



# Concretization of the direction of formation of artistry among female rhythmic gymnasts based on taking into account factors of success in creating a motor image to music

UDC 796.412.2



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Received by the editorial office on 27.09.2024

## Abstract

The article is devoted to specifying the factors of success in creating a motor image to music, as well as developing approaches to the formation of artistry of athletes in rhythmic gymnastics at the stage of initial training, based on the trends in the development of rhythmic gymnastics and the psychophysiological characteristics of athletes.

**Keywords:** *gymnasts' artistry, expressiveness of movements, perception of music, direction of developing artistry.*

**Introduction.** The content of competitive compositions in rhythmic gymnastics undergoes changes in different periods of its development. Depending on the requirements of the competition rules, the compositions became more dance-like or, conversely, more technical. At the current stage of development of rhythmic gymnastics, achieving a full disclosure of the artistic image is becoming an increasingly difficult task, since the competition rules reward combinations of technically complex elements, while the combination of body difficulty and waves, as an element of motor expressiveness, is not rewarded with additional points [1].

**Methods and structure of the study.** To achieve the goal and objectives, the following sets of scientific methods and research technologies were used: analysis of specialized literature and program documents; pedagogical observations of the training process (n=90) and competitive activity (n=60) in rhythmic gymnastics; electroencephalography; vibraimage technologies; hardware and software complex «Sigvet-command»; pedagogical experiment; methods of mathematical statistics. The methods made it possible to determine the factors that determine the manifestation of gymnasts' artistry, the focus and content of the methodology for developing artistry based on the factors of success in creating a motor image to music.

**Results of the study and discussion.** Having conducted a comparative analysis of competitive compositions (n=60) of different time periods of rhythmic gymnastics development (from 2004 to 2024), the percentage ratio of time spent by athletes on performing technical elements and expressive elements was revealed. The advantage of the 2004 compositions was established: they are harmonious in their content, which meets the laws of composition. The compositions are diverse in their content and use of expressive means. The requirements for artistry in the compositions of the 2000s were assessed as a separate aspect of skill and included high requirements for musical accompaniment, harmony in the composition, facial expression and holistic body movements. In subsequent years, the requirements for artistry changed, and more attention was paid to the originality in the use of technical elements, skill in using the object. Significant changes in the competition rules occurred in 2022, combined elements began to appear more and more often in competitive compositions, combining 2 or more technical elements in one, the time for their implementation is significantly reduced, now the performance of preparatory, service elements does not take up much time from the composition, but at the same time the amount of «object difficulty» has also



increased significantly. Having analyzed the compositions of 2022 and 2024, it was found that the number of technical elements in the competitive composition is continuously increasing, and the expressive elements are only components of service or technical elements. And, despite the fact that the demonstration of artistry is ensured by a variety of musical accompaniment (the use of various arrangements, music with words, etc.), the main trend is the monotony of rhythms and tempo, melodic patterns that determine the choice of expressive elements.

In the course of the survey of highly qualified female athletes (CMS, MS and MSIC; n=50), it was found that the majority of them choose rhythm (32%) and tempo (34%) as a guideline in creating an expressive composition, as they are easier to perceive musical characteristics. The next most popular guideline was the lyrics. Less significant for the athletes were musical dynamics and melodic pattern. The explanation for this lies in the complexity of perceiving these musical characteristics and their detailing in movements, which requires a developed musical ear and a large arsenal of means of motor expression.

The majority of respondents (90%) indicate the need to show empathy with musical images and the presence of emotions when listening to music (48%). The next most important are the emerging motor associations that characterize the formation of the «body language» capable of conveying a musical idea. This is a logical image that allows the gymnast to consciously and purposefully use the means of motor expression. Considering that the training process is designed and new competition compositions are created under the guidance of coaches, it was important to compare their opinion with the opinion of the students. Respondents clearly believe that the level of musicality development in gymnasts directly affects the artistry of the performance of a competition composition. At the same time, most respondents believe that musicality is most effectively developed between the ages of four and 10 (67%). However, coaches (n=50) spend no more than 15 minutes on developing musicality during training, and the means of its development include listening to music, exercises with a change in rhythm and tempo, and to a lesser extent, musical games and motor improvisation to music. At the same time, based on the survey data, exercises to develop the ability to express certain emotions to music were used by less than 7% of respondents.

In order to specify approaches to the formation of artistry in rhythmic gymnasts, pedagogical observations of the training process at the initial training stage (n=90) and an analysis of short-term planning documents were conducted.

It was found that in the projects and directly during the implementation of classes there is no specification of tasks aimed at developing musicality, expressiveness and artistry. The means used to form the artistic component of skill were games and improvisation exercises. An analysis of the percentage of exercises of various orientations showed the predominance of exercises for the development of physical qualities (43,5%) and the formation of motor skills (46,0%). At the same time, only 10,5% of the total lesson time was devoted to exercises for the development of the artistic component of performing skills.

In determining the focus of further research, it was taken into account that the creation of a motor image to music, the understanding of music by an athlete is associated with the level of general culture and a number of psychophysiological features of perception. Based on this, the influence of music on the psychophysiological state of gymnasts when performing movements, on the coordination of movements with music, the level of motor expressiveness and the success of creating a motor image as a whole was studied. For this purpose, the vibralmage technology (Vibralmage) was used, which allows recording micromovements and microvibrations of an athlete and, thus, is a universal detector of emotions, when identifying any emotional and psychophysiological states [2].

A comparative analysis of the indicators of the psychophysiological state of subgroups of gymnasts with different levels of performance skill made it possible to identify the following general trends: at rest, gymnasts with a high level of skill have lower indicators than gymnasts with an average level of skill; relative to rest, significant changes in the indicators of gymnasts with a high level of skill occur only after performing a series of dance steps to cheerful music, with a simple rhythmic structure; the indicators of gymnasts with an average level of skill undergo changes every time they listen to music and after performing a series of dance steps. The obtained results showed that when listening to music, as well as when performing a series of dance steps, athletes with a lower level of performance skills need to make more efforts to demonstrate artistry to music.

Based on the analysis of electroencephalography when listening to music of various emotional nature, it was found that the main reason for low motor expressiveness is the lack of understanding in gymnasts of the direction in creating a motor image, which is due to the accuracy of perception of the idea of the musical accompaniment.

In the process of specifying the factors of success in creating a motor image to music, a correlation analysis was carried out between the indicators of the



Table 1 – The relationship between the effectiveness of coordination of movements with music and psychophysiological indicators of female athletes (n=12, r)

emotional focus of musical fragments					
fun		love		protest	
high level of preparedness of gymnasts					
S	B	C	B	X	B
-0,7	-0,7	0,6	0,5	-0,6	0,8
average level of preparedness of gymnasts					
protest					
C		B		S	
-0,8		-0,8		-0,7	

Legend: S – “self-regulation”; B – “balance”; C – “charismatic”

psychophysiological state and the quality of the implementation of the artistic component of performance skills. It was found that gymnasts with a high level of training already at rest without listening to music have a strong feedback relationship between the number of deductions for aesthetic errors with such indicators as «balance» (r = - 0,6; - 0,89) and «self-regulation» (r = - 0,49, -0,94).

The analysis of the indicators of listening to the first musical fragment revealed a strong connection between «self-regulation» and the quality of the artistic component of performance skills (r = -0,94). At the

same time, after performing a series of dance steps to music, the relationship in the indicators of «balance» increases (r = -0,89) and decreases in the indicator of «self-regulation» (r = -0,71). It follows that when performing a competitive composition to cheerful music, it is necessary to have sufficient «self-regulation» skills. Having a high level of charisma is necessary for performing a competitive composition to lyrical, sad and tragic music. When performing a competitive composition to rock music, one should have sufficient indicators in «self-regulation», «charismatics» and «balance».

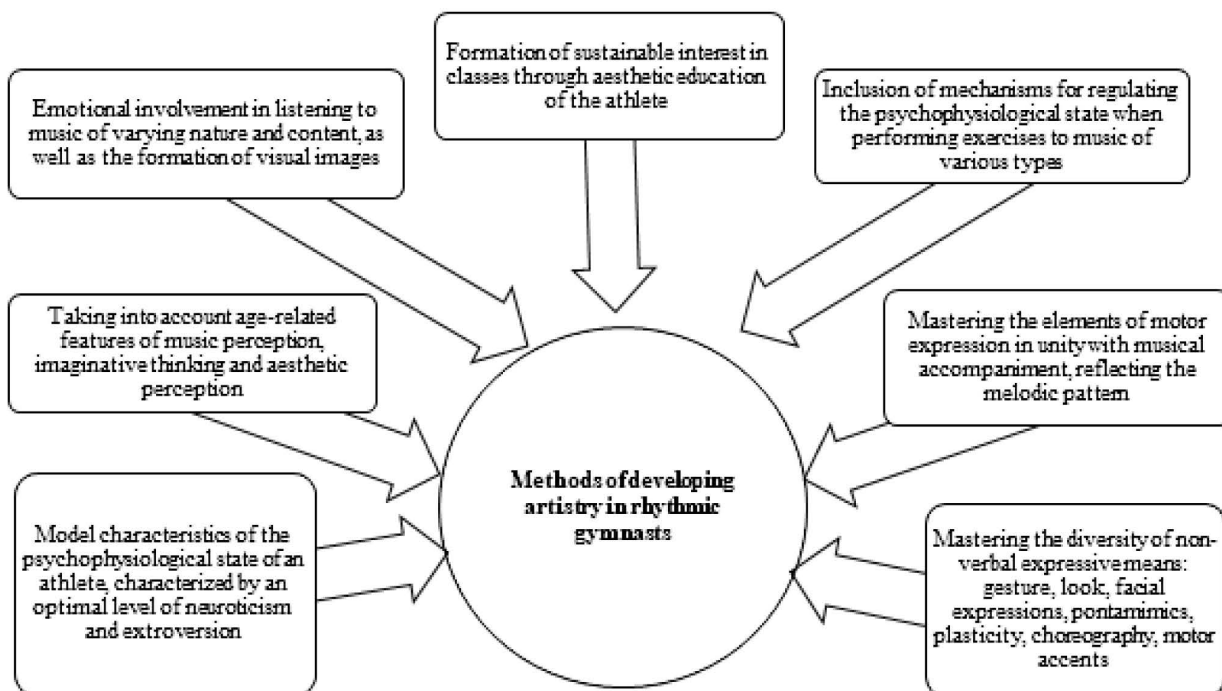
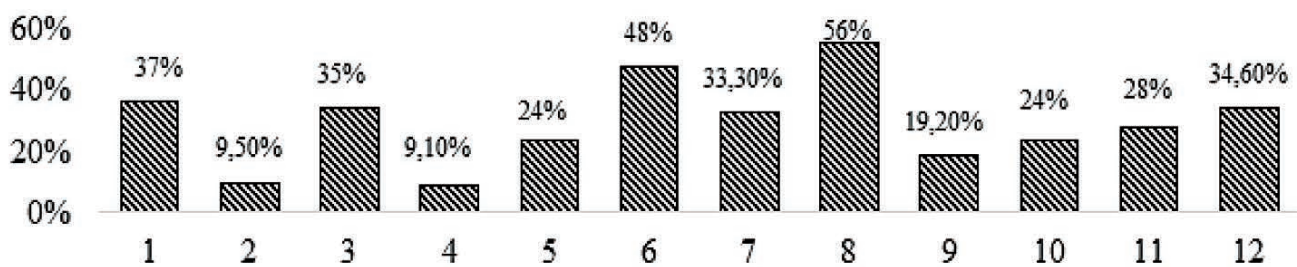


Figure 1 – Factors of success in creating a motor image to music



Note: 1 – gymnastic posture; 2 – turnout of the legs; 3 – foot lifts; 4 – body balance in technical elements; 5 – technical elements correspond to model characteristics; 6 – ease and plasticity of movements; 7 – smoothness of transitions and fusion of movements; 8 – integrity of the composition, without loss of subject; 9 – correspondence of movements to the rhythm of the music; 10 – correspondence of the dance track to the musical genre; 11 – reflection of the character of the music by movements; 12 – emotional expressiveness.

Figure 2 – Increases in the quality of the implementation of the artistic component of performance skills in competitive compositions of gymnasts at the end of the pedagogical experiment (%)

An assumption was made about the influence of such psychophysiological characteristics as: «charisma», «balance» and «self-regulation» on the ability to effectively reproduce musical rhythm and tempo using the hardware and software complex «Sigvet-command» (Table 1).

The obtained data confirmed the assumption made. The results of the conducted studies [3] made it possible to determine the direction of the process of forming the artistic component of the performing skills of female athletes in rhythmic gymnastics, taking into account the factors of success in creating a motor image to music (Figure 2). When developing the content of training, general pedagogical principles were taken into account, as well as the principles of sports training: awareness and activity, clarity, strength and progression, unity of all aspects of training [4]. Of great importance was taking into account the age-related psychophysiological characteristics of female athletes when mastering various musical characteristics (tempo, rhythmic structure, etc.), understanding the «character of music», involvement in the creation of visual artistic images and associations to music. The presence of figurative representations, in turn, formed an idea of movement, which is in a strong relationship with the success of creating a motor image to music.

The regulation of the design process was determined by the traditional structure and stages of training in motor actions. Each of the stages solved its own goals and objectives, but they were all united by the general focus of training on creating a competitive rhythmic gymnastics composition that reflects the main idea of a musical piece. The first stage of forming the artistic component of performing skills implied

the creation of an idea of the main idea of musical accompaniment, the basics of musical literacy and was aimed at forming visual and logical images in athletes. Mastering the mechanisms of psychophysiological regulation of the state by young gymnasts while listening to music with bright emotional coloring included the formation of self-regulation skills in combination with the improvement of facial expressions as an indicator of the manifestation of charisma. The second stage solved the problems of forming the athletes' knowledge about the means of motor expressiveness and their relationship with music, the skills and abilities of motor expressiveness (learning hand accents, hand movements, points with legs, body and arm waves, etc.), the skills of their coordination with the nature of the musical accompaniment and reflecting the idea of the music.

The third stage was aimed at constructing a competitive composition taking into account the previously studied means of motor expressiveness, mastering it, improving and detailing the elements of the athletes' artistry in accordance with the nature of the musical accompaniment.

Specifying the content of the process of forming artistry in gymnasts at the initial stage of training, goals, objectives were formulated, means, methods and methodological techniques were determined, which included listening to music with comments from a coach who forms an idea of music, musical games, exercises to coordinate movements with music, facial expressiveness.

Experimental testing of the designed methodology made it possible to reveal the high efficiency of the impact on each of the designated criteria determining the artistry of gymnasts (Figure 2).



Thus, the increase in «charisma» due to the diversity of facial expressions and motor expressiveness ensured a decrease in the amount of visible efforts, the achievement of ease and plasticity of movements when performing competitive compositions. Improvement of the «self-regulation» mechanisms, allowing switching and concentrating on the technique of elements performed to music, became the reason for significant increases in the criterion of «no loss of object» and, as a result, an increase in the integrity of movements that emphasize the character of the music. Improvement of gymnastic posture became the basis for creating a more precise motor image to music and ensured high-quality performance of elements of motor expressiveness.

**Conclusions.** Thus, in the process of sports training of young gymnasts, a methodology aimed at developing artistry and ensuring an increase in the effectiveness of competitive activity in rhythmic gymnastics was successfully tested. It has been proven that the artistry of gymnasts depends on objective factors of expressiveness, which determine the direction of the applied means and methods of training. The formation of emotional experience of empathy with a musical plot in young gymnasts, as well as an arsenal of means of motor and facial expressiveness, contributed to the manifestation of artistry in creating a motor image. The focus of the designed methodology on understanding and mastering the mechanisms of creating an artistic motor image by athletes contributed to the high-quality implementation of the principle of consciousness and activity in training sessions, ensuring their harmonious physical and spiritual development [5].

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