structure research.
2. This firmly based on the personality sphere concept - a design to insure initial converge for all the behaviour that commonly enters ratings and the directionally description of personality.
3. This is specially planned and carefully arranged according to the common interest and attitude of students
4. Coverage of personality is ensured by the sixteen functionally independent and psychologically meaningful dimensions isolated by extensive analytic research during twenty years.
5. This is an objectively scoreable test. This also gives the most complete coverage of personality possible in a brief time.
6. This has high validity, objectivity and reliability to its credit.
7. Experience with the 16 PF inventory shows that the use of the sixteen traits gives actual prescriptions superior to those from single scale measure.
8. Form B of the 16 PF questionnaire is meant for the literate group.

3.4 TOOL USED

To collect the data from the subjects Raymond B. Cattell's sixteen Personality Factor Questionnaire Form B was used. In order to ensure the interpretation of questions, a list of all the sixteen factors, their names and their meanings are provided with the questionnaire.

This is an objectively scorable test. This also gives the most complete coverage of personality factors in a brief time. This has been widely accepted and used throughout the world on variety of population samples. Further reliability, objectivity and validity of this is beyond any suspicion. Besides, this has been very successfully used in studies of such sportsmen.

3.5 A BRIEF ORIENTATION TO THE 16 PF TEST

The 16 PF questionnaire is an objectively scorable test devised by basic research of twenty years in psychology has given the most complete coverage of personality possible in a brief time. Form B is the most appropriate for literate group and college students. The test can be scored by hand.
This questionnaire consists of 187 simple questions and these questions cover all the sixteen personality factors. Each item or question represents a statement such as "One likes to watch games", which is responded in terms of three possible answers - Yes - occasionally - No. The respondent has to put a X mark in any one of the square given in the profile sheet against that particular question number. This is structured on a forced response basis but is voluntary and open since the subjects know that is a personality test.

Comprehensive coverage of personality tests upon measurement of sixteen functionally independent and psychologically meaningful dimensions isolated and replicated in more than twenty years of factors analytic research.

Factor analysis is complex statistical technique for reducing a large number of measures to a smaller number of independent discussions.¹

The personality factors measured by the 16 PF were not just unique to the test but instead rests within the context of general theory of personality. For convenience sake these dimensions are set out briefly. Each factor is listed with its alphabetical designation as A, B, C, E, F, G, H, I, L, M, N, O, Q1, Q2, Q3 and Q4 and brief descriptions of high and low scores. Each of the sixteen factors is provided with twenty to twenty six questions. The questions are arranged roughly in a cyclic order, to secure maximum convenience in scoring and to ensure variety and interest for the examinee. By this arrangement distortion and deliberate faking are considerably controlled. These sixteen dimensions are essentially independent. Any item in the test contributes to the score on only one factor, so that no dependencies are introduced at the level of scale construction.
FACTOR B

Less Intelligent Concrete thinking (Lower scholastic mental capacity)

The person scoring low on Fact B tends to slow to learn and grasp, dull given to concrete and literal interpretation. His dullness may be simply a reflection of low intelligence or it may represent poor functioning due to psychopathology.

Versus

More Intelligent Abstract-thinking, bright (Higher Scholastic mental capacity)

The person who scores high on Factor B tends to be quick to grasp ideas, a fast learner, intelligent. There is some correlation with level of culture, and some with alertness. High scores contraindicate deterioration of mental functions in pathological conditions.

FACTOR C

Affected by Feelings, Emotionally less stable, Easily upset (Lower ego strength)

The person who scores low on Factor C tends to be low in frustration tolerance for unsatisfactory condition, changeable and plastic, evading necessary reality demands, neurotically fatigued, fretful, easily emotional and annoyed.
active in dissatisfaction, having neurotic symptoms. (Phobias, sleep disturbances, Osychomatic complaints, etc). Low Factor C score is common to almost all forms of neurotic and some psychotic disorders.

Versus

Emotionally Stable, Faces Reality, Calm, Maure (Higher ego strength)

The person who scores high on Factor C tends to be emotionally mature, stable, realistic about life, unruffled, possessing ego strength, better able to maintain solid group memorable. Sometimes he may be a person making a resigned adjustment to unsolved emotional problems. Shrewd Clinical observers have pointed out that a good C level sometimes enables a person to achieve effective adjustment despite an underlying psychotic potential.

FACTOR E

Humble, Mild, Accommodating Conforming (Submissiveness). The person who scores low on Factor E tends to give way to others, to be docile, and to conform. He is often dependent, confessing, anxious for obsessional correctness. This passivity is part of many neurotic syndromes.

Versus

Assertive, Independent, Aggressive, Competitive, Stubborn (Dominance). The person who scores high on Factor E is assertive self-assured, and independent minded. He tends to be sustere, a law to himself, hostile or extrapunitive, authoritarian (Managing others) and disregards authority.
FACTOR F

Sober, Prudent, Serious Taciturn (Desurgency). The persons who scores low on Factor F tends to be restrained, reticent, introspective. He is sometimes dour, pessimistic, unduly deliberate, and considered among and primly correct by observers. He tends to be a sober, dependable person.

Versus

Happy-go-Lucky, Impulsively lively, Enthusiastic (Surgency). The person who scores high on this trait tends to be cheerful, active, talkative, frank expressive, effervescent, carefree. He is frequently chosen as an elected leader. He may be impulsive and mercurial.

FACTOR G

Expenditure, Evade Rules Feels Fes Obligations (Weaker superego strength).

The person who scores low on Factor G tends to be unsteady in purposes. He is often casual and lacking in effort for group undertakings and cultural demands. His freedom from group influences may lead to anti-social acts, but at times makes him more effective, while his refusal to be bound by rules causes him to have less somatic upset from stress.
**Versus**

Conscientious, Persevering, Staid, Rule bound (stronger superego strength). The person who scores high on Factor G tends to be exacting in character, dominated by sense of duty, persevering, responsible, playful, "Fills the unforgiving minute". He is usually conscientious and moralistic, and he prefers hardworking people to witty companions. The inner "Categorical imperative" of this essential superego (in the psychoanalytic sense) should be distinguished from the superficially similar "social ideal self" of Q3 +

**FACTOR II**

Shy, Restrained, Diffident, Timid (Threctia).

The person who scores low on this trait tends to be shy, withdrawing, cautious, retiring, a "Wallflower". He tends to be slow and impeded in speech and in expressing himself, dislikes occupations with personal contacts, prefers one or two close friends to large groups, and is not given to keeping in contact with all that is going on around him.

**Versus**

Venturesome, Sociallybold, Uninhibited, spontaneous (Parmia).

The person who scores high on Factor H is sociable, bold, ready to try new things, spontaneous and abundant in emotional response. His "thick skinniness" enables him to face wear and tear in dealing with people and grueling emotional situations, without fatigue. However, he can be careless of detail, ignore danger
signals, and consume much time talking. He tends to be "pushy" and actively interested in the opposite sex.

FACTOR I

Tough minded, Self-reliant, Realistic, No-nonsense (Harrier).

The person who scores low on Factor I tends to be practical, realistic, masculine, independent, responsible, but skeptical of subjective, cultural, elaborations. He is sometimes unmoved, hard, cynical smug. He tends to keep a group operating on a practical and realistic "No-nonsense" basis.

Versus

Tender minded, Dependent, Over-protected, Sensitive (Premsia).

The person who scores high on Factor I tends to be tender-minded, daydreaming, artistic fastidious, deminine. He is sometimes demanding of attention and help, impatient, dependent, impractical. He dislikes crude people and rough occupations. He tends to slow up group performance, and to upset group morale by unrealistic fussiness.

FACTOR L

Trusting, Adaptable, Free of Jealousy, Easy to get on with (Alaxia)
The person who scores low on Factor L tends to be free of jealous tendencies, adaptable, cheerful, uncompetitive, concerned about other people, a good team worker.

**Versus**

Suspicious, self opinionated, hard to fool (Frotension).

The person who scores high on Factor L tends to be mistrusting and doubtfult. He is often involved in his own ego, as self-opinionated, and interested in internal, mental life. He is usually deliberate in his actions, unconcerned about other people, a poor team member.

N.B.: This factor is not necessarily paranoia. In fact, the data on paranoid schizophrenics are not clear as to typical Factor L value to be expected.

**FACTOR M**

Practical, Careful, Conventional, regulated by External Realities, proper (Praxernia).

The person who scores low on Factor M tends to be anxious to do the right things, attentive to practical matters, and subject to the dictation of what is obviously possible. He is concerned over detail, able to keep his head in emergencies, but sometimes unimaginative.
Imaginative, Wrapped up in Inner Urgencies, Careless of Practical Matters, Absent-minded. (Autia).

The person who scores high on Factor M tends to be unconventional, unconcerned over everyday matters, bohemian, self-motivated, imaginatively creative, concerned with "essential", and obvious of particular people and physical realities. His inner directed interests sometimes lead to unrealistic situations accompanied by expressive outbursts. His individuality tends to cause him to be rejected in group activities.

FACTOR N

Forthright, Natural, Artless, Sentimental (Artlessness)

The person who scores low on Factor N tends to be unsophisticated, sentimental, and simple. He is sometimes crude and awkward, but easily pleased and content with what comes and is natural and spontaneous.

Versus

Shrewd, Calculating, Wordly penetrating (shrewdness).

The person who scores high on Factor N tends to be polished, experienced, wordly, shrewd. He is often hardheaded and analytical. He has an intellectual, unsentimental approach to situations, an approach skin to cunicism.
FACTPRO O

Placid, Self-Assured, Confident, Serene (Untroubled adequacy)

The person who scores low on Factor O tends to be placid, with unshakable nerve. He has a mature, unanxious confidence in himself and his capacity to deal with things. He is resilient and secure, but to the point of being insensitive of when a group is not going along with him so that he may evoke antipathies and distrust.

Versus

Apprehensive, Worrying, Depressive, Troubled (Guilt proneness)

The person who scores high on Factor O tends to be depressed, moody, a worrier, full of foreboding, and brooding. He has a child-like tendency to anxiety in difficulties. He does not feel accepted in groups or free to participate. High factor O score is very common in clinical groups of all types.

FACTOR Q1

Conservative, Respecting, Established Ideas, Tolerant of Traditional difficulties (Conservatism)

The person who scores low on factor Q1 is confident in what he has been taught to believe and accepts the "tried and true" despite inconsistencies, when something else might be better. He is cautious and compromising in regard to new ideas. Thus, he tends to oppose and postpone change, is inclined to go
along with tradition, is more conservative in religion and politics, and tends not to be interested in analytical "Intellectual" thought.

**Versus**

Experimenting Critical, Liberal, Analytical free thinking (Radicalism)

The person who scores high on Q1 tends to be interested in intellectual matters and has doubts on fundamental issues. He is skeptical and inquiring regarding ideas, either old or new. He tends to be more well informed, less inclined to moralise, more inclined to experiment in life generally, and more tolerant of inconvenience and change.

**FACTOR Q2**

Group-dependent, A "Joiner" and Sound Follower (Group Adherence)

The person who scores low on Factor Q2 prefers to work and make decisions with other people, likes and depends on social approval and admiration. He tends to go along with the group and may be lacking in individual solution. He is not necessarily gregarious by choice; rather he needs group support.

**Versus**

Self-sufficient, prefers Own Decisions, Resourceful (Self sufficiency).
The person who scores high on Factor Q2 is temperamentally independent, accustomed to going his own way, making decisions and taking action on his own. He discounts public opinion, but is not necessarily dominant in his relations with others (see factor E). He does not dislike people but simply does not need their agreement or support.

**FACTOR Q3**

Undisciplined Self conflict, Careless or protocol, follows own urges (Low integration)

The person who scores low on Factor Q3 will not be bothered with will control and regard for social demands. He is not overly considerate, careful, or painstaking, and many feel maladjusted, and many maladjustments (especially the affective, but not the paranoid) show Q3

Versus

Controlled, Socially precise, Following self-image (High self-concept control)

The person who scores high on Factor Q3 tend to have strong control of his emotions and general behaviour, is inclined to be socially aware and careful, and evidences what is commonly termed "self-respect" and regard for social reputation. He sometimes tends, however, to be obstinate, effective leaders, and some paranoids, are high on Q3.
FACTOR Q 4

Relzed, Tranquil, Torpid, Unfrustrated (Low ergic tension)

The person who scores low on Factor Q4 tends to be sedate, relaxed, composed, and satisfied (not frustrated). In some situations, his over satisfaction can lead to laziness and low performance, in the sense that low motivation produces little trial and error. Conversely, high tension level may disrupt school and work performance.

Versus

Tense, Frustrated, Driven, Overwrought (High ergic tension)

The person who scores high on Factor Q4 tends to be tense, excitable, restless, fretful, impatient. He is often fatigued, but unable to remain inactive. In groups he takes a poor view of the degree of unity, orderliness, and leadership. His frustration represents an excess of stimulated but undischarged drive.

3.7 ORIENTATION OF THE SUBJECTS

The subjects were made to understand the purpose and importance of the investigation. Emphasis was laid to get their frank responses in the best of their own interest. The subjects were made to understand that it was not an individual assessment and it was purely a group study.

The subjects were requested to answer in the separate answer sheet provided. They were asked to write their names, age and date at the right corner
of the answer sheet. One hour and thirty minutes time was allotted to complete the questionnaire.

3.8 EXPERIMENTAL CONTROL

The factors that could possibly influence the results of the research were adequately controlled. They were orientation, randomization and supplying Tamil and English Questionnaires to the particular language students.

3.9 ADMINISTRATION OF THE QUESTIONNAIRE

The sixteen personality factor questionnaire was administered separately on different dates, to ninety men who were selected randomly - thirty each from police, public sector undertaking and college students reminded not to cause undue delay in answering all questions but to give immediate replies in the answer sheets. Attempt was made to check whether the name and age have been filled in and all the questions answered.

3.10 PRINCIPLES AND MECHANICS OF SCORING

The test yielded scores on each of the sixteen personality factors. Each answer scored zero, one or two points, except for the factors B. Factor B being intelligence had a score of zero for incorrect answers and a score of one for correct answers. Scorings were done with already prepared scoring key easily, rapidly and in a standard manner. The scoring key was bought from the Psycho centre, Agra. The answers appeared as marks in the boxes on the given answer sheets.
The card board stencil scoring keys were used, out of which one covered factors such as A, C, F, H, L, N, Q1, and Q3 and the other covered B, E, G, I, M, O, Q2 and Q4. Both the keys were placed on each answer one by one, and the marks visible, through the holes for each factor was counted and the total scores were entered in the space provided for on the right end of each answer sheet. Factor B, intelligence was peculiar and each correct mark visible in a hole gave a score of one only.

3.11 AGE CORRECTION AND CONCERNING RAW SCORES TO STENS

Just as sex differences in the personality factors necessitate having separate norm table for men and women, it was essential to have a separate table for different age levels. Age correction must be made in order to unconfined individual difference variations and age trend variations in the factor score. The following equation as per the tabular supplement of 16 PF Hand book was used for age correction.³

\[ Y_{adj} = Y - b_{l} (X - X_{s}) \]

Where

\[ Y = \text{Obtained score from various factors} \]

\[ b_{l} = \text{Coefficient of } b_{l} \text{ obtained from the below table} \]

\[ X = \text{Real age} \]

\[ X_{s} = \text{Actual group cohesion} \]
Before these raw scores can be evaluated and interpreted, they must be converted into a system which places the examinees' score in relation to scores obtained by other people in some defined population (College students, adult males etc). The standardisation tables convert raw scores to what are called stens, a practice consistent with best modern Usage, aiming at a good, but not unrealistically refined degree of accuracy in expression of results.4

Catell, Eber and Tatsuoka states,5 that all IPAT test take ten units for their point scale range, each unit being called a sten ("Standard ten"). The advantages which led to us to adopt stens are, briefly that (1) most scientists accustomed to the decimal system find it simpler to think and work with ten points; (2) the extreme intervals one and ten do not have to be so disproportionate to span as do the one and nine interval in stanines, in words, stanines strictly run out only to 2 1/2 sigmas leaving nearly 2 1/2 percent of the population straggling outside, whereas stens run out to 2 1/2 sigmas and leave less than 1 percent to be "swept under the mat"; and (3) with psychologists, given equal experience of both systems, it has been found by survey that stens are preferred.

Sten scores are distributed over ten equal-interval standard score points, assuming normal distribution from one through ten, with the population average or mean fixed at sten five point five, Sten five and six extend, receptively, a half a standard deviation below and above the mean, constituting the solid center of the population, while the outer limits for stens one and ten were two and a half standard deviation above and below the mean. One would consider stens of five and six as average, four or seven slightly deviant (respectively in a low and a high direction), two, three, eight and nine strongly deviant, and one or ten extreme, all these being placements of the person relative to the defined population on which the standardisations were based.
While converting the age corrected raw scores into standard ten-point scores, one could find the raw scores for factor A in the "A" line and read the corresponding sten score above it. One should proceed likewise for the other factors also.

3.12. STATISTICAL TECHNIQUE

As the number in each group was thirty they had to be treated as small samples. Since the objective was to find out the differences in each factor of 16 PF among the three groups and between each groups one way analysis of variance was done, in order to find out the significance of variance amongst groups.

The formula used by Clarke and Clarke was used.

\[ F = \frac{(MS)_b}{(MS)_w} \]

\[ F = \text{Variance between groups / Variance within groups} \]

3.13. POST HOC TESTS OF SIGNIFICANCE

A test to determine the significance between all pairs of means where F ratios were significant was next applied. The formula used by Clarke and Clarke was used.

\[ I = \frac{S \sqrt{(MS)_w}}{W_g} \]

\[ I = \text{Confidence interval} \]

\[(MS)_w = \text{Variance within groups}\]

\[ S = \sqrt{(K-1) \frac{F}{W_g}} = 1/n + 1/n \]
REFERENCES


