



SCIENTIFIC KNOWLEDGE IN SPORT "CONTEXTUALIZATION: THEORY AND PRACTICE"



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Theory as a Form of Scientific Knowledge

In order to start a discussion about the scientific aspects applied to sport practice and, especially, to high performance sports, marked by the quest for excellence, besides knowledge, researchers need to interpret the competitive activity of a sport discipline. This task is further compounded when the discussion is about sport in general. Before anything else, whatever may be the type of reasoning about modern athlete preparation for sport, discussion must start with **theory**, which can provide, at least, a partial explanation of this worldwide phenomenon.

The term "theory" is used with several meanings. This particular aspect leads to the need to identify some specific and own features of theory in its scientific meaning. In this case, theory should be studied in its direct relationship with knowledge accrued in the sport domain.

In practice, any phenomenon, including athlete preparation, appears linked to a huge number of separate facts and events. This is why, it is typical of man to construe a general idea of the interconnected specific types of knowledge, which enable us explain observed phenomena^{1,2}.

Historically, the knowledge process is developed from the awareness of a single phenomenon up to the discovery of features that are common to several other phenomena. Within a complete dimension, this universal law applies to the domain of sport, as experience is accrued, repe-

ated facts and their mutual relationships are observed, enabling a successful preparation of an athlete. Accrued scientific knowledge allows us to compare it in the different sport disciplines. The process of generalization becomes a premise necessary to the construction of a specific sport theory. Based on this principle, theory is not just knowledge of the object, but rather the highest level of the most complex generalized objective of knowledge. Knowledge objectivity, that is, confirmation by facts, also represents an important condition to the development of theory as a form of scientific knowledge³.

We can add to collected data by looking for knowledge accrued in other fields of science, such as: **physiology, medicine, biochemistry, biomechanics, psychology etc.** Thus, a more or less generalized knowledge about modern sport practice is gradually acquired.

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As the full diversity of single facts and the conditions that determine athlete preparation for several disciplines are detected, the various types of knowledge must be interconnected as a whole to allow us to format a theory. However, it is only in the general database that we can assess where the essence of the studied phenomenon stands out. The essence constitutes a concentrated expression (in the form of concepts, laws, principles and general rules) of all the internal aspects that are specific of the phenomenon determining its development⁴.

As a higher form of scientific knowledge, scientific theory has a broad range of functions. Thus, theory has an elucidative function, since theory, for example, allows us to understand the causes that led to the changes seen in the body of an athlete. Together with the elucidative func-

tion, that provides understanding of both the past and the future, theory also functions as a scientific forecast. This function enables predicting the course of events and development perspectives in the near and long term future. The forecast may coincide with reality when scientific theory can provide inputs up to a level that enables us to take into account the full range of factors that determine the athlete preparation process⁵.

The instructional role of theory is immediately linked to its elucidative function. Theoretical knowledge constitutes the basis for investigation, and is a mandatory requirement of the training of any expert for professional activity in sport.

Theory plays a critical role and is linked to acquisition of new scientific knowledge. Theory assumes the design of a unique set of concepts and general views of the research on the essence of phenomena in the field of sport. This has a particular meaning, since in sport, the process of awareness happens in a significantly different way, being limited to the separate sport disciplines. Solely a single system of theoretical knowledge appears as the methodical link enabling the exchange of successes of scientific-methodical thinking between experts in the various sport disciplines, thus broadening the entire concept.

In the domain of sport, the value of theoretical knowledge is ultimately determined by the degree of success that allows an expert to find direction and solve the tasks linked to the various aspects of sport activity. This is why the issue of the interconnection between **theory** and **practice** is particularly important^{6,7}.

In its "pure" aspect, as a system of knowledge, theory should not have direct influence on practice. There must be a link between theory and practice. This link is represented by the **method of training**. Just when it becomes a system of guiding principles and rules (thus becoming a method) will theory be capable of influencing practice. Method performs a regulating role, indicating from of action to coach or athlete, which actions, and in which sequence they must practice in order to reach the proposed objectives. In the solution of practical tasks sometimes we will fail to reach athlete preparation objectives using a concrete method. This is why we need a set of methods, and this is linked to the notion of "**methodology**". No single method reflects the full content of its corresponding theory. Because of its content, theory is always broader than method. On the other hand, in its

evolution, a method that appears based on a theory, will forcibly go beyond the limits of this theory, enriching and adding accuracy to theoretical knowledge. We must take into account that practice by itself and immediately, and not just through theory, is capable of influencing the formation of methods. There are in sport many examples of the design of effective methods of athlete preparation based on the practical experience of coaches, athletes and experts, providing a significant contribution to the advancement of the theoretical understanding of these problems⁸⁻¹⁰.

Interaction between theory and practice always leads to new facts which, at first glance, do not agree with the theory. There are no scientific theories, which as they evolve fully agree with all the facts related to their scope. Theory does not explain all the empirical data without exception. The very fact that theory diverges from practice actually constitutes the source of theory evolution^{11,12}.

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Our perception of nature advances when discrepancies appear between theory and experience. These discrepancies show us the path to a broader perception of nature, and prompt us to develop our own theory. The larger are the discrepancies, the more critical becomes a restructuring of the laws we use to explain the processes that happen in nature. If theory or certain rules are unable to withstand discrepancies, we then go back on their accuracy, or the theoretical premises are consequently replaced by others^{13,14}.

The different areas of human activity, with respective areas of knowledge systematized in a theory, may explain certain manifestations that happen in the practice of high performance sports. This becomes even more clear when we begin to understand sport not just how it is seen, but how it can be prepared and, consequently, evidenced as a true show. Figures 1 and 2 present a direct relationship between the different areas and their relationships with high performance sport practice^{15,16}.



Figure 1 – Sport theory as a cultural, philosophical and methodological phenomenon.

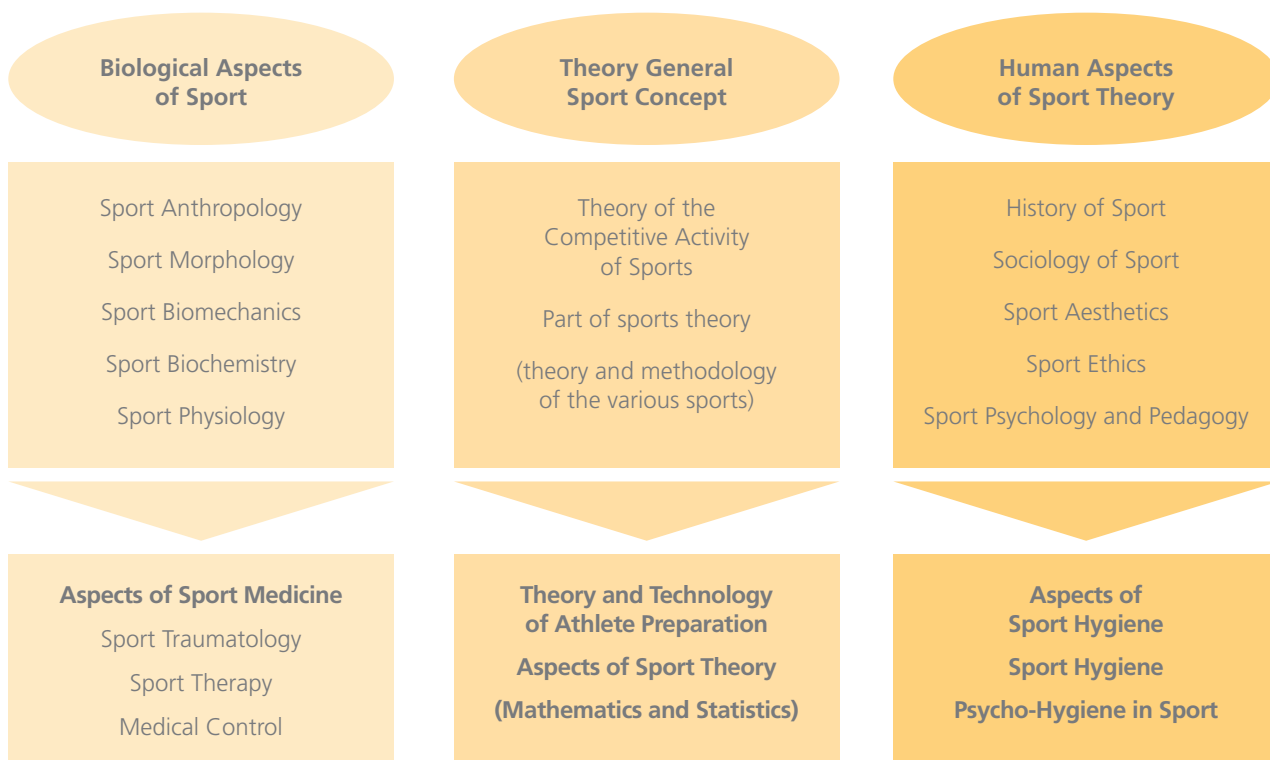


Figure 2 – Aspects influencing the construction of sport theory.

Key Concepts of the Athlete Preparation Theory

As in any field of scientific knowledge, the athlete preparation theory is, above all, characterized by an understanding of the key concepts of the preparation system. This is why, to start presenting the theory, these concepts must be defined as broadly as possible. Concept definition is a logic operation that reveals its very essence. This is particularly important when studying the disciplines involved in physical culture, since this field of knowledge is still in a formation stage and many of the terms are not used in an elucidative way¹⁷.

When presenting the system of concepts, generally, the base concepts (core concepts) are defined first and the derived functional concepts come next. The following terms are related to the core concepts: “*physical culture*” (fitness training), “*physical education*”, “*physical preparation*” and “*sport*”¹⁸.

Physical Culture – In order to define “physical culture” we should refer to a broader understanding of the term culture. The word “culture” is known to all and frequently used in daily life. However, in order to devise a scientific definition revealing the full content of this broad term, we face difficulties that are related to the many facets of the culture phenomenon. The word culture “applies” to several spheres of social life, thus generating a large number of views about the concept of culture. Normally, however, these views take just some aspects into account and forget others. Culture is often simply understood as a phenomenon of the spiritual life of man. In its scientific sense, culture comprises all fundamental spheres of man life and activities, linked to material production, social-political relations, spiritual life, daily life, human relations, etc. Differently from everything else that exists independently from mankind, culture comprises everything man has ever created. This is why when defining the term

“culture” we compare it to the term “nature”, with nature being everything that exists according to the natural laws which do not depend on man. Man sees himself an individual of culture as he frees himself from the power and circumstances of natural forces to become a being whose development is determined by the results achieved by his own activities. At this point, we need a specific understanding of the term “activity”, since this word has a methodological meaning and a meaning of principles, and this will enable to achieve an improved understanding of the complex essence of such phenomena as physical culture and sport. Activity is normally defined as the process of man behavior towards the surrounding world and himself. It is precisely the objective towards whose achievement man locomotive and intellectual activity is directed enabling to separate the very phenomenon from action. Along the process of the historical development of culture, several types of actions stood out, most of them directed to man self-improvement and to the transformation of everything which is natural in man. Physical culture refers precisely to such components of culture¹⁹.

Thus, physical culture, may be defined as : **“that part of society’s culture whose essence is action targeting physical improvement of human beings”**. Physical culture must be viewed as comprising two aspects: it must be seen as the result and the process of the activity.

As result of the activity, physical culture is represented by the material and spiritual values created by society along the process of historical development; we should distinguish between the social result of the action and personification (specific to one individual).

As the social-material result of action, physical culture was materialized in the technical-material inputs of the physical education process (competition venues, special diagnostic and information equipment, sports materials, etc.). In its personalized form, the material result appears as man morphofunctional and personal traits and as physical qualities and abilities based on such traits.

As a joint result of society’s spiritual activity, physical culture is translated into in the experience, methodical knowledge involving a directed use of several factors aiming at reaching the goals of man’s physical improvement; it is also translated into ideas about the aesthetic criteria of man physical development, ethical standards, etc.

As a process, physical culture is characterized by the concepts of “physical education” and “physical preparation”.

Physical Education – Physical Education represents the type of education whose purpose is the achievement of man physical development, special knowledge, habits and uses, allowing, according to society requirements, the performance of socially useful functions.

The level of physical education in society depends on many factors, among which are the following: man living standards in society, accessibility of the organized forms of physical education, advertisement, qualified frameworks, technical material conditions and the social-cultural and religious traditions²⁰.

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Physical Preparation – The understanding of the term physical preparation is preferably applied to the cases where a more specialized and applied guidance of physical education is needed. Physical preparation represents part of men preparation for a professional career or some other activity. Thus we have, for example, the physical preparation of soldiers, law enforcement personnel, firemen, pilots and athletes.

We must distinguish the concepts of “physical preparation” as a process, and “physical fitness” as the result of a preparation that comes from specialized knowledge, skills, level of development of physical capacity. The result of specialized action focusing on preparation represents the full index that characterizes the level of fitness²¹.

Sport – despite its international popularity, the term “sport” has broad differences in meaning, because the content of the concept is not equivalent. The term “sport” is often extended to the predominant part of physical culture components, including forms of physical exercise for recreational, prophylactic, curative and educational purposes, among others. Underlining this particularity of the use of the term “sport”, L. P. Matveev mentions that such a broad use of the term “sport” together with its

more restrict and determined use, makes no contribution to concept clarification. Additionally, there are few probabilities that it may be justified in the system of special terminology pertaining to physical culture and sport.

This situation prompts us to direct special attention to the assessment of the special features of sport.

When attempting to highlight the most important and critical features, sport may be defined as: **part of the culture of society, whose essence represents activity focused on the achievement of victory and realized in the competitions considered within the special preparation system**²².

Competitions and special preparation, in this specific case, appear just as inalienable features and components, but which are not specific just to sport activity. As an independent action, competition may be included in several types of action: contests between artists, skill competitions for professional hairdressers, chefs, police officers, etc. Special preparation may also be part of several types of activity, and is inherent to any professional activity.

The motive for achieving victory must be underlined as a specific index of sport performance. In this concrete case, victory represents advantage expressed in a fixed result, obtained in the process of comparison of qualities and competing parties. The authors are of the opinion that victor is the sole specific feature, which is specific only of sport activity, and enables distinguishing it from other types of activities that are often similar in their external features.

The Athlete Preparation System

Athlete preparation represents the system of targeted use of the full range of factors that condition the achievement of sport activity objectives.

When analyzing athlete preparation as a specific system, certain components must be highlighted, each of which representing a system comprised of several elements.

Three critical components of the athlete preparation system can be highlighted:

- *competition system;*
- *training system;*
- *supplementary factor system.*

All the components of athlete preparation are intimately interconnected, and are mutually complementary. Furthermore, these components have well defined tasks and methodological features that give them an independent (autonomous) meaning.

The competitions referred to above express one of the most critical features of sport. The competition system represents a series of official and non-official competitions which are part of the single system of athlete preparation. Achieving excellent results in the most important competitions, during a given preparation stage, appears as the objective of the key factor of system formation, which imparts a unique guidance to the whole system and to all the components of preparation. At the same time, less important competitions have an important preparatory role to play, once athlete participation in these competitions represents an important and powerful tool enabling improvement of specific basic skills and technical, tactical and psychological preparation. By highlighting the competition system in the athlete preparation system, we must bear in mind that taken separately, this system of competitions should not be seen as self-sufficient and capable of assuring a full athlete preparation. Just the combination of an optimum preparation for competition to other components of the preparation system will be capable of ensuring that the sport objectives will be achieved.

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The training system constitutes a core component of athlete preparation. **Sport training** represents a process in the pedagogically organized system, grounded on physical exercise methods aimed at maximum improvement of the potentials of an athlete's body, in line with the requirements of the selected sport discipline.

In the structure of sport training, physical, tactical, technical and psychological preparation is normally highlighted. It is within the framework of each one of these tasks that the more intimate tasks are solved. Thus, physical preparation includes the development of certain physical skills (strength, endurance, flexibility, speed and coordination), while in the process of technical preparation, we can distinguish the teaching of several technical actions, etc. The complex result of sport training is the achievement

of the state of training, which is expressed by a high level of body functional potentials and the achieved degree of mastery of technical actions.

The solution of athlete preparation tasks requires targeted use of several factors that contribute to a good adaptation of an athlete's body to the influences of training and competition. Among these supplementary off-training and off-competition factors the following may be highlighted: **physiotherapy, massage, sauna, specialized nutrition, pharmacological means, natural factors (as for example, a mountain climate)** etc²³.

The human body is a complex system in constant interaction with the environment, and it is just thanks to this connection that it may exist as an integral system. This is why, satisfaction of biological and social needs is a mandatory condition of a person's normal life. Several factors linked to the living conditions of man in society (living standards, conditions of daily life, eating habits, family relations, ecological conditions of the environment and many others) impact athlete preparation. Sometimes the influence of these circumstances on sport practice is not fully grasped against the specific factors of athlete preparation, but this in no way reduces its significance to the achievement of sport objectives.

Athlete preparation must be seen as a constantly evolving system. Targeted change along many years is a feature of this system, from the least ordained to the most ordained state. The higher the level of sport results, the more complex will be the athlete preparation structure. The adjustment of the preparation system to the performance of specific functions is carried out by increasing the number of elements and their differentiation and specialization. A complex interconnection exists between the parts and the elements of preparation. This interconnection may be direct or mediated, may have just one or multiple links. In some cases, links further the development of one component or of a group of components; in other cases development is repressed. For example, physical preparation encourages athlete's technical improvement. An opposite example: increase of competitive practice may

generate impacts cable of repressing the volume of training influences²⁴.

At each level of development in the preparation system, there must be a connection between separate elements. If the interconnection is impaired, the process of development of one element results in losses to the other. In sum, this unbalance leads to the collapse of the whole preparation system.

The main target of preparation system improvement is furthering its integral nature. Together with the already mentioned differentiation of elements in the process of normal system development, interactive trends appear and evolve. These trends coordinate and bring together the various functions of the specialized parts of the preparation, giving them a single and special direction.

Final Considerations

The preparation of a modern athlete must be improved not just by resorting to the various scientific fields of human activity but, actually, the very competitive activity of the athlete needs improved interpretation by coaches. Because of its emotional involvement, sport in several regions of the world is still part of what we call popular science, momentarily explained by myths, beliefs, different ways of thinking, such as the press, fans, managers who most often than not act driven by emotive and explosive feelings that permeate the heat of competition. Explaining the sport phenomenon in our time must be a task assigned to academic sciences, which in their most diverse fields of knowledge already have available well grounded theoretical assumptions that may help coaches to significantly reduce the number of errors in his/her daily practice. The laws that govern investigations in the areas of pedagogy, sociology, psychology, biomechanics, physiology, nutrition, medicine, etc. have already been confirmed by innumerable studies, which are capable of providing a decisive contribution to modern athlete preparation, provided such studies are properly interpreted and applied to practice.

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