IDENTIFYING THE PHYSIOMOTOR PREDISPOZITIONS CONSIDERED AS FAVOURABLE FOR PRACTICING SPEED SKATING

VAIDA MARIUS

Physical Education and Sport Department, Petroleum and Gas University from Ploiesti, ROMANIA
E-mail: vaidamarius@yahoo.com

Abstract

The present study points out the importance of the favorable predispositions in performance sport and it started from the hypothesis that, if we identify the main physiomotor predispositions considered favorable in practicing speed skating, then these can constitute a very important clue of appreciation of the future champions, being able to pointed out, by different specific tests, certain organic or functional deficiencies that later can create problems both from the athlete's health point of view or the athlete's results. By identifying these predispositions favorable we avoid the engaging in speed skating of the athletes that do not have the necessary qualities for practicing this sport.

This study forms on a hierarchical system the physiomotor aptitudes considered favorable, their classification being made on the basis of a hierarchy scheme, schemes completed with the help of certain specialists from speed skating from our country.

Material and methods

The identification and hierarchy of the main physiomotor aptitudes favorable for practicing speed skating have been made in collaboration with two of the best coaches in the country, the used research methods and techniques being: the bibliographic study method, the questionnaire method, the observation method, the statistic-mathematical method, the graphic method.

This study has been realized using the hierarchy scheme of the favorable predispositions (or choosing the best solution, from more possibilities) made by E . D. Colibaba (1998) and which we will present in the paper.

Results

Connected to the hierarchy of the physiomotor aptitudes we notices that, although at this age these are fluctuant, the order realized by the obtained score are: voluntary apnea, vital capacity, cardiac frequency and arterial tension.

Conclusions

The resulted conclusions from this paper can be at the base of certain future researches, knowing that speed skating is a very complex sport that has very varied tasks as the distance that must be crossed, from 100 m to 10000 m, containing actually all the effort forms encountered in sport. From the presented conclusions we point out the fact that, the voluntary apnea is considered a very important clue for foreseeing the future sport performances, through its connection with the hypoxia resistance, knowing that in the sport with cyclic character, such as speed skating, there is a connection proved by the superior results and the increase of the individual stability at hypoxia, the resistance at hypoxia being very strongly genetically determined.

Key words: favorable predispositions, speed skating, physiomotor aptitudes

Introduction

Identifying the physiomotor predispositions considered as favorable for practicing speed skating constitute a theme of present interest, because these aptitudes have a certain significant role in the initial selection process and not only.

Lately, it has been notices an increase of interest from the specialists for the performance sport, being able to observe and improvement of it at all the collateral disciplines with which the sport of high performance has tangency (biology, genetics, biomechanics, motor anthropology, psycho-pedagogy, technology, coaching methodology, etc.).

Performance sport is sustained also by the multidisciplinary researches of which results we can say that had a special influence in restructuring the old traditional strategies of selection and training of children of an early age and not only.

In Romania, with all that there is an acute lack of specific sport bases, even if the sport materials of last generation, the Romanian athletes have obtained the international results relatively well at the junior level. Through this hierarchy I whished to bring a plus of information in the domain, pointed out the fact that there have to be selected only those athletes that answer certain specific criteria, well limited.

The activity through which it is realized the tracking of talented elements for practicing speed skating is a very important one and that must contain a series of entire agents (coaches, teachers, educators etc). Just through a continuous activity and of quality at the level of orientation and selection process, of course having at its base clear and well made knowledge over the favorable predispositions that are at the base of the respective sport branch, we can obtain superior results at higher ages,

avoiding the engagement in the performance sport just of the children that manifest their desire to practice skating, not taking into account the real qualities that these children have, fact that limits the appearance of further superior results, realizing additional costs with many children that are not in the models and characteristics frame necessary to the respective sport.

The sport results of worldwide level are conditioned by certain qualities that are in part genetically determined, of course these being influenced also by the quality and quantity of the further training. Realizing the superior sport performance not only on the basis of the genetic qualities of the athlete, or only on the base of the training developed no matter its quantity and quality is a wrong conception that finally will lead only to the athlete's decline.

A. Madella (2000) considers that finding children with tendencies towards certain sports is situated in the center of the discussion had with researchers, coaches and federations, international organisms etc. Also, the same author says that the most used factors in order to search and discover talents are: anthrop-motor and morphological criteria, functional parameters, conditional capacities, coordinative capacities, psychological variables, environmental conditions and tolerance capacity of the specific tasks and of stress (A. Madella, 2000).

Usually, searching the talented elements for certain sport branches has been realized through certain strategies, that are pretty simple and that, mostly, have given results. These identification strategies are (A. Madella, 2000):
- First sight experience.
- Realized performance during the selection contest.
- The confrontation with the correlative test and with the reference models specific to the respective sport branch.
- The longitudinal analysis of the evolution rhythm.

It is recommended that, during the initial selection process, coaches to follow the testing of the children concerning (Romanian Federation of Speed Skating, 1991):
- The functional and morphological development of the subjects in concordance with the particularities specific to practicing speed skating.
- Developing the motor capacity of children reported to the structure of the skills and actions specific to speed skating.
- The development of personality traits of children in concordance with the behavior requirements specific to practicing speed skating.

As speed skating is a complex sport, with very varied tasks as the distance that must be crossed, these starting from 100 m until 10000 m, containing the fact that almost all the effort's forms encountered in sport, we can say that the identification of the predispositions favorable for the speed skating has become a necessity, knowing the fact that, in our country, there is no clear delimitation of these predispositions, their identification being able to make easier the work of specialists that are in charge with children's selection for practicing speed skating.

Hypotheses

In the present study I started from the hypothesis that, if we identify the main physiomotor predispositions considered as favorable for practicing speed skating, then these can constitute a very valuable clue of appreciation of the future champions or can point out, through different specific tests, certain organic or functional deficiencies that later can create problems both from the athlete's health and his results.

Research methods

The identification and hierarchy of the main physiomotor aptitudes favorable for practicing speed skating has been made in collaboration with two of the best coaches in the country, the coach of the junior Olympic lot (the category of athletes with the best international results lately) and the coach of one of the top clubs from Romania in what concerns the obtained results in speed skating across the time (The Sport Club Petrolul Ploiesti).

The realized classification has had into account also the age at which the initial selection in speed skating is being realized but also as evolution in time of those characteristics.

The used research methods and techniques have been the following: the bibliographic study method, the observation method, the questionnaire method, the statistic-mathematical method, the graphic method.

During this hierarchy we have followed the main physiomotor aptitudes used by the specialists, that are also easy to test, not being necessary a very complex equipment, being able to use also the clubs with a weaker rigging in what concerns the equipment, this classification containing: the arterial tension (T.A.), the cardiac frequency (F.C.), the voluntary apnea (A.V.) and the vital capacity (C.V.).

The three presented scores in the present paper are obtained on the basis of the hierarchy scheme, by the author (score 1), as ex performance athlete (multiple champion and national record man in speed skating), by the coach of the junior Olympic lot (score 2) and the coach of the Sport Club Petrolul Ploiesti (score 3).

The hierarchy study of the aptitudes favorable has been realized using the hierarchy scheme of the favorable predispositions (or choosing the better solution, from many possibilities) made by E. D. Colibaba (1998) and which we present in table 1.

Table 1: The hierarchy scheme of the favorable predispositions (E. D. Colibaba, I. Bota, 1998).

Comparison way Aptitudes, conditions and solutions	A	B	C	D	E	F	*Question*	*Answer*
A		+	+	-	+	-	Is *A* more important than *B*?	-
B	-		-	-	-	-	Is *A* more important than *C*?	-
C	-	+		-	-	-	Is *A* more important than *D*?	+
D	+	+	-		-	-	Is *A* more important than *E*?	-
E	-	+	+	+		+	Is *A* more important than *F*?	-
F	+	+	+	+	-		*C* more important than *D*	-
Total no. of "+" on columns	2	5	3	3	1	1	etc	etc
Aptitudes hierarchy	3	1	2	2	4	4		

The operational development used in the presented hierarchy had been the following: the predispositions have been noted on vertical and horizontal in the same order, each aptitude favorable on the horizontal (eg. Arterial tension) and are compared with the other predispositions on the vertical (eg. Cardiac frequency) asking questions – for example – is the arterial tension more important than the cardiac frequency?. If the given answer is "no" than we note with a minus the box near the arterial tension and with a plus in the box corresponding to the cardiac frequency.
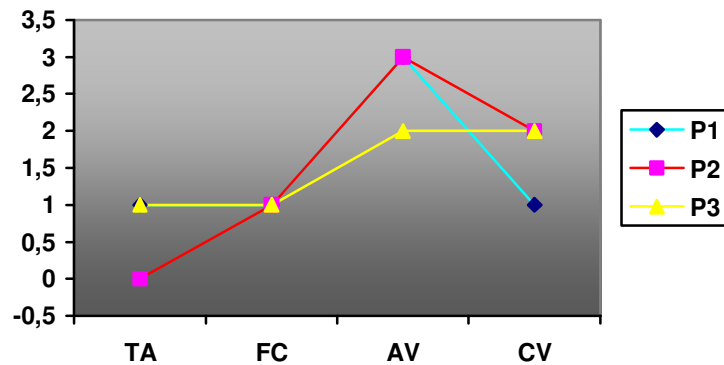
After we complete with the marks + and – this table we make the sum of pluses (+) at the end of each column in part. The hierarchy of the predispositions is ordered after the number of obtained pluses.

Results and discussions

After we have completed the hierarchy schemes proposed or have obtained the following scores from which we have realized the proper hierarchy. These scores are presented in table 2.

Table 2: The hierarchy of the favorable physiomotor aptitudes

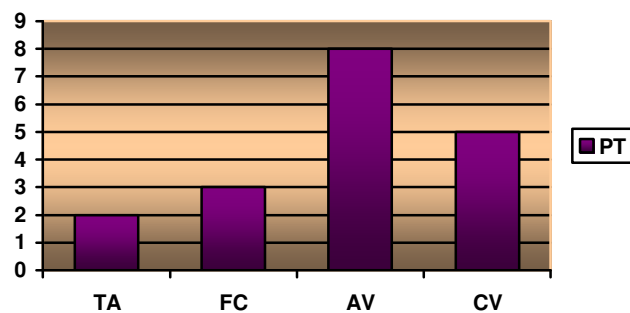|	**Physiomotor aptitudes**			
Aptitudes	**Arterial tension T.A.**	**Cardiac frequency F.C.**	**Voluntary apnea A.V.**	**Vital capacity C.V.**
Score 1 (P1)	1	1	3	1
Score 2 (P2)	0	1	3	2
Score 3 (P3)	1	1	2	2
Total score (PT)	2	3	8	5
Aptitudes hierarchy	**4**	**3**	**1**	**2**

Graphic 1: The graphic representation of the physiomotor aptitudes favorable depending on authors

In the graphic 1 we can notice the graphic representation of the favorable physiomotor aptitudes depending on the obtained scores by the 3 authors from the realized hierarchy scheme and their overlapping in the graphic form in order to be able to better understand their variation.

By the made hierarchy we tried to point out the main favorable physiomotor aptitudes favorable for the speed skating, trying to complete the emptiness from the scientific research connected to the selection in speed skating from our country, helping in this way the coaches and physical education teachers that are in charge of the selection in speed skating to promote the talented elements that are between certain parameters (by realizing the selection model), reducing in this way the risk to promote athletes that later will prove to me mediocre.

In graphic 2 we can notice graphically the hierarchy of the physiomotor aptitudes favorable, made classification according to the total obtained score (PT).

Graphic 2: Graphic representation of the hierarchy of the favorable physiomotor aptitudes

Connected with the hierarchy of physiomotor aptitudes we noticed that, although at this age these are fluctuant, the realized order after the obtained score being: voluntary apnea, vital capacity, cardiac frequency and arterial tension. The voluntary apnea is considered favorable in report with the other parameters by its connection with the resistance to hypoxia knowing that the increase of sport results in the sports with a cyclic character is made parallel with the increase of individual stability at hypoxia, and this factor is a very good criterion in foreseeing the athlete's future (V.B. Svarț, S.V. Hruşcev , 1986).

V.B. Svarț and S.V. Hruşcev (1986) considered that as the athlete has a higher qualification, the higher the individual reaction stability is at hypoxia. The hypoxia phenomenon consists in a reducing of the partial pressure of the oxygen in the inhaled air, time in which the venous blood gets a small quantity of oxygen in the lungs, fact that creates a state of hypoxia characterized by the decrease of the saturation degree with oxygen of the hemoglobin from the blood and a reduced pressure of this gas dissolved in the sanguine plasma. This state is tolerated by the organism only by the entering into function of certain additional mechanisms of adaptation (V.B. Svarț, S.V. Hruşcev , 1986).

Specialists from the domain have noticed that there is a strong hereditary predisposition for the resistance to hypoxia, their transformation being made both under the genetic factors influence and from those of the environment.

Connected with other physiomotor aptitudes we can say that also they are important (although the fluctuations at the age at which selection in skating is being made are rather high) due to the possibilities of the health state forecast of the cardio-respiratory system and of the adaptation capacity to effort of the selected athletes.

Specialists consider that certain physiologic parameters are considered non-perfectible (determined) have a favorable role in obtaining good results, but we must make the assignation that also the perfectible ones can influence the results, especially when they touch or surpass the optimum values.

Choosing the voluntary apnea as the most important physiomotor aptitude has been made on the basis that the complex studies made on twins have proved clearly that the resistance to hypoxia is strongly determined genetically, very high solicitation that are at the base of the specific effort's base in speed skating being influences by this resistance at hypoxia, so, this influencing directly the further sport results.

As speed skating is a very complex sport, that has very varied tasks as the distance that must be covered, from 100 m to 10000 m, containing the fact that almost all the effort's forms encountered in sport, the voluntary apnea has been considered determinant in comparison with the rest of the physiomotor aptitudes. Besides this scores have been received, in decreasing order, the vital capacity, the cardiac frequency and the arterial tension, knowing that the last two are influenced by different factors such as age, somatic growth etc.

The short distances tasks (500 m) are realized through an effort of neuromuscular type, in which the performance depends especially on the qualities and training of the neuromuscular apparatus. From an energetic point of view they are anaerobe lactacyde having the base on the energo-genesis of the ATP of the kreatin-phosphate and anaerobe glycolysis. The tasks of 1000 m and 1500 m are efforts of cardiovascular type. During them the necessary energy is obtained both on anaerobe way and aerobe, the effort being mix. The tasks of 10000 m are of an energetic type (metabolic) the necessary energy for making the mechanic work being obtained on an aerobe manner.

At the same time, there must be mentioned the fact that, it is very important that at the athletes' level that we select, these to present a good manifestation and a very good one at the aptitudes with scores higher than the ones with lower scores, with the mention that if we have children with relatively equal good values (as percentage) between the perfectible qualities and the non-perfectible ones, these can be selected for the performance sport because due to the functional maturity there can appear good results in the future, with the mention that these can be reoriented if the results are not satisfactory.

We can say that certain parameters are considered determined (non-perfectible) have a favorable role in obtaining good results, but we must say that also the perfectible ones can influence the results, especially when they reach or surpass the optimum values.

We have encountered situations when an athlete was considered inferior to another – that had a good manifestation and a very good one of the aptitudes considered favorable – it had obtained better results towards the last ones, precisely because of reaching better values at the perfectible parameters.

This conception concerning the hierarchy of the favorable aptitudes which I present in this study remains open, being able to be improved by the specialty coaches or specialists from the sport domain in concordance with their experiences.

Conclusion

After the ones mentioned before we can draw the following conclusions:

1. The voluntary apnea is considered a very important clue connected with the sport performances, through which its connection with the resistance to hypoxia, knowing the fact that in sports with a cyclic character, such as speed skating, there is a connection between the superior results and the increase of the individual stability at hypoxia.

2. Besides the voluntary apnea also the others physiomotor aptitudes are important due to the possibility of the health state forecast of the cardio-respiratory system and of the adaptation capacity at effort of the selected athletes.

3. The fluctuations of the physiomotor aptitudes values with lower scores (arterial tension, cardiac frequency) are rather high at an early age, age when the selection in skating is being made.

4. The resistance at hypoxia is strongly determined genetically this resistance influencing directly the sport results.

5. Athletes that we select for practicing speed skating to present a good manifestation and/or very good at the aptitudes with high scores than the ones with lower scores from the presented hierarchy.

REFERENCES

BARRY, P., 1999, *Speed on skates*, Human Kinetics, U.S.A.

BOMPA, T., 2001, *Dezvoltarea calităţilor biomotrice - periodizarea*, ediţie şi traducere în limba română, CNFPA, Editura Ex Ponto, Bucureşti.

BOMPA, T., 2002, *Teoria şi metodologia antrenamentului*, Editura Ex Ponto, Bucureşti.

COLIBABA, E. D., BOTA, I., 1998, *Jocuri sportive - Teorie şi metodică*, Editura Aldin, Bucureşti, 199-200.

DRAGNEA, A., MATE, S., 2002, *Teoria sportului*, Editura Fest, Bucureşti.

EPURAN, M., MAROLICARU, M., 2003, *Metodologia cercetării activităţilor corporale*, Editura Risoprint, Cluj-Napoca.

FEDERAŢIA ROMÂNĂ DE PATINAJ, 1991, *Patinaj*, U.I.P. Nr. 29, Bucureşti, 117-118.

HOLUM, D., 1984, *The complete handbook of speed skating*, Enslow Publishers, Inc, Hillside, U.S.A.

MADELLA A., 2000, *Talentul Sportiv* - C.C.P.S., S.C.J. Nr. 120-121, Bucureşti, 75-79.

MANNO R., 1996, *Bazele teoretice ale antrenamentului sportiv,* C.C.P.S., Bucureşti.

SVART, V.B., HRUSCEV, S.V., 1986, *Aspecte medico-biologice ale orientării şi selecţiei*, CNFS, Bucureşti, 59-60.

THOMAS, J., NELSON, J., 1996, *Metodologia cercetării în activitatea fizică*, Vol. I, C.C.P.S., SDP 375-377, Bucureşti.

THOMAS, J., NELSON, J., 1997, *Metodologia cercetării în activitatea fizică*, Vol. II, C.C.P.S., SDP, 386-389, Bucureşti.

VAIDA M., 2006, *Monografia proceselor de selecţie şi pregătire la vârstă timpurie în patinajul viteză,* Teză de doctorat, Universitatea din Piteşti, Facultatea de Educaţie Fizică şi Sport.