

# The relationship between reproduction of the jump's rhythm and technical score of their execution by gymnasts at the stage of initial training

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**Purpose:** to determine the interconnection between quality of performance of the jumps and reproduction of the rhythm of jumps by gymnasts at the stage of initial training.

**Material & Methods:** to determine the relationship between reproduction of rhythm and evaluation by the quality of technique of the jumps we used expert assessment, check the accuracy of the reproduction of rhythm with the help of computer program "rhythmic", methods of mathematical statistics.

**Results:** the study found the correlation between reproduction of rhythm and summing-up of quality the technique of jumps by the gymnasts at the stage of initial training.

**Conclusions:** the ability to reproduce a predetermined rhythm influences the level of technical readiness of gymnasts at the stage of initial training.

**Keywords:** rhythm, technique, jumps, gymnastics, art, stage of initial training.

## Introduction

The growth of requirements of competition rules of rhythmic gymnastics concerning the accuracy of performance of elements, the early specialization of gymnasts demand the search of new methods of training which will provide high-quality technical training of sportswomen from the stage of initial preparation [5; 11; 13].

Experts on cyclic and difficult-coordination kinds of sport claim that study of sports exercises with assimilation of rational rhythm of their performance considerably facilitates and accelerates the process of assimilation of sports technique, promotes fixing of motor skill [2; 3; 4; 7].

There is a problem of study of jumps at the stage of initial preparation in rhythmic gymnastics, in particular, as experts testify (O. Ye. Aftimchuk), running broad jumps and ascent for performance of jumps, which can be solved to applications of exercises, which promote assimilation of rhythm of jump [2]. However the statement of the author is not confirmed with the scientific data.

The reliable correlation interrelations are found in gymnasts at the stage of initial preparation between assessment of the general technical preparedness and ability to reconstruction of rhythm in the research of V. L. Botyayev [3].

However, the direct researches, concerning influence of assimilation of rational rhythm of jumps on quality of performance of their technique in rhythmic gymnastics, were not conducted.

The above attracts prerequisites to check of interrelation between the accuracy of reconstruction of rhythm of jumps and the quality of technique of their execution at gymnasts at the

stage of initial preparation. As numerous researches showed, the optimum prerequisites of improvement of motive activity happen on the basis of assimilation of expedient rhythm of the movement [3; 4; 7].

Modern rhythmic gymnastics is characterized by high precision of the performance of motor actions which demands the performance of movements by spatial, power and time parameters from a gymnast [3].

The foundations of technique are laid at the stage of the initial preparation, which is the base for the subsequent improvement and complication [5; 8]. It is extremely important to acquire the correct bases of method of execution of exercises at this stage [8].

Feeling of rhythm, being basis for the development of coordination of movements, is the inalienable part of technical training of athletes [12].

Feeling of rhythm is important in sports with the difficult and previously determined structure. Small deviations from the set rhythm of movements negatively influence the quality of sports technique in these sports [9].

Each motor action, depending on the nature of motive activity, has the motive rhythm which an athlete needs to seize for the achievement of result in the chosen sport, which is confirmed by the results of the researches [3].

It is possible to form consciously motive rhythm of physical exercise and to regulate it according to motive task, knowing the rhythmical structure of the complete movement, [2; 3; 9].

**Communication of the research with scientific programs, plans, subjects**

The research is executed according to the subject 2.7 "Improvement of the system of physical training of athletes taking into account individual and technical profiles of their preparedness" of the Built plan of the research work in the sphere of physical culture and sport for 2011–2015.

## Purpose of the research

To find the interrelation between indicators of accuracy of reconstruction of rhythm of jumps and assessment for quality of method of execution of jumps in gymnasts at the stage of the initial preparation.

### Research task:

1. To analyze the references concerning the influence of assimilation and reconstruction of rhythm on technique of sports exercises.
2. To define the indicators of accuracy of reconstruction of rhythm of jumps and to estimate quality of technique of their execution at gymnasts at the stage of the initial preparation before and after application of the experimental program of improvement of rhythm.
3. To find the interrelation between indicators of reconstruction of rhythm of jumps and assessment by the technique of their execution in gymnasts of both groups before and after the experiment.

## Material and Methods of the research

40 gymnasts of 6–7 years old took part in the research that answers the stage of the initial preparation in rhythmic gymnastics. Gymnasts of the second year of study took part in the research. Gymnasts reproduced the set reference rhythm of jumps by hands on the computer keyboard, separately in the room, in silence, on 3 times each rhythmical exercise. The average result of error of reconstruction of rhythm by means of the program "Excel" was calculated. Also gymnasts carried out jumps which were estimated by three experts according to the scale of estimation of quality of method of execution of jumps, which is developed on the basis of competition rules

of rhythmic gymnastics. Application of the experimental program of improvement of rhythm lasted 3 months. The correlation analysis in the program "Excel" was carried out between assessment for quality of method of execution of jumps and results of reconstruction of rhythm of jumps. The correlation analysis was carried out before and after application of the experimental program.

## Results of the research and their discussion

Indicators of accuracy of reconstruction of rhythm and assessment of quality of performance of jumps at gymnasts at the stage of the initial preparation for application of the experimental program for gymnasts of the control and experimental groups did not significantly differ (pic. 1, 2; tab. 1).

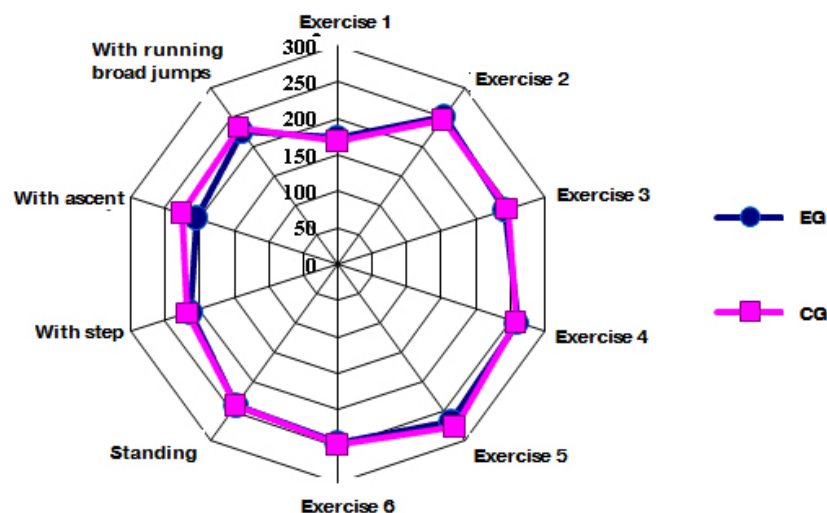
So, the rhythm reconstruction accuracy error indicator at the gymnasts of the experimental group fluctuated from  $202,85 \pm 32,5$  to  $250,55 \pm 20,34$  ms, at the gymnasts of the control group from  $209,7 \pm 14,15$  ms to  $240,3 \pm 25,65$  ms.

The assessment for quality of method of execution of jumps at gymnasts of the experimental group was from 3,95 to 3,15 points, gymnasts of the control group had from 3,92 to 3,1 points. The coherence of opinions of experts was high ( $W > 0,6$ ).

The recheck of accuracy of reconstruction of rhythm and estimation of the method of execution of jumps is carried out after the application of the experimental program [8] within three months, and the reliable improvement ( $p < 0,001$ ) is revealed in the studied indicators at gymnasts of the experimental group (tab. 1).

The correlation analysis with the determination of coefficients of the linear correlation of Pearson was used at the determination of dependences of the studied signs, where the threshold size of significance value was considered 0,05 (or 5%).

Strong correlation interrelations (tab. 1) are found at the gymnasts of the experimental group between the studied indicators before and after the application of the experimental program that confirms the position of authors [3; 4].



**Fig. 1. Rhythm reconstruction error at the gymnasts of the control and the experimental groups before the experiment**

Table 1

Correlation interrelations between results of reconstruction of rhythm and assessment for quality of method of execution of jumps at the gymnasts of the experimental group before and after the experiment

Type of jumps	Period	Expert assessment, p. (M±m)	Rhythm reconstruction accuracy error, η, ms (M±m)	Correlation coefficient, r
Standing jumps	Before the exper.	3,95±0,21	238,6±21,25	0,52*
	After the exper.	6,243±0,22	94,15±9,235	-0,589*
	t-crit.	8,001	6,26	
	p	<0,001	<0,001	
Jumps with step	Before the exper.	4,031±0,2	202,85±32,5	-0,64*
	After the exper.	6,124±0,07	97,3±7,13	-0,454*
	t-crit.	13,65	4,73	
	p	<0,001	<0,001	
Jumps with ascent	Before the exper.	3,59±0,25	215,3±25,2	-0,65*
	After the exper.	6,142±0,26	103,05±10,16	-0,484*
	t-crit.	11,6	6,53	
	p	<0,001	<0,001	
Running broad jumps	Before the exper.	3,15±0,24	250,55±20,34	-0,48*
	After the exper.	5,9±0,21	110,4±10,26	-0,891*
	t-crit.	8,67	7,40	
	p	<0,001	<0,001	

Note. \* – reliable correlation interrelation.

Table 2

Correlation interrelations between results of reconstruction of rhythm and assessment for quality of method of execution of jumps at the gymnasts of the control group before and after the experiment

Type of jumps	Period	Expert assessment, p. (M±m)	Rhythm reconstruction accuracy error, η, ms (M±m)	Correlation coefficient, r
Standing jumps	Before the exper.	3,9±0,29	240,3±25,65	0,34
	After the exper.	5,6±0,23	197,5±18,6	-0,487*
	t-crit.	0,99	1,35	
	p	>0,05	>0,05	
Jumps with step	Before the exper.	3,6±0,48	209,7±14,15	0,39*
	After the exper.	4,9±0,12	191,1±19,5	-0,578*
	t-crit.	0,84	1,96	
	p	>0,05	>0,05	
Jumps with ascent	Before the exper.	3,28±0,56	233,05±25,35	-0,52*
	After the exper.	4,5±0,28	195,4±9,67	-0,565*
	t-crit.	0,79	0,85	
	p	>0,05	>0,05	
Running broad jumps	Before the exper.	3,088±0,37	236,6±32,15	-0,46*
	After the exper.	4,4±0,24	214,7±11,75	-0,612*
	t-crit.	0,76	0,37	
	p	>0,05	>0,05	

Note. \* – reliable correlation interrelation.

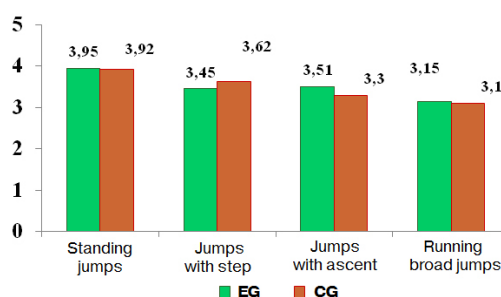


Fig. 2. Expert assessment for quality of method of execution of jumps at the gymnasts of the control and the experimental groups before carrying out the pedagogical experiment

The reliable correlation interrelations on different significance values are observed between the studied indicators at the gymnasts of the experimental group. The average statistical interrelation before and after the experiment is found in standing jumps, in jumps with step: before the experiment – average, after – weak interrelation, in jumps with ascent: before the experiment – average, after – weak interrelation, in running broad jumps: before the experiment – weak, after – strong statistical interrelation (see tab. 1).

The reliable improvement it was not observed at the gymnasts of the control group between results of reconstruction of rhythm and assessment of execution of jumps before and after the experiment of ( $p > 0,05$ ), however the existence of strong reliable correlation interrelations between the studied indicators (tab. 2) is also revealed.

The reliable correlation interrelations on different significance values are observed apparently from results of the carried-out correlation between indicators of reconstruction of rhythm of jumps and assessment for quality of technique of jumps, at the gymnasts of control group before and after carrying out the experiment. So, standing jumps are very weak at the gymnasts of the control group before the experiment, and after – weak correlation interrelation, jumps with step – before the experiment – weak, after – average statistical interrelation, jumps with ascent – average statistical interrelation before and after the experiment, running broad jumps – before the experiment – weak, after the experiment – average interrelation.

It should be noted that interrelations are also in the control group, where the accuracy of reconstruction of rhythm and assessment for quality of technique is lower (pic. 3, 4), than in the experimental, in which the highest indicators of accuracy of reconstruction of rhythm and style mark of execution of jumps.

The obtained data confirm numerous researches of experts concerning the interrelation between reconstruction of rhythm and technique of exercises, and, therefore, put forward development of ability to rhythm reconstruction as one of the prerequisites of assimilation of technique of sports exercises.

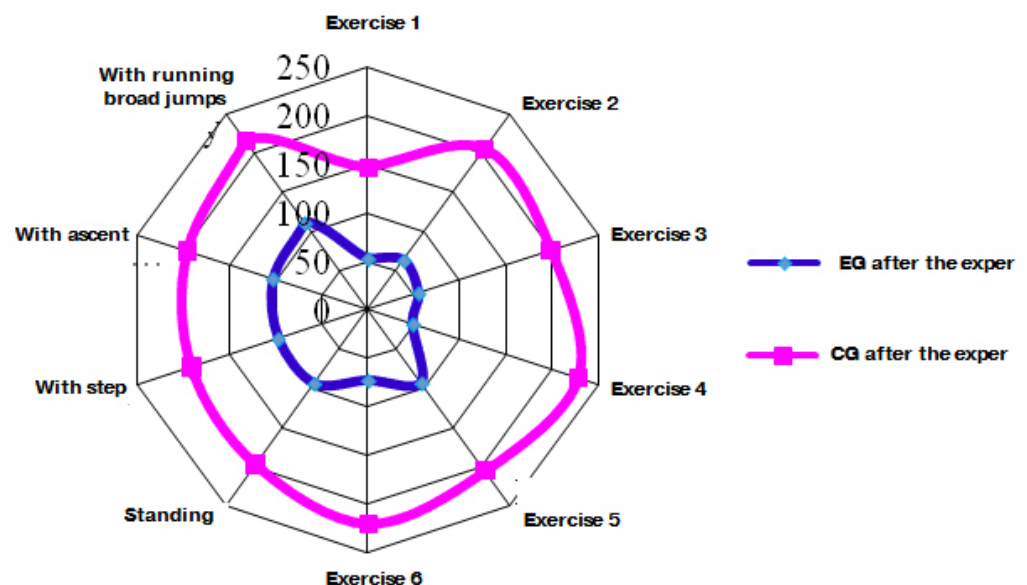
## Conclusions

The reliable improvements of indicators of accuracy of reconstruction of reference rhythm of jumps and assessment for quality of technique of their execution are observed ( $p < 0,001$ ), as a result of application of the developed program of study of jumps for the gymnasts of the experimental group in which the emphasis on the development of feeling of rhythm and assimilation of rhythm of jumps is placed during their studying.

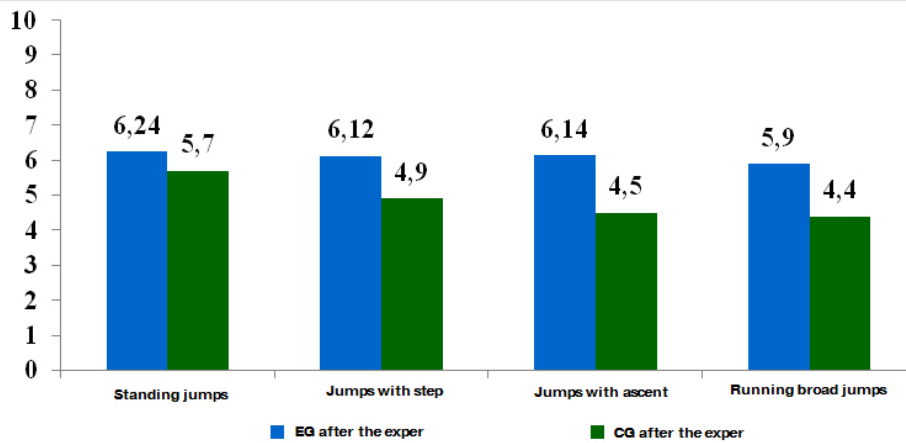
The studied correlation analysis between indicators is carried out before and after the application of the experimental program found high interrelations between reconstruction of rhythm and assessment of execution of jumps at the gymnasts of the experimental group.

The reliable improvement of indicators have reconstructions of rhythm and assessment of execution of jumps was not observed at the gymnasts of the control group ( $p > 0,05$ ), however strong correlation interrelations between the studied indicators are also found. It confirms calculation data of experts on interrelation of reconstruction of rhythm and technical preparedness of athletes.

**Prospects of the subsequent researches.** The testing of interrelation between indicators of reconstruction of rhythm and assessment for performance of competitive exercises without a subject at gymnasts at different stages of long-term preparation is planned.



**Pic. 3. Results of accuracy of reconstruction of rhythm at the gymnasts of the experimental and the control groups after the pedagogical experiment**



**Pic. 4. Expert assessment for quality of method of execution of jumps at gymnasts of the experimental group and the control group after the experiment**

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