TALENT IDENTIFICATION IN SPORTS: COMPUTERISED CRITERIA USING DERMATOGLYPHIC PATTERNS

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AN ABSTRACT

At present in India, the identification of talents in sports is performance oriented i.e. the talents are spotted on the basis of their performance in different motor qualities. The study of the trends of 40 dermatoglyphic variables of both the palms has generated some valuable information for the development of a new criterion for the identification of talents in sports. This criterion saves time, as well as the experimentation of the trial and error method on children. This computerized criterion can be used for classifying an individual into any of the three broadly classified sports like Track and Field, Swimming and Cycling.

Keywords : Dermatoglyphic Patterns, Athletes, Swimmers, Cyclists

Sport is a medium that can provide a sense of purpose, a sense of ongoing challenge, and a spectrum of emotions that are sometimes difficult to experience in other settings. (Chouhan & Tripathi, 2018). There are numerous opportunities for personal growth and for stretching to both physical and psychological limits of human potential (Orlick, 2016). The desire to do the personal best, to excel, to attain the highest standards of performance, to be supreme in one chosen field is a worthy human ambition which has led and can continue to lead to increased standards and personal growth(Schuler, 2000).

Normally, an individual begins participating in a sport without sufficient guidance. (Cook et al., 2006). It is therefore a remote possibility that one's sport of choice will match their inherent abilities (Manoj, 2014). The sporting arena has grown so competitive that talents in various games and sports must be found at a young age in order to provide them with highly specialized coaching.(Williams & Reilly, 2000).

In India, talent identification in sports is currently performance-oriented, which means that talents are identified based on their performance in motor abilities such as speed, back strength, explosive power, agility, cardio-vascular endurance, and shoulder strength. Aside from that, anthropometric characteristics such as height, weight, and foot length are considered. This method of identifying sports talents does not suit the various conditions that exist in India, such as climatic conditions, food habits, and so on. The majority of Indian children do not come forward for talent identification, resulting in the selection of only a few

children who perform better as a result of the practice they may have received due to the facilities they may have enjoyed in their neighborhood or due to the interest taken by their parents, who have the necessary socioeconomic background. These results in getting only children who are not sufficiently talented to the level of Asian or Olympic performance which had ultimately resulted in our failure to bring honors for India(Manoj, K. P., & Jacob, M.,2018).

Thus, the identification of talents in Sports would have to be based on scientific methods with which more children need be tested (Buekers et al., 2015). An impediment that had been preventing the idea of testing a much bigger population was a foolproof procedure or rather clear-cut norms based on specific criteria (Manoj, K. P., & Jacob, M.,2018).

Dermatoglyphics are the components of human traits, which remain unaltered after birth either by age or by environmental influences. Infact, these patterns are formed during the eight week of conception. Besides, dermtoglyphics are governed by the same biological laws, which determine inheritance or other characteristics whether structural, physiological or psychological. Hence, it is a well known fact that the genetic properties of a person in relation to certain qualities are reflected in dermatoglyphic patterns.

METHODOLOGY

The investigator has personally visited various national competitions, coaching camps of the selected sports. After explaining the purpose, significance of the study to the organizers, coaches and participants, the investigator, with their whole-hearted cooperation have taken the palm prints. The subjects in Track and Field were participants of the 3rd National Games at Pune in January 1994 and participants of the National coaching camp held at Netaji Subhas National Institute of Sports, Patiala in April 1993 and they included 40 Sprinters, 40 Jumpers, 40 Throwers and 40 Long Distance Runners. The subjects in swimming were participants of the 3rd National Games held at Pune in January 1994 and were 40 Sprint Swimmers and 40 Long Distance Swimmers. The subjects in cycling were 80 participants of the National Cycling Championship held at New Delhi in March 1993. Besides, 80 non –sportsmen (who has not undergone any training in sports) have also acted as subjects. Thus a total of 320 sportsmen and 80 non-sportsmen have acted as subjects for this study.

METHOD OF TAKING FINGER PRINTS

Firstly, the skin of the subject's palms was cleaned and dried before taking the print. Then a small danb of printer ink will be placed on a glass plate and spread into a thin layer with a roller. Then the stretched palm of the subject will be placed at once in such a manner, so that it will not move. The investigator then presses the palm eventually with a uniform pressure with a special care on finger tips, mounts and butts of the palm. After assuring that the ink has been uniformly spread, the palm will be placed on another sheet of plain paper with an uniform pressure applied by the investigator. The print will be then left to dry, for further investigation of the study.

DETAILED DESCRIPTION OF THE VARABLES

The forty dermatoglyphic variables selected for this study includes the following.

Loops, Arches and Whorls are the different patterns found on fingers. The total of each pattern from all the fingers are counted and added separately. Thus an individual's total of all patterns will range from one to ten, which may or may not consist of Arches, Loops and Whorls.

L1, L2, L3, L4, L5, R1, R2, R3, R4 and R5 are the Ridge Counts lying between the Triradial point and the point of core on the thumb, index finger, middle finger, ring finger and the little finger of the left palm and the right palm respectively and were measured in numbers.

LTPI and RTPI are the total number of pattern intensities lying in all the five fingers of the left and right palm respectively and are obtained by adding all the triradial points all the five fingers of the left and right palm respectively. TTPI(L+R) is the total pattern intensities of both the left and right palm combined.

LR /Sq Cms and RR/ Sq Cms are the ridge counts lying in one square centimeter on the radial side of the left and right palm respectively and where measured in numbers.

Latd and Ratd are the attained angle at "d" of the three inter- triradial points "a" "d" and t'' of the left palm and right palm respectively and is measured in degrees.

The inter-triradial distance are measured from the five Triradial points of right and left palm separately. the distance between the inter triradial "a" and "b" of the left and right palm were measured as Lab and Rab respectively by using a scale. All the other inter-triradial distance connecting the triradial "a", "b", "c", "d" and "t" were also measured in the same manner. Thus, the following inter-triradial distance variables are measured in centimeter Lab, Lac, Lad, Lat, Lbc, Lbd, Lbt, Lcd, Lct, Ldt, Rab, Rac, Rad, Rat, Rbc, Rbd, Rbt, Rcd, Rct and Rdt.
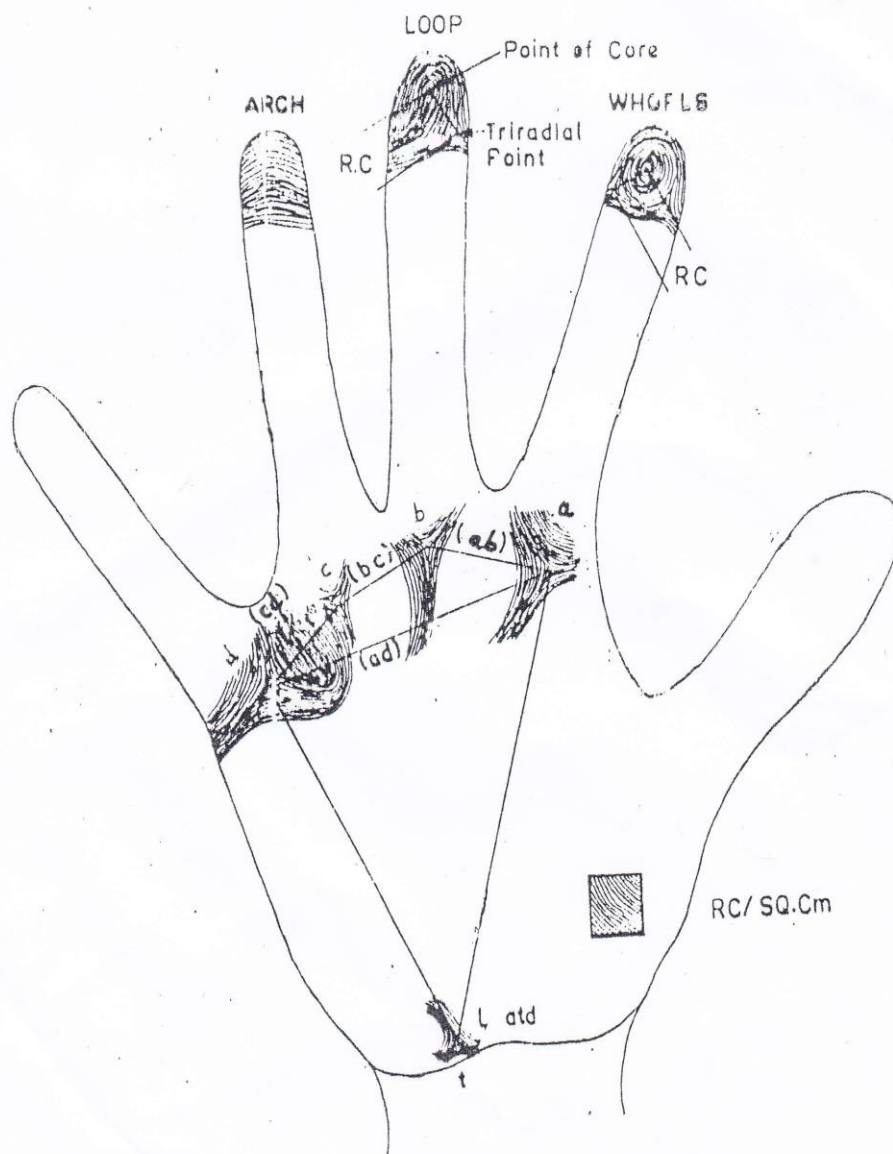
Fig. 2 : FIGURE ON THE RIDGE PATTERNS, POINT OF CORE, TRI RADIAL POINT, RIDGE COUNT/ Sq.Cm. AND atd ANGLE.

STATISTICAL PROCEDURE

Various descriptive statistics like the lowest and highest scores, kurtosis, skewness, mean, standard deviation, Standard error and co-efficient of variation were calculated for each group of all the three selected sports. This have given an idea about the distribution of the variables.

Analysis of variance was used to investigate the relationship between various sports and digit patterns.

Factor Analysis was done to investigate the dominant factors of dermatoglyphic variables in different sports, for which the principal component analysis method was used and final solution was obtained by the Varimax Rotation Method.

Discriminant Analysis was done to develop the criteria for classifying an individual into any of the three sports on the basis of significant dermatoglyphic variables having high discriminating powers.

ADVANTAGES OF USING THIS COMPUTERIZED PACKAGE

(1) Needs little time for testing an individual and hence mass testing can be done in schools.

(2) Needs little or no training for personnel for testing.

(3) Needs less expenditure for testing as no costly equipment are required.

THE WORKING OF THE COMPUTERISED CRITERIA

The study done on 160 Track & Field athletes, 80 swimmers and 80 cyclists of National and International standards has yielded some interesting results and has enabled to discriminate certain dermatoglyphic variables, which were prominent in various groups of the selected sports. From among the trends of 40 dermatoglyphic variables of both the palm, more information has been retrieved for the development of a new criteria for the identification of talents in sports. This criterion saves time as well as the experimentation of the trial and error method on children.

The package for classifying into Track and Field, Swimming and Cycling was developed in COBOL language. The computerized criteria use both temporary and permanent variables. Temporary variables are those which changes after 18 years of age. As a matter of fact, these variables cannot be used in the computerized criteria for the selection of talents among children below 18 years of age. While permanent variables are those which remains constant from birth to death. On the other hand, all the permanent and temporary (Inter triradial distance variables)can be used for advising a prospective sportsman of age above 18 years about his potentials into any of the three broadly classified sports.

The computerized criteria have multi stage procedure. Firstly, an individual will be directed into any of the three sports namely track and field, swimming or cycling based on 8 permanent variables namely L2, L4, L5, R5, LTRC, RTRC, Whorl and Arch, if the age of the subject is below 18 years. On the other hand, if the age of the subject is above 18 years, the computerized criteria is developed on 12 variables which includes 8 permanent variables and they are L2, L4, L5, R5, LTRC, RTRC, Whorl, Arch, Lbc, Lct, Lbd and Rad.

Later the classification of subjects below 18 years and coming under the Track and Field category into sprint running, long distance running, throwing or jumping, 8 age constant variables will be used and they are L5, R4, Whorl, Latd, Ratd, LTPI, RTPI and TTPI (L+R). At the same time, if the subject's age is above 18 years, apart from the 8 permanent variables and 19 Temporary Variables (inter- triradial distance variables) will also be used, thereby taking the total number of variables to 27 and they are L5, R4, Whorl, Latd, Ratd, LTPI, RTPI and TTPI (L+R), Lab, Lac, Lad, Lat, Lbc, Lbd, Lbt, Lcd, Lct, Ldt, Rab, Rac, Rad, Rat, Rbd, Rbt, Rcd, Rct and Rdt.

If the subject is assessed into swimming, the computerized criteria enables an individual to be guided into sprint swimming or long distance swimming on the basis of a single dermatoglyphic variable, LR/Sq.cm., irrespective of the age of the subject. Besides, as cycling is not classified, the prospective talent if identified will be directed into cycling.

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