

Talent Selection for Present Conception of Women Sports Gymnastics and Practical Verification of the Test Battery

G. Bago, P. Hedbávný, M. Kalichová

Abstract—The aim of the contribution is to project and consequently verify a testing battery which in practice would facilitate the selection of talented gymnasts for current concept of men's gymnastics. Based on study of professional literature a test array consisting of three parts projected – power testing, speed testing and flexibility testing – was projected. The evaluating scales used in the tests are standardized. This test array was applied to girls aged 6 - 7 during recruitment for Sokol Brno I. and SG Pelhrimov Gymnastic Club. After 6 months of training activity the projected set of tests was applied again. The results were evaluated through observation and questionnaire and they were consequently transformed into charts. Recommendation for practice was proposed based on these results.

Keywords—Talent selection, sports gymnastics, power testing, speed testing, flexibility testing.

I. INTRODUCTION

EVERY sport gymnastics club should pay a great attention to talent discovery, as early discovery and systematic development of sport talent is a prerequisite for future success on a sport scene. For this reason, sport clubs should not change trainers just after an unsuccessful season, but let a certified coach work systematically to search for and develop a sportsman's talent.

A lot of theoretical knowledge and practical skills are involved in creation of a test battery used for discovering sport talent in women sport gymnastics. In this role of a coach is crucial, as he should apply the battery at least twice a year and children aged less than 12 should be tested every year. If the test results are filed regularly, considerable changes occur which may influence a view on every individual and future work with him.

Definitely, it is impossible to find talent after one measurement or observation. A coach's trained eye might be useful, however, the main criteria for selection always is a complex of psychomotoric skills which change during development.

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The aim of the selection is to find an individual showing a long-term high performance in this sport branch. The demands on individual in branch of sports gymnastics are very high, from somatic, physical or psychological point of view; therefore it is not easy to discover such talent.

II. PROBLEM

A. Basic Aspects of Theory of Sport Talent Selection

Sport preparation is a long-lasting process in which the fundaments for later performance are created as early as a child starts to go to school. Therefore it is advisable that the prospects (or talent) of an individual was discovered as soon as possible [1].

Talent is understood as a complex of prerequisites covering demands on a sportsman who is to achieve a high level of sport performance. An individual tries to more or less reach the demands, according to what level he fulfills them, and we talk about level of talent [2].

Creation and origin of talent is determined by genetics (conditionality, determinacy). It lies in a fact that talent is based on inborn predispositions, which are genetically determined by a complex of all skills – genotype [3].

B. Talent in Sports Gymnastics

Talent selection in sport gymnastics represents an important part of a training process. The number of physically and mentally talented individuals who have natural preconditions for reaching the required performance is decreasing due to constantly increasing demands on the content of gymnastic routine, high difficulty of exercises as well as more precise technique of complicated gymnastic performances.

Coaches who work with precisely selected individuals are positively motivated by their performance growth, are more intensively incited to studying and thinking about their job. In this case a profession is not more only a job, but it becomes a hobby [4].

C. Professional Selection of Talent in Sport Gymnastics

Professional selection of talent in sport gymnastics is driven by tendency of affecting all crucial factors of talent, which means morphological and psychological. Professional selection has to be understood as a multilevel evaluation which starts the basic training phase and fits in it in terms of time.

D. Optimal Characteristics of a Woman Sport Gymnast Are:

- 1) Symmetric lighter body
- 2) Healthy and flexible spine
- 3) Range of movement in hip and shoulder joints

E. Characteristics of Functional Nature

Demands of functional nature on a woman in sport gymnastics:

- 1) Skilful
- 2) Fast
- 3) Strong
- 4) With good space orientation

F. Mental Characteristics

Sport gymnastics requires very good mental characteristics, such as:

- 1) Intelligence
- 2) Mental stamina, endurance
- 3) Discipline
- 4) Courage
- 5) Concentration (advertence)

Somato-functional and functional characteristics can be well identified using suitable tests, while the mental characteristics must be observed for longer period of time and must be assessed sensitively as there are huge behavioral differences among children.

G. Antropometric and Health Parameters

1. Prediction of Body Height

Girls = ((father's height x 0,923) + mother's height) / 2

[1]. Comparing the heights of Olympic women champions from past years we found out that the average height of a talented woman gymnast should be around 154cm. (Podkopajevová, Amanarová, Pattersonová, Liukinová, Douglasová, OH 1996 2000 2004 2008 2012) [5]

2. Typology of Women Sport Gymnasts

From gymnastic point of view, the somatotype is assessed in order to find out how proportional body composition will the tested individual have and whether he is suitable for this kind of sport.

3. Examination of Locomotion System, Static Postural Component

The locomotion system is examined during selection so that any health problems are discovered, mainly problems connected to bone deformities.

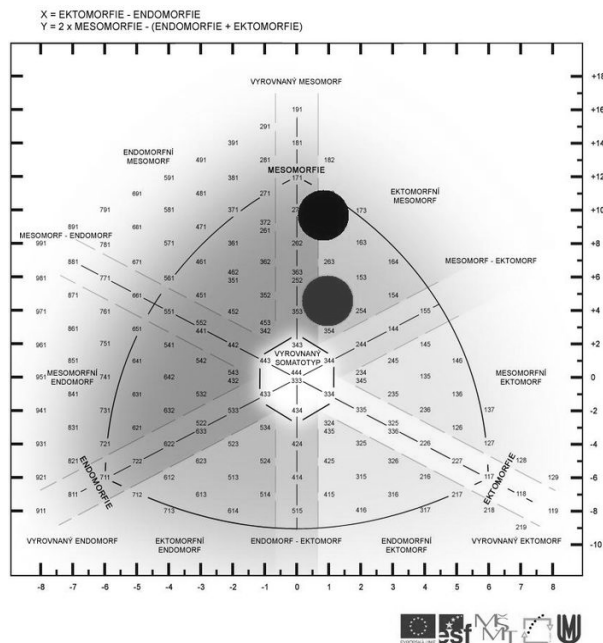


Fig. 1 Somatograph of women sport gymnasts (women in red, components around 2 – 4.8 – 2.8)

H. Functional Characteristics

This component characterizes mainly individual's movement characteristics involving abilities such as rhythm, strength, coordination, velocity and stamina which make up considerable part of talent.

1. Condition Abilities

By condition abilities we understand those abilities which are determined by energetic processes. Complex of these abilities consists of strength ability, stamina ability and very limitedly velocity ability [6].

2. Strength Abilities

Strength as a movement ability of an individual is a complex of inner prerequisites to create strength in physical sense, it is connected with muscle activity which can be called muscle strength [7].

3. Dynamic Strength

In all cases we talk about reaching certain speed or increase the speed of movement [7].

4. Explosive Strength

This ability shows during take-off phase [6].

5. Speed Abilities

Speed is an ability to do a movement act in the shortest possible time [6].

6. Stamina – Aerobic Sturdiness

Stamina is an ability to do long-term movement activities [8].

7. Movement Range in Joints (Flexibility)

Flexibility is one of the movement abilities which influence functional capacity of human locomotion system [8].

I. Mental Characteristics

1. Mental Development in Younger School Age

Every activity is perceived very sensitively, a child's perception of surroundings increases, is more courageous. Self-criticism to own actions is still low. Also, the time during which a child is able to fully concentrate is very short, it lasts usually 4-5 minutes, then attenuation and discursiveness occurs [9].

III. AIMS AND METHODS

The main aim of this project was to create a modern testing battery for talent selection in women sport gymnastics and its verification in practice.

A. Testing Battery

Measurement and somatotype assessment

- Endomorphic component
- Mezomorphic component
- Ectomorphic component

Tests of strength abilities in sport gymnastics

- Long jump from place – explosive strength of lower extremities
- Persistence in bent arm hang – dynamic strength of arms
- Persistence in half lever – static strength of muscles of lower extremities
- Repeated sit-lies – endurance strength of abdominal muscles

Tests of speed abilities

- Shuttle running – speed and handiness of an individual

Test of stamina

- Jacik's test – overall motoric test

Tests of flexibility

- Deep forward bend – spine flexion
- Bridge – range of extension deflection
- Forward split – range of movement of hip joints in frontal axis
- Side split - range of movement of hip joints in cross axis

B. Observation

Mental characteristics determining talent of a woman sport gymnast

- Intelligence
- Mental stamina, endurance
- Discipline
- Courage
- Concentration (advertence)

C. Description of a Tested Group

Testing battery is created so that it discovers talent in actual condition of an individual, disregarding the time of testing during a year, but the age limit must be observed. To test the testing battery a gymnastic sport club Sokol Brno I. and club SG Pelhřimov were selected. The tested group consists of girls born in 2007 who took part in enrollment in September 2012 and since then they prepare regularly in these clubs.

D. Organization of Testing Lesson

The first measurement was to find out the somato-functional characteristics of all girls. We measured their height, weight, size of skin fold and dimensions of certain body parts and noted them into the protocol no. 1. Then we took front and profile photographs of girls so that we could evaluate the body carriage after the lesson.

After the first part we moved to the second part of testing. Testing of functional (condition) characteristics was done in order in which the protocol no. 2 was created. The last part, discovering mental characteristics, was done in February and March during 12 training units. The report was done by a woman coach who noted the mental traits of girls into protocol no. 3.

IV. RESULTS AND DISCUSSION

A. Example of Results of the Complete Testing Battery Used in Practice

This extensive testing battery enables us to observe our wards not only from condition, but also from mental and health point of view. The battery consists of four parts. These parts include a questionnaire where we find out information about parents and predict the body height. From this information a future relation of a child towards sport can be predicted, and partly also the child's height.

TABLE I
ANTROPOMETRIC PARAMETERS – SOMATOGRAPH OF A GYMNAST

Date	12.2.2013	Testing	Bago Gustav		
ANTROPOMETRIC PARAMETERS					
Name	Linda	Height (cm)	109	Weight (kg)	19,7
Surname	Kuncak	Category	Prep	Year of birth	2007
		Height (cm)	Average ideal	meets/fails	
Prediction of height	156	149 - 160cm	YES		
Somatotype of talent			1.comp.	2.comp.	3.comp.
mezomorph.-ectomorph.			1,8 - 2,0	3,7 - 4,8	2,8 - 3,1
Somatotype of tested			1.comp.	2.comp.	3.comp.
mezomorph.-ektomorph.			1,05	4,04	2,5
Meets		Fails		Approaching the ideal value	
				Very close to the value	
Somatotype: (green - test record, red - assumption)					

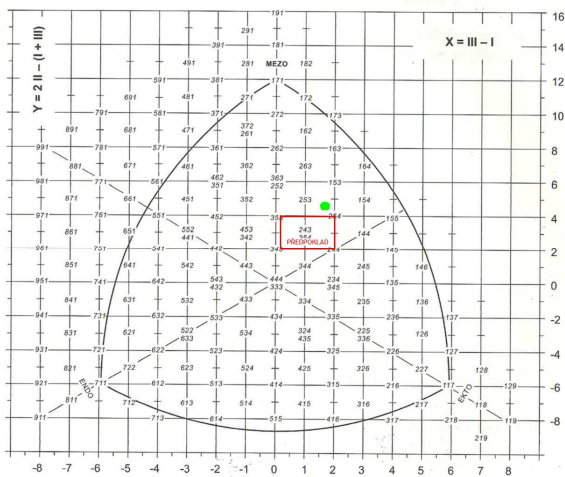


Fig. 2 Anthropometric parameters – somatograph of a gymnast



Fig. 3 Anthropometric parameters – figure of a gymnast a) front view, b) side view, c) performance of bridge

In next part we focused on evaluation of gymnast's body figure. The coach will be aware of his wards' physical proportions and predispositions. Here we talk mainly about body carriage and sportsman's somatotype.

The third part contains condition tests which are, in this case, a relative marker as these characteristics may be in this age by training quickly changed.

The last part of the battery is devoted to mental characteristics of an individual which are, in this development period, unstable. However, when we discover someone with suitable characteristics, it is very likely that future work with such individual will be very successful.

TABLE II
ANTROPOMETRIC PARAMETERS

Date of test	12.2.2013	Testing	Bago Gustav
ANTROPOMETRIC PARAMETERS			
Name	Linda	Year of birthday	2007
Surname	Kuncak	Category	Prep
Health evaluation	Points	Meets	
Head and neck holding	2	Yes	
Chest	1	Yes	
Abdomen and pelvis	1	Yes	
Back curve	1	Yes	
Posture in the frontal plane	2	Yes	
Lower limbs evaluation	2	Yes	
Total	9	With minor variations	

TABLE III
FUNCTIONAL CHARACTERISTICS OF A GYMNAST

Date of test	12.2.2013	Testing	Bago Gustav
FUNCTIONAL CHARACTERISTICS			
Name	Linda	Year of birth	2007
Surname	Kuncak	Category	Prep
Weight (kg)	19,7	Height(cm)	109
Strength abilities			
Name of the test	Performance	Points	Meets >3 points
Long jump from place	122 cm	3	YES
Persistence in bent arm hang	22,9 s	5	YES
Persistence in half lever	25,4 s	5	YES
Repeated sit-lies	39	5	YES
Strength abilities – total score	18		
Speed abilities			
Name of the test	Performance	Points	Meets >3 points
Shuttle running	17,3 s	3	YES
Stamina			
Name of the test	Performance	Points	Meets >3 points
Jacik's test	80	4	YES
Flexibility			
Name of the test	Performance	Points	Meets >3 points
Deep forward bend	10 cm	5	YES
Bridge	D	4	YES
Forward split	3 cm	5	YES
Side split	P 3 cm, L 5 cm	P 5, L5	YES
Flexibility – total score	24		
			Generally met
Total	49		YES

The evaluation tables and testing scales are individual for each exercise and were selected for females and age category (6-7). The research was done in two sport clubs, Sokol Brno I. which trains one of the most successful gymnasts in the Czech Republic, and in small average sport club SG Pelhřimov where the training loads and attitude is not at such professional level. Measurement, observations and evaluation was done with assistance of certified trainers.

TABLE IV
MENTAL CHARACTERISTICS OF A GYMNAST

Date of test	12. 2 – 5. 3. 2013		Testing	Bago Gustav
MENTAL CHARACTERISTICS				
Name	Linda		Year of birth	2007
Surname	Kuncak		Category	Prep
Weight (kg)	19,7		Height (cm)	109
Training unit number	Diligence	Concentration	Courage	Discipline
TU no.1	YES	YES	YES	YES
TU no.2	YES	NO	YES	YES
TU no.3	YES	YES	YES	YES
TU no.4	YES	YES	YES	YES
TU no.5	NO	YES	YES	YES
TU no.6	YES	NO	YES	NO
TU no.7	YES	YES	NO	YES
TU no.8	YES	YES	YES	YES
TU no.9	YES	YES	NO	NO
TU no.10	NO	YES	NO	YES
TU no.11	YES	YES	YES	YES
TU no.12	YES	NO	YES	YES
No of positive TU	10	9	9	10
Percentage of characteristics	83%	75%	75%	83%
Meets	YES	YES	YES	YES

An example of a tested girl – she fulfills the body height prediction, somatotype reaching the values, parents sports-minded, very likely having relationship to sport, good health condition, fulfilled the condition tests on a very high level, from psychological observations can be deduced that she is very talented, according to this testing battery she can be marked as a talent.

V. CONCLUSIONS

The aim of this paper was to suggest a testing battery for talent selection in women sport gymnastics and its verification in practice. After studying the special literature and based on practical experience of trainers a testing battery based on somatic, functional and mental characteristics which should be fulfilled by every professional gymnast was suggested.

Battery of condition tests and its evaluation corresponds to age group 6 – 7 years old. The functionality of the battery was verified in practice.

The testing was conducted in full extent of years 2007 in both sport clubs. The testing battery selected a talented individual in one case, by which its functionality was verified and simultaneously pointed out with which individual we should systematically work so that professional successes are achieved in this sport field.

The testing battery could help trainers who want to devote their time and experience to those who have the highest expectation to become successful. However, in case of not talented individual, the aim is not to exclude him from the club, but demands laid on such individuals should not be so high, he may reinforce only for his own personal sport feeling.

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