CHAPTER I
INTRODUCTION

The developing trends in the field of physical education have greatly enabled to centralized techniques that provide for individual development. And the attractive rewards involved in sports, certainly call for greater competence in achieving the required supremacy by any individual. New insights to the field have made it possible for the growth of an individual concurrent to the required standard in the present context.

In the contemporary context of physical education there exists a large scope for the scientific evolution of discipline. In the course of evolution, the expertise imparted on an individual has a direct bearing on the overall development of an individual. In the modern context, the field of physical education and sports has imparted refined knowledge and skill that has developed due to an impetus provided by the large strides in technology. Concurrent growth of the field such as Bio-mechanics, Exercise-physiology, Sports psychology, Sports medicine, etc. impart a sound basis to higher degrees of competence in contemporary society.

In order to discern the athlete's performance various variables as a system operate, and the isolation of an accurate system with its numerous sub-system is a complex task. Such a complexity is simplified by appreciating the quantifiability of
relationships. Such relationships are governed by variables existing within the system and though variables external to the system too influence the system, their influence is truly external. With the advent of computing machines identification and isolation of governing criteria of such systems tends to be more viable.

Developing an individual's physical fitness is one of the major objectives of the process of physical education. Physical fitness is one of the potential characteristics of every human being. Physically fit citizens are a major asset for a strong nation, and hence physical fitness of the youth should be a national and general concern. Few decades ago, when the Americans realised the need to develop the fitness standard of their youth much research was carried out on youth fitness, and as a result, they could take proper steps to develop youth fitness on a national scale. It is needless to mention here that now the Americans are the strongest contenders in almost all sports activities at the international level. Surprisingly, in India physical fitness of youth is yet to be emphasized on a national scale though some positive steps are being taken to make physical education and yoga programmes mandatory at the school level. But it is still inadequate for the upliftment of youth physical fitness in India. Many research programmes could be therefore, carried out in order to decipher this lacunae, with regard to physical fitness of Indian youth, at the regional levels.
A synthesis of the ability as well as the skill in performing a task are accountable in deciphering the evolution of physical fitness. Fleishman's,¹ distinction between ability and skill is that "ability refers to a more general trait of the individual which has been inferred from certain response consistencies (e.g. correlations) on certain kinds of tasks" and "skill refers to the level of proficiency on a specific task or limited group of tasks." Individual's ability is what he does, whereas his skill refers to the extent to which he can do the given task with ease and comfort. For example, throwing a cricket ball around the target could be one's ability. If a cricketer throws a ball on to the stumps, what is needed is the precision of throwing, which certainly demands the skill of throwing in the player.

Bucher² opines that "physical fitness includes more than muscular strength." He further enunciates that "physical fitness implies soundness of body organs such as the heart and lungs, a human mechanism that performs efficiently under exercise or work conditions (......), and a reasonable measure of skill in the performance of selected physical activities." In describing individual physical fitness, it is not merely the strength factor, but something more has to be accounted for.

To summarise, physical fitness tends to be defined by the contemporary advancements in skills imparted to the individuals, with insights towards probable future trends. Mathews, in a broad sense, elaborates on physical fitness as the "capacity of an individual to perform given physical tasks involving muscular effort." Troester Jr., states that "physical fitness includes those qualities which will permit an individual to perform life activities involving speed, strength, agility, power and endurance and to engage in various kinds of physical activities required of modern-day living including sports and athletics, and to be able to maintain optimum amount of fitness for the individual involved." Uppal defines physical fitness as "the capacity to carry out reasonably well various forms of physical activities without being unduly tired and includes qualities important to the individual's health and well being."

Hunter elaborately defines physical fitness as "work capacity, the total functional capacity to perform some specified

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task requiring muscular effort; considers the individual involved, task to be performed, quality and intensity of effort; one aspect of total fitness; involves sound organic development, motor skill, and the capacity to perform physical work with biological efficiency." Such insights of the time, provide material for the evolution of discipline. Physical fitness is in effect, the involvement of muscular movement or a series of movements in co-ordination with the cardio-respiratory system of an individual to perform any kind of task. Such performance is also governed by numerous inherent determinants. Such inherent determinants, on being isolated at various times, provide for the growth of the discipline of physical fitness, consequent to which the performance of an individual is deemed to be enhanced and appreciated.

Physical fitness tends to vary from one individual to another. Apparently, it varies in accordance with the nature of a person, depending on whether he is sedentary or dynamic. As we see individual differences in characteristics of psychological studies, a similar evaluation could be said to hold good with respect to physical fitness also. There may be some generalised facts of individual fitness in a group, but each individual will differ in some or the other way as far as physical fitness is concerned. For example, strength is a common factor in every one, the level of strength one possesses is of the specific quality of an individual.
Barrow and McGee define evaluation as "the art of judgement scientifically applied to some trait, quality, or characteristic in the universe according to some predetermined standards." Johnson and Nelson precisely define evaluation as "the process of giving meaning to measurement by judging it against some standard." Tests are instrumental and are techniques in teaching and learning processes involved, in objectively classifying heterogenous traits of students, and in knowing the necessities and latunae of the students, evaluation of instruction and programme, and grading of pupils etc.

Mathews opines that the "measurement of strength, power and speed are simple and direct, often yeilding more reliable results than measurements involving personality, intelligence and attitudes." Thus objective assessment of physical fitness through physical variables is possible; and the subtlety educational balance, the concept of organism and individual needs are factors involved in measurement and quantification.

In the academic spectrum of physical education, the impetus

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given by the enormous researches carried out in the United States of America is significant. Physical education involved pioneering studies on Anthropometric measurements and an excellent weightage placed on strength tests since 1988. Mention should be made of the pioneering work of C.H. McCloy at the University of Iowa (see Barrow and McGee)\(^{10}\) wherein he developed achievement test scales. Other eminent personalities like D.A. Sargent, F.R. Rogers, David Brace, H.H. Clarke, etc. have contributed significantly in the field of measurement.

The construction and standardisation of physical fitness test batteries started around 1940 and to date such studies are going on. The use of factor analysis as a research technique provided ample opportunities for the growth of knowledge in the field of measurement, specially with respect to physical fitness. Hebbelinck\(^{11}\) identifies factor analytic approach as a mode "to create a precise and systematic order among a great number of variables, classifying certain similarities and differences according to a logical mathematical rational." He further enunciate that "factor analysis is the logical outgrowth of the testing method and can be applied in fields where concepts composed of many elements are used and where the experimental


method cannot be readily applied because of complex nature of the concept."

Physical fitness differs from one area to the other. Reported studies reveal that transcontinental physical fitness level of school children differ significantly. The physical fitness of north Indians may differ from that of the south Indians. Physical fitness of physical education majors may be superior to that of non-major students. Physical fitness may depend on the nature of work to be performed. It may be health related, in the form of maintaining our physical well being and being free from diseases; it may be dance related, to attain optimum grace in dancing; it may be sports related, to win laurels; it may be office work related, to carryout office work efficiently; and, so on. Physical fitness is a comprehensive phenomenon, which can be precisely defined or identified with reference to a pertinent group or aspect, rather than in general terms.

The environmental conditions, nutritional set-up, topography, heridity, living style, etc. may influence individual's physical fitness. People living at high altitudes may differ in their fitness when compared to people living in low altitudes. Different climatic conditions may affect physical performances. Food habits certainly act upon individual's fitness. Likewise numerous other factors may also influence physical fitness.

The institutional set-up in India plays an important role in
identifying the probable nature of the physical fitness level of our school going children. Some schools have no play fields, some do not have facilities, some schools are confined only to classroom teaching because of inadequate space, etc. Majority of the institutions fail to provide minimum facilities for the pupils as far as sports and games are concerned. Even physical education teachers are not appointed in many schools.

Many physical fitness test batteries for various levels including men and women, boys and girls, children, etc. have been reported by Americans. Very few studies were reported in India pertinent to construction of specific physical fitness test for particular games. Keeping these facts in view, the construction of physical fitness test for high school boys to our standard and the setting up norms in grading the physical fitness level of high school students is deemed very necessary. Such a study has not yet been reported in India. Hence the researcher finds it necessary to take up the present study.

Statement of the Problem

The purpose of this study was to construct and standardize a physical fitness test battery for high school boys.

Delimitation

The study was confined to the high school boys of the age group of 13 to 15 years from Dakshina Kannada District, Karnataka, India.
Constraints

1. The climatic conditions, students' behavior, their physical capacity and their health conditions, etc. while administering the test items were beyond the control of the investigator and hence were considered as a limitation in this study.

2. Proper care has been taken to use the available standard equipments. The instrumental errors may also be a limitation for this study, but consistent calibration has been attempted.

Hypothesis

It is hypothesised that the test constructed will stand the criteria of scientific authenticity, administration feasibility and educational application and will help in assessing the physical fitness of high school boys.

The Definition and Explanation of Terms

Physical Fitness

The definitions given by Bucher,\textsuperscript{12} Mathews,\textsuperscript{13} Hunter,\textsuperscript{14} etc. are

\textsuperscript{12}Bucher, Foundations of Physical Education, p.298.

\textsuperscript{13}Mathews, Measurement in Physical Education, p.5.

\textsuperscript{14}Hunter, A Practical Approach to Measurement in Physical Education, pp. 573-75.
already cited in the introduction. The most appropriate
definition would be of Clarke and Clarke\textsuperscript{15} who define physical
fitness as the "ability to carry out daily tasks with vigour and
alertness, without undue fatigue, and with ample energy to engage
in leisure pursuits and to meet emergency situation." Physical
fitness pertinent to this study would be the performance of high
school boys on different test items.

Muscular Strength

Barrow and McGee\textsuperscript{16} define muscular strength as the "capacity
of the individual to exert muscular force."

Mathew,\textsuperscript{17} defines it as the "force that a muscle or group of
muscles can exert against a resistance in one maximum effort."

The most suitable definition would be Basco and Gustafson\textsuperscript{18}
in, according to whom "strength is the muscular force utilized in
creation or prevention of movement."

\textsuperscript{15}Harrison H. Clarke and David H. Clarke, Application of
\textsuperscript{16}Barrow and McGee, A Practical Approach to Measurement in
Physical Education, p. 112.
\textsuperscript{17}Mathews, Op. Cit., p.5.
\textsuperscript{18}James S. Basco and William F. Gustafson, Measurement and
Muscular Endurance

Mathews¹⁹ defines muscular endurance as the "ability of muscle to work against a moderate resistance for a long period of time."

Speed

Barrow and McGee²⁰ define speed as the "capacity of the individual to perform successive movements of the same pattern at a fast rate."

Agility

Barrow and McGee²¹ define agility as the "ability of the body or parts of the body to change directions rapidly and accurately."

Test

Barrow and McGee²² define test as a "tool of measurement for the collection of data, implying a response from the person being measured."

²¹ Ibid., p. 113.
²² Ibid.
Objectivity

Basco and Gustafson\textsuperscript{23} define objectivity as the "consistency of agreement among scores with respect to the quality or correctness of a performance."

Reliability

Basco and Gustafson\textsuperscript{24} define reliability as the "degree to which a test consistently measures and gives factor."

Validity

Basco and Gustafson\textsuperscript{25} define validity as "the estimate of the degree to which a test measures the factor or factors for which it was designed."

Norm

As defined by Mathews\textsuperscript{26} "a norm is a standard to which an obtained score may be compared."

\textsuperscript{23} Basco and Gustafson, Op.Cit., p.73.

\textsuperscript{24} Ibid., p.70.

\textsuperscript{25} Ibid.

\textsuperscript{26} Mathews, Measurement in Physical Education, p.29.
Significance of the Study

The study is deemed significant for the following reasons:

1. The study will provide effective tools for measuring the physical fitness of high school boys in India.
2. The teachers of physical education can make use of the test to evaluate their students as also their instruction patterns.
3. The test can be used by the coaches in order to know the physical capacity of a player while selecting potential competitors.
4. The study may help to find the relationship of age, weight and height with respect to the physical fitness of high school students.
5. The study may reveal the possible combinations of using multivariate analysis for further studies.
6. The Study may help in better understanding of the established test items.
7. Regional level standards of physical fitness of high school boys could be identified and standardised.
8. The study may throw new light on the field of measurement highlighting the need for and direction of further research.