

Evolution of the content of competitive programs of qualified athletes in acrobatic rock and roll

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Abstract

Background and Study: The modern type of competitive activity of qualified athletes of acrobatic rock and roll is undergoing contradictory changes in the content of the competitive program “Acrobatics” of the category “Main class contact style” due to an increase in the static performance of acrobatic elements, their number in combinations, where a loss of dynamics in the implementation of the competitive program is observed, which contradicts the definition of “rock and roll” as a dance where the acrobatic elements performed are the emotional, culminating accents of the dance figures. The main purpose of the study is to identify the patterns of the evolutionary process of the content of competitive programs of qualified acrobatic rock and roll athletes.

Material and methods. As a result of the study, a comparative analysis of video materials of the final part of the competition was carried out: the final of the Ukrainian Championship in the category “Basic class contact style” (2010) 6 pairs (n=12); final of the Ukrainian Championship in the category “Basic Contact Style Class” (2023) – 6 pairs (n=12); final of the World Championship category “Basic freestyle class” (2011) – 7 pairs (n=14); final of the World Championship category “Basic freestyle class” (2020) – 7 pairs (n=14).

Results. During the analysis of viewing video materials of the final part of the Ukrainian and World Championships, structural changes were identified that affected the percentage of components of the competitive program “Acrobatics” in the category “Basic class contact style”, where acrobatic elements and their combinations with a large number of their components become a priority in the competitive program in relation to the structure of the competitive program “Acrobatics” of the category “Main class free style”.

Conclusions. The evolutionary process of the content of the competitive program in acrobatic rock and roll has been identified, which is carried out due to changes in the Competition Rules, the implementation of new achievements of choreographic different styles of dance figures and the search for extreme, optimally adjusted motor actions in performing complex (high-risk) actions, which in the future involves changes and differentiation of the components of the educational and training process of qualified acrobatic rock and roll athletes.

Key words: qualified athletes, acrobatic rock and roll, competitive program “Main class contact style”, “Main class free style”.

Наталія Батєєва, Петро Кизім. Еволюція контенту змагальних програм кваліфікованих спортсменів в акробатичному рок-н-ролі.

Передумови та мета дослідження. Сучасний вид змагальної діяльності кваліфікованих спортсменів акробатичного рок-н-ролу зазнає суперечливі зміни в контенті змагальної програми «Акробатика» категорії «Основний клас контактний стиль» за рахунок збільшення статичного виконання акробатичних елементів, їх кількість у комбінаціях, де прослідковується втрата динаміки виконання змагальної програми, що суперечить визначенню поняттю «рок-н-рол», як танцю, де виконані акробатичні елементи є емоційними, кульмінаційними акцентами танцювальних фігур. Головною метою дослідження є виявлення закономірностей еволюційного процесу контенту змагальних програм кваліфікованих спортсменів акробатичного рок-н-ролу.

Матеріал і методи. В результаті дослідження проведено порівняльний аналіз відеоматеріалів фінальної частини змагань: фінал Чемпіонату України категорії «Основний клас контактний стиль» (2010 р.) 6 пар (n=12); фінал Чемпіонату України категорії «Основний клас контактний стиль» (2023 р.) – 6 пар (n=12); фінал Чемпіонату Світу категорії «Основний клас вільний стиль» (2011 р.) – 7 пар (n=14); фінал Чемпіонату Світу категорії «Основний клас вільний стиль» (2020 р.) – 7 пар (n=14).

Результати. У ході аналізу перегляду відеоматеріалів фінальної частини Чемпіонатів України та Світу, було встановлено структурні зміни, які впливають на відсоткове співвідношення складових змагальної програми «Акробатика» категорії «Основний клас контактний стиль», де в повній мірі в змагальній програмі стають пріоритетними акробатичні елементи та їх комбінації з великою кількістю їх складових по відношенню до структури змагальної програми «Акробатика» категорії «Основний клас вільний стиль».

Висновки. Виявлено еволюційний процес контенту змагальної програми в акробатичному рок-н-ролі, який здійснюється за рахунок змін до Правил проведення змагань, втілення нових надбань хореографічних різностильових напрямлень танцювальних фігур та пошуку екстремальних оптимально вивірених рухових дій у виконанні складних

(високого ступеню ризику) акробатичних фігур, що в подальшому передбачає зміни та диференціацію складових навчально-тренувального процесу кваліфікованих спортсменів акробатичного рок-н-ролу.

Ключові слова: кваліфіковані спортсмени, акробатичний рок-н-рол, змагальна програма, «Основний клас контактний стиль», «Основний клас вільний стиль».

Introduction

The historical origins of rock and roll dance date back to the mid-twentieth century. "For the first time, US audiences saw the performance of slightly expressive and careless movements to the melody of Bill Haley, performed in the film with his participation "Rock around the clock," which was shown on US screens in 1954." Rock and roll gained wide popularity with the rapid rise of Elvis Presley, the most successful performer of the song repertoire, recognized by the world community in the mid-twentieth century as the "King of Rock and Roll." The performing skills of a musician and the unsurpassed voice of Elvis Presley, his special dance movements during a performance, prompted the perception of the young segment of the population to the emergence of a new popular rock and roll dance [6]. Rock and roll dance was performed individually, in groups, in a line one after another, and only over time, in pairs. Dancing in pairs made it possible to demonstrate the culminating moments in dance figures by performing semi-acrobatic, acrobatic lifts of varying complexity. It is the performance of acrobatic elements that is the culmination of the dance figure, which later contributed to the definition of the new dance term "rock and roll". And by this basic definition, rock and roll moved into the range of competitive dance, and over time into a sport - acrobatic rock and roll. The distinctive feature of this sport, which has existed in the world for almost 40 years (the World Rock and Roll Confederation (WRRC) was created in 1984), is that it is: complex coordination, acyclic, speed-strength, structural and has its own choreographic features [4,5,19].

Acrobatic rock and roll as a complex coordination sport, built on the interaction of partners when performing a dance-acrobatic composition, which includes: various movements, jumps, rotations and acrobatic elements (N.P. Batieieva, 2013, S.V. Gumenyuk, 2012, Lutsenko, 2021). Complexly coordinated acrobatic elements in combination with dance movements are performed at a high tempo (48-52 beats per minute), without static poses and pauses, with a characteristic choreographic coloring, determined by the peculiarities of the "rock and roll" musical accompaniment [9, 11,12].

Competitive activity in acrobatic rock and roll is characterized by a continuously growing flow of information about changes in modern competition rules and judging of competitive compositions [13, 15]. According to the current Rules of sports competitions in acrobatic rock and roll [20], the age categories of the rock and roll discipline, pairs: there are adults "contact style" (Main-class contact style) - at least 14 years; adults "free style" (Main-class free style) (performing acrobatic elements by a partner in unsupported movement) – minimum 15 years. Athletes of dance couples of these ages belong to the qualified level. Competitions in the competitive categories "Basic free style class" and "Basic contact style class" of the rock and roll discipline are held according to two programs: "foot technique" (in the final) lasting in the range from 1 minute to 1 minute 15 seconds at the speed of the music 50-52 t·min⁻¹; "Acrobatics" program – musical accompaniment speed is 48-50 t·min⁻¹, duration in qualifying rounds is 1:30 – 1:45, which provides for the performance of 5 acrobatic elements. In the semi-finals and finals, the requirements for the "acrobatics" exercise in the competitive categories "Main class free style" and

"Main class contact style" are regulated by the performance of 6 acrobatic elements during the performance in the range from 1 minute 45 seconds to 2 minutes, the speed of the music remains unchanged variable, 48-50 t·min⁻¹.

In the adult category "Basic free style class" in the "Acrobatics" program, it is expected to perform acrobatic elements of the highest category of complexity, including flying somersault elements. In the adult category "Basic class contact style" in the "Acrobatics" program, it is allowed to perform somersault elements only in contact with a partner, and flying is considered as a method of approaching an element. All acrobatic elements, performed separately or in combination, have a gradation of difficulty and are scored in points [14,16,17].

As noted by the authors Mulyk V.V., Lutsenko Yu.M. (2017), in acrobatic rock and roll, significant indicators used in monitoring the competitive activity of qualified athletes are the execution of a competitive composition, which directly affects the final competitive result. Based on the scientific works of leading specialists in technical and aesthetic sports, which include acrobatic rock and roll, it can be stated that the replacement of the primary type of content creation for competitive programs "Acrobatics" with the actual adult category "Basic class contact style", where changes took place in the main outline, gives a contradictory result in the perception of acrobatic rock and roll as a new "non-indigenous" type of dance, emotional and spectacular performance, which at its birth prompted the viewer, but also society as a whole, to a high degree of positive emotional state of the individual [3,5, 17]. The question is, what influences the evolution of the development of a sport and its components, including the content of the competitive program? One of the components of influence is the change in the Competition Rules and, basically, these are the requirements for the creation of competitive "Acrobatics" programs for adults in acrobatic rock and roll. But if there is a whole, then changes in it both increase its level and reveal an insufficiently unreasonable change in the components [18,21].

Analyzing the modern type of competitive activity of qualified athletes of acrobatic rock and roll, we have contradictory changes in the content of the competitive program "Acrobatics" of the category "Main class contact style" due to an increase in the static performance of acrobatic elements, their number in combinations, where a loss of dynamics in the implementation of the competitive program can be seen. This indicates the need for further scientific research in this direction for a deeper understanding and optimization of approaches to the structure of the content of competitive programs and the components of the educational and training process of qualified acrobatic rock and roll athletes.

The purpose of the article (problem setting) is to identify the patterns of the evolutionary process of the content of competitive programs of qualified acrobatic rock and roll athletes. Based on the purpose, the research task was set: to analyze the results of different levels of finals of competitions of qualified acrobatic rock and roll athletes and determine the impact of changes in constituent structures on the evolution of the content of competitive programs.

Material and methods: theoretical analysis and syn-

thesis of scientific and methodological literature, video analysis and methods of mathematical statistics. The study was carried out in accordance with the initiative topic of scientific research of the Department of Dance Sports and Choreography of the Kharkov State Academy of Physical Culture: "Theoretical and methodological foundations for the development of system-forming components of physical culture (sports, fitness and recreation) for 2020-2025, state registration number 0120U01215." To determine the state of development of the problem, theoretical methods and video analysis were used. Statistical analysis of study indicators was carried out using Student's t test.

Results

To identify the patterns of the evolutionary process of the content of competitive programs of qualified acrobatic rock and roll athletes, a comparative analysis of video materials of the final part of the competition was carried out using the Logitech C920 HD Pro Web camera of All-Ukrainian and international rank, namely: the final of the Ukrainian Championship in the category "Basic class contact style" (2010) – 6 pairs ($n=12$); final of the Ukrainian Championship in the category "Basic Contact Style Class" (2023) – 6 pairs ($n=12$); final of the World Championship category "Basic freestyle class" (2011) – 7 pairs ($n=14$); final of the World Championship category "Basic freestyle class" (2020) – 7 pairs ($n=14$).

The analysis of video materials of the competition shows that sports pairs performed a cascade of acrobatic elements in the Acrobatics program "Basic class contact style". Such cascades and combinations are performed for 6 to 10 seconds, while in the "Acrobatics" competition program "Main class free style" the acrobatic element is performed in an unsupported movement for no more than 2 seconds (performing a partner fus (staf) double somersault, forward landing on the floor). A biomechanical analysis of the performance of a double backflip by the 1983 and 1984 world champions of the M-class category, the sports pairs Diego and Maruzio Chiodonni, stated the kinematic characteristics of the general center of mass of the body of the female partner, where time ($t = 1,86$ s.), the angle of deviation from the vertical of the final the upper position of the general center of mass (GCM) of the partner's body $\varphi = 4^\circ$, a

large (steep) curvature of the parabola of the path S to landing on the parquet. All this, when performed harmoniously, gave a feeling of "hovering" in the unsupported movement of the upper position of GCM of the female partner's body [1,6,22]. Also confirmed is the study conducted by N. Bateeva (2014), in which a biomechanical model of the technique for performing the competitive exercise "front todes in fus" of the "M-class" category in acrobatic rock and roll was built; The time for performing the competitive exercise "front todes from fus" was determined to be 1,97 seconds (Figure 1.) [2,5,8].

The study conducted a video analysis of the performance of competitive programs by qualified athletes of different periods of evolutionary development of acrobatic rock and roll: category "Main class contact style" $n = 24$ (Ukrainian Championship – 2010, 2023); category "Basic free style class" $n = 28$ (World Cup – 2011, 2020). Analysis of the performance of competitive programs "Acrobatics" by athletes of the category "Main class contact style" to changes in the Rules of the World Rock and Roll Confederation (WRRC, 2014) shows a stable dominant advantage of dance figures in their content compared to acrobatic figures (Figure 2) that reflected in the ratio of the components of the content of competitive programs and corresponds to the basic definition of "acrobatic rock and roll - dance with the performance of acrobatic elements (figures)."

After changes were made to the Competition Rules of the World Rock and Roll Confederation (WRRC, 2014), an analysis of the content of competitive programs in this category showed a different priority for its components (Figure 2). An increase in the percentage of performance of acrobatic elements (figures) compared to dance figures indicates a change in the execution of content components over time in the modern creation of competitive programs, their level of complexity, an increase in load, this leads to the loss of the dance (rock and roll) component. As a result, we observe a short-term movement of partners (leading in a pair - changing places) before performing the next cascade of acrobatic elements (figures).

Statistical data from a study of the content of the modern competitive program "Acrobatics" in the category "Main class contact style" indicate the dominant influence of acrobatic figures in relation to the adoption of changes in the Competition

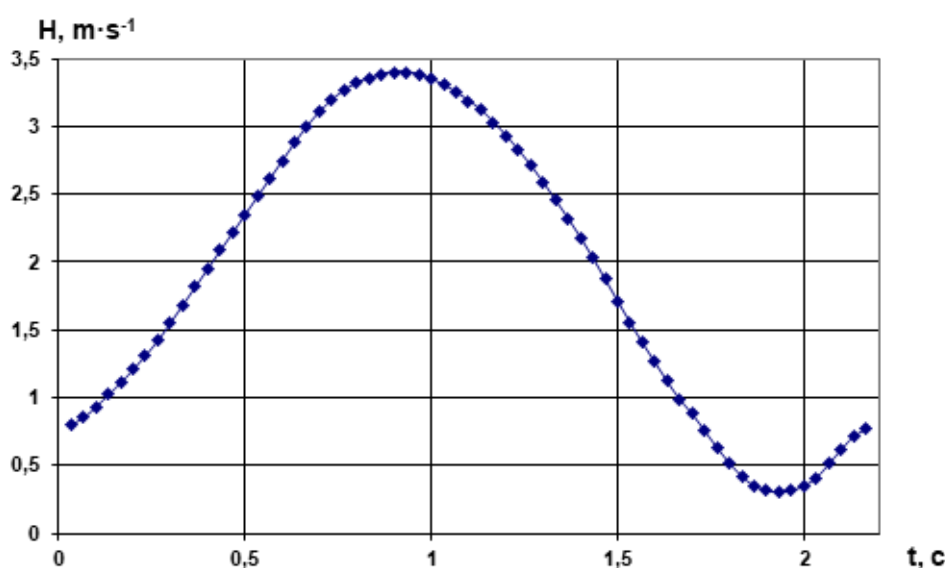


Figure 1. Vertical movement of the general center of body mass of the female partner when performing the element "front todes from fus" [11].

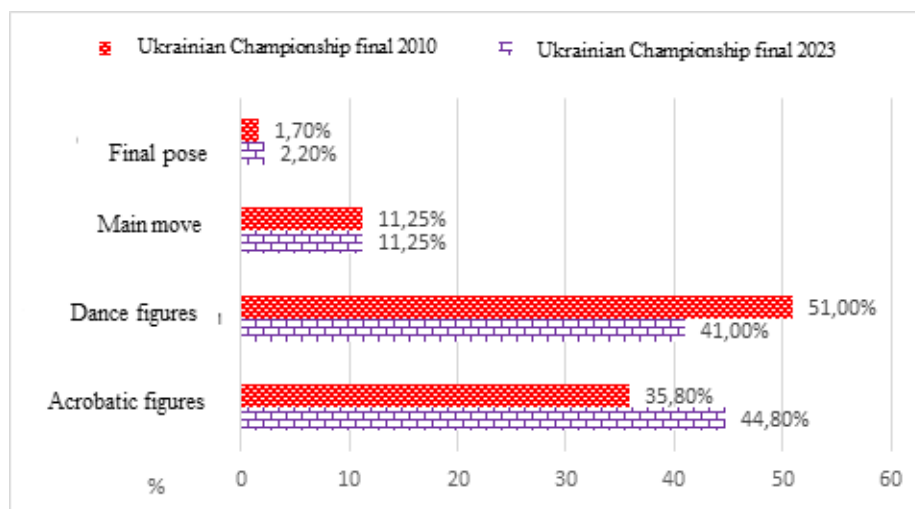


Figure 2. Percentage ratio of the components of the content of the competitive program “Acrobatics” of the category “Basic class contact style” of the finals of the Ukrainian Championship-2010, Ukrainian Championship-2023

Table 1. Results of the content components of the competitive program “Acrobatics” of the finals of the Ukrainian Acrobatic Rock and Roll Championship in the Main class category (2010, n=12; 2023, n=12)

Pairs № i/o	Acrobatic figures, s		Dance figures, s.		Main move, s		Final pose, s	
	2010 p.	2023 p.	2010 p.	2023 p.	2010 p.	2023 p.	2010 p.	2023 p.
1	31,3	44,44	46,3	32,91	11,25	11,25	1,45	1,4
2	32,6	39,25	45,1	37,1	11,24	11,24	1,66	2,41
3	31,4	37,26	46,3	39,3	11,25	11,25	1,45	2,19
4	32,4	39,67	44,2	37,2	11,22	11,22	1,58	1,91
5	30,3	39,54	46,3	37,3	11,25	11,25	1,45	1,91
6	30,1	41,23	47,3	35,3	11,27	11,27	1,43	2,2
$\bar{X} \pm m$	31,35±0,41	40,23±0,98	45,90±0,45	36,51±0,88	11,25±0,01	11,25±0,01	1,5±0,04	2,0±0,14

Table 2. Statistical indicators of the components of the content of the competitive program “Acrobatics” of the finals of the Ukrainian Championship in acrobatic rock and roll of the Main class category ($P < 0,001$; $< 0,05$; $> 0,05$)

№ i/o	Components of the competition program	$\bar{X} \pm m$		t_p	P
		2010 p. n = 12	2023 p. n = 12		
1.	Acrobatic figures, s	31,35±0,41	40,23±0,98	8,36	< 0,001
2.	Dance figures, s	45,90±0,45	36,51±0,88	9,50	< 0,001
3.	Main move, s	11,25±0,01	11,25±0,02	0,00	> 0,05
4.	Final pose, s	1,5±0,04	2,0±0,14	3,43	< 0,05

Rules of the World Rock and Roll Confederation (WRRC, 2014) compared to the content of the competitive program, where the mathematical component shows a significant difference in the average group results (Table 1).

Table 2 reflects the statistical indicators of the comparative video analysis of the components of the content of the competitive program “Acrobatics” of the finals of the Ukrainian championships in acrobatic rock and roll of the category Main class contact style.

Acrobatic figures have group averages of $31,35 \pm 0,41$ s and $40,23 \pm 0,98$ s with ($t_p = 8,36$; $p < 0,001$) and an increase of 9,57%; dance figures have average group indicators of $45,9 \pm 0,45$ s and $36,51 \pm 0,88$ s ($t_p = 9,50$; $p < 0,001$) – with a decrease of 11,87%; the main move has one numerical value in the group average of $11,25 \pm 0,01$ s at ($t_p = 0,05$; $p > 0,00$); final pose $1,5 \pm 0,04$ s and $2,0 \pm 0,14$ s, respectively ($t_p = 3,43$; $p < 0,05$); an increase of 25,0%.

Figure 3 graphically reproduces the reliability of the

static results of the components of the content of the Acrobatics competitive program of this category at different completion times.

In our opinion, this trend in the evolution of the content of the competitive program “Acrobatics” of qualified athletes of the category “Basic class contact style” is contradictory, since it departs from the basic definition of acrobatic rock and roll stated above and changes in the structure in the quantitative performance of acrobatic elements in combinations of content of the competitive program.

In contrast to certain statistical data, the results of the analysis of the implementation of the competitive program “Acrobatics” category “Main class free style” by qualified athletes of acrobatic rock and roll (Figure 4.) show the stability of the components in relation to the content of the competitive program, both to changes in the Competition Rules and after their acceptance.

Analysis of the percentage of components of the content

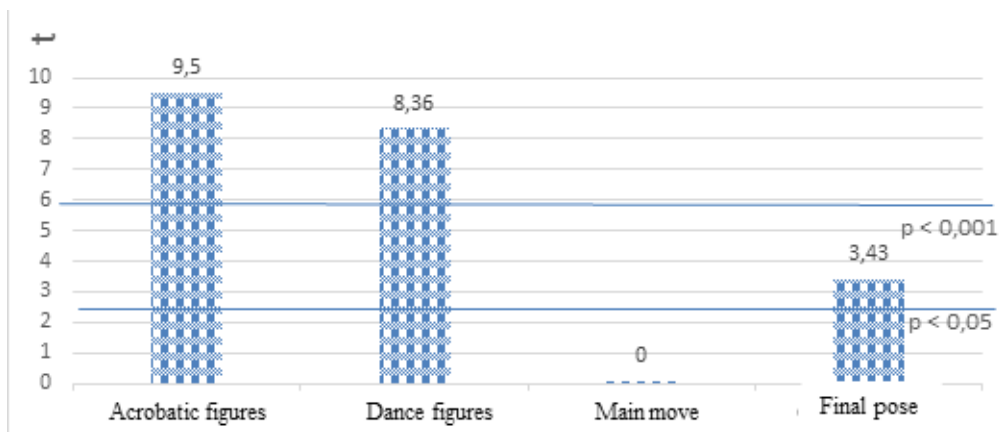


Figure 3. Reliability of statistical results of the content components of the competitive program “Acrobatics” of the finals of the Ukrainian championships 2010 and 2023 in acrobatic rock and roll category Main class contact style

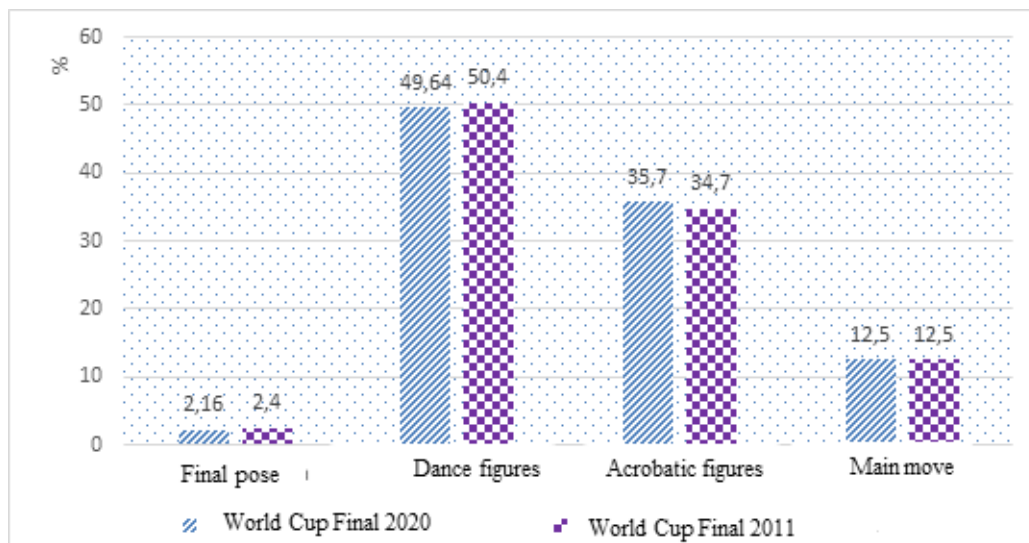


Figure 4. Percentage of content components of the competitive program of the category “Main class free style” of the finals of the 2011 World Cup, 2020 World Cup

Table 3. Results of the “Acrobatics” competition program of the finals of the World Championship in acrobatic rock and roll, category Main class free style (2011, n=14; 2020, n=14)

Pairs № i/o	Acrobatic figures, s.		Dance figures, s		Main move, s		Final pose, s	
	2011 p.	2020 p.	2011 p.	2020 p.	2011 p.	2020 p.	2011 p.	2020 p.
1	31,2	30,8	45,4	45,75	11,25	11,25	2,15	2,2
2	29,3	29,1	46,9	47,17	11,24	11,23	2,56	2,5
3	30,1	31,5	46,2	44,81	11,26	11,24	2,44	2,45
4	34,3	33,4	42,1	43,0	11,25	11,25	2,35	2,3
5	32,7	33,7	44,5	43,05	11,24	11,26	1,56	1,46
6	30,2	33,6	45,2	45,2	11,25	11,25	3,35	1,37
7	31,1	33,2	44,9	43,78	11,27	11,26	2,73	2,56
$\bar{X} \pm m$	31,3±0,65	32,2±0,66	45,03±0,57	44,68±0,58	11,25±0,004	11,25±0,004	2,2±0,2	2,44±0,18

of the competitive program “Acrobatics” of the category “Basic free style class” shown in Figure 4 indicates the absence of significant changes, while when athletes performed the program, dynamics, sophistication of choreographic and basic specific exercises were added and complexity, and indeed the degree of risk, increased, which in general emotional terms is considered unattainable in the space-time dimension.

Statistical data from a study of the content of the modern

competitive program “Acrobatics” in the category “Basic free style class” indicate a slight deviation in the ratio of the components of the competitive program in comparison with the content of the competitive program to the adoption of changes in the Competition Rules of the World Rock and Roll Confederation (WRRRC, 2014), where the mathematical component shows the minimum difference between the average group results (Table 3).

Table 4. Statistical indicators of the components of the content of the competitive program “Acrobatics” of the finals of the World Championships in acrobatic rock and roll category Main class free style ($P > 0,05$)

№ i/o	Components of the competition program	$\bar{X} \pm m$		t_p	P
		2011 p. n = 14	2020 p. n = 14		
1.	Acrobatic figures, s.	31,3±0,65	32,2±0,66	0,97	> 0,05
2.	Dance figures, s	45,03±0,57	44,68±0,58	0,43	> 0,05
3.	Main move, s	11,25±0,004	11,25±0,004	0,00	> 0,05
4.	Final pose, s	2,2±0,2	2,44±0,18	0,89	> 0,05

Table 4 reflects the statistical indicators of the comparative video analysis of the content of the competitive program “Acrobatics” of the finals of the World Championships in acrobatic rock and roll in the category Main class free style

In statistical indicators of this category, acrobatic figures have group average results of $31,3 \pm 0,65$ s and $32,20 \pm 0,66$ s ($t_p = 0,97$; $p > 0,05$), which increased the execution time by 1.0 %; dance figures have average group results of $45,03 \pm 0,57$ s and $44,68 \pm 0,58$ s ($t_p = 0,43$; $p > 0,05$), with a decrease of 0.76%; the main move has the same numerical value in the average group indicators in the results of $11,25 \pm 0,01$ s at ($t_p = 0,00$; $p > 0,05$); the final pose is $2,2 \pm 0,2$ s and $2,44 \pm 0,18$ s, respectively ($t_p = 0,89$; $p > 0,05$); with an increase of 9,9%.

Also, the analysis of this category showed the integrity of the outline for creating competitive programs, which is based on a certain structure in the performance of choreographic and basic exercises and tactically verified acrobatic elements, no more than two in combination in terms of difficulty level and load, both for special physical and technical readiness, and emotional, psychological state of a sports couple, male partner and female partner.

Discussion

Scientific research on the preparation of qualified athletes in sports and their stages state a step-by-step method of transition from one stage to another, both in terms of age and in the acquisition of high skill [18, 19]. In acrobatic rock and roll, the stages of training athletes are regulated by categories, where the “Basic contact style class” is the basic one in acquiring skills in their skill level to move to the “Main freestyle class” category [4, 20]. Based on this definition of a sport approved by the regulations, the “Acrobatics” competition program of the “Main class contact style” category must correspond to a structure where the main goal is to prepare the partner and her readiness at the technical and psychological level to perform acrobatic elements in unsupported movement used in competitive program “Acrobatics” category “Basic class free style”.

In a new interpretation of the Rules of the World Rock-n-Roll Confederation - WRRRC (World Rock-n-Roll Confederation - WRRRC 2014) and the requirements for judging criteria (mathematical component in the total quantitative result of points for performing acrobatic elements and their combinations) in evolutionary dimension, the content of the competitive program “Acrobatics” in the category “Main class contact style” [4,20]. Of course, in accordance with the requirements of the judging criteria, the components of the competitive program are being updated, the content of choreographic movements that are new in style is being used, acrobatic combinations and

combinations are being enriched due to the number of acrobatic elements (after all, each element for execution has its own numerical score according to the new Rules) [20]. But if in the “Acrobatics” program “Main class free style” in updating the style of choreographic movements and the stability of performing acrobatic elements of high complexity and combinations we have a positive emotional reaction, then in the second version – in the competitive program “Acrobatics” “Main class contact style saturation combinations with the performance of three to four acrobatic elements in contact, we have a loss of the dynamic characteristics of the execution of the entire competitive program and the basic definition of the term “acrobatic rock and roll” (the performance of an acrobatic element is the culmination of a dance figure). This generally affects the characteristics of acrobatic rock and roll in this category and departs from the structure of the content of the competitive program “Acrobatics” “Main class free style”.

Conclusions

The results of the study allow us to conclude that after the adoption of the updated Rules of the World Rock and Roll Confederation (WRRRC, 2014), structural changes took place in the competitive program “Acrobatics” of the category “Main class contact style”, where full priority in the competitive program became acrobatic elements with a large number of their components in relation to the structure of the competitive program “Acrobatics” of the category “Main class free style”. The above does not correspond to the basic definition of the concept “acrobatic rock and roll” - a dance with the performance of acrobatic elements. Based on the analysis of the video sequence of the final part of the Ukrainian and World Championships, the evolutionary process of the content of the competitive program in acrobatic rock and roll was identified, which is carried out due to both factors and changes to the Competition Rules of this sport, and the embodiment in it of new choreographic achievements of different styles directions of dance figures. This contributes to the search for extreme, optimally adjusted motor actions in the performance of complex elements of high-risk acrobatic figures, which further implies changes and differentiation of the components of the educational and training process of qualified acrobatic rock and roll athletes.

Conflict of interest

The authors declare that there is no conflict of interest.

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References

1. Amandeep K., Syed M., Hussain A., Nishan S. Kinematic analysis of take-off in triple jump of two Indian international level jumpers. *International journal of yogic, human movement and sports sciences*. 2019; 4(1): 33-34. <https://doi.org/10.2478/hukin-2014>
2. Ameti V., Iseni A., Shpresa M. The effect of the plyometric program in the long jump and triple jump at students. *Journal of sport and health research*. 2022; 9(17): 222-228.
3. Bazela D., Pavliuk T., Babych O., Batiieva N., & Kyzim P. Contemporary global trends in choreographic art development at the beginning of the 21st century. *SPORT TK-Revista EuroAmericana de Ciencias del Deporte*, 2022; 11: 60. <https://doi.org/10.6018/sportk.536581>
4. Batiieva NP. Optimization of the training process of qualified acrobatic rock and roll athletes in the annual training macrocycle, taking into account model characteristics. *Pedagogy, psychology and medical and biological problems of physical education and sports*. 2014;8:3-8. <https://doi.org/10.6084/m9.figshare.1022947>
5. Batiieva N. Improving the special physical and technical training of qualified athletes in acrobatic rock and roll in the annual macrocycle. abstract of the dissertation of a candidate of sciences in physical education and sports: 24.00.01. Kharkiv, 2013; 22.
6. Eissa A. Biomechanical Evaluation of the Phases of the Triple Jump Take-Off in a Top Female Athlete. *Journal of Human Kinetics*. 2014; 40: 29-35. <https://doi.org/10.2478/hukin-2014-0004>.
7. Elvis Presli. URL: https://uk.wikipedia.org/wiki/%D0%95%D0%BB%D0%B2%D1%96%D1%81_%D0%9F%D1%80%D0%B5%D1%81%D0%BB%D1%96 (data zvernennia 17.11.2023)
8. Huang SJ, Wei M, Zhu L, Zhang JW, Ding ZY, Luo F, Liu TZ. Mechanical function of the human knee joint region during triple jump by combined multi-body dynamics and finite element analysis. *Procedia Manufacturing* 2019; 35: 956-961. <https://doi.org/10.1016/j.promfg.2019.06.041>.
9. Humeniuk SV. Organization and conduct of training sessions in dance sports: methodological recommendations. *Physical education and sports direction*. Vol. No. 15 Supplement to the scientific and methodological bulletin «Istok», Kharkiv, 2012; 15-17.
10. History of rock and roll dance. URL:<https://dance.knukim.edu.ua/istoriya-tancyu-rok-n-rol/> (date of the application: 23.12.2023).
11. Kyzim PM. Biomechanics in acrobatic rock and roll: tutorial, 2018:130 ISBN 978-617-7555-62-8
12. Lutsenko YM. Improving the competitive programs of qualified athletes in acrobatic rock and roll, taking into account the level of their special physical and technical preparedness: doctor of philosophy dissertation in specialty 017 – physical education and sports. Kharkiv, 2021; 277.
13. Lutsenko YM, Lutsenko LS. The influence of the latest provisions of the rules of judging of competitions in acrobatic rock and roll on the improvement of competitive programs of qualified athletes of class “B”. *Physical culture, sport and health: materials of the XVII international scientific and practical conference Kharkiv, December 7-8, 2017*; 165-169.
14. Lutsenko YM, Mulyk VV, Taran L. Structure and content of competitive programs of qualified athletes in acrobatic rock and roll. *Slobozhanskyi Herald of Science and Sport*. 2017; 5 (61): 75-79.
15. Lutsenko YM. Features of the training process of qualified athletes in acrobatic rock and roll. *Scientific journal of the National Pedagogical University named after M.P. Drahomanov. Episode 15: Scientific and pedagogical problems of physical culture (physical culture and sports)*. 2017;3(84):43-46.
16. Lutsenko YM. Improving the training process of qualified athletes in acrobatic rock and roll in the annual macrocycle. *Physical culture, sport and health: materials of the XVI international scientific and practical conference Kharkiv, December 8-9 2016*. 2016; 139-142.
17. Mulyk VV, Lutsenko YM. Control of the process of preparation and competitive activity of qualified «B» class athletes in acrobatic rock'n'roll. *Scientific journal of the National Pedagogical University named after M.P. Drahomanov. Episode 15: Scientific and pedagogical problems of physical culture (physical culture and sports)*. 2017; 10(92): 66-71.
18. Petrenko A, Taran L. Features of the dynamics of difficulty of competitive routines and the results of performances of the strongest teams in the world in artistic swimming. *Slobozhanskyi Herald of Science and Sport*. 2021; 9 (4): 114-126. <https://doi.org/10.15391/snsv.2021-4.010>
19. Platonov VM. System of training athletes in Olympic sports. Kyiv: Olympic literature, 2004; 808.
20. Rules for sports competitions in acrobatic rock and roll. URL: http://ufarr.com.ua/wp-content/uploads/2023/01/pravyla-rok-n-rol-1_5.2_23-vid-06.01.2023.pdf (date of the application: 210.11.2023)
21. World RocknRoll Confederation (WRRRC). URL: <https://wrrc.dance/rules/rock-n-roll-rules/> (data zvernennia: 10.01.2024).
22. Waad GS, Sarmad AM. The effect of special exercises using modern techniques in learning the technical performance of the effectiveness of the triple jump for students. *Galaxy international interdisciplinary research journal*. 2023; 11(8): 169-185

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