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Algorithm of competitive program's correction in acrobatic rock and roll

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Abstract

Introduction. Constantly increasing competition brings new challenges to athletes' training forcing them to master the world-class programs in a short time at a high-quality level and to demonstrate the stability and reliability of performance under competition conditions [4, 6, 13, 20]. Modern trends in acrobatic rock and roll are influenced by new rules and are associated with the increasing complexity of competitive programs, with finding new original elements and bringing technical skills of sports couples to virtuosity [7, 4, 14, 15]. The intensification of athletes' preparation, the development of their special physical qualities, and the improvement of their technical skills open up new potentials for elevating the success of competitive activity of qualified athletes in acrobatic rock and roll [16, 18, 19, 21]. Aim of Study. The study aimed to establish the relationship between the preparedness of skilled athletes and competitive structural components of the main class contact style (MCCS) program in acrobatic rock and roll, to develop and experimentally prove the algorithm of competitive programs' correction of qualified MCCS athletes in acrobatic rock and roll. Methods. Pedagogical methods of testing and mathematical statistics were used. The experimental part was attended by 16 qualified athletes (8 sports couples, sports category MCCS aged 14 to 21 years – girls, boys). Results. The relationship between the preparedness of skilled athletes and competitive structural components of the main class contact style program in acrobatic rock and roll highlighted 6 factors on which the correction algorithm of competitive programs was developed. Conclusions. The process of mastering the technical elements was determined, the objective conditions for the modeling of complex new elements and combinations were created, the strategy of forming technical skills of sports couples in main class contact style was developed, and the algorithm of correction of competitive programs that display the content of each block with the degree of its significance and sequence of a competitive program was proposed.

KEYWORDS: acrobatic rock and roll, main class contact style (MCCS), preparedness, competitive program, structural blocks, factor structure.

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Introduction

Constantly increasing competition in the international arena brings new challenges to athletes' training process. One of the priorities is to master the world-class programs and to demonstrate the stability and reliability of their performance in conditions of competition [2, 4, 17]. Acrobatic rock and roll is a sport in which there is an active search for optimal competition rules and, accordingly, methods of competitive activity in order to enhance the overall effectiveness of competitive programs and their spectacular's in general [3, 4, 25]. Modern trends in acrobatic rock and roll are associated with the increasing complexity of competitive programs, finding new original elements, and bringing technical skills of sports couples to virtuosity [4, 19, 26]. The mentioned tendencies are caused by the existing international rules of competitions in acrobatic rock and roll, which focus on the complexity of acrobatic elements and combinations that are performed by athletes, the technology of "basic step" performance,

as well as on increasing the number of dance figures included in the competitive program.

Thus, the need to intensify the training process, to improve the competition programs through the development of special physical qualities and improvement of technical skills is relevant to the chosen research topic and opens up new potentials for the increasing success of competitive activity of qualified main class contact style athletes in acrobatic rock-n-roll [12, 19, 21]. The works of authors [10, 13, 14, 20] revealed the features of the structure of competitive programs of qualified athletes, and this study focuses on the contradictions that exist in the assessment of acrobatic elements used in competitive programs of skilled athletes. It is also important to analyze the competitive activity of leading sports couples of the present time.

Based on the analysis of literature, survey data of qualified judges and coaches in acrobatic rock and roll, the most important directions of improvement of competitive programs in acrobatic rock and roll were highlighted [1, 8, 19]. It was found that the list of objective factors of structural elements' complexity groups in acrobatic rock and roll is a prerequisite for the development of an algorithm for constructing competitive programs, and it is necessary to consider the value of technical elements and preparedness of sports couple in order to execute them correctly and efficiently. The purpose of this study was to develop and experimentally prove the algorithm of competitive programs' correction of qualified MCCS athletes in acrobatic rock and roll. The objective of the study was to establish the relationship between the preparedness of qualified athletes and structural components of the competitive MCCS program in acrobatic rock and roll.

Material and Methods

To achieve the objectives, the following research methods were used: the pedagogical testing method and mathematical statistics. The study was conducted during the year 2019 based on acrobatic rock and roll sports clubs in Ukraine, including Kyiv city ("FARRK", "School of Filimonovs LIA") and Kharkiv city ("Grand", "Rapid"). The experimental part was attended by 16 qualified athletes (8 couples, sports category MCCS aged 14 to 21 years – girls and boys). Testing and evaluation of qualified main class contact style athletes were carried out using conventional and developed methods [11, 18, 22, 23]. The selection of tests was carried out based on the dominant motor mode of competitive exercise analysis and the specificity of acrobatic rock and roll, age characteristics of the tested athletes and the requirements of modern rules of competition, as well as on data of previously conducted researches in complex coordination sports (sports gymnastics, acrobatics, sports aerobics, figure skating, etc.). Given this, we have selected, developed, and used control exercises (15 tests). They are all justified and meet the requirements of the theory test standardization [4, 15].

The structural components of the competitive programs were determined by analyzing video materials of different level competitions and the electronic results scored by the independent experts in this sport [4]. Particular attention was paid to the parameters of the competitive program, its construction, means, and design's methods, taking into account the age characteristics and qualifications of athletes. In our experiment, first, we developed a block structure for the competitive program (6 blocks consisting of 2 content modules) and assigned 5 independent experts to score the performance of them (0 to 10 points).

The data obtained were statistically analyzed using the SPSS, XLSTAT programs [5, 12, 24]. Factor analysis was used as a data reduction method and as a classification method. This analysis helped to reduce the number of variables (data reduction), determine the structure of relationships between variables, and to reveal the structure of the competition program.

Results

A detailed study of qualified MCCS athletes' capabilities and values (points scored) of technical elements in the competitive program indicated a special relationship between levels of physical and technical preparedness of athletes, and performance quality (points scored) of structural components (blocks) and competitive programs' parameters. In total, factor analysis analyzed 10 indicators of special physical preparedness, 7 parameters of technical preparedness, 6 parameters of structural blocks, and 4 scoring components of competitive programs. To analyze the factor loadings, reliable correlation coefficients were used, each indicator with individual factors at $p < 0.05$. After applying mathematical processing to all research data of complex testing (27 testing tasks), there were 6 main factors, and their contribution to the general variance was 87.5% (Table 1).

Table 1 illustrates the relationship between athletes' preparedness and competitive structural components of MCCS program in acrobatic rock and roll, and the load factor, which was the base for the identification of blocks' load sequence in the competitive program.

Table 1. Factors that determine the competitive program of qualified main class contact style athletes in acrobatic rock and roll (n = 16; p < 0.05)

No.	Tests	Factors					
		1	2	3	4	5	6
	Scoring parameters of the competitive program						
T1	Elements of acrobatics, acrobatic combinations (points scored)	0.94*	0.92*	0.63#	0.38	0.41	0.35
T2	"Basic Step" (points scored)	0.44	0.76#	0.37	0.64#	0.39	0.72#
T3	Dancing figures (points scored)	0.58	0.29	0.43	0.31	0.22	0.33
T4	Choreography (points scored)	0.42	0.31	0.66#	0.27	0.45	0.51
	Special physical preparedness (solo, in a couple)						
T5	Two "Basic Steps" holding medical ball with both hands, position "Staff" throw and catch the ball for 30 seconds (number of times)	0.77#	0.84*	0.50	0.40	0.41	0.38
T6	Facing gymnastic wall to hold partner (woman) who is standing on the shoulders (seconds)	0.49	0.43	0.82*	0.40	0.77#	0.44
T7	Jump up, holding a partner sitting on the shoulders (number of times)	0.55	0.51	0.41	0.67#	0.43	0.63#
T8	Combination: back roll into a handstand, Kurbet, turn jump 360°, 540°, 720° (points)	0.71#	0.47	0.67#	0.73#	0.41	0.52
T9	Handstand near wall on the elevated surface with the run (tucked, picked, straight) (points)	0.49	0.51	0.38	0.75#	0.52	0.78#
T10	Hight jump for 30 seconds (number of times)	0.72#	0.84*	0.50	0.61#	0.57	0.52
T11	Facing partner, woman rolls back on the floor (both hands in contact), exits directly to the ice position into straight hands of the partner (number of times)	0.91*	0.48	0.52	0.63#	0.58	0.67#
T12	Two changes of places with basic step (R, L), spin (woman's solo) (points)	0.41	0.45	0.32	0.51	0.33	0.48
T13	Two front rolls in couple, roll to the left twice, roll to the right twice, two back rolls (hand (s) in contact) (points)	0.48	0.51	0.97*	0.62#	0.58	0.43
T14	Competitive program execution 2 times without rest (%)	0.28	0.37	0.79#	0.60#	0.88*	0.66#
	Technical preparedness						
T15	Basic step, change places (R turn), change places (L turn), acrobatic element of Group 1 (somersault element with rotation forward), basic step (points)	0.43	0.96*	0.57	0.64#	0.51	0.72#
T16	Basic step, change places (R turn), change places (L turn), acrobatic element of Group 2 (somersault element with rotation backwards), basic step (points)	0.98*	0.43	0.47	0.62#	0.54	0.48
T17	Basic step, change places R, change places L, acrobatic element of Group 3 (dive), basic step (points)	0.55	0.48	0.32	0.67#	0.59	0.78#
T18	Basic step, change places R, change places L, acrobatic element of Group 4 (rotation and its variations), basic step (points)	0.55	0.61#	0.97*	0.43	0.38	0.41
T19	Basic step, change places R, change places L, combination of acrobatic elements – Group 5 (main class contact style), basic step (points)	0.55	0.91*	0.87*	0.48	0.51	0.43
T20	Basic step, change places R, change places L, acrobatic element of Group 6 (other acrobatic elements), basic step (points)	0.52	0.42	0.38	0.66#	0.78#	0.62#
T21	Dance series (points)	0.77#	0.52	0.84*	0.42	0.48	0.57
	Structural blocks of the competitive program						
T22	I Block of competitive program (points)	0.53	0.94*	0.72#	0.51	0.63#	0.52
T23	II Block of competitive program (points)	0.51	0.47	0.52	0.61#	0.49	0.67#
T24	III Block of competitive program (points)	0.97*	0.64#	0.71#	0.55	0.68#	0.44

T25	IV Block of competitive program (points)	0.55	0.60#	0.59	0.79#	0.53	0.67#
T26	V Block of competitive program (points)	0.65#	0.55	0.88*	0.66#	0.52	0.49
T27	VI Block competitive program (points)	0.57	0.44	0.59	0.61#	0.69#	0.59
	Contribution to variance (%)	**21.14**	**18.38**	**15.22**	**13.04**	**10.75**	**8.82**

Note: T1-T27 – test task; # medium correlations; * high correlations

The share of the first factor, which is the III Block of the competitive program, has 21.14% of the total variance of the sample. It is characterized by a high load factor performance in tests: technical preparedness (TP) No. 15, No. 19; special physical preparedness (SPP) No. 10; scoring parameters of the competitive program (SPCP), test No. 1.

The second factor loads I Block of the competitive program and is characterized by high factor load of test results: TP No. 16, No. 21 and No. 19; SPP No. 11; SPCP, test No. 1 and is 18.38% of the total variance of the sample.

V Block of the competitive program determines the third factor, which is 15.22%. The most significant load factor for the third factor is characterized by the results of the TP tests No. 14, No. 18, No. 19, No. 21; SPP tests No. 6 and No. 8, and SPCP tests No. 1 and No. 4.

The fourth factor highlights IV Block, which is 13.04%. This factor is characterized by high load factor tests result of TP No. 17 and No. 20; SPP No. 7-9; parameters of SPCP test No. 2.

The fifth factor which is 10.75% of the total sample variance is VI Block. The most significant load factor is in the following parameters: TP No. 14 and No. 20; SPP No. 6; SPCP tests No. 3, No. 4.

The sixth factor is II Block, manifested as 8.82%, the parameters that give its characteristics: TP No. 15, No. 17, No. 20; SPP No. 9, No. 11; SPCP test No. 2; 12.65% are unidentified factors.

The factor structure of the preparedness of qualified athletes, model characteristics, and performance skills were analyzed. Based on the results of the factor structure of the competitive program, algorithm of correction of competitive program of main class contact style couples was compiled (Figure 1).

Based on the results of the research, the process of mastering elements' techniques was put in order, objective conditions for modeling of complex new

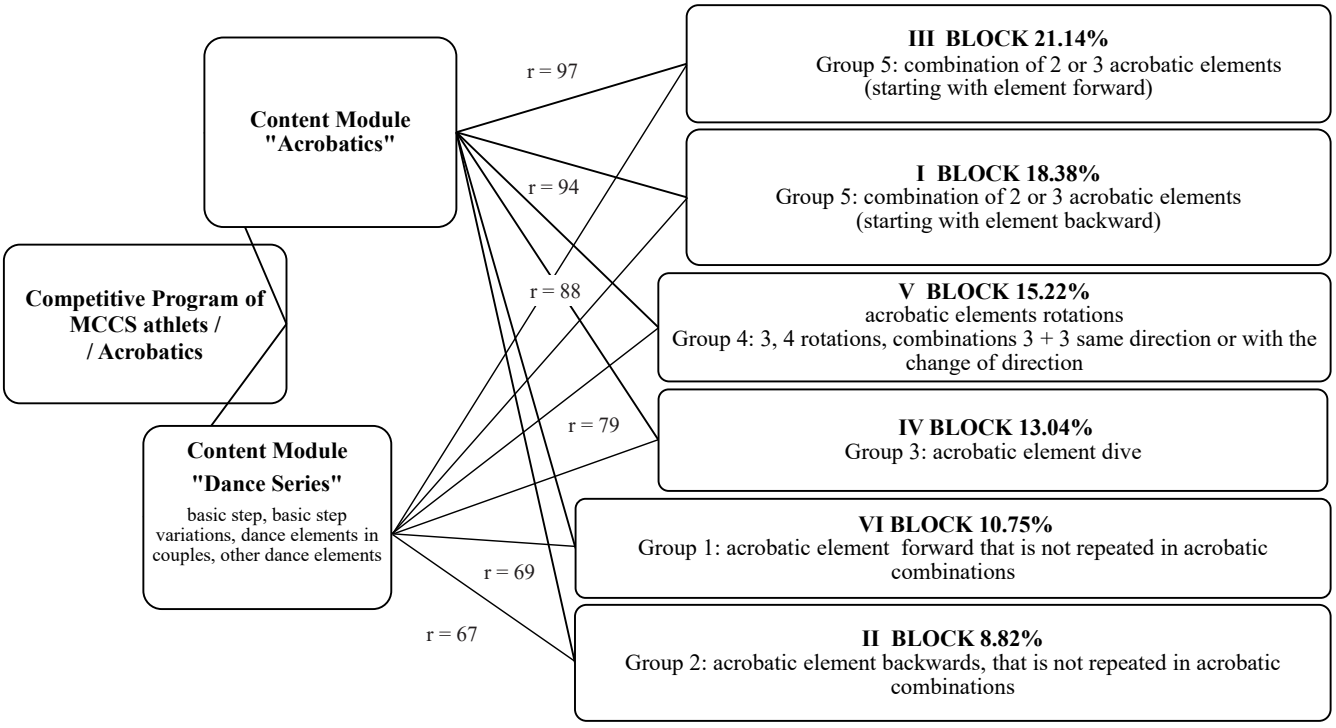

Figure 1. Algorithm of competitive program's correction in acrobatic rock and roll, MCCS

elements and combinations were created, and a strategy of forming technical mastery for main class contact style sports couples was created.

Discussion

Currently, there is insufficient scientific research in the field of an individual approach to the training process in acrobatic rock and roll and this study is the first in terms of developing an algorithm for the correction of competitive programs in acrobatic rock and roll. There are only a few theoretical, methodological and organizational foundations for combining the level of preparedness of a sports couple and an individual approach to the training process of acrobatic rock and roll athletes [13, 14], which is confirmed by our research. At the same time, some authors are engaged in research and development of different parameters of athletes' training [11, 20, 23] and they do not consider the process of improving competitive programs in terms of analyzing the special physical and technical preparedness of qualified athletes.

In our work, the process of constructing competitive programs is based on the results of the factor structure of the preparedness of each athlete and couple together. Therefore, the creation of an algorithm for the correction of competitive programs in acrobatic rock and roll is a new task, developed for the first time. Our study makes it possible to use the individual characteristics of athletes to create effective competitive programs and successful competitive activity. The research uses the methodology of preparing athletes for competitive activities in gymnastics and dance sports [6, 8, 10, 17]. From this point of view, the system for improving competitive programs in acrobatic rock and roll is an extension and addition to the results of other studies.

Training of athletes in acrobatic rock and roll is a complex and multilayered process. Finding the optimal balance between the difficulty of acrobatics and the quality of dance is one of the most difficult tasks. To date, among the huge variety of complex-coordination, gymnastic, and dance sports, special attention is paid to acrobatic rock and roll, as it is the improvement of physical qualities, motor skills, and achievement of sports results. It is a complex and emotional sport in which athletes perform the complex exercise to music, connected without undue pauses logically and dynamically, and perform them with confidence and energy. The specific content of the competitive programs, manner of performance, and exercise style significantly complicate the motor activity of athletes in this sport. This study consisted of a conceptual approach to the preparation of competitive sports program of main class contact style couples in acrobatic rock and rolls that is based on algorithms of acrobatic elements' complexity and combinations, dance series (blocks, elements of competitive program), and factors that are driven by the characteristics of special physical and technical preparedness of the athletes. Research-based algorithms of competitive programs with the technical values of acrobatic rock and roll elements based on the complexity factors enabled the implementation of the principle of perspective-predictive approach in training qualified athletes. This offered a positive progress trajectory of acrobatic rock and roll based on stimulation of natural complexity growth of competition programs and objectification of evaluation of sports achievements of qualified athletes in acrobatic rock and roll.

Conclusions

The algorithm has been developed for the correction of competitive programs of qualified athletes in acrobatic rock and roll, taking into account the level of their special physical and technical preparedness. Factor analysis was used in this approach. The algorithm contains all stages of the standard multivariate analysis procedure. The factor analysis revealed six factors based on the six blocks of the competitive program. The general and individual factor structure of the athletes' comprehensive preparedness was determined.

It is recommended that the content of competitive programs was analyzed to correct and improve selected blocks and content of modules ("Acrobatics", "Dance Series"), which consist of acrobatic elements, acrobatic combinations, and dance series. The algorithm of correction of competitive programs that displays the contents of each block, with the degrees of its significance and its sequence in a competitive program performance is suggested.

Thus, for mastering a high-quality world-class program and to achieve a high athletic performance level, main class contact style competitive program should be divided into 6 blocks and refer to the following algorithm: I Block of the competitive program is a combination of 2 or 3 acrobatic elements (Group 5, starting with element backwards) – 18.83%; II Block is an acrobatic element backwards that is not repeated in the performed combinations (Group 2, backwards) – 8.82%; III Block is a combination of 2 or 3 acrobatic elements (Group 5, starting with element forward) – 21.14%; IV Block is an acrobatic element dive (Group 3, front or back) – 13.04%; V Block is an acrobatic element rotation (Group 4) – 15.22%; and VI Block is acrobatic

element forward that is not repeated in the combinations (Group 1, forward) – 10.75%. Implementation of the algorithm can significantly improve the performance of competitive main class contact style. Further research is expected to construct a model of the training process in acrobatic rock and roll of main class contact style athletes.

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