FORECAST MODEL TO OPTIMIZE THE PREPARATION ON BALANCE BEAM

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Summary

The selection in a multi-year aspect is an indelible part of the scientifically grounded organization and management of the preparation of the sports reserve (Nikitushkin, 2009; Rosin, 2007; Dimitrova, 2014). It is based on the comprehensive study and characterization of athletes' athletic abilities and creating of possible most realistic forecasting models (Sivash, 2012; Chernuhina, 2004). The purpose of our research is to create a competitive model of the balance beam for our best gymnast in girls. To achieve the goal, we have produced model features of elite athletes in Europe for the surveyed age in 2015-2017, based on their participation and presentation at major competitions during this period. On the basis of the discovered parameters with the testing method and the analyzed stage of our gymnast training, we have prepared an individual optimized predictive model for the balance beam. The research showed that the actual achievement of the desired level of technical preparedness requires a change in the planned load in the different countries of the sports training. The comparative analysis identified the weak points in our contestant's subtitle. This allowed the development of new realistically achievable parameters of the forecasting model and a new corrected preparation plan.

Key words: technique, difficulty, model characteristic

Introduction

The selection in a multi-year aspect is an indelible part of the scientifically grounded organization and management of the preparation of the sports reserve (Nikitushkin, 2009; Rosin, 2007; Dimitrova, 2014). It is based on comprehensive study and characterization of athletes' athletic abilities and the forming of possible most realistic forecasting models (Sivash, 2012; Chernuhina, 2004).

The comparative analysis of the difficulty of the routines of the Bulgarian national competitors and the world elite from OG'2012 in London (Dimitrova, 2015) showed that the exercises they have mastered and routines of different apparatuses, constructed according to their capabilities, are far from those of the best. This has led us to construct a competitive capable predictive model for an age group of women, of our gymnast who participated in the European Championship (EC) for juniors in 2016. The selection of this contestant had to be carried out according to the following criteria:

- Level of technical and physical preparation;
- Participation and ranking of international competitions;
- Psychological stability;
- Motivation and desire for victory.

The study showed that we do not have a complex competitor who meets our requirements. This led us to only one apparatus – the beam, where our representative would have been the best chance of success. In the process of multiannual preparation in artistic gymnastics increases the reliability and stability of performance of various gymnastic exercises, connection from them and competition routines (Smolevski, Gaverdovsky, 1999). The beam is a kind of gymnastic all around that symbolizes the accuracy and grace of the motion action on a small support area. Many authors point to this apparatus as a "checkpoint" for successful performance in various competitions (Dimitrova, 2002; Dondi, 2007).

Aim and Objectives of the study

The purpose of our research is to create a competitive model of the balance beam routine of for our best gymnast in junior, given its upcoming participation in women's competitions for 2018. In order to achieve this goal we have set the following tasks:

- To create model characteristics for the technical training of elite gymnasts in Europe for the test age in 2015-2017, based on their participation and presentation at major competitions during this period.
- To testing and analyze the physical and technical preparation of our gymnasts.
- To create an individual optimized forecast model for the apparatus beam

Methods

In our work, we used the methods of observation, testing, modeling and analysis. The subject of our study is the routines of the beam and the object are the exercises determining the technical difficulty. We have analyzed 36 beam routines of competitors from the world elite and in our country.

Results

We have analyzed the beam routines of the best competitors on this apparatus in 2015 and 2016, respectively – the European Youth Olympic Festival, 2015 (EYOF'2015) and the European championship for juniors – 2016 (EC'2016).

Table 1 Results of the C I – Qualifications on beam for juniors of the EYOF'2015

Ranking (place)	Name	Nationality	D-score (points)		E-score (points)		Final score (points)	
				Difference		Difference		Difference
1.	D. Skrypnik	RUS	5,80		8,500		14,300	
2.	A. Klinkaret	BEL	6,00	+ 0,20	8,300	- 0,200	14,300	0,000
3.	N. Derwael	BEL	5,60	- 0,20	8,400	- 0,100	14,000	- 0,300
4.	I.T.Crisan	ROU	5,90	+ 0,10	8,100	- 0,400	14,000	- 0,300
5.	Z. Kovacs	HUN	5,70	- 0,20	8,050	- 0,450	13,750	- 0,550
6.	M.R. Metheuen	GBR	5,30	- 0,50	8,400	- 0,100	13,700	- 0,600
7.	M. Maggio	ITA	5,60	- 0,20	8,050	- 0,450	13,650	- 0,650
8.	A. Iliankova	RUS	5,40	- 0,40	8,100	- 0,400	13,500	- 0,800
Average EYOF'2015			5,663		8,238		13,900	

Table 2 Results of the C I – Qualifications on beam for juniors of the EC'2016

Ranking (place)	Name	Nationality	D-score (points)		E-score (points)		Final score (points)	
				Difference		Difference		Difference
1.	A. Iliankova	RUS	5,80		8,483		14,283	
2.	E. Eremina	RUS	5,40	- 0,40	8,866	+ 0,383	14,266	- 0,017
3.	L. Charpy	FRA	5,70	- 0,10	8,475	- 0,008	14,175	- 0,055
4.	I.T.Crisan	ROU	6,00	+ 0,20	8,133	- 0,350	14,133	- 0,150
5.	P. Borzykh	GEO	6,00	+ 0,20	8,033	- 0,450	14,033	- 0,250
6.	A. Kinsella	GBR	5,60	- 0,20	8,400	- 0,083	14,000	- 0,283
7.	M.R. Metheuen	GBR	5,80	0,00	8,133	- 0,350	13,933	- 0,350
8.	H. Schaefer	GER	5,70	- 0,10	8,100	- 0,383	13,800	- 0,483
Average EC'2016			5,75		8,328		14,078	
52.	R. Ranchova	BUL	5,20	- 0,60	6,966	- 1,517	12,166	- 2,117

Table 1 and 2 show the results of the first eight of Competition I – Qualifications (C I). The model features of elite gymnasts from the C I, show that the difficulty score is within the range of 5.30 – 6.00 points and the average of the model is 5,663. The results are no different than these of the EC'2016. There, the average difficulty in routines is 5.75 points. This reveals the continuous growth in the level of technical readiness for excellence in gymnastics.

The difficulty score (D-score) of our competitor – 5.2 p. – comes close to the best, which shows us the potential of success. In the execution score (E-score), however, it is nearly two points lower than the aver-

age for the elite, which leads to a final score – 12.116 p. In Figure 1 shows the level of the Bulgarian participant in the EC'16 and the values of the model characteristics of the best for the studied competitions. The study showed that the actual achievement of the desired level of technical preparedness is possible given the difficulty, which has reached for the moment. Improving performance, in our opinion, is related to the level of the competitor's physical qualities. Therefore, to prepare the forecasting model we studied the level of physical and technical preparation during the transition to the age group - women. For this purpose, we analyzed the attestations for the national team in 2016-2017.

Figure 1 Average final score of the beam from Competition I – Qualifications of the eight finalists from EMOF'2015 and EC'2016 and the R.R. – BUL, participant of the EP'16

The analysis of the results of the national team attestation (Table 3) of our competitor identified the weak units in its preparation. The technical readiness of the beam (Table 4) has the largest contribution to the overall excellent score on this side of the sport preparation.

Table 3 Results in points, from conducted national team attestation junior – 06-07.02.2017

Name	Competition II -AA	category	Technical preparation	category	Physical preparation	category	Trampoline preparation	category	Total	category
R. R.	48.300	III	91	I	95	IV	3	II	237.300	III

Table 4 Results in points, from conducted national team attestation junior – Competition II – AA – 06-07.02.2017

Name													Total scoring
	D-score	E-score	Final score	D-score	E-score	Final score	D-score	E-score	Final score	D-score	E-score	Final score	
R. R.	4.00	8.60	12.600	1.90	8.00	9.900	5.50	7.80	13.300	4.60	7.90	12.500	48.300

Table 5 Results of R. R. from the attestation of technical preparation for a national team of girls – 07.02.2017

Apparatus																			Total scoring
Difficulty of the executed exercise	D	E	Total	D	E	Total	D		E		Total	D		E		Total			
							G	A	G	A		G	A	G	A				
Number of exercises	-	-	-	2	-	2	5	6	1	-	12	3	3	1	1	8	22		
Number of points	-	-	0	8	0	8	20	24	5	-	49	12	12	5	5	34	91		
							44		5		49	24		10					

Note: They are respected technically correctly executed exercises with difficulty D and more. Each vault with a value of 4.50 to 5.00 point by the Code of points – FIG is group D – 0.4 p.; E – 0.5 p. and etc. On the beam and floor ex. exercises can be gymnastic (G) and acrobatic (A).

Table 5* Evaluation table for level of technical preparation for national team – juniors.

Evaluation on technical preparation	excellent	very good	good	medium	poor
Number of points	more than 90	76 - 89	66 - 75	51 - 65	under 50

Table 6 Results of an attestation on physical preparation for national team juniors – 07.02.2017

Name	Physical preparation tests for national team junior															Total (points)
	Test № 1 20 m sprint race from standing start		Test № 2 High jump after jump from 50 cm height		Test № 3 flexibility in hip joints - with left / right leg, for- ward and sideways		Test № 4 Glide Kip to handstand		Test № 5 From straddle angular support force lifting to handstand		Test № 6 15 jumps, from lie on his back		Test № 7 hold in a handstand		Test № 8 climb rope in a straddle angular hang	
	sec	points	sm	points	degrees	points	number	points	number	points	sec	points	sec	points	sec	points
R.R.	3,31	0	48	15	163,5	34	11	35	2	5	31,58	6	10	0	0	95

Note: The maximum value for each test is 50 points, i.e. for 8 tests - the maximum is 400 points

Table 6* Evaluation table for level of physical preparation for national team – juniors.

Evaluation on physical preparation	excellent	very good	good	medium	poor
Number of points	321 – 400	241 – 320	161 – 240	81 – 160	1 – 80

The advantage absorption of acrobatic and gymnastic exercises on beam and floor exercises, with great difficulty (D and E) and the lack of such or extremely insufficient of the other two apparatuses – vault and uneven bars, reveal gaps or unilateralities in preparation (Table 5, 5*). This is due, according to us, to the level of physical training of the gymnast. Its physical fitness does not correspond to the high aspirations for realization. From a possible 400 points, it has only 95 (Table 6, 6*), which according to the rating scale gives her average grade at the physical preparation. The table shows that with a maximum of 50 test points, R.R. has a relatively good set of points 34-35 in just two tests - for flexibility and for force. That is why we consider one of the requirements for the gymnast's entry in the world elite is the better physical preparation, especially work for speed, force, explosive force and endurance.

The analysis of performance of routines in a competitive environment of our gymnast shows that she makes more mistakes on more responsible competitions. This reveals a lack of psychological stability in a more complex setting. We suppose that the ex-

istence of competition, poor physical training lead to greater uncertainty and implementation mistakes. Unlike these competitions, the presentation of state championships and national attestations of the apparatus beam in most cases is an indicator of stability, confidence and high technical level. This gives us reason to build a predictable model competing with the world's elite.

Discussion

According to the obtained results of the conducted study, we compiled a forecast model presented in Fig. The proposed beam's routine, consists of 17 exercises (Figure 2).

Figure 2 Composite Structure of the Projected Model of the routine of a beam for R. R. – BUL for 2018

Figure 3 Compositional structure of the beam routine of K. Ponor – ROU from the EC'2017 for women

According to the FIG rules, for difficulty are considered only 8 exercises (3 gymnastic and 3 acrobatic and 2 optional), usually those that have the highest value. The estimated difficulty is 3.2 points. In this way, the combination fulfills the composition requirement, which adds another 2.0 points and is represented possible connections from exercises of value – 0.8 points. Thus, the estimated D-score is 6.0 points. The model characteristic of the best gymnast of the beam for the period under consideration (Figure 3) gives us the parameters of the sought-after sporting perfection. The comparison of the two models shows that our competitor has a higher initial score of 0.1 point. The individual gifting of our gymnast to this model is an essential prerequisite for the success. Finally, we can draw the following conclusions:

- The individual forecasting model thus constructed by us is an objective consequence of the mastered volume of acrobatic and gymnastic exercises from R.R.

- The proposed compositional structure of the beam routine and suggested connections from exercises is actually achievable and competitive for the 2018 competitive year.

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