Ritmik ve Estetik Jimnastik Kız Öğrencilerinin Ritmik Kabiliyetleri İncelenmesi

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Öz

Ritmik ve estetik jimnastik alanındaki yarışma etkinliği müzik eşliğinde gerçekleştirilir. Müzik-hareket arasındaki ilişki her şeyden önce yarışma yönetmelikleri standartları ile birlikte bireysel ritmik kabiliyetler tarafından belirlenir. Farklı yönetmeliklerdeki kurallara göre yarışan jimnastikçilerin farklı ritmik kabiliyet düzeyine sahip oldukları tahmini ritmik ve estetik jimnastik alanında yarışan kız öğrencilerinin objektif ritmik kabiliyet düzeyi incelenmek üzere işbu incelemenin amacını oluşturdu. Bu alanda yarışan 61 kız öğrencisi inceleme işlerimize katıldı. Test: 1. Dört kare sıçrama; 3. Dört kareye çapraz sıçrama; 3. El ayak duvara frontal vuruş; 4. Ayak ve el ile ritim dışı vuruşlar. Egzersizleri el ve ayak ile eş zamanlı ve ritmik olarak yerine getirilmesi kabiliyeti ritmik jimnastiğin özel belirtilerinden biridir. Bu beceriler her iki grupta yarışma yönetmelikleri standartlarına ve farklı aletler ile yapılan kompozisyonlarda el ile ayak işi gereklerine göre farklı yollardan mükemmelleştirilmiştir. Hareketlerin aynı ritmik yapıya tabi oldukları ritmik koordinasyon test bataryasının /grubunun/ uygulanması iç hareket mekanizması ile müzik eşliğinde gerçekleştirilen jimnastik dallarındaki motor aktivitenin ritmi arasındaki ilişkinin açıklanmasını mümkün kılmıştır. İnceleme sonuçları artistik spor alanlarından kız yarışmacılarının bireysel ritmik kabiliyetlerinin mükemmelleştirilmesine yeni yollar açacak yaratıcılık süreçlerine yardımda bulunacaktır.

Anahtar kelimeler: koordinasyon unsurları, jimnastik, müzik ritmi

Research of Rhythmic Abilities of Rhythmic and Aesthetic Gymnastics-Students

Abstract

The competitive performance in rhythmic and aesthetic gymnastics is done with musical accompaniment. The connection between music and movements is determined by the requirements of the Code of Rules and the individual rhythmic abilities. The suggestion that gymnasts who have competed according to different rules have different level of rhythmic abilities determined the aim of our research: to determine objectively the level of rhythmic abilities of rhythmic and aesthetic gymnasts. The research was done among 61 students – former competitors. Testing: 1. Jumps in four squares; 2. Crossover jumps in four squares; 3. Frontal kicking with legs and arms on the wall; 4. Kicking with legs and arms (in corner). The skills for rhythmical execution of the arm and leg movements are one of the specifics typical of rhythmic gymnastics. These skills have been perfected indifferent way by the two groups according to the competitive rules and the requirement for a certain arm and leg work in the routines with different apparatuses. Applying a test battery for coordination in rhythm, where the movements are subjected to the same rhythmical structure, will enable the clarification of the relation between the inner motor mechanism and the rhythm of motor activity in gymnastics disciplines, practiced with musical accompaniment. The results from the research will help the creative process when looking for new ways of perfecting the individual rhythmic abilities of competitors in artistic sports disciplines.

Keywords: coordination components, gymnastics, music rhythm

INTRODUCTION

Rhythmic gymnastics and aesthetic group gymnastics are disciplines that have their own distinctive characteristics, but also significant similarities. Rhythmic gymnastics has two disciplines: individual and ensemble. Individual participation, performing with apparatuses – rope, hoop, bal, clubs and ribbon. Ensemble – five gymnasts perform one combination with one apparatus and one combination with two different appratuses. The performance with apparatuses, which have been the same since one thousand nine hundred and seventy-three, is the most recognizable element of this gymnastics kind (Gantcheva, 2018).

Aesthetic group gymnastics – a team of 6 to 10 gymnasts, but practice show that the optimal number is eight gymnasts, a combination without apparatuses. Aesthetic group gymnastics historically preceded rhythmic gymnastics but despite the numerous competitions of different rank and the increasing rivalry, it is still considered to be easier to practice. The body exercises performed in both disciplines are the same. The competitive performance in rhythmic and aesthetic gymnastics is made with musical accompaniment. The relation music-movements is established mostly because of the requirements in the Code of Rules, but also due to coaches' views about the use of different music styles and genres, on the basis of gymnasts' abilities for interpretation of music compositions and their individual rhythmical abilities (Viner-Usmanova, 2015). These requirements are the foundation for the creation and evaluation of the routines.

They set the parameters of play with music, dance steps execution, and rhythmical execution of the exercises from the major structural groups related to their correct technical performance (Gantcheva, 2017).

A number of authors have done research on the rhythmical abilitites of athletes and people engaged in motor activities with musical accompaniment (Jeffcock, 2006, Zachopoulou vd 2004, Videv, 2015). The rhythm of human activities can be generally defined as a way of synchronization or unification of the rhythms between the movements of different body parts, between moving object and person, two people, and a person and melody (Schaal vd 2004). From the point of view of our image of musical rhythm, we think both musical and body-motor rhythm are identical (Kursi ve Gzirian, 2014). Being an inborn sense, rhtyhm is present in almost all human daily activities, and in the very human organism – heart rate, breathing, etc. (Zachopoulou vd 2004).

All body systems (respiratory, cardiovascular, locomotory) work in a certain rhythm. In this complex sense, rhythm has a particular place in human organism both for maintaining its homeostasis and for performing its movements (Jeffcock, 2006).

The ability to feel and reproduce rhythm is in the base of a number of sports disciplines, called 'artistic" because of the synchronization of human movements with music – rhythmic gymnastics, synchronized swimming, figure skating, sports dances (Karpenko, 2003). It is considered one of the most important complex qualities and the nature of these disciplines requires its continuous perfection (Rosato ve Fazio, 2006).

The rhythmical ability, defined as a component of coordination abilities, has its manifestation in gymnastics disciplines – rhythmic, aesthetic, artistic gymnastics, aerobics, sports acrobatics, where routines are performed with music accompaniment (Hadjiev vd 2011). Authors divide them into the following five components: reaction ability; rhythmic ability; balance ability; spatial orientation ability; kinesthetic ability for differentiation.

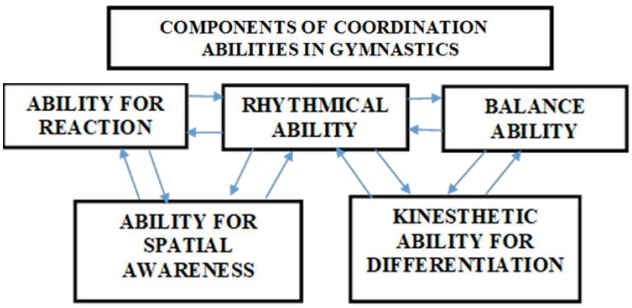

Figure 1 Components of coordination abilities in gymnastics (according to Hadjiev, N., K. Andonov, D. Dobrev, V. Petrov)

Human movements can adapt their rhythm to an outer rhythm (Hafe, 2016). In gymnastics this is expressed through the adaptation to the relation music-movement and the connection of the music phrases, accents, rhythm, specific dynamics and harmony (Rosato, 2006). Music is the only means which, during motor activity, could set the exact rhythm of performance and measure precisely the continuation of the different phases of the movements (Viner-Usmanova, 2015). It is also an accurate reference point for restoration of the execution precision when a mistake has been made (Marcez ve DiSanto, 2000). Music rhythm influences to a great extent the process of mutual actions in group gymnastics (Gantcheva, 2017) but is also an important element in the contents of the curative kinds of gymnastics aimed at developing biological abilities of human body, adequate breathing rhythm which facilitates the adaptation of organisms to the environment (Macovei, 2006).

Rhythmical abilities, being a phenomenon in the field of physical culture, have provoked interest in lots of researchers in the field of gymnastics in their attempt to solve some curative, aesthetic, general development and rehabilitation tasks (Terehina, 1991, Sosina, 2009). In the artistic disciplines, where the relation music-movements is particularly important, researchers use tests including movements close in structure to basic movements in the

certain discipline (Shaykin, 2015). Setting a rhythm and tempo of execution with the use of a metronome or the modified option – the use of music accompaniment with preliminarily set moderate tempo (122 or 128 beats per minute) is a successful way to unite the two components of the discipline – movement and music (Tarnichkova, 2016). Aim of this study , To objectively establish the level of rhythmical abilities of people who practiced rhythmic and aesthetic gymnastics.

METHODOLOGY

Participants

The research was done among 61 students – former competitors and in two stages: in 2021, at the National sports Academy, Sofia:

I group – rhythmic gymnastics students;

II group – aesthetic group gymnastics students.

We recorded anthropometric data about stature and weight and data about age and sports experience.

Methods

To record data about the rhythmical abilities of the researched individuals upon execution of movements performed only with legs and movements performed with legs and arms simultaneously. In order to fulfill the aim of the research we used tests recommended by Damjanovska vd (2013) and tried out in rhythmic gymnastics (Damjanovska vd 2015). Four tests for assessment of coordination in rhythm were used and the results were recorded in number of cycles made in 20 seconds:

Jumps in four squares – In the floor are painted four squares of the same dimension, 40x40 cm, spaced from each other in 5 cm. The performer stands in an upright position, with free slumped hands beside the body, in the right lower square. The movement starts with a jump of the right foot into the right upper square, jumping with the left foot into the left upper square, starting with the right foot in the lower left square and taking three steps (right, left, right foot), after the performed three steps, with his left foot jumps in the left upper square, with the right foot jumps in the top right square, and starting with the left foot in the lower right square takes three steps (left, right, left foot). This makes one cycle of movements. The test is executed three times, the number of the best performed cycles in 20 seconds is recorded. Practicing is not allowed. (Damjanovska et al., 2013, p. 282).

Crossover jumps in four squares – Is the same as the previous test, but here the movement starts with left foot jump in the left upper square, and with his right foot in the right upper square, with the left leg jump in the lower left square is performed three steps (left, right, left foot). Then the movement starts with the right foot jump in the top right square, then with left foot jump in the left upper square and starting with the right foot in the lower right square is performed three steps (right, left, right foot). This makes one cycle of movement. The test is executed three times, the number of the best cycles in 20 seconds is recorded. Practicing is not allowed. (Damjanovska et al., 2013, p. 282).

Frontal kicking with legs and arms on the wall – On the floor in length of 20 cm from the wall, is marked a line, behind which stands the performer in upright position, turned with her face to the wall. Also, in 20 cm height is drawn a line. Hands of subjects are raised at a right angle in the height of the shoulders. Within 20 seconds, the performer should do the following actions: with his right foot hits the wall over the line, lowers his right foot on the floor, then takes a shot with his left foot, lowers the leg down to the floor. Then follows alternately hits with hands to the wall as follows: right hand, after that with the left hand and again with the right one. That is one cycle of movement. The next cycle of movement starts with a hit of his left foot to the wall, and then with the right foot continuing with alternately hitting the left, right, left hand to the wall. Cycles of movements is performed by the end of 20 seconds. The test is executed three times, the number of the best performed cycles is recorded. Practicing is not allowed. (Damjanovska et al., 2013, p. 282).

Kicking with legs and arms (in a corner) – This test is performed in the corner of a room. On the left and right side of the floor, in height and distance from the floor, are marked lines with a length of 20 cm. Respondent in upright position, with arms raised to the level of the shoulders, stands on the marked place. With the right side of the body the hits are performed to the right side wall, while with left side of the body to the left side of the wall. But the movements are performed as follows: the respondent with the left foot hits the left wall above the line and lowers the leg on the floor, with his right hand hits the right wall at the height of the chests, separates the arm from the wall, with his left hand, at the height of the chests, hits two consecutive times in the left wall, separates the left hand from the wall, with the right foot strikes the right wall and lowers the leg on the floor. This makes one cycle of movement. Respondent, starting with hitting with his left foot into the left wall opens the next cycle of movement. The test is executed three times, the number of the best performed cycles in 20 seconds is recorded. Practicing is not allowed. (Damjanovska et al., 2013, p. 282).

Math-statistical methods:

Variation analysis of the results from the research aimed at establishing the statistically significant relations between the variables of coordination in rhythm.

All statistical analyses were performed with the use of SPSS 19.

RESULTS

The variation analysis of the results is presented in tables 1 and 2. The average number of cycles performed for test 1 ranged between 7.23 and 7.46 in both groups, and on the basis of the values of the variation we can claim that the samples were relatively homogeneous V=26.22 and V=20.84, at critical values of the coefficients of asymmetry (As) and excess (Ex) at significance level α=0.05 from 0.795 and 1.556.

The distribution of the values was normal. We can draw such a conclusion on the basis of the coefficients of asymmetry and excess and the values of the range (R) which were approximately the same (R=8, R=6). The results from test 2 are similar– Crossover jumps in four squares. The complication of the task compared to test 1, i.e. the execution of crossover steps in test 2, did not alter the achieved results significantly for x=7.09 for the first group and x=6.81. The increased values of the range (R) with two units (R=10, R=8), a total of 20 steps, mean that the subjects' achievements were definitely weaker. The coefficient of variation V=29.51 and V=24.94 shows an approximate homogeneity of the sample.

In the second group of tests, where the movements are executed with legs and arms simultaneously (test 3 Frontal kicking with legs and arms on the wall, and test 4 – Kicking with legs and arms (in a corner) the average values of the results were numerically close for the two groups separately – x=10.20 and 10.60 for the first group and x=11.92 and 11.62 for the second group. The values of the coefficient of variation were between 10 and 30% and determined that the sample was relatively homogeneous with the exception of test 3 for the first group of researched individuals with V=30.98, which determined the sample as highly non-homogeneous. These results were supported by the values of R (15, 11, 12, 13) being an index for a great dispersion in the sample.

Table 1 Variation analysis of the results from the research among students from the I group

	INDICATOR	n	Xmin	Xmax	R	X	$m_{\bar{x}}$	S	V	As	Ex
1	Jumps in four squares	35	3	11	8	7,23	0,32	1,90	26,22	-0,294	0,174
2	Crossover jumps in four squares	35	1	11	10	7,09	0,35	2,09	29,51	-0,509	0,702
3	Frontal kicking with legs and arms on the wall	35	5	20	15	10,20	0,53	3,16	30,98	1,027	1,698
4	Kicking with legs and arms (in a corner)	35	5	16	11	10,60	0,51	3,03	28,59	-0,057	-0,622
5	Age	35	19	24	5	20,91	0,24	1,40	6,70	0,161	-0,908
6	Sports experience	35	7	18	11	13,17	0,44	2,60	19,70	-0,575	-0,134
7	Height	35	158	180	22	167,94	0,79	4,70	2,80	0,201	0,461
8	Weight	35	45	63	18	54,66	0,67	3,96	7,24	-0,144	0,305

Table 2 Variation analysis of the results from the research among students from the II group

	INDICATOR	n	Xmin	Xmax	R	X	S	V	As	Ex
1	Jumps in four squares	26	4	10	6	7.46	1.56	20.84	-0.303	-0.37
2	Crossover jumps in four squares	26	2	10	8	6.81	1.70	24.94	-1.003*	2.226*
3	Frontal kicking with legs and arms on the wall	26	8	20	12	11.92	2.98	24.98	0.789	0.713
4	Kicking with legs and arms (in a corner)	26	7	20	13	11.62	3.16	27.23	1.147*	1.085
5	Age	26	19	33	14	21.27	2.65	12.44	3.71*	16.397*
6	Sports experience	26	8	16	8	13.15	1.87	14.21	-0.679	0.728
7	Height	26	160	182	22	169.35	4.27	2.52	0.519	2.262*
8	Weight	26	48	69	21	56.54	5.85	10.35	0.431	-0.861

The results from the correlation analysis of the researched indexes is presented in the table 3 and the conditional division of the tests into two groups (movements performed only with legs and movements performed with legs and arms simultaneously) can help the analysis of the obtained results. The tests from the I group correlate to a great extent (,707**), while the tests from the II group are in a moderate degree of correlation (0,423). The results from test 4, Kicking with legs and arms (in a corner) correlate to a normal extent with the other tests for coordination in rhythm (,423* ,441** ,465**).

Table 3 Correlation analysis of the researched indexes

Gymnasts	Frontal feet and hands hitting against a wall	Jumps in four squares	Cross jumps in four squares	Feet and hands hitting (in a comer)	Age	Sports experience	Height	Weight
Frontal kicking with legs and arms on the wall	1							
Jumps in four squares	0,267	1						
Cross jumps in four squares	0,175	,707**	1					
Kicking with legs and arms (in a corner)	,423*	,441**	,465**	1				
Age	-0,155	0,019	0,083	0,22	1			
Sports experience	-0,062	-0,074	0,111	-0,073	0,037	1		
Height	-0,061	0,12	-0,029	0,271	0,174	0,008	1	
Weight	-0,161	0,305	0,135	0,226	-0,027	-0,103	,506**	1

DISCUSSION

The rhythm of the movements, according to Shaykin, (2015), is determined to a great extent by the natural rhythm of the body. Metikoš vd (2003) added that individual rhythmical abilities were domineering for the accurate execution of the movements.

The actions in different kinds of gymnastics are generally a preliminarily established motor model with relatively constant structure. Learning the movements is closely related to typifying the rhythm of their execution and the rhythm of the musical accompaniment used (Hadjiev vd 2011). The requirements of the competitive rules regarding music and its usage are an important factor for the rhythm

of gymnastics exercises (they are shown in table 4). The ability to re-create the peculiarities of the sound through movements is one of the main qualities in gymnastics (Rosato, 2006) and the re-creation of complex rhythmical structures depends, to a great extent, on the level of preparation – technical and musical, as well as on the complexity of the musical forms (Borissenko, 2000).

Table 4 Requirements to the musical accompaniment used

ACCORDING TO THE TEMPO, RHYTHM, MUSICAL CHARACTER AND ACCENTS
Rhythmic gymnastics
Rhythm: The movements of the body as well as the apparatus must correlate precisely with the musical accents, and the musical phrases; both the body and apparatus movements should emphasize the tempo/pace of the music.
Aesthetic gymnastics
Variety in the music: Music of the composition must be varied. Variation in the music comes from different rhythms, tempos, and dynamics. The music must be rhythmically varied and this can include the rhythm of the music itself or the use of the basic rhythm and melody of the music during the composition of the routine. Structure of the music supports the composition: The composition must complement the structure of the music such as the use of the background rhythm and melody. In addition, the use of rhythm and melody as well as different shades and effects of the music must be shown in the composition and execution.

The nature of the two gymnastics kinds and their similarities in the performance with body are the basis for development and perfection of rhythmical abilities through their contents. The skill to change the rhythm of execution of basic movements such as steps, runs, turns, change in the level of play (high – jumps; average – balances, spins; low – rolls, pre-acrobatic movements), collaborations and other interactions with partners are the specific side of the disciplines. The identical results from the tests for the two groups show that despite some differences in the discipline which the subjects practice and the differences in the requirements in the competitive Code of Rules for the certain Olympic cycle, the main component for perfection of rhythmical abilities is the musical accompaniment being the only proper means for measurement of the duration of the exercises and more specifically – their different phases (Tishinov vd 2010). The performance of motor activities with musical accompaniment with different structure improves the abilities for quick and correct change in the rhythm of performance of different movements and combinations. The applied tests for coordination in rhythm are designed in a similar way, according to their rhythmical structure (table 3). The movements are executed in two four (2/4) rhythm. The conditional division of the tests into two groups corresponds to both the index execution with certain limbs and the above mentioned rhythmical structure. In tests 1, 2 and 3, the feet movements are performed in one rhythm. The faster movements in the second rhythm are performed with hand in test 3, and with feet in tests 1 and 2. We can say that test 4 introduces a more complex option because in both rhythms (first and second) the movements are performed with hands and feet, in the first part they are slower, and in the second part they are faster, i.e. the rhythm of the movements is changed and the sequence of the movements is changed too.

Table 5. Design of the tests for coordination in rhythm

Time	**2/4**	
Rhythm	**One, two + one, two-three** 	
Movements counting	**One, two**	**One, two-three**
Test-1 Jumps in four squares	Two movements with feet	Three quick movements with feet
Test-2 Cross jumps in four squares	Two movements with feet (change of direction)	Three quick movements with feet
Test-3 Frontal feet and hands hitting against a wall	Two movements with feet	Three quick movements with hands
Test-4 Feet and hands hitting (in a corner)	Two movements – with foot and hand	Three quick movements – two with hand and one with foot

The gymnasts have perfected such exercises typical for rhythmic gymnastics, mostly with apparatuses or especially when the combination of exercises with body and apparatus requires greater amplitude and wider movements with the body (jumps, travelling, broad steps) and faster movements with lower amplitude with the apparatus (small circles, spins, snakes, spirals and mills). The execution of such motor activity where the different parts of the body can perform simultaneously three and more movements in different rhythm is visible in the achieved results. The execution of a number of rhythmical steps with musical accompaniment in competitive routines is an obligatory requirement according to the Code of Points and it definitely helps gymnasts' mastery of

coordination in rhythm. The use of musical accompaniment on a day-to-day basis in the education-training process is one of the reasons why the execution of movements with complex rhythmical structure and the ability to change the rhythm of the movements quickly, sometimes within one rhythm, is a habit which the gymnasts have built.

CONCLUSION

The establishment of the level of rhythmical abilities of the female students who major in rhythmic and aesthetic gymnastics allows us to justify the assumption that the main factor for the development and perfection of these abilities is the purposeful use of musical accompaniment in the training process.

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