METHODOLOGICAL FUNDAMENTALS RELATED TO TECHNIQUES OF TALENT SELECTION

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Abstract:

The development of motor abilities underlies achievement of top performances. One of the important conditions is the ability of sports experts to transfer a great deal of acquired knowledge into training practice and to accept progressive approach represented by terminological, content and interpretation innovations. A key stage is the domain of talent selection and the prospects of upcoming phases of sports participation. Acquired knowledge is becoming a part of experimental plans, which are the subject for innovating approaches to educational methodology. This enables to associate biological specificities as a relevant part of sports skill development with the existence of progressive, proportional, or disproportional development of physical qualities.

INTRODUCTION

With regard to the issue of sport talent, it should be noted that no athlete has ever achieved top level of performance only by training itself since training commencement until retirement from sport. Application and regular use of such potential is ensured by experts in different levels of long-term sports preparation. The more precise the process of *selection and orientation*, the higher the sports performance level and the more stable sports performance characteristics are going to be. During acquisition stage, these processes based on the use of continuous experience assist in formulating foundations of initial sports orientation of children. The issue of initial sports orientation and sport selection has become an independent scientific subject. Over a 30-year period, *Guba* [2], together with other experts, progressively conducted an extensive research (1978-2007). The research also included a 16-year longitudinal study dealing with the selection of children having talent for team sports and with the selection of parameters necessary for the selection and participation in regular sports training. Partial findings on the prediction of anthropometric parameters of physically mature children in a particular stage were continuously verified. The approach to sports skills acquisition and initial orientation is partially uses the knowledge from the field of adapted physical education. The context of early sports specialization confirms the need to define the sport-specific **"dominant type of harmony"** *(morphological, functional, biomechanical, psychomotor parameters)*. This adopted approach has formed a methodological foundation for applying the technology of research and practical procedures. Findings determined by the application of the system based on educational, biomechanical and constitutional technologies, showed high degree of effectiveness of morphobiomechanical approach resulting in specification of adequate requirements *(selection of the type and volume of exercise)* for a particular athlete [1].

MATERIAL AND METHODS

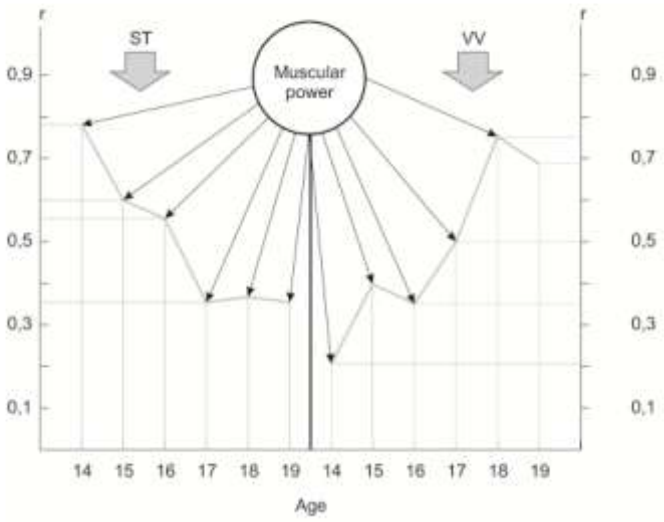
For the purposes of practical sports participation, two technologies used to evaluate both children's talents for sports and motor preconditions have been applied [2]. The first approach is characterized by a non-complex analysis of sports talent. In such cases, a principle of further specialization is applied. Research evidence and sports practice have confirmed higher frequency of negative results. This approach to initial orientation in training is a consequence of accelerated improvement in sports performance in a variety of age categories of young children. These negative effects result in stagnation and absence of progression, which frequently causes retirement from sport. The application of the second type of technology during the initial training stage recommends participation in multiple sports. In this case, sports orientation should begin by selecting all-round young athletes who exhibit talent for sports. Such approach is applied in the principle of "wider specialization", which precedes post-stage assessment of initial preconditions characteristic for particular sports. This procedure has direct effect on the correction of errors present in the selection of sports specialization by enabling to avoid "redundant children" during the stage of initial sports orientation. Within a 30-year period, *Guba* [2], conducted continuous measurements in 10 to 13 years old children (8,600 students, 1,569 athletes participating in 32 sports). Processing of numerical data was based on the selection of talented children playing especially team sports. A key element underlying children's participation in regular sports training is the results related to prediction of the development of anthropometric parameters. Procedure applied during the primary assessment process based on 4 body dimensions: ***body mass, body height, chest girth and head girth*** was found to be effective. Collected data enable to assess the proportionality of morphological parameters. The assessment of anthropometric parameters follows a variety of existing standards. Practically in all developed countries, a percentile method is used for individual assessment of somatic development. This method is based on evidence that all variants of a studied parameter are distributed according to classes ranging from minimal to maximal values through mathematical procedure dividing the scale to 100 equal parts. Columns of percentile tables present values enabling to assign children according to age and gender into respective groups. The scale used makes use of the following percentiles ***3; 5; 10; 25; 50; 75; 90; 95; 97 %.*** Somatic development is most frequently controlled using two types of percentile standards:

- univariate percentile scales *(the distribution of observations according to age and gender).*
- graphical illustration using nomograms *(the ratio of body mass distribution to body height).*

Every observation is classified at three levels *(sections)* of somatic development: *average, below-average and above-average*. The applied procedure is determined by a middle numerical value of a set of observations *(median)* and mean square deviation. The parameters studied higher than the average morphological profile may be associated with a prospectively high degree of somatic development.

RESULTS AND DISCUSSION

Correlation coefficient confirmed that correlation coefficients for somatotypes and development variants reached almost absolute values ranging from 95 - 99%.



Note: ST – somatotypes, **DV** – development variant

Fig. 1 Values of correlation coefficients: muscular power, somatotypes and development variants

Experimental findings have confirmed that sports performances of children aged 10 to 13 years participating in cyclic sports are by 80% determined by biological development. The conclusions from analogous testing in sports games point to "errors" made during initial orientation and to its biomechanical inconsistency in particular sports disciplines (see Table 1).

Tab. 1 Dynamics of "redundancy" in game sports [1]

Sport	**AGE CATEGORY *(years)***					**National team members**
	10	**12**	**15**	**18**	**21**	
Soccer	100	31.6	44.9	76.5	85.7	12
Volleyball	100	20.4	51.0	63.2	82.7	14
Basketball	100	23.6	58.8	58.8	89.8	9
Ice hockey	100	12.6	31.7	67.2	85.0	4
Handball	100	21.6	50.2	74.6	92.8	6

The distribution according to the variability level showed that children with MeS *(mesosomatic)* are most skilled in movement execution. Such children demonstrate high level of multi-limb (upper and lower body) coordination. Differences in research have confirmed that motor coordination of preschoolers is primarily determined by body shape variability rather than by development variant.

To study children exhibiting specific rates of biological development in particular age groups constants (percentage of children at initial and final stage of somatic development) were computed according to [1]. The follow-up analysis included age-specific indicators at the level of ***25 – 50 – 75 %.*** Proportional somatic development is determined by maximal difference between percentile scale ranges following measurement of body height, body mass, chest girth and head girth:

- ***0 – 2 harmonius development.***
- ***3 disharmonious development.***
- ***4 – 7 accelerated and disharmonious development.***

If the numerical difference between percentile intervals for any two indicators is less than 1, somatic development is considered to be proportional. In case the numerical difference exceeds 2, there is a disproportional trend and values higher than 3 indicate accelerated, disharmonious, or heterogeneous development. Table 2 presents an example of evaluation and comparison between samples for body height – Russian federation and young ice hockey players of HC Košice [3]; [4]. To make data interpretation clear, the first evaluation interval was determined at ***6 years of age*** and the second one at ***16 years of age***. The comparison showed diametrically different values as indicated by 10 year difference. Most probably, high number of participants included in the Russian sample may have minimized internal selection.

Tab. 2 Example of use: *(body height and body mass)*

<table>
<tr><td>AGE:</td><td colspan="6">6</td><td colspan="6">16</td></tr>
<tr><td></td><td colspan="12">BODY HEIGHT</td></tr>
<tr><td>PERCENTILE:</td><td colspan="2">25%</td><td colspan="2">50%</td><td colspan="2">75%</td><td colspan="2">25%</td><td colspan="2">50%</td><td colspan="2">75%</td></tr>
<tr><td>Russian federation</td><td colspan="2">110.9</td><td colspan="2">115.0</td><td colspan="2">118.7</td><td colspan="2">166.8</td><td colspan="2">173.2</td><td colspan="2">177.8</td></tr>
<tr><td>HC Košice</td><td colspan="2">115.3</td><td colspan="2">117.0</td><td colspan="2">120.3</td><td colspan="2">176.3</td><td colspan="2">177.0</td><td colspan="2">178.8</td></tr>
<tr><td>Difference</td><td colspan="12"></td></tr>
<tr><td>Russian federation</td><td colspan="3">4.1</td><td colspan="3">3.7</td><td colspan="3">6.4</td><td colspan="3">4.6</td></tr>
<tr><td>HC Košice</td><td colspan="3">1.7</td><td colspan="3">2.7</td><td colspan="3">0.7</td><td colspan="3">1.2</td></tr>
<tr><td></td><td colspan="12">BODY MASS</td></tr>
<tr><td>Russian federation</td><td colspan="2">18.8</td><td colspan="2">20.4</td><td colspan="2">22.6</td><td colspan="2">54.0</td><td colspan="2">61.0</td><td colspan="2">69.6</td></tr>
<tr><td>HC Košice</td><td colspan="2">21.0</td><td colspan="2">21.1</td><td colspan="2">23.3</td><td colspan="2">62.4</td><td colspan="2">66.0</td><td colspan="2">70.8</td></tr>
<tr><td>Difference</td><td colspan="12"></td></tr>
<tr><td>Russian federation</td><td colspan="3">1.6</td><td colspan="3">2.2</td><td colspan="3">7.0</td><td colspan="3">8.6</td></tr>
<tr><td>HC Košice</td><td colspan="3">0.1</td><td colspan="3">2.2</td><td colspan="3">3.6</td><td colspan="3">4.8</td></tr>
</table>

CONCLUSIONS

Every sport is characterized by a “black box” containing more stable or less stable characteristics usable when predicting potential results. Among basic characteristics of individual qualities of athletes’ organisms are anthropomorphological parameters, which determine endurance, strength, speed, flexibility and adaptation to various states of external environments. These characteristics also have effect on work capacity, recovery and competition results. The control over anthropomorphological parameters allows for continuous monitoring of somatic development and intra-individual planning of training load with the possibility of recommending novice athletes a specific type of sport. The application of this method enables to monitor gains in body mass, body weight, chest girth and head girth together with sport-specific volume and intensity. The method contributes to the simplification of diagnostic procedures used in training and to the removal of coaches’ aversion to fictional interference into the training process.

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