Chapter 3

METHODOLOGY

The purpose of the study was to evolve and suggest a homogeneous method for the secondary school boys of Amravati Reason based on statistical evaluation of the coefficients of determination of the biometric factors of age, height and weight considered individually and in various combinations with respect to the motor ability and sifting the best correlate there from.

Subjects

Five hundred and twenty four normal healthy boys without any physical deformity were selected from twenty secondary schools of Rural and urban (Vide Appendix A.1) of Amravati Reason at random to serve as subjects for the study. The boys were sampled out from 8th, 9th and 10th standards by adopting systematic sampling procedure. Fifty students were selected from each institution on an average. The subjects participated in the compulsory programme of physical education offered by the Institutions.

Place of Testing

The biometric measurements of age, height and weight and the performance measures of the subjects were obtained at the institutions where the subjects studies.
Testing Assistants

The physical education teachers working in the selected schools were made use of as testing assistants in the administration of the performance test. They were oriented with respect to the type of assistance required of them in administering the test.

Procedure for Obtaining the Age, Height & Weight of Subjects

The following procedure was adopted to obtain the data of age, height and weight of subjects.¹

Age – The dates of birth as entered in the school records were taken as valid proof of age. Age was taken in completed months as on the date of measurements. It was felt desirable that age in months would be more justifiable than age in completed years as the study involved relationship with the physical performance.

Height— A wall Scale was made by fixing a flexible plasticised linen measuring tape with centimeter marking read to tenths of a centimeter to the plain wall surface. The subject was

asked to stand barefooted, erect, feet together with heels, buttocks, upper back and back of the head making firm contact with the wall scale. The subject was instructed to take a deep breath and hold it as the broca plane made of two rigid wooden planks fixed at right angles, was lowered on to the vertex of the subject’s head. Then the subject was asked to step off by bending the knees. Height was read on the measuring tape and recorded to the nearest 1 mm.

**Weight**— Subject bare footed with school uniform stood on the weighing machine platform and looked straight ahead while the investigator read the scale and the weight was recorded to the nearest 0.25 kg.

Age in months, height in centimeters, weight in kilograms and performance scores of five hundred and twenty four subjects have been presented in Appendix B. 1.

The age group of the subjects ranged from a minimum of 135 months to a maximum of 246 months. The height ranged from a minimum of 103 centimeters to a maximum of 180 centimeters while weight ranged from a minimum of 21 kilograms to a maximum of 66.5 kilograms.

**Reliability of Measures**

For the reliability of measures of height and weight,
absolute criteria of reliability were followed.\textsuperscript{2}

**Performance Criterion**

The scores made by the subjects on the Scoot Motor Ability Test was taken as the performance criterion since motor ability includes such factors basic to performance as muscular strength, muscular endurance, circuloendurance, speed, agility, power, flexibility, hand and eye coordination and foot and eye coordination.\textsuperscript{3}

Scoot Motor Ability Test\textsuperscript{4} consisting of the following items was administered to the subjects.

1. Basket Ball Throw
2. Four Seconds Dash
3. Standing Broad Jump
4. Wall Pass

The test battery is applicable for both college men and high school

\textsuperscript{2}Ibid. p.2.2


Procedure of Administration of Tests

Basket Ball Throw— A restraining line of reasonable length was drawn. The subject was asked to throw the Basket Ball using any technique without stepping on or across the restraining line. Successive three trials were allowed. Each throw was measured from the nearest break made by the ball, to the restraining line perpendicularly, and recorded to the nearest foot. The best distance of the three trials was taken as the subject’s score in the event. The measurement procedure is depicted in Figure.1.

Four Seconds Dash— A thirty yards running course was marked and numbered in one yard zones, ten yards onwards from the starting line. Two subjects were tested at a time. Performance was recorded with the help of testing assistants. Each assistant was assigned one subject. It was made clear to each testee that the running time would be four seconds and at a signal ‘Ready, Go’ from the Investigator, the subject was to run down the course as fast as possible until the whistle was blown after four seconds. The assistants were instructed specifically to watch the testee assigned to him and to mark the zone in which the runner’s leading foot was at the time the whistle was blown. The number of the zone covered by the runner was taken as the score for the event. The field marking is indicated in Figure.2.
FIG: 1 PROCEDURE OF MEASURING THE BASKET BALL THROW
FIG: 2 FIELD MARKING FOR THE FOUR SECONDS DASH RUNNING COURSE.
Standing Broad Jump— A starting line four feet long and two inches wide was drawn on the field. The subject was asked to stand behind the starting line, knees bent. She was directed to jump as far forward as possible without stepping on or across the starting line by a forward swing of her arms. A demonstration jump was shown. The distance jumped was measured in inches perpendicularly from the nearest break upon landing to the edge of the starting line farthest the break and recorded to the nearest inch. Three trials were allowed to each subject consecutively and the best performance was recorded. The procedure of measurement is shown in Figure 3.

Wall Pass— A plain wall surface was made use of for the test. A restraining line two inches wide was drawn parallel to the wall at a distance of nine feet from the wall. The subject was asked to stand behind the restraining line and pass a Basket Ball against the wall in any manner and catch the rebound as many times as possible in fifteen seconds. To deliver a legal pass, the feet must remain behind the starting line. If the subject lost the control over the ball, she was asked to retrieve it and return to the restraining line and continue passing. Number of times the ball hit the wall in fifteen seconds was taken as the score. The ground marking for the test can be seen in Figure 4.

The performance scores of subjects in individual items
FIG: 3 PROCEDURE OF MEASURING THE PERFORMANCE IN BROAD JUMP
FIG: 4  GROUND MARKING FOR WALL PASS
Scoring

Two neat tricks of arriving at composite score of an individual on the test battery have been suggested.  

1. Taking an average of the T-score on the items.

2. Use of the following simplified regression equation found from the multiple correlation.

\[ .7 \text{ (Basket Ball Throw)} + 2 \text{ (4 seconds Dash)} + 1.0 \text{ (Wall Pass)} + 0.5 \text{ (Standing Broad Jump)}. \]

The second method of arriving at composite scores of individuals was adopted. The performance scores of individual events were multiplied by their respective regression coefficients before summing up, to arrive at the total score. The total performance scores of subjects may be found on the computer output presented in Appendix C. (Pages 113-115)

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6Ibid. p.131.

Hull Scale\(^8\) \(\left(\text{Mean} \pm \frac{3.5\sigma}{50}\right)\) percentile scores of performance was constructed by computing mean and standard deviation of the performance scores (vide appendix C ; Page 115) as it was thought that the T-scores accompanying the test battery were framed for American girls and was thought unadoptable for Indian girls. The Hull Scale provided in Appendix D was utilized to convert the raw performance scores to percentile scores. These percentile scores of performance of the subjects was treated as the dependent variable for purposes of statistical analysis presented in Chapter 4.