



TRENDS OF EXERCISES CONTENT ON THE RINGS FINAL FROM THE 1ST JUNIOR WORLD ARTISTIC GYMNASTICS CHAMPIONSHIPS

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ABSTRACT

The purpose of this study was to give information and provide to coaches and junior gymnasts some trends and important guidelines for exercises that are key to the development of gymnasts at an earlier age. Recordings of exercises from the rings' finalists were taken and used. An analysis of the content of the combinations was made by two international category judges, according to the current Code of Points. The results showed that elements with C difficulty are most common in the finalist's routines. The average difficulty score was 4,538, and execution score was 8,843. The routine with the highest recognized difficulty was performed by a gymnast from China with a score of 4,8. The most common element was from group I - Kip and swing elements & swings through or to handstand. All of the considered routines contained Yamawaki, Jonasson, swing fwd. with straight arms to handstand (2 s.), and giant swing to handstand with straight arms (2 s.). Coaches and junior gymnasts should try to increase the D score above 4,5 by including elements with a higher score from groups II and III, in addition to decreasing deduction of elements in routines below 1,2.

Key words: Artistic gymnastics, Code of points, Difficulty score, Execution score, Gymnastics elements, Gymnastic exercises, Still rings

INTRODUCTION

The First Junior World Artistic Gymnastics Championships was held in Gyor, Hungary, from June 27 to June 30, 2019. Juniors born in 2002 and 2003 were the only gymnasts who were allowed to participation in the MAG's competition. The Junior World Championships is planned to take place every two years, and it is performed with the same structure as the Men's and Women's World Championships. All competitors at the Junior Gymnastics Championships have to be at the age of 16 and

17, registered with the International Artistic Gymnastics Federation (FIG).

The Men's artistic gymnastics includes six apparatuses: floor exercise, pommel horse, still rings, vault, parallel bars, and horizontal bar. The elements on each apparatus are divided into four groups and the final element is always the dismount with the exception of vault and floor exercise. A contemporary rings routine is characterized by swing transitions to strength and hold elements or vice versa. Elements with crossing of the cables are not permitted, and are deducted from the final score as composition errors. Still rings elements are divided into four groups (1). The element groups (EG) are as follows: EG I - kip and swing elements and swings through or to handstand, EG II - strength elements and hold elements (2 sec.), EG III - swing to strength hold elements (2 sec.), EG IV –

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dismounts. Each element in the Code of Points has a difficulty value from A = 0,1 to I = 0,9 points.

The FIG Code of Points is revised every four years. Each Olympic cycle has an updated or new rules with the aim to regulate development in sports technique, innovations introduced by coaches and athletes, as well as the growing opportunities caused by the improvement of training and competition apparatuses. After the 2004 Olympic Games in Athens, there was a new era in the evaluation of the sport of gymnastics. The way of calculating the final score was changed by divided it into difficulty (D) score and execution (E) score. The D score starts from 0 points and can be increased depending on the difficulty of the 9 elements with highest value included in the routine. The E score starts from 10 points and it is deducted by the execution judges depending on the mistakes made by the gymnast. The final score is obtained after adding the D and E scores. The new rules provided objectivity, accuracy, clarity and precision in the evaluation of gymnastics performances. FIG has approved some additional rules for Juniors. The D score is form of 8 elements instead of 10. A bonus of 0.5 is added when a gymnast includes an exercise from each element group in their routine. The dismount must be at least with a difficulty of C in order to gain the 0,5 bonus points. Repeated elements (same ID number) cannot contribute to the D score, and this rule is extended on the rings, so that a maximum of one final strength position from each EG may be recognized for difficulty. Routines can have many composition possibilities, but there are also bigger chances to make errors.

Gymnastics provides almost limitless possibilities for research, and consequently with

its large number of elements, it requires more studies (2). Biomechanical analyses of giant swings (reaction forces; body configuration; optimization solutions), dismounts (twisting techniques and segmental contributions), and swing elements (CM velocity and displacement; timing) have all been conducted. According to Han and Kwon (3), only 3.9% of research related to the gymnastics rings was published in the Journal of Korean Alliance for Health, Physical Education, Recreation & Dance and the Korean Journal of Sport Biomechanics between 1995 and 2006 due to the fact that the elements performed on the rings are difficult to analyze. Studies have been concentrated on strength elements (4-7), swing elements (8, 9) and rings dismounts (10, 11). Studies have also been conducted on artistic gymnastics routines to clarify the start value, difficulty score and identify some trends for the current technical regulations (12-19). Among them, Nam looked at the score distribution of the men's floor exercise in the 2008 Olympic Games in Beijing. However, studies on the analysis of rings routines regarding junior gymnastics have not been carried out since the revised Code of Points. To the best of our knowledge, there is only one published study analyzing the trend of exercise content on the Rings (20), which was on the Code of Points used two Olympic cycles before the current one. Therefore, the aim of this study was to provide coaches and junior gymnasts with current trends and important guidelines for rings exercises that are key for the development of gymnasts at an earlier age.

METHODS

The subjects in this study were eight male gymnasts who were finalists in the rings final from the 1st Junior World Artistic Gymnastics Championships in Győr, Hungary (**Table 1**).

Table 1. Ranking of the still rings final

Rank	Gymnast Name	NOC Code	Rank	Gymnast Name	NOC Code
1	D. F.	CAN	5	O. S.	JPN
2	S. D.	BRA	6	B. G.	USA
3	Y. H.	CHN	7	K. I.	RUS
4	D. I.	USA	8	Y. Y.	CHN

Data collection: Recordings of the 8 rings finalists were taken and used. The recordings were part of a complete evaluation judging system, and were made by means of video

cameras, intended for analysis in case of the need to clarify controversial moments from the routines.

Data analysis: The routines of the 8 rings finalists from the 1st Junior World Artistic Gymnastics Championships were reviewed using a video. An analysis of the content of the combinations was made by two experienced judges with an international category, according to the current MAG Code of Points (2017). Data on the rings elements were extracted and recorded in a Microsoft Excel spreadsheet. The data was analyzed as frequency and percentage by using SPSS statistics software, version 27.0.

RESULTS

Analysis of the difficulty of the exercises performed in the rings final are presented in **Figure 1**. The values range from A = 0,1 to I = 0,9. Exercises with a difficulty of C were the most frequently performed elements (48,4% of overall difficulty). Exercises with a difficulty of D, B, E, F were performed 21,9%, 20,3%, 7,8%, and 1,6%, respectively.

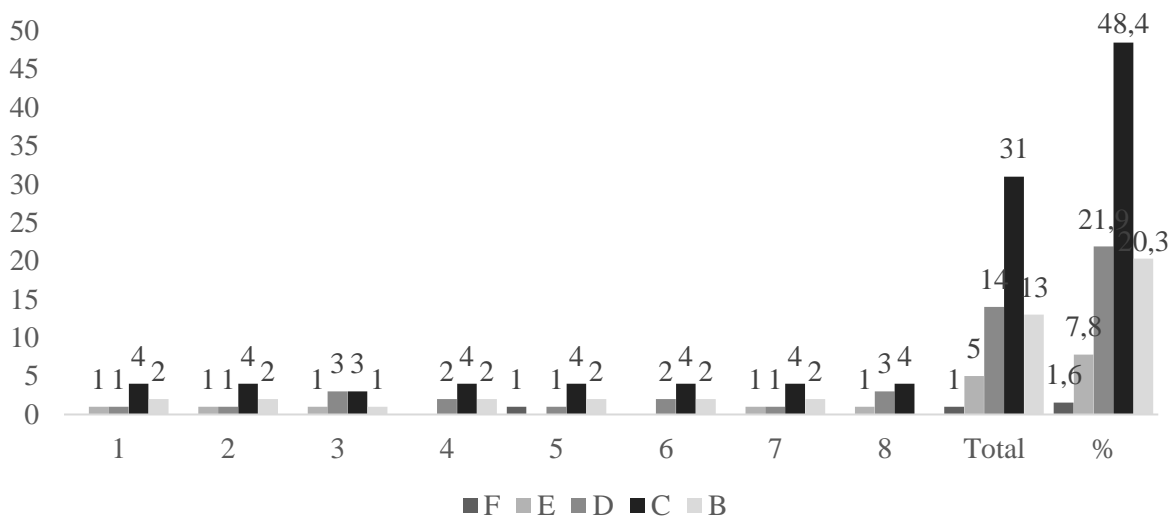


Figure 1. Number of difficulties presented by gymnasts, total and percent.

The 1st (CAN) and 2nd (BRA) ranked gymnasts performed routines with the same difficulty: 1E, 1D, 4C and 2B (D score = 4,5). However, the 3rd gymnast (CHN) executed a routine with even a higher difficulty: 1E, 3D, 3C and 1B (D score = 4,8), and the 8th ranked gymnast (CHN) was the one with the highest difficulty: 1E, 3D, 4C elements (D score = 4,9), but one of his D elements was poorly performed and was not recognized. This was the reason why his D score was 0,3 points lower than the score which was expected by him and his coach. Additionally, the third gymnast (CHN) had a higher value of his execution score with an E score of 8,4, which was greater than the second and first gymnasts. Therefore, junior gymnasts should perform with less deductions instead of trying to build a routine with too high difficulty. This can be achieved by

reducing the errors in their routines in order to have a high E score.

Analysis of element group from the ring's final is shown in **Figure 2**. Gymnasts must include at least one exercise from each element groups (EG) in their routines in order to be awarded 0,5 points by D jury per element group. As it can be seen in **Figure 2**, the most exercises performed by the gymnasts in the rings final were from EG I - 59,4%, followed by EG II - 15,6%, EG III - 12,5%, and EG IV - 12,5%. Moreover, all of the gymnasts performed the following elements from EG I: Jonasson, Yamawaki, swing fwd. with straight arms to handstand, and giant swing to handstand with straight arms. These skills are often connected together one after another on the rings, for example, Yamawaki to Jonasson or vice versa. Such connections reduce the length of the combination, as well as the gymnasts' efforts.

Therefore, coaches and junior gymnasts ought to construct their routines by using Jonasson and Yamawaki elements from EG I. Furthermore, they should include more swing to handstand elements in order to be similar to the highest ranked gymnasts. Perhaps gymnasts perform the majority of their exercises from EG I due to the

fact that swing elements in this group are more likely to have less deduction than strength and swing to strength elements. The main difficulty in strength elements is that shoulders should not rise above the position in which they are expected to be held in.

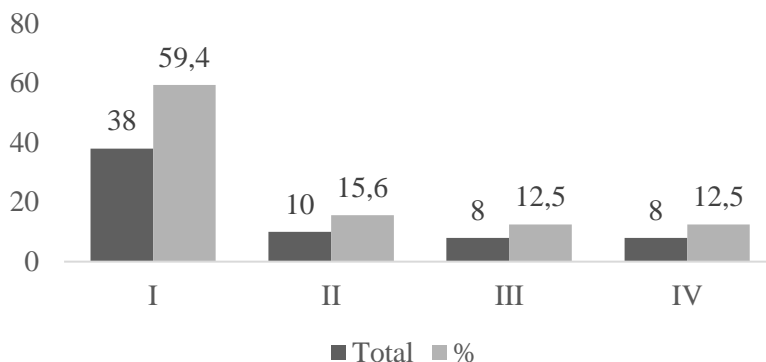


Figure 2. Number of difficulties presented by element group (EG) presented in total and in percents.

All of the rings started their routines with an element from EG III – uprise bwd. to support scale or to support scale straddled. Junior gymnasts and their coaches must be careful with those elements and use them in competitive routines only when the elements are performed at a really good level close to perfection. A good alternative will be to replace it with an easier element from the same element group.

presented in **Figures 3, 4, and 5**. Looking at the D score, the highest one (score of 4,8) was shown by the 3rd ranked gymnasts (CHN), while the 1st gymnast (CAN) had a D score of 4,5. The average D score of all gymnasts was 4,538. The results showed that the 1st and 2nd ranked gymnasts (CAN and BRA, respectively) performed below the mean D score, but they received the two highest E scores. In order to get a high score, gymnasts should aim for high E score and appropriate and well-achievable D score.

Analysis of the difficulty score, execution score, and final score of the gymnasts in the rings are

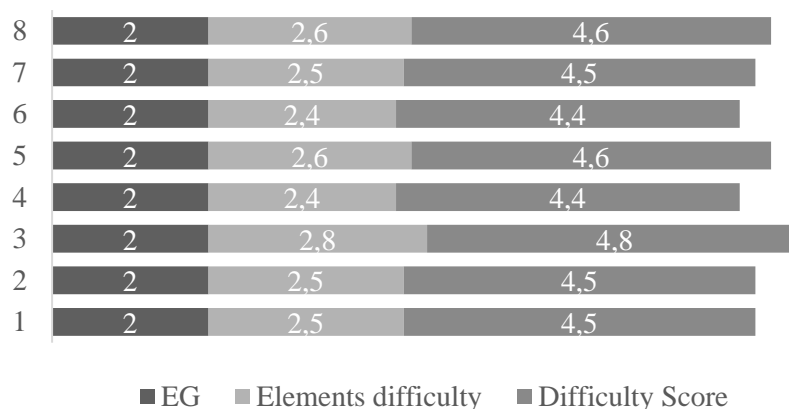


Figure 3. Difficulty score divided by EG, elements difficulty and total D score.

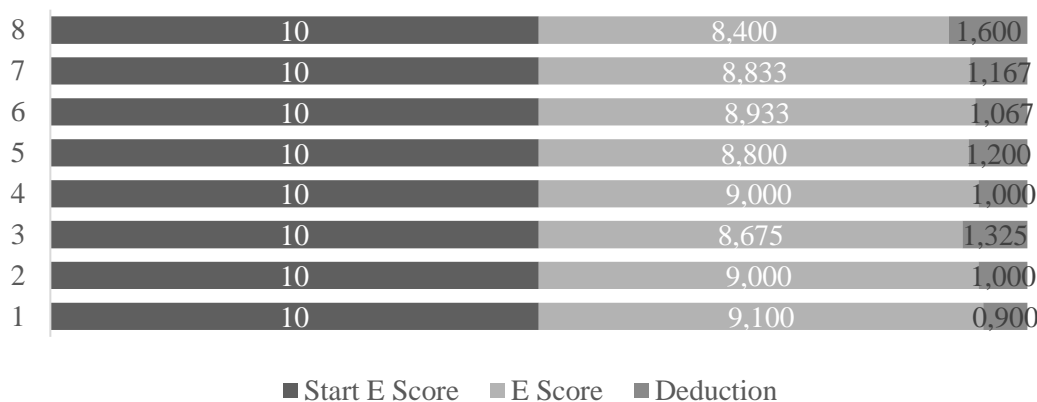


Figure 4. E score

The execution score (E score) evaluates the execution of the routine, and it is the most important score for obtaining a good final score. The 8th gymnast (CHN) received the lowest E score which was 8,400, and the second lowest E score was given to the 3rd gymnasts (CHN), who received 8,675. The two best gymnasts (CAN and

BRA) received the highest E scores - 9,100 and 9,000, respectively. Therefore, in order to get a high E score, gymnasts need to performs their routine with the least possible deductions and errors. The difference between the E scores of the first and the eight gymnasts was 0,6 points (Figure 5).

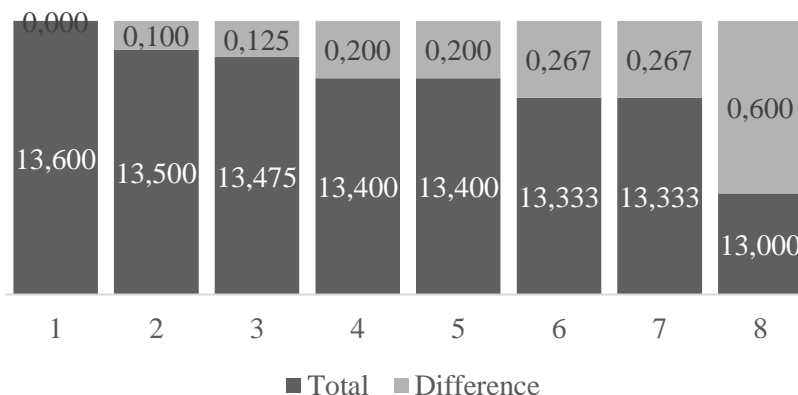


Figure 5. Difference of total score between finalists

This study provides many possibilities for future analyses of the trends on the rings competitions. It will be interesting to observe the way that coaches and young gymnasts will interpret the future MAG Code of Points in the next Olympic Cycle 2021-2024.

CONCLUSION

The information obtained from the current study was used to construct the exercises content on rings for the Bulgarian Juniors National Team in their preparation for the 34th European Men's Artistic Gymnastics Championships. The

elements with the highest frequency were from group C, and the majority of the exercises were from EG I. Moreover, all of the gymnasts performed the elements Jonasson and Yamawaki from EG I. Junior gymnasts need to make sure that they perform Jonasson and Yamawaki correctly. The 1st ranked gymnast (CAN) from this study performed a routine with a high difficulty value and with the highest E score (9,100). The 8th gymnast (CHN) received the lowest E score (8,450), and the 3rd gymnast (CHN) had the second lowest E score (8,675).

Coaches and junior gymnasts should try to increase the D score above 4,538 by selecting swing and swing to handstand elements from EG I, and should also try to decrease errors to the minimum. In order to achieve a high score, the most important thing is to build an appropriate D score which can be executed with minimum errors in order to obtain a high E score. This study can be used to adapt juniors exercise content to the code of points requirements, and can it can be useful to coaches and junior gymnasts for exercise construction in the long term development of young gymnast.

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