Study of New Graphical Method for Sportman Evaluation

L. Dan Milici, Elena Rata and Mariana R. Milici

***Abstract*—**The large majority of specialists on sport domain, after the undertaken studies, proposed varied solutions to improve this process and promoted modern methods and means. In this way, came into being some installations, equipments and computerized technologies that more contributed to the improvement of the training process development. The computing technique also integrated itself into the selection process and into sportsmen training. Through this it is used multiple programs for physical effort planning and for refreshment. The informational system can forecast next results that will be obtained by the sportsmen. Through the experimental results obtained in this work we can establish that the mathematical model elaborated and applied during the training of the youngster swimming sports-girls led to obtain some significant results concerning the forecasting methodology on sports and concerning the improvement of the psycho-motive and psychological parameters. This methodology can be also applied efficiently in other levels of sportive practice. The theoretical and methodological concept can be included in the theoretical and methodical training of the trainers and of the specialist from sport sphere.

***Keywords*—**estimation, extrapolation, graphical analysis method, mathematical approach, prediction, sportsman.

I. Introduction

Forecasting on sport using the computing technique represents a complex process whose goal is to obtain competition performances. Using the computer on forecasting can create the possibility to obtain in short time great quantities of information, proving itself extremely important to estimate the most important parameters concerning somatically, functional, motive, psycho-motive, and psychological aspects, specific to the respective event.

There are more approaches concerning the using of the informatics on sport domain, in the important fields of it, the most important being the analysis of training and competition. The biomechanical analysis instruments, data bases for documentation concerning the training and competition and the video techniques plays an essential part on the systems for studying of the sportsmen as part of teams, on individual sports and on sportive subjects.

On this direction are available methods, algorithms and instruments came from informatics, very different as form and quality, which was improved significant during the last years concerning the technical possibilities, the importance of the applications and the ease with which these can be used. Using of these in practical is still scanty, from reasons generated by financial problems, by the absence of specialized personnel, by the insufficient knowledge of the possibilities to use these, and also by the reasons which stick by those acceptances.

Studying the specialty literature it was observed that in actual epoch, the sportive training process is based on the well organized activities, planned and lead by laws, principles and rules subordinated to biological, psychical and social sides, where are especially observed the progress of the motive aptitudes simultaneous with that intellectual and affective. This process must organized and planned with more attention during the period in which appears a series of biological, physical and psycho-motive changes in the sportsman body.

The large majority of specialists on sport domain, after the undertaken studies, proposed varied solutions to improve this process and promoted modern methods and means. In this way, came into being some installations, equipments and computerized technologies that more contributed to the improvement of the training process development. The computing technique also integrated itself into the selection process and into sportsmen training. Through this it is used multiple programs for physical effort planning and for refreshment. The informational system can forecast next results that will be obtained by the sportsmen.

From the bibliographical analysis process it was constituted an ample supply concerning the organization and evolution of the sportive training at the high performance level, especially at the senior sportsmen. We consider that in the junior stage doesn't lent a sufficient attention for implementation of some methodologies based on informational technique and on the mathematical methods. The application of mathematical methods and of the computing techniques can contribute to training forecasting and to establish the selection, planning and psycho-motive training way, so to make the sportive performances obtaining to be efficient.

The scientific and technological evolution at an unimaginable pace, in the last ten-year period, the coming into being of extremely sophisticated devices changed the sports domain, holding out large variety and high quality ways. If till

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no long ago the sportsmen training had on the base the experience of a technical team more or less capable, today the computer became a necessity that plays a decisive part in some sports directions.

The scientific innovation of this paper consists in the preparing of one methodology to forecast the sportsmen training through applying of one mathematical modeling method that, through the exponential functions, establishes, with an approximation of maximum 2%, the forecasting of the sportsmen's individual parameters enhancing. In most cases, the extrapolation functions, obtained by computing technique, overlap the real values obtained after a short training period. This phenomenon demonstrates that the mathematical modeling contributes efficiently to improve the training and contesting process.

Theoretical-scientifically importance of this paper consists in elaboration and argumentation of the methodology for forecasting of sportsmen training, during one training stage, which completes the theoretical concept of the structure and contents of the sportive training.

Through the experimental results obtained in this work we can establish that the mathematical model elaborated and applied during the training of the youngster swimming sports-girls led to obtain some significant results concerning the forecasting methodology on sports and concerning the improvement of the psycho-motive and psychological parameters. This methodology can be also applied efficiently in other levels of sportive practice. The theoretical and methodological concept can be included in the theoretical and methodical training of the trainers and of the specialist from sport sphere.

Taking into account that the sportive training is a complex process and has the prioritar mission to prepare the performance sportsmen, we consider that into its structure and content must be applied an whole set of advanced methodologies among which the computing technique also. The mathematical methods elaborated through the computing technique must include enough information concerning the growing level of the sports-girls and the way to foresee those improvement. The forecasting methodology based on the mathematical modeling methods must emphasize the most important developing directions of the sportsman both during the initial stages and at the performance stages.

II. Optimal approximation of data obtained after sportsmen testing

The "model" and "modeling" notions reached deeply in the sport theory and practice. The functions (cognitional, cultivational-educational, instrumental and normative), accomplished by the models used to solve the problems of the sport theory and practice, can have various characteristics. The efficient management of the training process is coherent with using of various models. V. Achim affirms that "the modeling will progressive became one of the most important principles of the sport training", while B.N. Şustin (1995) considers that the implementation of the modeling in sport represents an efficient and objective way to obtain sportive performances.

The models used on sports are divided in two basic categories: in the firs are included the models which characterize the structure of the contest activity namely those that hint at various aspects of the sportive training, the morpho-functional models, that reflect the morphological particularities of the human body, therefore assuring the reaching after the level requested by the sportive performance. In the second category are included models which reflect the continuity and the dynamics of the sportive performance establishing and of the short, medium, long and very long time plane planning and the models of various training exercises with the foresight of their complexity.

The general models reflect the characteristic of the object or of the process, obtained based on the study of a large sportsmen batch having an exactly sex, age, weight and which practice a certain kind of sport. To these models join, for example, the contest activity models at cross and swimming, the functional models of the basket-ball-men or hand-ball-men, the performance models on skiing and foot-ball, etc.

The group models are made based on a study of a sportsmen ensemble (or team), being different through a specific index in the category of each kind of sport, for example: The models of the "pass in five" technical-tactical actions at hockey, the models from the contest action of the wrestler and swimming etc.

The individual models are elaborated for each sportsman in part and these are based upon the data of the long researching of the separate training of the sportsman and upon his reactions to various tasks, etc.

The sportsmen performances are evaluated through periodical tests. Based upon these tests we can draw conclusions referring to the way in which the sportsman answered to a certain training program, to the parameters which can be increased, to the accumulated tiredness level. To extrapolate these data in the sight to aim at the next evolution of the sportsman and to predict some next performances it must to find an evolution law for values controlled periodically till a certain moment. This prediction can be made for one or more tests, at the middle of the training period, so that the evolution from the second part or from the end of this period could be instituted, in order to prepare the new training program.

From the specialized literature results that the sports forecasting problems centres round the using of the various forecasting methods (extrapolation method, modelling method and examination method). The forecasting made using the extrapolation method allows to form the sportive results on the hierarchical system on the basis of the study of some adequate laws from the previous period. The forecasting accuracy can be right if the forecasting period is shorter and if the data are more.

The extrapolation is very frequent used as a method to model and to obtained expertise data; therefore it will have in the future a more and more wide applicability on sports result

forecasting. The forecasting applicability expectation will be closer by reality if it will be used prompter, more efficient and if it will use the informational technology possibilities, with the help of that will be processed and analyzed the sportive results obtained during a training macro-cycle or more macro-cycles even an Olympic cycle.

Knowing that the evolution of the human performances is made through leaps (discontinuous functions, with variable level thresholds that appear at different moments of time for the same sportsman and with variation difficult analyzed from a person to another), the time periods for which it is made the approximation must be longer than the time between two performance leaps of the tested sportsman, but at the same time must not include more than three evolution bearing because the prediction for a too longer time can't be made. Because the evolution step functions can not be approximated it is tried the approximation used continuous functions that coincide with the evolution functions at the edges of the approximation interval and in another maximum two points chosen into this interval (figure 1).

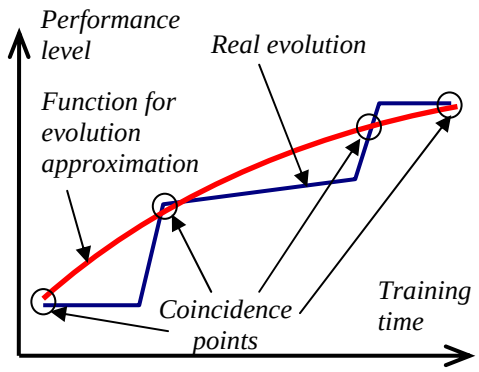


Fig. 1.

Going from the idea that the psycho-motive training must be based on the integration of the motive and mental functions, under the effect of the nervous system maturation, generally, and of the age of sportsmen by 14-16 years, especially, we considered to accomplish a study concerning the functional, motive, psycho-motive and psychological forming of the respective age. According with the training theory and methods, the sportive training takes into consideration the optimization and the maximization of the capability to obtain sportive performances. In this respect, the growing up human body forming is needed, through training as long-time activity, which supposes numerous specific techniques and intervention ways.

Concerning the characteristics of the age of 14-16, the literature presents following aspects:

- height – the girl's growing speed decrease progressive;
- weight – continues to be increasing;
- the step growing speed changes, the bust having an increasing;
- the definitive body proportions are established;
- increase the thorax dimensions, the shoulders remain smaller;
- simultaneous with superior members the inferior members grow also, the span exceed the height with 2-3 cm;
- the locomotory system becomes more vigorous, the bone growing less as length and more as width;
- increase the muscle volume and force;
- the psychical functions becomes more active.

At the and of this period of high endocrine storm, the differences between sexes are installed oneself.

Based on the data sets drawn during the training period (months: September 2006, December 2006 and January 2006) for 12 swimming-girls with age between 14 and 16 years, it was evaluated the exponential approximation functions described into previous paragraphs.

III. The Necessity to Use a Graphical Evaluation Method

Sports are a domain that has the competition as dominant, and the motivation to obtain sportive results determined the increasing of the number of hours of intense effort. Also the training became more complex due to the help given by the specialists and by the researchers form sportive domain. There is now a large data base about the sportsmen, base that reflects itself into the sportive training methodology.

The greatest part of scientifically knowledge, either as part of practical activity or of research activity, has in the sight the understanding and optimization of the effects of physical exercise over the human body.

The sportive training is a complex pedagogical and biological process, performed systematically, continuously and gradual, in the aim to adapt the human body at physical and psychical efforts by different intensities, to obtain results by a certain value. It is based on the ways of competitive practice of the physical exercise. It is defined as a complex process, whose objective is represented by the sportive performance re-making of the sportive performance, into a systematic and directed to goal manner. In this context the complex sportive training is a process of action, effected in aim to obtain exact results as against the all characteristics that determine the performances of one sportsman or of one team.

During the training, the sportsman reacts at different stimulus, among which some are predictable, other little predictable. Form the direct training process the physiological, biochemical, psychological, social and methodological information is brought as requests, norms, principles, etc. The training principles constitute the basis of this complex process. The knowledge of the training factors elucidates the part played by each factor in training, in concordance with the characteristics of one sport or of one sportive event.

The sportsmen are born with different predispositions that which imply the achievement of one specific instructive-educative process. Talent is in the most part of genetic nature. The force, speed, resistance and skill inherited aptitudes play an important part into the reaching of the high performance levels. In the sportive training, it no happening that a single quality to predominate the effort and the movement specific to

one sportsman. From this point of view, in the sportive training never it is aimed the forming of one single quality but the combination of two or more.

The researches performed till now emphasize that the human mind allows a quicker analyse in case of one graphical representation then in case of a numerical values succession. This is the reason for which we referred to another intuitive graphical representation method, method that would be applied in other activity domains. In the sight of the analysis, at the end of the training period, we can use the same graphical representation that has on the base two indicators which place each sportsman in a plane through a point.

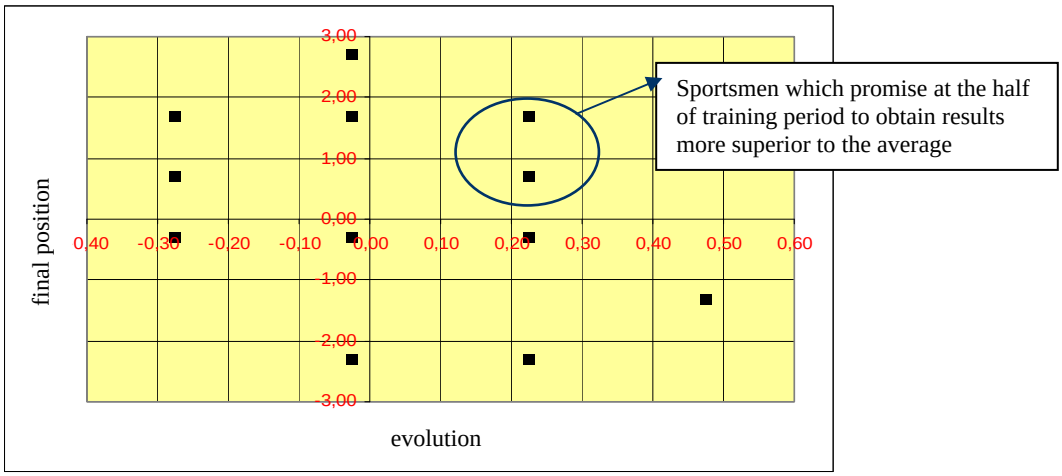


Fig. 2. Proposed graphic representation

In sportmen performant training it is necessary the periodical evaluation of their performance with a view to optimize the training program depending on their evolution. If we refer to the swimming, the overview of the sportmen performances in psychodriveability tests permit a complex analisys of training for each sportman and a personalization of training depending on the characteristic features of each sportman.

There is following presented an original method to analize the sportmen lot using a grafich representation that permits an intuitive evaluation of the potential sportmen able of performance, evaluation that is made on the half of the 8 month training period (the fourth month) or at the end of this period (figure 2). The sportmen which have been take most nearby the right-top corner are the sportmen which certainly permit to obtain the superior times. The sportmen of which punctiform representation is placed toward the left-bottom corner have not evolutions on the 4 past training month but have from beginning performances superior to the average of the group. The sportmen placed at the right under the horizontal axis have not any evolution after the training and not even start with data that assure their a convenable position into the tested sportmen group. Depending on this representation it can draw a conclusion regarding the sportmen which deserve to continue the training or regarding to those sportmen which have not aptitudes for this sport or require to change the training program for purpose to obtain the desired performances.

With a view to the analisys at the end of the training period it can use the same grafich representation. The representation has on the base two indicators that place each sportman on a plane through a point. The researches accomplished up to the present emphasize that the human mind permits a faster analisys in case of a grafich representation than in case of a series of numerical values. This is the reason for that it resorted to this intuitive representation method applied successfully also in other analisys cases.

IV. Presentation of the Graphich Analisys Method

The two state indicators of some sportmen used in graphich representation are:

- *the evolution during the training period* (vertical axis) – computed as diferrent between the slope of the linear evoluting function between the last two testes of the sportman and the slope of the linear evoluting function of the average of whole sportmen group. In the given case the slope was computed for the second half of training period.
- *final position in comparison with the average* (horizontal axis) – computed as diferrent between the final value obtained by the sportman during the test and the average of the group computed at the end of the training period.

The obtained results was weighted with a coefficient that permits the evaluation and the reading of the obtained representations.

The two indicators divide de representation plane in four quadrants as following:

- the left-bottom quadrant in that will be find the sportmen which are situated over the average of the group at the end of the training period but which obtained a progress under the average in the last half of the training period;
- the right-top quadrant in that will be represented the sportmen which obtained performances over the average of the lot at the end of the training period and at the same time had an

- the right-top quadrant wil contain the soprtmen which although had an evolution over the average in the last period, still obtain results under the average of training colegues;
- the left-bottom quadrant will contain the sportmen which didn't succed to situate over the average of the group after the training period not even regarding the obtained results, not even regarding the training evolution.

Based on proposed representation it can make an analisys of the sportmen's activity at the end of the training period in goal to classify the individs of the group as:

- the sportmen plassed in right-top quadrant are that who had evolutions and results over the average and therefore who can accede to performance in sport. The point that represents the performances of one sportman is situated nearer by the right-top corner of the representation surface, the performances of this sportman are more considerable.
- the sportmen plassed in left-top quadrant are that who have results over the average but who obtained considerable evolutions during thetrainign period. For these sportmen it is recommended to change the training program with aim to view if they have potential to increase their performances or if they already touched a level that can not else be overtake.
- the right-bottom quadrant groups toghether the sportmen which obtained major evolutions during the training period but their results are still situated under the average of the group due to the low performances with that they start the training. For these sportmen it is recommended to extend the training period or to accomplish suplimentar training but without overtaking the tiredness level able to be supported by the human body.
- the sportmen which are situated in the left-bottom quadrant after the training program have not abilities to obtain performance. They could continue to practice the sport but on the material grounds they must be taken out form the group that prepare for performance.

Based on the data set sampled during the training period (september 2006, december 2006 and january 2007) for 12 girls with age between 14 and 16 years, it was achieved representations for 14 psychodriveability tests. The table 1 represents for example the results obtained at one of these tests namely the establishing of the capacity to lead the minimum speed. It must to mention that the values are computed based on the result of the exploration. To obtain more precise results it is recommended the effective testing at the end of the training period.

So we can observe the behaviour of one sportman by the point of view of the obtained performance but also in prospect of the obtained evolution for all proposed tests. An unitary representation of the sportman's performances, that to include all tests, should be recommanded but it is imposible to achieve it because should be necessary to plase a point in the N-dimensional space (with N – number of datum). But, for a limited number of tests, it can try to represent in the same plan, by diferrent color, the result of the sportmen aim to have a general view about the evolution at diferrent tests or at diferrent moments.

Table 1. The establishing of the capacity to lead the minimum speed

THE ESTABLISHING OF THE CAPACITY TO LEAD THE MINIMUM SPEED [M/S]				PREDICTION	
PERIOD		sep.05	dec.05	jan.06	may.06
NAME	AGE	0	3	4	8
A.A.	14	0,17	0,1	0,08	0,04
A.R.	15	0,15	0,14	0,11	0,09
C.N.	14	0,19	0,15	0,11	0,07
B.R.	14	0,1	0,13	0,09	0,11
S.D.	16	0,13	0,12	0,09	0,07
V.E.	15	0,16	0,09	0,08	0,04
R.S.	15	0,11	0,12	0,09	0,09
G.B.	16	0,12	0,1	0,12	0,10
S.B.	16	0,16	0,11	0,1	0,06
C.V.	15	0,15	0,13	0,06	0,04
S.A.	14	0,14	0,11	0,09	0,06
T.A.	14	0,11	0,09	0,08	0,06
AVR.	14,83	0,14	0,12	0,09	0,0693

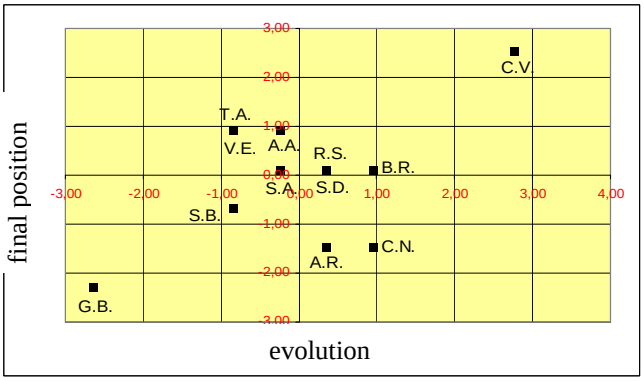
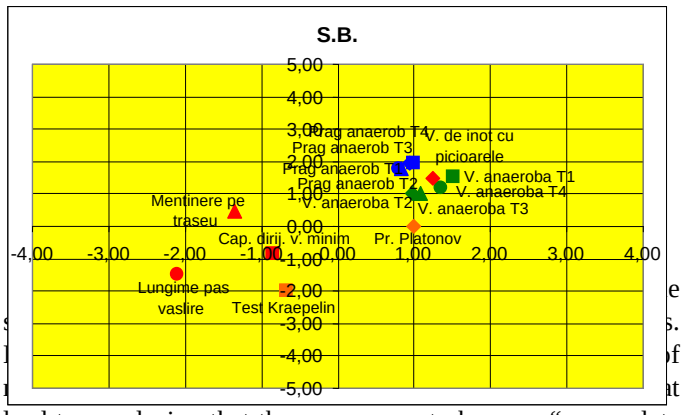
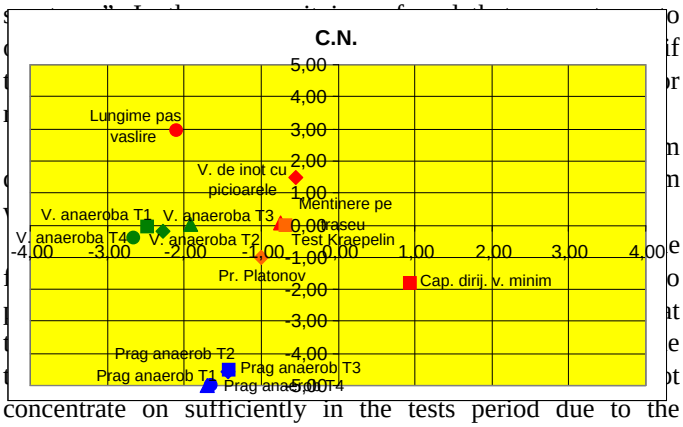
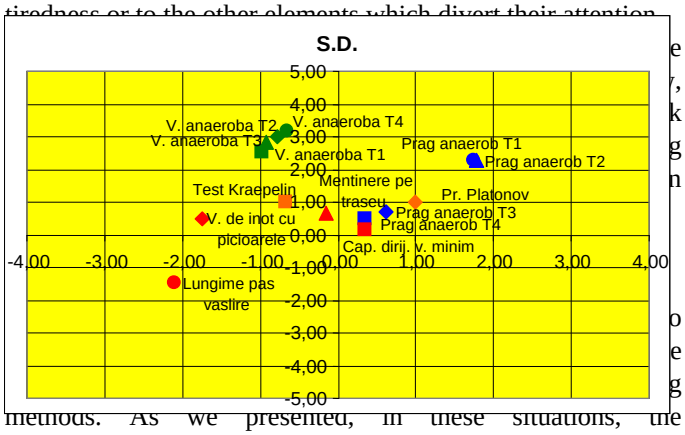


Fig. 3.
The establishing of the capacity to lead the minimum speed







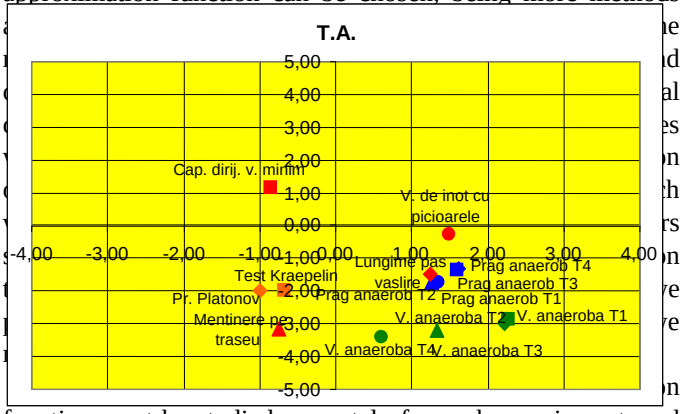


Fig. 4.

lead to conclusion that they are nearer to become "a complete

concentrate on sufficiently in the tests period due to the

methods. As we presented, in these situations, the approximation function can be chosen, being more methods

function must be studied separately for each case in part, and the effective computing of the best approximation function is a special problem because this needs at its turn the accomplishing of some operations. Even in the case of computing accomplishing with the help of the computer the results are obtained by truncating and rounding, therefore by numerical values approximation.

Due to the above, we propose the problem of determination of one best approximation from the technical point of view, of experimental nature, which consists in estimation from the metrological point of view of the error that appears by function approximation.

On the measurement technique the absolute error is defined as being the difference between the value measured by the measurement device X_m and the real value of the measured quantity X_r:

$$\varepsilon_a = \left| X_m - X_r \right| \tag{1}$$

Because the information given by the absolute error is conclusive from the point of view of the precision with which the relative error is determined, corresponding to the relation:

$$\varepsilon_r = \frac{\varepsilon_{a\max}}{X_{\max}} \cdot 100 \tag{2}$$

with X_{max} – the maximaum value of the measured quantity.

We propose, for determination of the optimal approximation method, to use relative error in the respect of previous definition, in computing considering the real value of the measured quantity as being the value of the evaluated quantity, it being measured into a certain number of points n with the help of some precision methods, and the measured value, in the respect of the previous definition, being the value computed in the respective input points using the approximation points determined through the previous presented methods. This methodology is in actual fact the same with that used to establish the precision class of the measurement devices, corresponding to the metrological norms.

In figure 5 the approximation error is graphical presented in case of evaluation of sportsmen's performances in the 8th month form the beginning of the training, in case of extrapolation of data from the first four months and of the comparison of these with the values determined at the end of period for the 50 m crossing.

From the presented data we observe only three cases in which the error exceeds the value of 2%. If we make a comparison with the measurement instruments, which normally assure an error of 2,5%, we can say that we obtained through extrapolation errors good enough. To mention that the values average is 1,5%.

To obtain a values average around the value of 1% is needed the re-evaluation of the functions which led to the two significant errors and the identifying of the graphical shape that needs an adjustment of the approximated values.

VI. Conlcusions

On the base of the above presented, we can make important conclusions concerning of the value exploration and the prediction of some performances of tested sports-girls:

- from the achieved graphics, where we represented the linear and exponential interpolated characteristics for each sports-girls, we observe the satisfactory way in which the exponential function approximates the obtained data (the exceptions are given by the very great performance leaps of some sports-girls);

- the grouping of the initial and final values within the framework of tests divide them into three categories: test at which the obtained initial values are compact, the final values being dispersed (example: the tests for evaluation of the anaerobic speed), tests at which the obtained value, after a training period, are more grouped, then we obtain a homogeneity of the group (example: the establishing of the capacity to control de minimum speed, the test for heart frequency) and test that lead to a changing of the sports-girls values but with the keeping of the difference between them (example: the Wells and Dillon test, the standing long jump).

The result at the psycho-motive tests are characterized by a constant evolution of the sportsmen but with a different slope. There are also detached cases in which we can observe regress at some test, non-evolution or evolution in significant leaps.

From the experiments and the tests made by authors, which numbered a very important volume of results and which include the previous representations, we can make the following conclusions concerning to the extrapolation error, using the exponential functions:

- the evaluation using exponential functions is made for training periods big enough, so that to include at least a discreet period of individual evolution, in other words to approximate the leap evolution for a certain test;

- the evaluation of the sportsmen which are trained for high performance (at the representative teams level) will be not made using extrapolation functions, because the person evolution cannot keep a certain shape of the function from one person to another or from one test to another, in these cases the evolution having on the base functions with discontinuities and leaps;

- the human nature offers a no-uniform growing not only from person to person (reason for that it was determined one approximation function specific to each sports-girls) but for the same person also, at the different time intervals and for different training programs. From this reason there was obtained, in dispersed cases, great approximation errors, either negative (in case in which the dynamic was more then great in the first part of the training period) or positive (for the case of the sports-girls which, in the first part, have not performances great alike that in the second part of the training);

- we can observe a approximation by missing for some events (speed crossing, floatings) – that means a sub-estimation by extrapolation, or approximation by addition at another events as long jump and high jump, performed by predictive overestimation. From here results the evolution characteristic of some sportive performances during the training period;

- the human performances modelling, using the continuous mathematical functions, is the source of the appearing of some performance evaluations difficult to anticipate for some sportsmen. Thus, for sports-girl C.N. we obtain a maximum positive error at the speed crossing and a maximum negative error in group for long jump, fact due to the different evolution in the first respectively second part of the training period. This fact has on the base either the specific characteristics of the human body or the accent putted, during the training period, on the different aspects of the training depending on the obtained intermediary results;

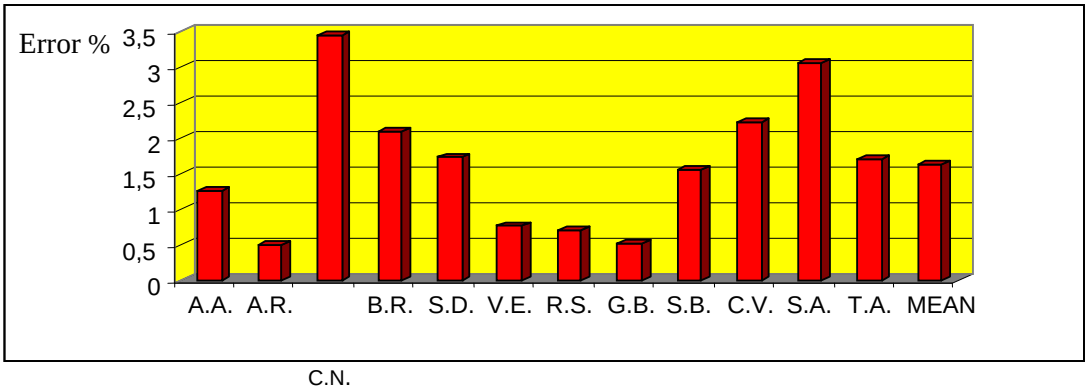


Fig. 5. The approximation errors in case of evaluation of the sportsmen's performances durring of the 8th month begining with the training start maintaining on an established direction event

- over than 50% from the obtained errors integrates oneself with the accepted scientific domain, that represents a satisfactory prediction, if we take into account the complexity of the alive nature and the distribution with fractal characteristic of the performances evolution of man;

- the used function at extrapolation assures satisfactory errors also in case of the approximation using two, maximum three points which divide the interval in equal subintervals;

- for the sportsmen at which we obtained great errors in case of extrapolation, it is recommended the introduction into the approximation functions of one correction coefficient, if their evolution can be observed.

The authors is working now at a digital self-adjustment algorithm in case of computing the extrapolation functions that lead at decreasing of the errors values in the evaluation process of the coefficients of the approximation continuous function.

We can mention that, in the actual training process, the modelling method became a basis method, a working instrument of trainers.

Based on the previous presented we can make some important conclusions concerning the extrapolation of the values and the prediction of some performances at the tested sportsmen level:

- taking into account the human nature, the its evolution and the specific of the sportsmen training, for medium and short times, the evolution by leaps can be modelled through a continuous curve that offers the extrapolated values only to the end of the interval;

- after the effected tests, we arrived at the conclusion that for the considered time interval the best approximation by extrapolation is achieved with exponential functions;

- there are tests (of height, of weight) at which the testing period not leads each time at the obtaining of the significant evolutions, case in that the approximation function is a constant. This fact can be explained by that the period after we notice the quality leap at most of the sportsmen is greater then the time between the achieved tests.

From the functional point of view, the coordination structures of the neurone-endocrine system mature itselves, fact significant in the equilibration of performing of the motive acts and actions and in the superior adjusting of them. On the base of development of the abilities to emphasize the significant elements for an efficient motive conduct, the motive responses become complex and analytic. The main form of motive stress can be evaluated through the motive aptitudes, which could be divided into conditional and coordinative qualities.

From the proposed representations it can quickly sett off the performance of one sportman by as more point of view with emphasing of the elements in that it must to work suplimentar, so establishing an individual training program, specific to the sportman, in prospect to obtain significant sportive performances.

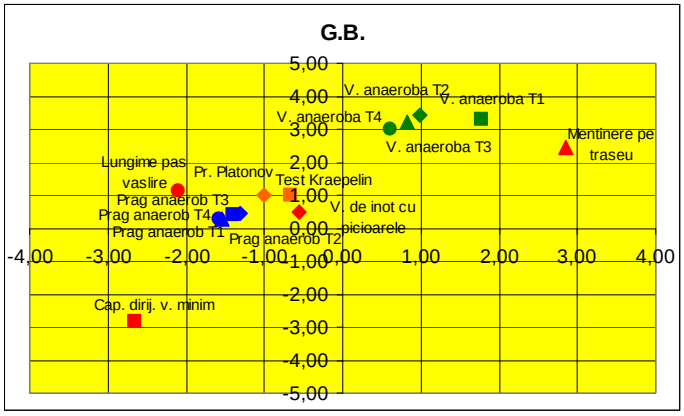


Fig. 6.

So it can emphasize a great number of cases, one more important being the G.B sportman which, for a part of the tests, places in right-top quadrant (maximum performance) and in the opposite quadrant (left-top) for the other tests. This is the case of a significant lack of balance due to either training inconsistency or physiological and psychological conformations that can produce unexpected leaps of performance at a given moment.

Regarding the continuation of the training up of the lot the method recomands:

- to continue the program as it was started for the sportmen plased in the right-top quadrant,

- to change the training program for the sportmen plased in the left-top quadrant, sportmen which did not obtain a satisfactory evolution although they have good results,

- the supplement of the training program for the sportmen represented in the right-bottom quadrant, sportmen which although have a superior training evolution obtaine result under the average,

- the renunciation at the training in the view to obtain performance for the sportmen plased in left-bottom quadrant, all these being valid at the majority significant achieved tests.

From the proccesed datum results that there are not sportmen which have not results at any test, so it is recommanded a complex analisys of the obtained information aim to evaluate the possibility that a sportman which have not evolution chance in the choosen sport to be selected in training programs of another sport in that the already obtained positive results matter as significant.

This analisys method can be applied many times in different training periods to emphasize the touch by the sportmen of some performance thresholds that can not be overtaken, to emphasize the necessity to change the training way with another that offers a faster evolution, to decrease the sportmen group so that will be put the stress only on the sportmen able of performance, to emphasize the zones in that it is necessary to increase the training volume in prospect to obtain some complete sportmen.

Another advantage of using of this method consists in achievement of some classifications of sportmen by the prospect of a certain test.

If we refer only at the psychological and psychodriveability tests we can deduce an important feature of the sportmen's age namely the existence of some moments in that the concentrating diminish. Regarding these tests it is observed an uniform distribution of the sportmen in representation plan from where it can deduce that the sportmen have a very different evolution from one individ to another, during the training period. To notice that during the length of the rowing step test any sportman was not plased in right-top quadrant, from where we can deduce that these abilities can not be developed yet in this part of the training period or that the tested sportmen could not sufficient contratrate upon in the testing period due to the tiredness or another elements that turn off their attention.

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