

***El control de las direcciones físicas determinantes del
rendimiento en boxeadores de categoría mayores en
Guantánamo***
***The control of physical directions determinants of
performance in senior category boxers in Guantanamo***

Elixan Bayeux-Sayú; Andrés-Fuentes Domínguez; Manuel Sandes-Movlla

Academia Provincial de Boxeo. Guantánamo. Cuba
Universidad de Guantánamo. Cuba

Correo (s) electrónico (s)

elixanbayeux@gmail.com

andresfd@cug.co.cu

manuel@s@cug.co.cu

ORCID: <https://orcid.org/0000-0002-7783-675x>

<https://orcid.org/0000-0003-4821-5695>

<https://orcid.org/0000-0003-3168-0617>

Recibido: 6 de julio 2022

Aceptado: 19 de enero de 2023

Resumen

Constituye un problema ¿cómo perfeccionar el control de las direcciones físicas determinantes en los boxeadores de Guantánamo? Para solucionar el mismo se propone: aplicar pruebas físicas específicas para mejorar el control de las direcciones determinantes en boxeadores de la categoría mayores de Guantánamo. Para ello fue necesario el empleo de métodos teóricos, empíricos y estadísticos, que permitieron la estructuración del trabajo. El nivel de aceptación de la propuesta es muy adecuado, de acuerdo al criterio de especialista, evidenciado en una concepción estructural, metodológica, y el ordenamiento lógico de los pasos para la aplicación de las pruebas en el proceso de preparación de los boxeadores.

Palabras clave: Boxeadores; Control; Direcciones; Capacidades físicas; Determinantes.

Abstract

It constitutes a problem: how to improve the control of the determinant physical directions in Guantanamo boxers? In order to solve this problem, it is proposed: to apply specific physical tests to improve the control of the determinant directions in boxers of the senior category of Guantanamo. For this, it was necessary the use of theoretical, empirical and statistical methods, which allowed the structuring of the work. The level of acceptance of the proposal is very adequate, according to the specialist's criteria, evidenced in a structural and methodological conception, and the logical ordering of the steps for the application of the tests in the boxers' preparation process.

Keywords: Boxers; Control; Directions; Physical capabilities; Determinants.

Introduction

The concrete orientation of the control in the training process should be carried out from the establishment of concrete quantitative parameters, which refer to the conditions of the athlete and the training program, as an interacting system of the process that is carried out according to the tasks that are directed to an object and that are manifested at a pre-established level of improvement of the sports result.

The control of the effectiveness of the training process is achieved, comparing the expected results and if necessary, carrying out the correction of this process, constituting the final operations of the indicated cycle, naturally all this is possible and effective to the extent that there is a precise idea and if possible, supported by quantitative data of the structure of the competition.

The control must be integral to the system of preparation of the athlete, so we must not forget that on the directions of the preparation it is necessary to carry out a systematic control, that is, on the physical, technical, tactical, theoretical and psychological condition of the athlete.

The control, during a given period of time allows, in addition, organizing the work of planning, since each of them reflects a set of particularities that allow to guide the coach in the dosage of the contents that characterize it.

When considering the physical condition, it becomes necessary and of great importance, the priority attention of this factor within the sports training, starting from the physical preparation, considering it as the basis or first step that an athlete should consider to reach an optimal sports form. This preparation is oriented to the strengthening of organs and systems, the elevation of their functional possibilities and the development of motor skills.

As the condition of an athlete varies under the influences of exercise, it is necessary to monitor his condition during the process and compare the expected values with the real ones. Otherwise, the path to maximum performance is not conceivable. In Boxing, as in all sports, it should be almost a motto that "if I train, I control and if I compete, I control".

Related to the need to carry out an adequate control of the physical preparation of the athlete, there are many criteria of the authors, among which it is worth mentioning (Platonov, 1999; Campos and Cervera, 2001; Ruvalcaba and Loaiza, 2001; Weineck, 2005; Collazo, 2006; Garcia Manso;) and who generally agree on the need to apply different ways and means to ensure the effectiveness of this process. Defending the idea that pedagogical tests constitute an instrument, procedure or technique used to obtain information, through which it is possible to quantitatively determine the degree of efficiency and physical capacities achieved by the athlete, allowing to verify the effectiveness of the training process and to assert or modify the contents according to the fulfillment of the objectives, standards and performance forecasts. In this direction, it is worth noting that the problem under study of this work aims to respond to one of the technological demands of boxing in Guantanamo province and to the need raised by the Cuban Boxing Association (ACB).

With this purpose, the author of this work has been given the task of applying diagnostics related to the control of the physical preparation of boxers in the senior category in Guantanamo, evidencing a deficit of specific physical tests to control the determinant conditional directions in boxers of the senior category in Guantanamo during the process of sports preparation, where some insufficiencies in the control and evaluation of the physical abilities of boxers are declared.

These inadequacies led to pose the problem: how to contribute to improve the control of the physical determinant directions of performance during the process of sports preparation in boxers of the senior category in Guantanamo province?

In order to solve the research problem, the following objective is proposed: To apply specific physical tests to improve the control of the physical conditional directions determinants of sports performance during the sports preparation process of boxers in the senior category of Guantanamo.

Development

A rigorous control on scientific bases is a guarantee of a good direction of the preparation of athletes.

This need for control of the preparation in current times is confirmed in the criterion of Forteza (1999) when he states that the concept - Preparation of the Athlete - approached in the Theory and Methodology of Sports Training in its academic and scientific contents, for many years has been referring in its publications to an aspect that relates the different types of sports preparation, which Matveev (1966) has defined as the main concept of the Theory of Training.

This concept - Preparation of the Athlete - has tried to address all those contents that an athlete should receive (general and special physical preparation, technical, tactical, psychological and theoretical preparation), not only in his annual cycle of preparation, but also during his sports life.

In this sense, Forteza (1999) refers that the study of the relation for the preparation contents in the training plans, attending to the current demands of the load programming, has led to consider that the five aspects of the preparation of the athlete, are very generic contents and do not approach the reality of the planning, do not relate the whole arsenal of contents to be developed in the athletes, and defends the precept that "a Plan is real to the extent that it is susceptible to be controlled".

For this reason, Forteza (1999), quoted by Fernandez (2004), calls for the need to plan only those contents that condition and determine the athlete's performance and not to plan open contents that get lost and go beyond the possibility of being controlled. If we do not control we do not know how we are doing and we will not be able to correct the mistakes during the process towards the right direction. This author proposes a form of organization, which he called training directions, defining it as the directional aspects that will indicate not only the training content, but also relates two important categories of sports training the load and the method.

Forteza classifies the directions of training in two groups:

- Performance Determining Direction (DDR): they constitute the contents of the necessary and sufficient preparation for performance, they are the determining factors that characterize the activity of a specific sport, and their influence is immediate in the competitive performance.

- Performance conditioning direction (DCR): They constitute the necessary contents that condition the effectiveness in the preparation of the DDR, influencing in a mediate way the sport performance.

These directions are classified as follows:

- Functionally oriented direction: This refers to the work areas based on the predominant energy systems necessary for the development of the physical-motor capacities.

- Direction with physical-motor orientation: It refers to the physical, technical, technical-tactical capacities, necessary to influence in a mediate and immediate way in the sport performance. It is included here as an indissoluble part of each one, the aspects of the intellectual and psychological preparation of the athlete.

The aspect related to the directions of training has been addressed in our country by different authors, among which stand out (Collazo, 2002; Romero, 2006; and Fernandez 2004), who agree on the advantages offered by such preparation in the planning, implementation and control of current training.

In relation to the previously analyzed aspects related to the directions of sports training, we share the criterion of Romero (2006), when referring that they lead to consider that these are only examples, which do not allow establishing dogmatic concepts when defining the DDR and the DCR in the different sports, but they are directed to orientate around the methodology for their definition; In this sense, let's reflect on the fact that it is a superior procedure to carry out the training plan considering the DDR and the DCR, because when listing the preparations to which the athletes are subjected, these would really be disaggregated in directions, facilitating the interconnection of the loads of different purposes.

In this sense, Romero (2006) offers recommendations of determining and conditioning directions for different groups of sports, but in the case of combat sports, to determine one type or another of directions, he suggests starting from the following aspects:

- Duration of the competition.
- Approximate number of bouts.
- Actual duration of each bout.
- Types of effort according to the actions.
- Functional and dynamic structure of the actions.
- Density of the loads in the combat.

- Predominance of the area of competition.

With the purpose of solving the insufficiencies that are manifested in boxers of the senior category in Guantanamo and pointed out by the evaluators in national competitions, fundamentally related to the power in the punching, the reaction speed and the early appearance of fatigue in some athletes during the fight, we set ourselves the task of working with greater emphasis during the preparation on the determinant directions of performance in which these insufficiencies are manifested and propose specific physical tests to control them, based on the criteria of different authors consulted and the classification of the directions of training declared in the Integral Program of Athlete Preparation for the 2021-2024 cycle. The directions to work and control are:

Reaction speed:

For Collazo (2002). It uses muscular ATP as the predominant energy substrate, its duration time is less than 3 seconds of work, its physiological objective is to develop the capacity of the organism to react to external stimuli in the shortest possible time, it does not produce lactate concentrations and for its development generally short start exercises and races with changes of direction are used.

Fast strength According to Collazo (2002). For its development with weights should be worked with 60 - 79% of the maximum strength that is in a given exercise, you can also work with weights, between 30 - 59% of the maximum strength of a given exercise, but should be performed with a maximum execution speed, is a direction of the anaerobic alactacid system, so its duration should not exceed more than 10 seconds of work, its physiological objective is in the multiplication of muscle myofibrils. The recovery time between repetitions should be between 1 - 3 minutes and between sets should be between 3 - 5 minutes.

For García Manso et al (1996). Rapid strength, also called "forcé de démarrage", which, as in the previous manifestations of strength, requires a high initial and working speed, but the resistances against which it acts are minimal, but not less than 20% of 1RM (e.g., boxing or tennis punches).

Explosive strength

For Collazo (2002). Its fundamental characteristic is the explosiveness of the movements to be performed, it is a direction of the anaerobic alactacid system, and its duration should not exceed more than 3 seconds, since this direction uses muscular ATP as energy. Its physiological objective is to develop the capacity of impulse of some muscular plane of our own body or

external object, it cannot be preceded by any type of movement, but always starts from a static position, it does not produce lactate concentrations and for its development, exercises that require great explosiveness are generally used.

For Cappa (2000). Explosive strength is to try to develop the greatest amount of force in the smallest possible time unit (maximum speed), its fundamental difference with fast strength is that it is applied in other types of movements (acyclic), the training of this type of strength is proposed with exercises that are of high speed contraction (ballistic) such as jumps, punches, throws or overload exercises derived from weightlifting and generally this type of exercise is executed with a time of application of force that does not exceed 300 milliseconds (Kraemer 87). According to Ehlenz-Grosser and Zimmerman (1991), cited by Barrios and Ransola (1998), this capacity is to execute one or several fast movements.

For Platonov (1999). He also calls it impulsion strength, which is the ability to overcome a resistance with a high speed of muscular contraction. This author also states that in conditions of notable resistance, it is decisive for executing an effective start in sprinting or swimming, wrestling throws and in conditions exercised against a small or medium resistance with a high initial speed it is characterized as starting force, decisive for badminton and boxing punches, fencing actions, etc.

Resistance to force

According to Collazo (2002). For its development with weights, it should be worked with less than 45% of the maximum strength in a certain exercise, in a time of duration greater than 90 seconds and with a slow execution rhythm, because above this percentage, the loads generate high muscular tensions, which does not allow vasodilation and with it the blood flow, making impossible the transport of myoglobin and with it the development of the resistance to strength.

Its physiological objective is the activation of the largest number of muscle myofibrils, it is a direction that generates low concentrations of lactic acid (less than 4 mmol / l) and the recovery time among repetitions should not ensure full recovery of the body (Example: If we start an exercise of this nature with a heart rate of 130 p / m, then the next repetition should not ensure full recovery).

It is worth noting that the directions described above are not exclusive or unique as determining physical-motor directions of performance in this category of Boxing, but we believe that these

are fundamental in obtaining the sporting result, confirming our criterion the results obtained during several consecutive years.

Sample and methodology

To carry out the research, a population of 24 boxers was chosen which represents 100% of the boxing team of the senior category of the Guantanamo province. Nine (9) athletes were selected as a sample, representing 37.5% of the population. The study also included five coaches from the provincial academy and two methodologists, officials of this sport in the province. Of the coaches who participated in the research, all have more than 10 years of experience as coaches of this sport; all of them have a degree in Physical Culture and Sport, a Specialist and a Master of Science.

Several methods and procedures were used in the research, such as theoretical methods to determine the theoretical basis and current conceptions of physical preparation and control in boxing. In addition, empirical methods such as documentary study, interview, measurement and consultation with specialists were used to know the current state of the problem under study, and statistical-mathematical methods to determine the results of the tests applied in the training process.

Results

For the control of the physical capacities determinants of performance in boxers, four (4) fundamental tests are proposed; punching the bag in 6 seconds, straight punches with garter hold in 10 seconds, impulsion of the bullet from the combat posture and shadow with dumbbell in 3 minutes, these allowed to evaluate the alactic and lactic energy systems in the preparation of boxers.

In order to know the current state of the problem under study, it was necessary to interview coaches and methodologists who work directly with boxers of the senior category in Guantanamo. In addition to a survey to specialists to assess the feasibility of the proposed tests for the control of boxers.

In the interview with coaches and methodologists, there is coincidence in the knowledge of the determinant physical capacities in boxing (quick strength, explosive strength, resistance to

strength, reaction speed), among others. They claim to have knowledge established in the PIPD, but they lack tests to control and evaluate the boxers' preparation, applying only the tests that are assigned in the PIPD, which they consider insufficient. 100% of the coaches consider including new tests to control the determinant directions in the boxers.

In order to know the pertinence or feasibility of the proposal, a survey was made to boxing specialists (9), to know their criteria on the structure and methodology of the proposal, the logical and methodological order and the level of practical satisfaction of the applied tests. The information was processed based on the evaluations issued by the respondents, for which an anonymous dialogue was established until a consensus was reached, obtaining the following results:

Table No. I- Results of the application of the survey (Likert scale).

Survey respondents	Questions			Total
	1	2	3	
1	12	15	14	14
2	14	15	13	14
3	15	15	15	15
4	15	14	13	14
5	11	15	12	13
6	15	15	15	15
7	12	15	15	14
8	13	12	14	13
9	11	13	15	13

Evaluative scale:

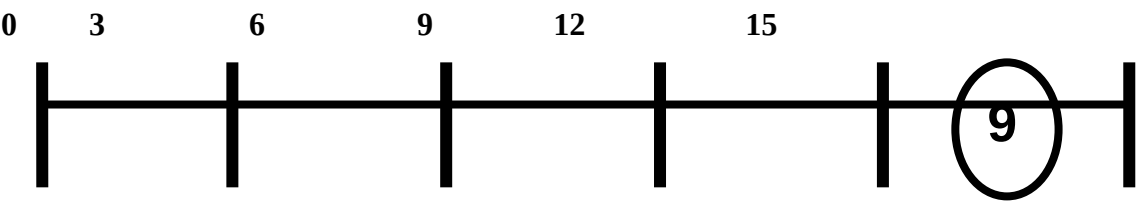
(0-3) Strongly Disagree (TED).

(4-6) Disagree (ED).

(7-9) Neutral (N).

(10-12) Agree (DA).

(13-15) Strongly agree (TDA).



Graph 1. Results of the applied survey (Likert scale).

In general, it was possible to conform the definitive proposal for the control of the physical conditional directions determinants of performance in boxers of the senior category in Guantanamo, giving the 9 respondents who constitute 100% of the evaluators the rating of totally agree with the proposed tests for the control of boxers during the preparation process.

The data presented in table 1 and graph 1, support the idea conceived by the authors of the research.

Table II below shows the results of the tests applied to boxers of the senior category of Guantanamo to control and evaluate the determinant conditional capacities during the preparation process.

Table II. First measurement (Year 2019) and second measurement (Year 2022).

tes	Hitting the hangin g bag in 6 second s	Action of straight blows with garter hold for 10 seconds				Bale thrust from combat stance.								Shade with dumblet in 3 minutes								Arms position	Gene ral point s	Gene al evalu ation
						Left arm				Right arm														
Hit	%	Ev alu ati on	Poi nts	Hit	%	Eval uati on.	Po int s	Dist ance (mts)	%	Eval uatio n	P oi nt s	Dist ance (mts)	%	Eva luat ion	Poi nts	Hit.	%	Eva luat ion	Po int s	Hi gh	M ed ia	Lo		

	24	57	R	7	42	65	R	7	4,57	71	B	9	5,14	63	R	7	227	56	R	7			
	42	10 0	M B	10	65	10 0	MB	10	6,6	10 0	MB	1 0	8,36	10 0	MB	10	402	10 0	MB	10			
	31,66	76	B	9	47,5 5	74	B	9	5,35	71	B	9	6,71	88	B	9	338	84	B	9			
	5,78				6,96				0,62				1,16				64,4 0						
	18,27				14,6 4				11,6 0				17,3 7				19,0 5						
	32	71	B	9	47	68	R	7	4,61	71	B	9	5,49	63	R	7	232	56	R	7			
	45	10 0	M B	10	69	10 0	MB	10	6,69	10 0	MB	1 0	8,45	10 0	MB	10	417	10 0	MB	10			
	37,77	84	B	9	53,4 4	77	B	9	5,45	71	B	9	6,83	88	B	9	349, 22	84	B	9			
	4,91				6,52				0,63				1,09				66,9 8						
	13,02				12,2 0				11,5 8				16,0 2				19,1 8						

To control the determinant conditional abilities of the boxers, four (4) fundamental indicators were taken into account (punching the bag in 6 seconds, straight punches with garter hold in 10 seconds, impulsion of the bullet seat the fighting stance and shadow with dumblet in 3 minutes). Two tests were conducted, the initial test in 2019 and a second test in 2022. Nine boxers members of the Guantanamo senior team selection were object of study.

When assessing the results between the initial and final tests applied, it can be observed that there was some improvement in the final test (2022), after a process of preparation of the boxers to face the fundamental competitions.

In general, in both measurements, the sample reaches an overall average score of 45, for an evaluation of Good, but progress is observed in the second test in relation to the first one.

The data presented in Table 2 support the idea described by the authors.

Discussion

The studies carried out to the guiding documents (PIPD, 2017-2020 and 2021-2024) and to the specialized literature of sports training, related to the determinant directions of performance for the preparation of boxers, have shown that even when they have well stated and grounded the physical directions both conditioning and determinant for the physical preparation of boxers throughout the preparation process, the specific determinant physical directions that allow a more rational control in the preparation of boxers are limited. It could also be seen that these studies do not foresee how to control the specific determinant directions that are most related to the practice of boxing.

As it has been recognized that the physical direction of sports training has been addressed in our country by different authors, among them Forteza (1999); Romero (2006); Collazo (2002) and Fernandez (2004), agree on the advantages offered by such preparation in the planning, implementation and control of current training.

taking into account the above, it was necessary to carry out a study in the boxers of the first category of Guantanamo, in order to control the physical determinants of performance during the preparation, based on the inadequacies detected by observers and evaluators in the national boxing events of the Cuban boxer.

The inadequacies are related to the power in the punching, the reaction speed and the early appearance of fatigue in some athletes during the fight. For them, we set ourselves the task of working with greater emphasis during the preparation on the determinant directions of performance in which these insufficiencies were manifested and proposing specific physical tests to control them, based on the criteria of different authors consulted and the classification of the directions of training declared in the Integral Program of Athlete's Preparation for the 2021-2024 cycle.

The directions proposed by the authors of this research are reaction speed (punching the bag in 6 seconds), quick strength (action of straight punches holding the leagues for 10 seconds), explosive strength (impulsion of the bullet from the fighting stance), resistance to strength, resistance to strength (shadow with dumbbell in 3 minutes).

It is important to emphasize that these contributions to Guantanamo boxing improve the pedagogical actions of the trainers, and are linked with more objectivity to the control of the specific physical determinant directions of performance in the process of preparation of the boxers.

Conclusions

Finally, it can be concluded by stating that the study of the control of the determinant physical directions of performance of boxers in the senior category in Guantanamo, allowed confirming the need to continue improving this work, which corroborates the scientific problem of this research. In the research process, the problem was solved by applying specific physical tests, taking into account the characteristics of this sport and the age of the athletes, allowing perfecting the control of the physical directions determinants of performance in boxers, taking as a way of concretion the control of physical preparation and as a center of direction of the process to the coaches, which constitutes the contribution of this research. The level of acceptance of the test proposal is high, evidenced in the conclusive result obtained from the evaluation of the specialists, when evaluating its structural and methodological conception, the logical and methodological order of the steps and the level of satisfaction to the problem and the possibilities of its practical application, in the very adequate category.

Bibliographic references

- Alonso, R. Y. (2014). *Interpretación de las Pruebas Físicas en Tierra de los Polistas del Municipio Guantánamo*. Trabajo de Diploma en opción al título de Licenciado en Cultura Física. Universidad de Ciencias de la Cultura Física y el Deporte “Manuel Fajardo”. Facultad de Guantánamo, Cuba.
- Campos, G. J. y Cervera, V. R. (2001). *Teoría y Planificación del Entrenamiento Deportivo*. Barcelona, España: Editorial Paidotribo.
- Collazo, M. A. y Betancourt, A. N. (2006). *Teoría y Metodología del Entrenamiento Deportivo*. Tomo I. Instituto Superior de Cultura Física “Manuel Fajardo”. Ciudad de La Habana, Cuba.
- Collazo, M. A. (2002). *Fundamentos Biometodológicos para el Desarrollo de las Capacidades Físicas*. Instituto Superior de Cultura Física “Manuel Fajardo”. Ciudad de La Habana, Cuba.
- Domínguez, J.; Puig, A.; Horta, H.; Acebal, R.; Limonta, E.; Barrientos, A.; Álvarez L.M. y Milán, J.R. (2021-2024). Programa Integral de Preparación del Deportista. Comisión Nacional de Boxeo.
- Forteza, D. A. (1999). *Las Direcciones del Entrenamiento Deportivo*. Revista digital. Año 4 · N° 17 | Buenos Aires, www.efdeportes.com

- Forteza, D. A. (1999). *Direcciones del Entrenamiento Deportivo. Metodología de la preparación del deportista*. Habana, Cuba: Editorial Científico Técnica.
- Forteza, D. A. (2004). *Planificación por Direcciones del Entrenamiento Deportivo con el Diseño de las Campanas Estructurales*. PubliCE Standard. 01/03/2004. Pid: 263.
- Fernández, F. R. (2004). *Las Direcciones Determinantes del Entrenamiento en la Práctica del Taekwondo*. <http://www.efdeportes.com/> Revista Digital - Buenos Aires - Año 10 - N° 74 - Julio de 2004.
- Gainza, I. (2003). *El Control Físico de las Cargas de Entrenamiento en los Saltadores*. Trabajo de diploma en opción al título de Licenciado en cultura Física. Instituto Superior de Cultura física “Manuel Fajardo”, Facultad de Guantánamo, Cuba.
- García, M., Navarro, V. M. y Ruiz, C. J. A. (1996) *Planificación del Entrenamiento deportivo*. Madrid, España: Editorial Gymnos.
- Platonov, V. (1999). *El Entrenamiento Deportivo, Teoría y Metodología*. 6ta. Edición. Barcelona, España. Paidotribo.
- Rubalcaba, O. y Loaiza, C. (2001). *Metodología y Deporte. Consideraciones Básicas*. San Juan de Los Morros, Venezuela.
- Stelvio, B. y Polletti, C. (1995). *Preparación Física Total*. Barcelona, España. Hispano Europea S.A.
- Weineck, J. (2005). *Entrenamiento Total*. Barcelona, España. Paidotribo.