

MOVEMENTS SYMMETRIZATION – A NEW CONCEPT OF MOTOR LEARNING IN SPORT

by

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Symmetrical structure of human body allows to perform asymmetrical and symmetrical extremities movement. However, most people use mainly right hand, what could be an effect of social tradition and genetic background. Both factors probably causes a right — hand dominance in human motorics. The problem what kind of movement, asymmetrical or symmetrical, is more profitable for man has not been solved yet. Since alternative attitudes to this problem not include many social, biological, physiological and psychological aspects of the human motorics, a new concept has been developed to create the better movements of the upper extremities. In contrast to other theories the concept prefers interrelation between both asymmetrical and symmetrical elements in the human motoric system. In practice, the interrelation is individually adjusted to the subject, according to his experience in movement. The concept is based, therefore, on a procedure of symmetrization of movements, that is on the equalising process of efficiency for left and right hands with a preference for an individual dominance the one of it. Starosta (1975, 1984, 1990) and others authors showed that the symmetrization process improves the coordination of movement and its efficiency, quality and accuracy. It has also been showed that recovery of the exhausted hand can be accelerated, when the other hand performs some exercise. Recent cross-sectional study proved that 20% of judoist who were under symmetrization process during preparation for Olympic Games of 1980 won over 50% of medals, including 6 gold among 7 possible. I conclude, therefore, that the symmetrization process is beneficial for sport performance, working and everyday movements practice

Key words: movement, teaching, symmetrization, new concept, sport, laterality.

Introduction

There are numerous facts indicating that the dynamic development of competitive sport is coming to an end. If further progress is to be achieved, new reserves should be utilised. The greatest hope lies in the methodology of teaching and improving the technique. One of the reserves that could be used in sport is movements symmetrization understood as the process of equalising the fitness of both body

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sides while preserving the dominant one. In a wider perspective, this movements symmetrization is concerned with the upper and lower limbs and the movements of the whole body with turns (ambidexterity, bidirectionality, double-leggedness). This way of human motor development was rarely adopted, especially, in competitive sport. However, **everyone, irrespective of age, follows this process to a lesser or greater extent both in every day and professional life as well as in a form of physical activity pursued in sport, recreation and rehabilitation.** Movements symmetrization is most often undertaken by left-handed individuals who want to adapt to the majority of the society, namely to the right-handed. Thus, we may agree with the following: „A left-handed person has always a certain advantage over the right handed person who never attempts to gain so much skill in his left hand as the left-handed individual in his right hand” (Boehmig 1973:137). As a result, the left-handed show a higher level of symmetrization and thus a higher level of movements coordination.

Symmetrization becomes a prerequisite for the competitors who practice sport disciplines (e.g. breast stroke and freestyle swimming or kayak sport) that require equal involvement of both body sides. There are many types of movements symmetrization that are determined by various factors (Tabl. 1). The process of symmetrization usually proceeds spontaneously and periodically. **Needless to say, it is applied and followed without any knowledge of didactic principles.** This is why its effectiveness does not always correspond to the sportsman potential. Moreover, we should ask the following question: Is there any need for the application of the symmetrization process if the individuals with a low level of symmetrization also achieve remarkable sports results on the international arena? The question is best answered by the synthesis of the results obtained by different researchers who investigated the issue of symmetrization (Tabl. 2). Although the studies included subjects of different age and sex, various sport disciplines practised by them and different methods of recording symmetrization effects, in all cases positive results were obtained. On the basis of the conclusions reached in the experiments and studies I drew up a list of positive and negative effects of movements symmetrization (Starosta 1995) was established. As the positive effects are definitely predominant thus we may purport that **movements symmetrization is as an indispensable process on the way to motor development and improvement of any human being. In addition, the symmetrization gives an opportunity for improving the technique of exercise performance and for raising the level of movement coordination; it also increases movement accuracy, and the like. If the favourable effect of the symmetrization process is so clear, thus it should be an integral part of the theory of movement teaching regardless of its purpose: everyday and professional activities as well as productive, artistic, rehabilitative, recreation and sports activities.**

Considered from the above point of view, movements symmetrization can be recognised as a social problem since it **affects every human being and his various**

Table 1. The types of movements symmetrization found in everyday life activities and sport

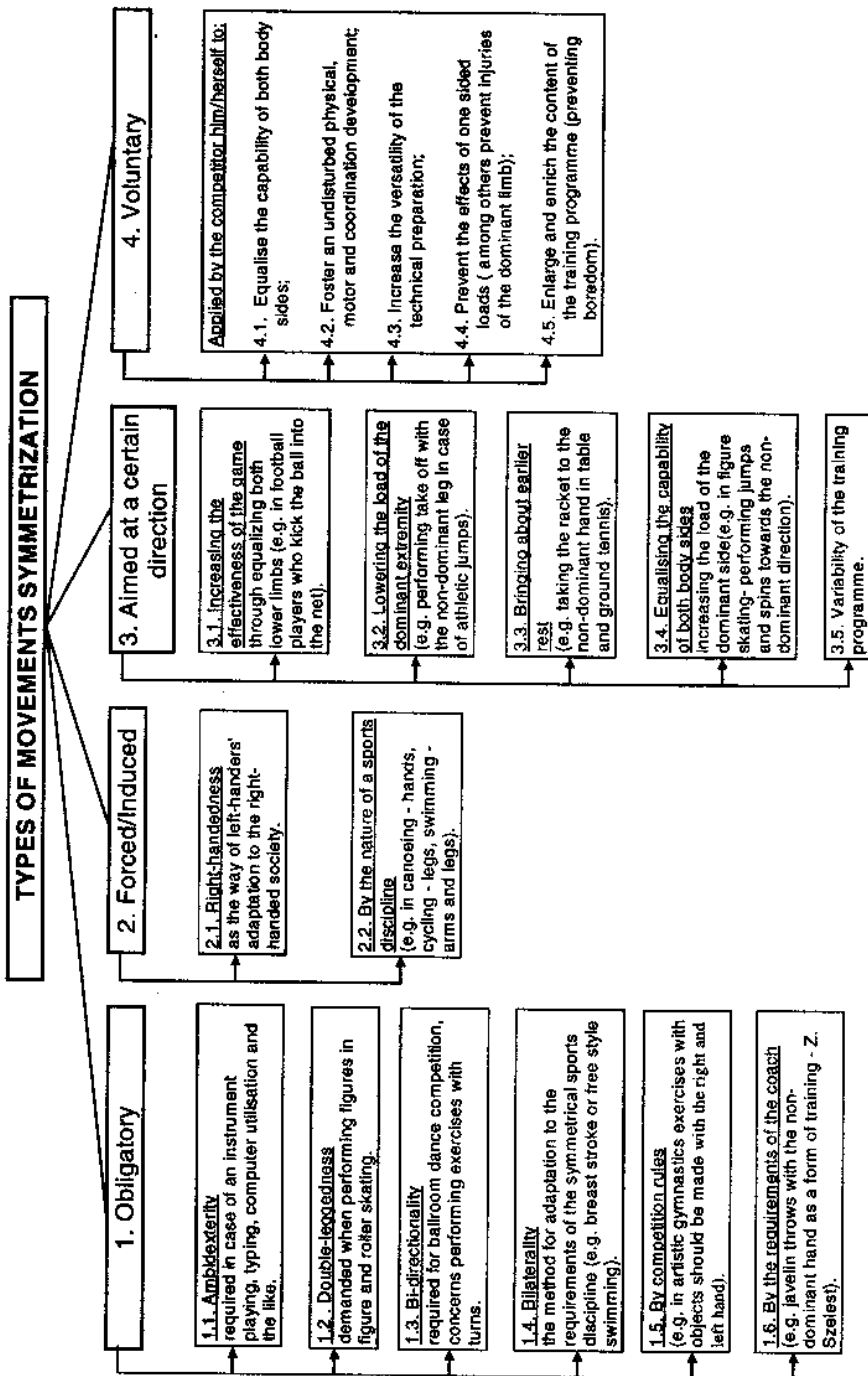
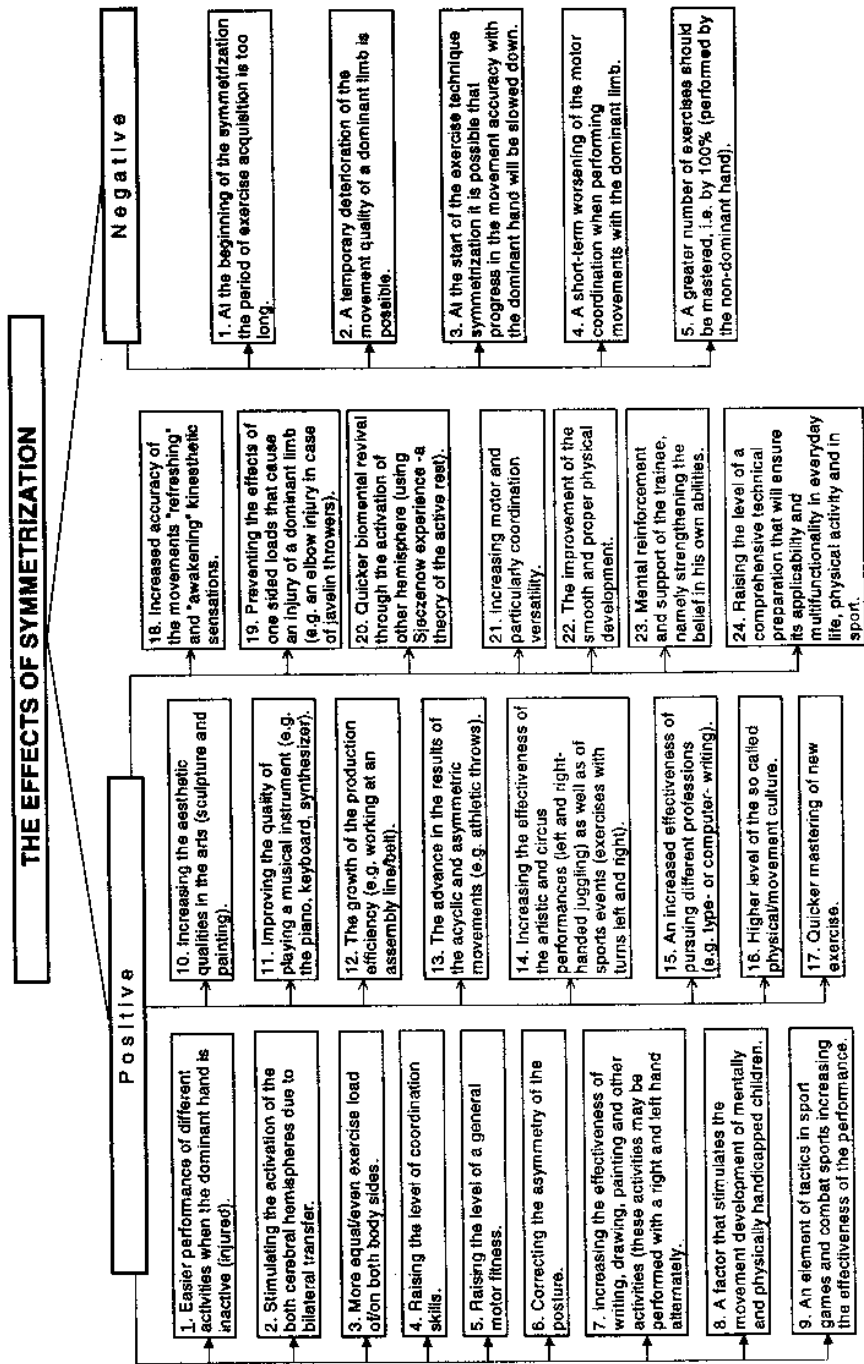


Table 2. The effects of movements (technique) symmetrization in sport competitors and non-practitioner of sport



forms of activity. Therefore, what we need is the optimisation of the process to achieve the greatest effectiveness possible. Bearing this in mind, the aim of the paper is to present the following:

1. The basic assumptions of a new concept.
2. The principles and conditions of its application .

2. The basic assumption of the new concept

These assumptions include the following elements:

2.1. Functional asymmetry is favourable in sport if it is based on symmetry. If asymmetry has no such foundation, the symmetrization of movements leading to an improvement of the less capable body side is recommended. This is one of the important elements of contemporary training of young competitors.

2.2. Early specialisation of an extremity or body side lowers the top level of motor abilities. Whereas, a more comprehensive preparation, and thus the symmetric one (Starosta 1984), is conducive to the higher level of movement asymmetry, (i.e., better sports results).

2.3. Sports performance is a result of the symmetric and asymmetric movement preparation (Starosta 1984). Skillful combination of these two elements (i.e. comprehensive and versatile preparation including symmetric preparation) in many years of training gives better chances of attaining top results in sports activity.

2.4. Many years of training call for different proportions of symmetric and asymmetric preparation should be applied. At the very beginning, the symmetry of performance of all the exercises in general and special preparation is required.

2.5. Movements symmetrization is more effective when all types of preparations are aimed for its development.

3. The principles and conditions of the new concept application

3.1. According to sports discipline

Almost every sports discipline requires from an individual practising it, a different type of adjustment (movements modification) (Starosta 1990). The type of the sport and the nature of exercises used in the practice of this sport may either strengthen unilaterality or develop bilaterality, i.e., similar fitness of the left and right side of body. A lateral differentiation of movements allows us to distinguish the following groups of sports disciplines: asymmetric (they are prevailing), symmetric and mixed.

The asymmetric sports demand the specialisation of one extremity (e.g. fencing) or one body side (e.g. judo or figure skating), whereas symmetric sports require that a person to use both limbs with almost equal skills (e.g. kayak sport — both hands, ski jumps — the whole body). So far, the symmetrization has been carried out on the basis of a trial and error method. Although this method proved to be successful in the past, it cannot be considered as effective now. The reason for this is

that symmetrization, as the element in the process of improving the technique of movements, calls for the application of concret principles indicating the course of action. It may seem surprising that the methods employed so far, not always reasonable and feasible, contributed to the attainment of the high level of technical mastership by the competitors, particularly in symmetric disciplines. This only proves that human adaptation possibilities are great, although we do not know how many people showed unsuccessful symmetrization.

3.2. According to the movement complexity

The effectiveness of the symmetrization process is determined by the complexity of the movement (Starosta 1991). The local movements of particular parts of the body (legs, hands) are easier to be symmetrized. The symmetrization is much more difficult in case of total movements that require the concurrence of the lower and upper limbs movements, which becomes even more difficult when combined with a simultaneous change in the position of the whole body. In terms of coordination the most complex movements are those that involve the whole body connected with turns. Such movements occur very often in everyday life activities and, particularly, in various forms of dancing and sport. When adopting the symmetrization process it would be advisable to consider a draft scale of movement complexity to act in accordance with one of the basic didactic principles that states from „simple” to „complex”. The more complex the exercise is, the longer the time duration of symmetrization is. The effectiveness of symmetrization depends on the level of coordination. The individuals who show higher level of coordination are quicker and more accurate at the acquisition of the exercise including their non-dominant extremity and the turns towards a non-dominant direction.

3.3. According to the level of coordination.

The range (the number of exercises) and level (the level of acquisition) of symmetrization depends on the coordination potential. The higher the level of coordination is, the greater the number of exercises can be successfully symmetrized. Moreover, higher coordination level allows to obtain greater approximation of the quality of the exercise technique that involves the right and left side of the body. Those with weaker motor abilities may attain symmetrization only through simple exercises. Only the most talented individuals may be the subjects of the very complex symmetrization exercises. The above presented conclusions were reached on the basis of the empirical studies and research (Starosta 1975, 1990).

Depending on the capacity of the technique that is concerned with a concret discipline we decide on a particular number of symmetrization exercises. At the beginning, we employ basic exercises typical of a given discipline. The more complex the exercises are, the smaller there is a number of the exercises that can be mastered symmetrically (Starosta 1995). There are three stages during which symmetrization takes place:

1. exercise performance during the training ;
2. exercise performance during sports competition;
3. exercise performance as an element of the tactic.

The third stage requires the perfect mastering of the movement performance. The movements symmetrization is ruled by the same principles as those found in the teaching and improving sports technique, namely conforming to the process of the stages determined by the levels of coordination by Farfel (Starosta 1995). It means that first an accurate movement is demanded (Level I), then the combination of the accuracy and speed of its performance (Level II) and finally we require a precise and quick movement performed in changing conditions (Level III).

Symmetric exercise performance during competition as the tactic element is available only to the top competitors and it concerns most often the so called „crucial elements“, namely specific for a technical preparation of concret competitors. The results of the studies showed a marked effectiveness of symmetric movements in combat sports, among others in wrestling and judo in the master class athletes during European and World Championships (Starosta 1990).

3.4. According to the form of movement preparation.

As competitors begin practising sport having different movement preparation experience (different scope and level of versatility) thus various methods and approaches should be adopted by the teacher. The crucial idea to be applied is as follows: whatever the skills of the sportsman are the ultimate goal of teaching should aim at developing movements asymmetry through complex exercises (if this is required by the practised discipline) supported by the symmetry in the simple exercises.

Symmetry should be applied regularly from the beginning to an end of the competitor's career. We may distinguish three types of competitor's preparation. They are starting points for an teacher. Thus, we have symmetric (A), asymmetric (B) and asymmetric-symmetric preparation (C).

Out of the eight variants, the fifth one seems to be the most feasible and rational. In this variant, a competitor, who has already developed symmetric skills, starts performing one part of exercises using his left leg (with turns left) and the other using his right leg (with turns right). He maintains symmetry in complex exercises while specialising in asymmetric performance of the most difficult exercises. It is an optimal variant, however, it has not been fully tested yet.

4. Final remarks

The concept presented here and the ways of its application were verified by studying first, beginners and then advanced figure skaters. I transmitted the obtained results with the competitors of 14 sports disciplines. Although the concept was utilised, it still does not ensure the achievement of high scores in a short period. There is no denying, however, that it increases the effectiveness of the training.

The proposed concept considers motor education as an element of the system that makes it possible to develop all types of movement performance with the use of hands, legs, the whole body and the movements combined with the turns of the body. In addition, it takes into account cyclic and acyclic movements and this is why it may be **helpful in improving the technique of all sports disciplines. The above statement makes the concept universal.** The concept seems to be original because of the following qualities:

- multivariant aspect — it may be used for the competitors with different level of movement preparation;
- dynamic aspect — it allows for the variability of movement preparation;
- prospective aspect — (the most important feature) it is intended for a many years of training — from the beginning until the end of the competitor's sports career.

The implementation of the presented concept will be favourable in all stages of training. This is probably due to the fact that **the specialisation of one limb or one direction of body turns, if applied from the beginning of the sports education and without movements symmetrization, lowered the level of the competitors capabilities.** Moreover, in asymmetric sports the permanent over load of one body side brought about injuries that for life prevented the competitors from practising sport. Whereas, creating the strong foundation for comprehensive movement preparation, including symmetric preparation, is conducive to the attainment of the movements asymmetry level ensuing better sports results.

Symmetrization, thus understood, is a process of the coordination improvement. It is not only preoccupied with a sport result but first of all with the health status and a proper physical and psychomotoric development of a young competitor. No sport result, even the highest one such as the world record can be more important than a human well-being.

Conclusion

1. The symmetrization of movements as a process of equalising of fitness of both sides of the human body is undertaken by each individual. It concerns all activities of everyday and professional life, as well as motor activity directed at recreation or rehabilitation. This process progresses usually in a spontaneous way, not systematically and without adhering to any principles of rational learning. Despite that as a rule it brings about positive results.

2. The practicing of some sports disciplines (e.g. swimming, canoeing) requires from the competitors the symmetrization of their technique. A high level of this technique ensures attaining technical mastery and significant sports results. Also in this case the symmetrization is implemented frequently without any knowledge of principles of rational didactic system.

3. The process of symmetrization is also indispensable in those sports disciplines in which dominating are asymmetrical movements. Even a partial equalising of fitness of both sides of the body increases the level of movement coordinations and improves the technique of implementation of all exercises, and, what is just as important, prevents injuries resulting from excessive using of the dominating limb (side of the body).

4. Results of studies of numerous authors (including own studies) point at a considerable dominance of positive consequences of movements symmetrization. Therefore this process may be considered as indispensable in the motor improvement of each man. It should constitute an integral component of the theory of movement teaching.

5. On the basis of long term own studies, proposed was a new concept of teaching and improving the technique of movements. Its basic assumption is based on a rational connection of symmetry and asymmetry of movements. This is due to the fact that functional symmetry is only favourable in sports when it is based on symmetry.

6. The symmetrization of movements concerns each individual and all types of his activity. That is why the optimisation of that process obtains an importance of a social problem directed at increasing the efficiency of functioning of man.

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