Module 1. Periodization, planning and methodologies. Theories and new paradigms

Unit 1.1 Theoretical framework and traditional methodologies

1.1.1 Periodization, planning and methodology concept

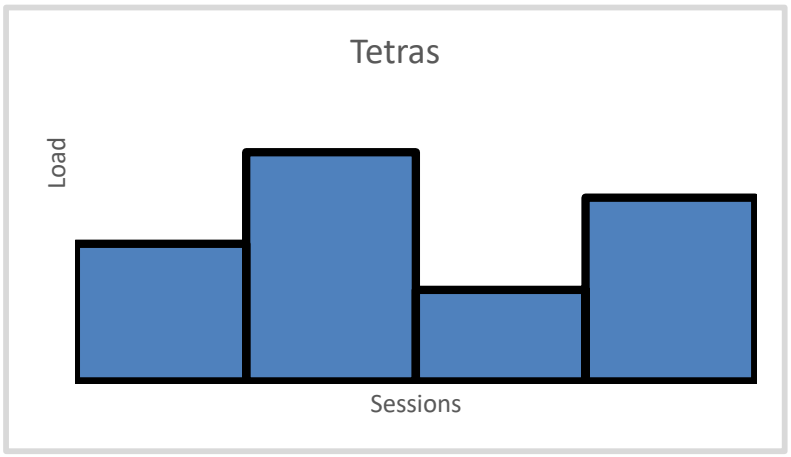
Since the moment physical activity became aimed at performance and competition, the concept of training planning came to existence. The figure of the coach already existed in ancient Greece and their training methodologies included a time structure, called Tetras. These were simply a succession of 4 training sessions with a given load, aimed at physical improvement and development. Training cycles were composed by an N quantity of these structures, seeking improved physical performance when competing. It is assumed that the main objective of these Tetras was to be able to strictly control training loads (yes, loads, even at that time they were already considered as important as they are today), since the only difference that existed between one session and another within the time structure, was precisely the Load. This concept will be discussed later in this course.

If we look at the current training methodologies, we will find the Microcycle, or micro structure, referring to a week of training approximately, in all of them, and in the case of team sports it refers to the time between one match and another. Clearly, the Tetras were a time structure similar to the cycles used nowadays.

The four training sessions in the Tetras were scheduled in the following way.

- Day 1: Medium/low intensity preparatory training.
- Day 2: Very intense training. The most intense training of the block.
- Day 3: Low/very low intensity recovery training.
- Day 4: Medium intensity training.

Figure 1



Source: Prepared by the author.

Coincidentally (or causally) Fleck and Kraemer talk about load fluctuation as the most effective method for strength training.

Since the formulation of the first sports training theories by the USSR, and over time, training programs abandoned an empirical formulation basis, leaving room for applied sciences. In other words, based on all the data that science can provide thanks to research, new exercise programs are developed for different athlete populations that will then give rise to new sports training paradigms or currents (Verkhoshansky, 2002).

In order to give the student some general ideas about how the specialists' conception of training has mutated over time, setting aside empiricism and drawing nearer to science, as stated above, we will analyze the ideas proposed by this author.

Verkhoshansky (2002) refers to the aspects that show the development of contemporary training, listed below:

1) As there is a noticeable increase in the fitness level of athletes, preparation systems (the appearance of the word preparation will be explained later in this text) must be refined, as well as of the entire methodological organization system for long-term training.
2) The competition result is subject to the quality, stability and security of a high tactical technical level, along with a moral, volitional preparation and psychological stability of the athlete.
3) Athletes achieve a level of preparation and, therefore, of performance that is so high that in order to improve they must seek increasingly specific resources in their physical, technical and tactical preparation, as well as in the rationalization of the sports development process as a whole.
4) Training volumes grow exponentially. This is why rationalization in the distribution of loads throughout the entire season and in its different stages is so important. The goal is to maximize the effectiveness in the relationship between the output and recovery of energy resources when developing different capabilities.
5) There have been great advances in technology applied to sports in the last 25 years. This has led to changes both in terms of rules and training methodologies, which has facilitated the resolution of technical and methodological problems in preparing high level athletes.
6) By identifying the training's effectiveness, resources are managed more productively. As we can see here:

    - The competitive activity model is developed under the conditions of the training. That is, training takes place at the same intensity and with the same rules as the actual competition. This increases decision-making capabilities during the competition.
    - Specific training loads are increased and tasks are aimed at solving them.
    - Specific training loads are focused according to the different moments of the season.

7) Science becomes relevant when solving issues related to training methodology. Traditional types of training are not consistent with the reality of today's competition calendars. For instance, Matveev's (1985) training periodization methodology was created in the 50s, when the Russian team was preparing for the

Olympic Games in Helsinki, at a time when sciences applied to human movement were just emerging and could not provide solid foundations to construct the training program or cycle. It is a progressive-type methodology, which begins with a high-volume of training at low intensities, the situation reverses over time and at the end of the cycle volumes are low but with maximum and submaximal intensities. This has a low level of suitability for current competition calendars, especially in team sports. Therefore, its applicability has been decreasing.

Based on what we saw above, we understand that sciences applied to sports influence athlete formation, since they determine, among other things, the limits the body can withstand and based on that, allow us to understand that any sport formation process must have a biological foundation.

No matter what trend or paradigm the different methodologies are based on, within sports training theory the focus is always on load. It represents the way in which the stimulus proposed by coaches impacts the athlete. This is what triggers the athlete's physiological responses and adaptations to the training process, at both the immediate and long-term level.

That is why, after this brief introduction to the history of training and before we continue discussing the different currents and contemporary methodologies we will take a moment to explain the training load.

Load is defined as the "quantitative and qualitative measure of stimulus developed during training which determines the adaptations as 'ensembles' and not through their isolated application."

Let's review how each one of the global referents in training define load and determine its variables:
According to Verjoshanski (1990) the load is "Muscular work that involves in itself the potential of training derived from the athlete's condition, which produces a training effect that leads to an adaptation process".

According to Gonzalez Vadillo (2002) the load is the set of psychological and biological demands (internal or real load) provoked by training [or competition] activities (external or proposed load)".

Training load:

T.O. Bompa:
- Volume: duration, distance and number of reps.
- Intensity: load and speed.
- Density: execution frequency.

V.M. Platonov:
- Nature of the exercises.
- Work intensity.

- Work duration.
- Duration and nature of rest.
- Number of reps.

M. Grosser:

- Stimulus intensity.
- Stimulus duration.
- Stimulus density.
- Stimulus frequency.
- Stimulus magnitude.
- Training frequency.

V. Verjoshanski:

- Load content: Level of specificity - Training potential.
- Load organization: Load distribution - load interconnection.
- Load volume: Load magnitude - load intensity - load duration.

Load components as detailed by Navarro (2003):

Nature of the load: implies the work to be done. Is determined by level of specificity and training potential (Verkhoshansky, 2000). The level of specificity indicates the greater or lesser similarity of the exercise with the manifestation of the motor pattern during the competition. Depending on the level of specificity of the load, the training load has traditionally been classified as general load or specific load (proposed loads with sub-levels are also found).

Load magnitude: it is the quantitative aspect of the stimulus used in the training and it is determined by the volume, intensity, duration, frequency and density of the training required of the athlete (Verkhoshansky & Siff, 2000). The load volume is the quantitative measure of the different functional orientation training loads developed in a training unit or cycle. It may be global, when the volume of all the different functional orientation loads is quantified, or partial, if the load volume refers to a specific type of training with a specific functional orientation. The load intensity is understood as the quantitative aspect of the load, carried out within a determined period of time (Bompa, 2003). Thus, the more work that is performed per time unit, the greater the intensity. The load duration is the influence period of a single stimulus, or a longer period in which one works with loads of one same orientation (Verkhoshansky, 2000).

Load organization: consists in the systematization of the load during a given time period to attain a positive cumulative effect of different orientation loads. Two aspects must be addressed: the load distribution over time and the interconnection of the loads (Verkhoshansky, 2000). The load distribution over time is the way in which the different loads are arranged in a session, day, microcycle, mesocycle or macrocycle.

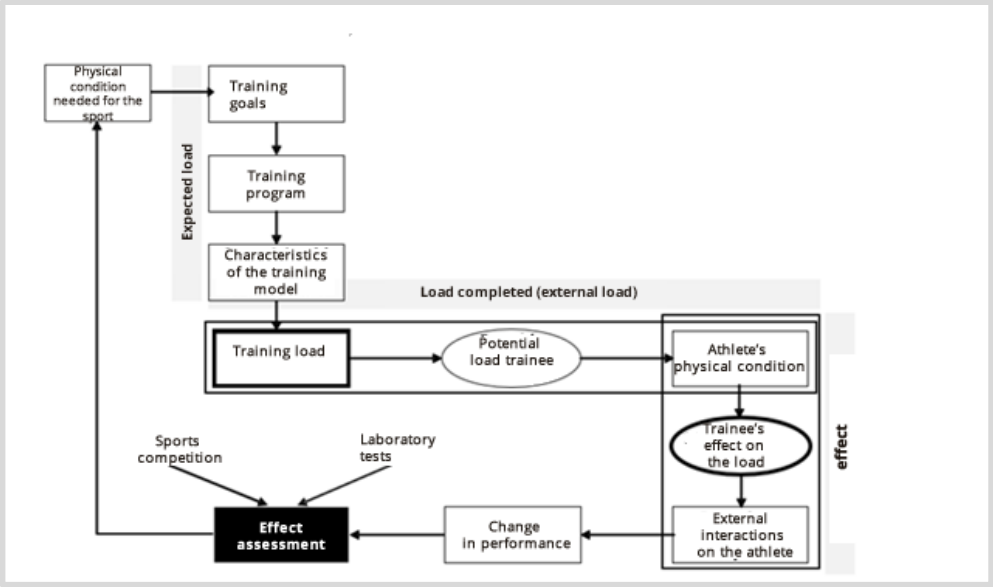
Volume: is determined by the number of reps or sets performed in a session or during a time period of training (e.g. microcycle, mesocycle or macrocycle).

Intensity: refers to the work or effort performed by the athlete and determines the specificity of the training load. Intensity can be assessed predominantly in its external load component (e.g. the quantity of weight lifted in an exercise) or internal load component (e.g. the increase in the blood lactate concentration produced by the quantity of weight lifted).

Frequency: the number of times in a time period (days - weeks - months) a training is performed.

Duration: the time the activity lasts. It depends on the content of the work to be performed and the intended objective.

Figure 2



Source: Verkhoshansky, 2000.

1.1.2 Behavioral and mechanistic theories vs. dynamic systems theories

Sports training can be regarded from a reflective perspective on practice within the framework of learning theories. Reflecting on the practice involves creating theoretical comprehension frameworks that help improve the relationship between the coach and the athletes. In this way, the subjects learn to master their bodies in order to perform specific roles in different disciplines. In this regard, it is important to know the didactic perspectives that regulate this task.

Over the past century, sports was built around behaviorist and mechanistic theories on which its respective teaching and training were based. The development of the athlete and the evolution of the sport were based on ideal models built by contrasted evolution based on factors unrelated to the athlete himself. With the change from the mechanistic to the ecological paradigm, a shift in knowledge theories occurred. The mechanistic vision of the human being with the consequent metaphor of the man-machine began to change with the appearance of new approaches. The human being became an unstable and Complex Dynamic System, a system that changes state in situations of imbalance that he accumulates during his life experience. (Pol, 2012)

Behavioral and mechanistic theories

Behaviorism is a psychological current that appeared at the beginning of the 20th century that has impacted other disciplines, such as the study of learning processes. This current originated as a counterproposal to Psychoanalysis, which considers the unity of the mind-body and, through its introspective methods, attempts to untangle the signification processes of the human unconscious. This totally subjective task, in a context marked by the dominance of the empiric model, distanced Psychology from any attempt of rising up as a scientific discipline.

Behaviorism defines behavior as its field of study, which it regards as a fact determined by the situation, by the response and by the body. Likewise, it is based on an absolutely empirical methodology but that, unlike Psychoanalysis, ignores any subjectivity. Thus, Behaviorism perceives Psychology as an applied science, the aim of which is to predict and modify behavior.

Sports training was influenced by this Behavioral theory during a large part of the 20th century, dual comprehension of athletes being one of the most important characteristics of this training approach, which considers, on one hand, the mind that learns certain behaviors, and on the other, the body that responds mechanically.

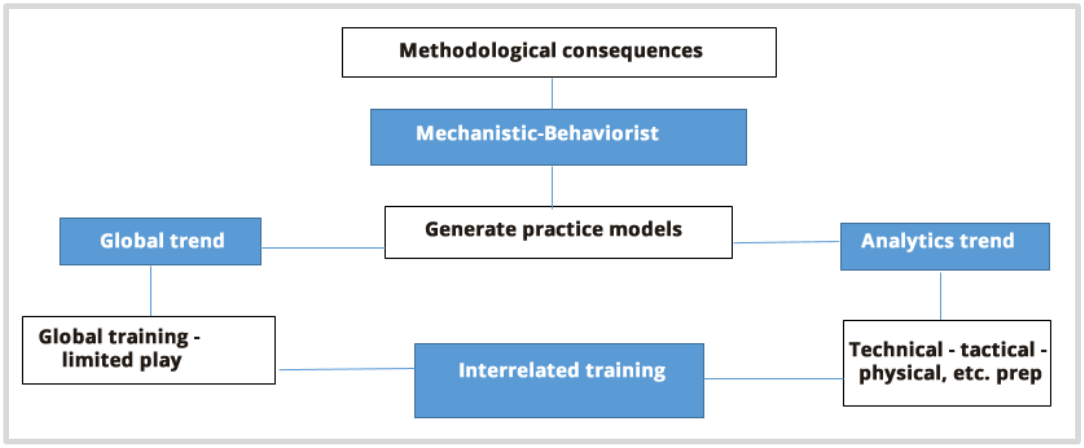
In this sense, training process structures appear detached and each athlete/player learns determined individual responses that would later be applied during team play. It is a model linked to execution that considers repetition as the basis for learning. From all this, it is understood that the more a determined motor skill is stimulated, the better the results attained. It is the age of proportionality, the more, the better. All of this led to the generation of training models and methodologies based on the incremental, the linear, and the quantitative. The infinite division of skills to be trained, and each one of them is understood as isolated and independent from the others. Individual technique is developed and refined through the use of isolated exercises. When we refer to isolated, we refer to the NON-use of activities that include actual game situations. In addition, the conditional capabilities of athletes are trained individually with elements and tools from different disciplines of Athletics. Then, the technical and physical development is complemented by including game situations to develop tactics and strategy. Concepts that are theoretically reinforced in coaches' technical speeches prior to the game. The tools and information provided by the coach in this case must be sufficient for the athlete to find adaptive responses when problems due to opposition and cooperation arise during the game.

According to Seirul.lo (1993), behaviorist learning consists in shifting from attitude to motor habit. The key is stereotypical movement repetition, where motor-spacial-temporal parameters are maintained, and from that homogeneous and immutable repetition we achieve the motor habit.

Seirul.lo says that in the 20th century, training was dominated by quantitative practice of analytical exercises in progressive linear sequences that were designed to build players that meet the demands of the behaviorist (mind) - mechanistic (body) model, which was

reproduced according to a series of factors unrelated to the athlete (rules, competition demands, society, etc.). Mind and body were worked on separately.

Figure 3



Source: Seirul.lo Vargas, 2002

Sports training has been influenced by the mechanistic conception of the human being. Although the need to integrate all the aspects of training is constantly alluded to and more holistic (integrated) trends are proposed, the Cartesian vision that conceives living organisms essentially as machines consisting of different parts is still the dominant conceptual structure (Torrents, 2005).

Dossil (2002), defines the characteristics of the behaviorist model in sports in the following way:

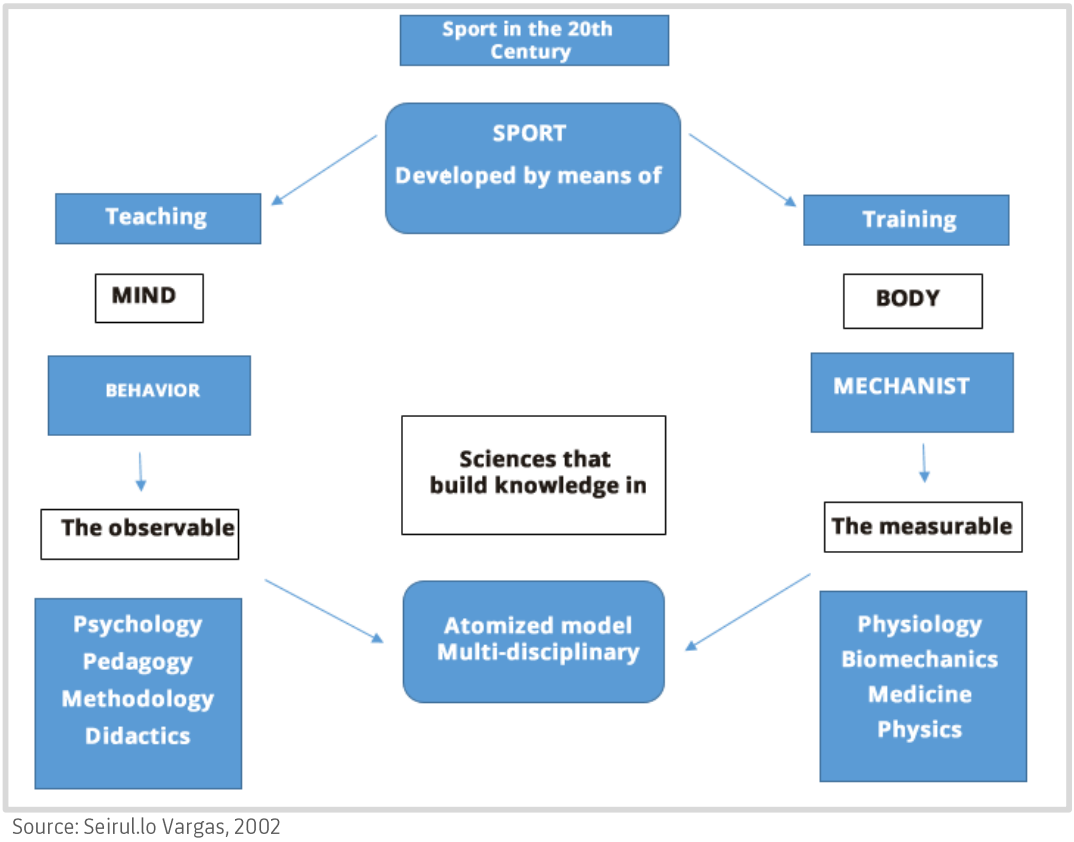
- Assessment of the observed behavior.
- Observation techniques are created which, when followed, have scientific reliability.
- Efficiency is defined and conclusions are drawn according to the stimulus-response.
- Teaching using models is proposed.
- A pedagogical model is constructed to learn more quickly and to allow for stability in the results: progressions, adverse and positive reinforcements and transfers.
- The subject undergoes the process of learning those techniques.
- Man adapts to the "model" built according to the needs of the sport and his specialty (adapting potential).
- This leads to pre-established models to which we must adapt.
- It very much applies to sports where the environment is very stable and the elements that comprise it have little interaction.
- Extrinsic motivations predominate in these types of sport: prizes, money, social recognition, even if motor freedom is restricted.
- Models change in a Utopian way; when an individual breaks the model and creates a personal one that is later scientifically justified and established as another model. (Ossorio, Lozano, Fernandez Sanchez, 2011, p. 1.)

In Summary

Research in our field has traditionally been based on classical science, just as in all other fields of research, which evolve thanks to the concepts provided by physics and mathematics. This science is systematic, as it identifies variables and evaluates the relationship between these variables; empirical, based on the use of data; reductive, as it generalizes based on observation of a few facts observed in a small sample; replicable, since if the process is reproduced the same results should be obtained; and logical, as the procedures followed are in harmony with the objectives pursued (Thomas and Nelson, 1990). It is very influenced by the acceptance of the linear relationship of cause and effect, or in other words, the relationship between the predictive variables and the outcome variables. (Torrents, 2005).

This paradigm, now in recession, has dominated our culture throughout hundreds of years, during which it has conformed our Western society and significantly influenced the rest of the world. It contains ideas and values such as: a vision of the universe as a mechanical system composed of parts - the human body as a machine - life in society as a competitive struggle for existence. (Capra, 1998)

Figure 4.



Source: Seirul.lo Vargas, 2002

Dynamic systems theory

Throughout the 20th century, various theories emerged, DST among them, which resulted in a substantial change in many areas of science. The conception of living organisms as a whole that interact with the environment and the discovery of equations that can describe the behavior of living beings have affected knowledge in areas as diverse as mathematics, physics, psychology, or economy. Sport and physical activity sciences have not been an exception and, logically, according to the latest trends, are already using the new existing tools at hand to explain and refine human movement in function of objectives.

In order to begin to understand the topic better, a System is defined as a set of two or more elements interrelated with each other working to achieve a common objective.

The General Systems Theory is the history of a philosophy and method to analyze and study reality and develop models, from which I can try to gradually approach the perception of a part of that wholeness, which is the universe, thus configuring a model of it that is not isolated from the rest, which we shall call the system. (Bertalanffy, 1969)

All systems conceived in this way by an individual result in a model of the universe, a world view, the key to which is conviction, that any part of creation, however small it may be, that can be considered, plays a role and its ultimate reality cannot be studied or captured in an isolated context.

In contrast to the mechanistic view (behaviorist models), problems related to wholeness, dynamic interaction and organization have appeared in various areas of modern science. Regarding Heisenberg and quantum physics, it became impossible to resolve phenomena in local events; problems of order and organization arise, whether in the structure of atoms, the architecture of proteins or interaction phenomena in thermodynamics. Similarly, biology, under a mechanistic light, ensures its goal in the fragmentation of vital phenomena in atomic entities and partial processes. (Bertalanffy, 1968)

From the formal and mathematical point of view, a system is considered an entity formed by a set of elements, which are the basic components of the system, and by the relationships that exist between them and with their environment. Mathematically, the attempt is to establish equations that govern the interactions between the elements of the system, thus creating a mathematical model thereof. (Torrents, 2005)

Traditionally, the living organism was fragmented into cells, its activities into physiological and physicochemical processes, behavior into conditioned and non-conditioned reflexes, the inheritance substrate into discrete genes, and so on. On the other hand, the organismic conception is basic for modern biology.

Not only parts and isolated processes need to be studied, but also the critical problems found in the organization and order that unifies them, resulting from the dynamic interaction of parts that cause their behavior to be different when they are studied separately or as part of the whole. Similar tendencies arose in psychology. While classical association psychology tried to solve mental phenomena in elementary units - one could say psychological atoms -, such as elemental sensations, Gestalt psychology revealed the

existence and primacy of psychological wholes which are not the sum of elementary units and which would be governed by dynamic laws. Finally, in social sciences, the concept of society as the sum of individuals as social atoms -the model of the economic man- was replaced by the inclination to consider the society, the economy, the nation as a whole superordinated to its parts. (Bertalanffy, 1968)

Dynamic systems theory and sports training

Unlike the classic paradigm, based on the holistic view of the human being, the dynamic systems theory (DST) emerges as an object of study, which offers us a wide range of tools and innovative concepts to apply both to research and to sports training. Its contribution to sports sciences has mainly been in research and in the areas of learning and motor control. There are more and more researchers, coaches and sports professionals interested in this new vision. The implicit acceptance of the influence of all parts of the body and environment in the final behavior of the individual, as well as the existence of general principles applicable to all systems, force us to take into account the studies that have been done in different areas of human knowledge. (Sanchez. Uriondo, 2012)

This is not intended to question the possible effectiveness of traditional training methods based on exercise reps and increasing workloads, but to pose that the same results can be achieved in a shorter, less aggressive and probably more rewarding way for the individual. However, there are also aspects of traditional training that are worthy of criticism and even harmful to athletes, and that can be easily improved if we consider the individual as a global being that interacts with himself and his environment. These proposals may be applied to all kinds of sports. In the case of team sports, the constant variations of game conditions is evident, which is why learning to adapt to these variations, while it may appear redundant, would be very useful (Sanchez Uriondo, 2012). This is possible if we understand the athlete subject as a complex and unpredictable being, who needs a training context that follows or resembles the reality he faces as closely as possible. A reality that is never the same, because we never find ourselves in a moment that is identical to another. Repetition only adapts the athlete to respond in that way, we train the same stimulus hundreds of times, which must be applied in an always changing context. With this we teach how to respond and analyze the situation with few tools.

Dynamic systems theory is based on the idea that “the whole is more than the sum of its parts”. The great contribution that this brings to the training world is that of understanding that tasks must be contextualized. The athlete is considered a whole being inside which multiple skills and conditions that are used at all times in sports practice coexist at the same time. It is never a single condition at a time, they are all working simultaneously with predominance of one over the other, where the great challenge is precisely generating that kind of training to rise to the challenge of a context that is never the same.

Traditionally, since Descartes, science has taught us to study a phenomenon by dividing it into parts, breaking it down to an atomic level. Generating academic groups specialized in the study of each fragment of each part of a being. Thus, countless disciplines specializing in particular topics have emerged, namely: Physiology, biology, anatomy, biomechanics, etc.; it was understood that this was the only study possibility to analyze a

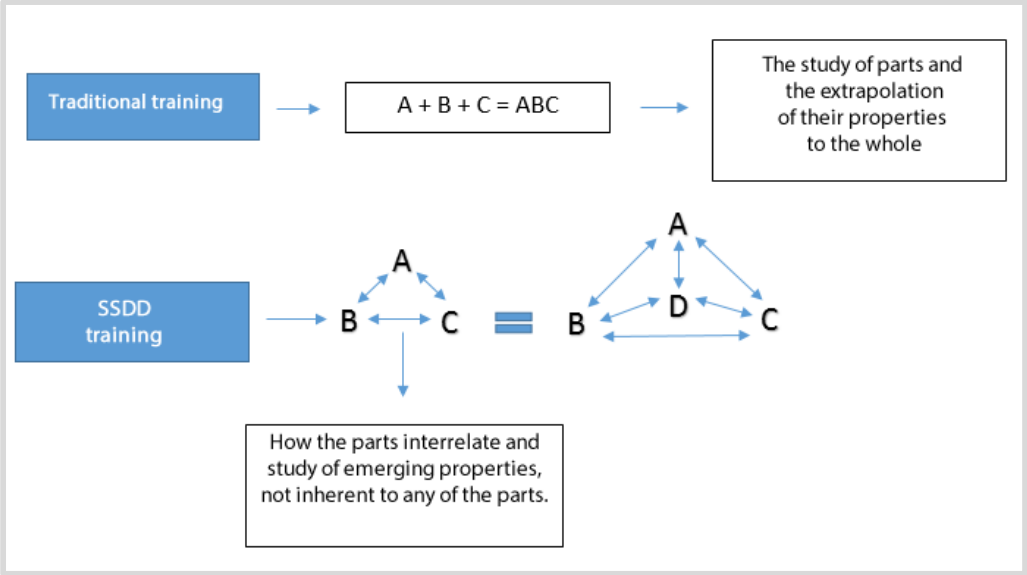
particular phenomenon. Taking a case, breaking it down into parts and having each specialty study it separately.

The parts that made up the game were separately and analytically studied in traditional training. In this new trend the game is defined as something more than the sum of its parts. (Pol, 2012)

This traditional mechanistic scientific paradigm continues predominating in the world of training today. The athlete has been classically regarded as something independent from the environment in which he operates, without understanding that from the athlete's interaction with his surroundings other opportunities to interact with it will emerge. These opportunities to interact with the environment are specific to the characteristics of the environment and player in his interaction therewith. Thus, it is more important to study the way in which the athlete interacts with his competitive environment.

The athlete is now conceived as an irreducible whole, where the collective of his organized components will exhibit qualities absent in his parts. With this new paradigm a change is produced in the way we understand the individual, in this case an athlete, as an indivisible, interconnected, dynamic and relativistic reality. (Capra, 1998)

Figure 5.



Source: Pol, 2012

1.1.3 Trends and tendencies in training methodologies

Contemporary theories and methodologies in sports training

Is important to note that to achieve a proper process of athlete formation, we must have absolute knowledge of the biological laws that may affect subjects, especially in the long-term.

We will make a first division according to the different currents that can be distinguished within the training methodology:

1) **Pedagogical:** developed based on logical conclusions drawn from experience in sports practice. The greatest referent of this theory is Matveev. With great impetus, due to the athletic success of Russian athletes, his precepts regarding sports periodization transcended worldwide.
   Here the objective is to achieve, by means of constructing small units of training time, usually called microcycles, to logically order the contents, in terms of work intensity, volume and specificity, to be able to create larger temporal structures such as mesocycles and macrocycles.
   This current gave rise to the General Sports Theory and the General Athlete Preparation for the Olympic aspects of sports Theory.
   Here preparation of the athlete is also regarded, a concept that has come to replace that of training. This is due to the extent that is given to the significance of the athlete's formation and the inclusion of other areas of influence. The problem is that, based on this concept, the fundamental issues posed in regard to sports training are no longer dealt with.

2) **Theoretical-pedagogical:** Athlete preparation and development comes from a combination of isolated experienced events and information from sports physiology thanks to science. Unlike the above current, access to biology-related knowledge, more particularly exercise physiology, allows for more accurate conclusions to be drawn regarding what happens to athletes formed by training, and thus build more successful training processes specifically measured in athletic achievements. However, decisions continue to be based on the old training periodization, without making any relevant contributions in this regard. Here we feature Tudor Bompa as the leading example of this current.
   The difference between sport periodization proposed by Bompa, compared to traditional periodization, proposed by Matveev, lies in the times and intensities. While Matveev uses macrocycles equivalent to sports years or seasons, Bompa aims at a structure of time no longer than 5 or 6 weeks, presenting this as the macrocycle (which would be equivalent to the mesocycle in traditional periodization). This model is related to current sports competition calendars, especially in team sports, where competitions are weekly and, therefore, there cannot be a single annual performance peak, which is basically what traditional periodization seeks.
   On the other hand, Bompa mainly focuses on intensity and not so much volume, precisely due to the need to carry out a more specific training according to the needs of these athletes. Regarding rest, this methodology establishes 24 hours as a parameter a recovery time after every training or competition. This may be decreased to 6 to 9 hours, or increased to 36 or 48 hours, depending on the energy demand that was generated by the physical effort. Athletes aged between 18 and 25 need less recovery time under normal conditions. On the other hand, older or younger athletes depend on a good rest period in order to achieve a full recovery and thus enhance the super-compensation phase (Verkhoshansky, 2002).

3) **Scientific-applied:** here the conditions and biological mechanisms which regulate movement applied to sports and which influence the mastery scope of all the competitive aspect conditions are studied in greater depth. This current is directly

influenced by sciences applied to movement such as physiology, functional anatomy, biomechanics and bioenergetics of sports among others. The training process, and therefore sports practice, will be directly influenced by the principles formulated thanks to scientific research applied to exercise physiology and human biology. Dantas (2003) proposes that in the training process periodization the principles proposed by exercise sciences must be respected first and foremost, in order to plan the time he has available to train according to the previously established objectives.
Most modern training methodologies are based on this current, especially in team sports.
Likewise, this current may take different paths depending on the work philosophies or ideologies. Within which we can find two trends, which we describe below:

- **Biological:** Conceives athletic performance as the result of the sum of different factors, analyzing each of its components separately. Here a multidisciplinary work methodology emerges, in which the aim is to achieve the athlete's maximum performance by means of the sum of the elements that are involved and that determine athletic improvement, but that themselves have a purpose when they are worked on. Conditional capabilities, technique and tactics are worked on using completely isolated tasks. Thus, combining the results is only sought by means of the formal game, which takes place during a low percentage of the total volume of work. We believe that one of the major drawbacks of this methodology, from the point of view of the athlete's energy resource management, is that they may result in overuse by repeating similar actions from the physical or biological aspect, but different from each other in relation to the objectives they pursue.

- **Holistic:** Athletic performance is analyzed taking its components as a whole, i.e. there is a global approach to sports practice and the training process. Methodologically, here we have an integrated job, seeking to combine different stimuli that promote improved performance, but always transmitting the development of technical and tactical aspects first and foremost. Therefore, here we find endurance development work involving the use of the ball, with rules and instructions that involve technique and tactics, and even each team's strategy. Performance is considered a result of the interaction between conditional capabilities, psychological and visual skills, and their effect on technique and tactics. This methodology is characterized by:

    - Everything is contingent upon the technical-tactical aspect. It is used as a means to develop other qualities that are considered athletic performance determinants.
    - That which will later be needed in order to meet the demands of the game can be stimulated and developed precisely through technique and tactics.
    - Training and preparation are more motivating for the player, due to the use of the element and rules of the sport within each of the tasks.

- It forces the athlete to understand the sport from a broader philosophy, as a whole.
- This way of working requires that the athlete have a technical level and decision-making capacity in accordance with the demands of the task. And this should be designed in order to, knowing the athlete's qualities, stimulate and develop the capabilities that are intended to be improved.

1.1.4 Principles of athletic training

We do not want to end this unit without mentioning the fundamental principles of training. It is of no use at all to sit down and program the sporting calendar or moments of the season if we are still not clear on what these principles are about. The simple fact that these are not followed in each of the tasks that we propose to our athletes or teams, as well as during rest times and during all the work, whether we are talking about training sessions or complete mesocycles, will make it impossible to achieve the proposed objectives.

These principles are contingent upon key features of human biology and psychology, and their main characteristic is the close relationship that exists between each of them.

Although they are theoretical offspring of individual training, each one of them is transferable to any sport, and they cannot be ignored in collective games.

- **Biological principles:** are all those responsible for physical performance adaptations to stimulus provoked by training.

- **Load principle:** for a stimulus to generate positive adaptations in the performance of a subject, it should exceed a minimum intensity threshold or in other words, it should mean a particular minimum load or effort for the person that performs it. Schultz-Arnold law proposes the existence of a load threshold above which the subject undergoes adaptations after undergoing a training load or stimulus. On the other hand, the existence of a maximum bearable load level is also posed, above which the adaptations in the subject are at the expense of physical performance. If the load applied during training means a level above which the athlete can withstand, he runs the risk of suffering injuries or, at the very least, decreasing his performance.
  Therefore, we find a load capacity zone that the athlete can withstand, between his minimum threshold and his maximum tolerance point. Here we will find maintenance stimuli, which will be those that are located at his threshold level or slightly above it and, on the other hand, optimal stimuli, achieved with load levels sufficient for generating positive performance adaptations in the athlete.

  If we relate this to practice, we will find three types of stimulus, detailed below:

  - With loads under 20% with respect to the athlete's performance, especially in terms of intensity, the stimulus will be infracritical.
  - With excessive loads produced by the combination of intensity and volume above the athlete's tolerance, the stimuli will be too high.

- The optimal relationship between volume and intensities in the proposed load generates positive adaptations in performance, considering these as adequate stimuli.

- **Overload progression principle:** this refers to the progressive increase of the demand level proposed for training. This increase refers to both volume as well as intensity, movement complexity and the decision-making level.

  Training loads are associated with the training and preparation level of the athlete as well as the time of preparation and season in which they take place. It is also worth noting that athletes at the highest level of training have shorter recovery periods. This is the reason why the load must be greater as the athlete's performance increases. Remember that performance will depend on the stimuli the athlete receives, therefore, if a subject increases performance, but continues receiving the same training loads, the increase in performance will stop and it will eventually begin to decrease.

- **Variety principle:** refers to the stagnation that occurs in the athlete's performance when the training presents monotonous stimuli from different aspects, such as load maintenance, the repetition of exercises or the monotony in the training methods used.

  This can involve a decrease of the ergotrophic effect for athletes, causing a stagnation in performance improvement or increase (Grosser, 1992).

- **Optimization between load and recovery principle:** the biological basis that sustains this principle is the supercompensation phenomenon. This happens when the recovery time and method between a training stimulus and the one that follows is appropriate . An infinite number of combinations between stimuli and recoveries can be made in the effort to find different supercompensation types and levels. In this regard, the quality of the recovery will determine whether the supercompensation is negative, positive or zero.

- **Repetition and continuity principle:** repetition is needed for actual learning. This principle refers to learning athletic motor patterns, as well as adapting to game situations that require almost automatic decision-making. The biological foundation of this section lies in the central nervous system, since these lessons are learned through it. We especially want to point out that repetition and continuity create the training process itself, therefore this principle will also be required for physical performance adaptations or gains, since training frequency and its continuation over time will be mostly responsible for this, if the work is adequately programmed.

- **Reversibility principle:** all gains produced by training may be lost if the athlete is no longer adequately stimulated. Detraining periods generate decreases in the player's physical performance. Therefore, the longer and more inactive the postseason or transition periods are, the more work the coaches will have when it comes to beginning trainings for the next season. When we speak of more

work, we refer to the responsibility of reintegrating the athlete in the game system, including physical performance levels, which must also be reset with the greatest care. This is where we see the start of the dilemma between promoting rapid performance recovery with the risk of causing an injury or always recurring to protecting the player's physical health and delaying the scope of his optimal physical performance to face the first competitions.

This is why we point out the importance of the work that the player or team does during the period of transition from one season to another in order to, in this way, maintain the balance between recovery, rest and optimal performance levels.

- **Periodization principle:** responds to the load flow during the different moments of the season, seeking to achieve the objectives of the three major periods which are: performance development in the preparatory period, maintenance during the competition period and controlled reduction during the transition phase. Usually, the volume and intensity curves go in opposite directions, i.e., as one increases, the other decreases. This is the case during most of the year, always depending on the aim of the training cycle. However, there are key moments where both components of the training load take the same direction (either decrease or increase), but always in different magnitudes.

- **Periodic regeneration principle:** this principle refers to the athlete's need for rest after a prolonged period of competitive activity. Nowadays, athlete competitions, considering their teams and adding national or local level team competitions, lead to an annual calendar with virtually no break. This means that after a few seasons, the athletes begin to experience a decline or stagnation in their performance, produced by a phenomenon that we could define as sports activity saturation. This is the point where the player or the club should opt to take a break from competitions. This principle is also related to motivation, which diminishes with the passing of time without rest.

- **Individuality principle:** each person responds differently to training stimuli, due to the following factors:

    - genetic load;
    - maturity, from the biological aspect;
    - nutrition, which determines the energetic foundations that the subject has in order to face physical activity;
    - sleep and rest;
    - training level;
    - motivation;
    - environmental influences.

  The principle of individualization requires that the athlete's preparation objectives and tasks, i.e., physical exercises, form, type, intensity and duration, the execution methods and many other aspects of preparation, be selected according to the sex and age of participants, their functional possibilities, sports

preparation and health condition, taking into account the particularities of their personality, psychological qualities, etc. (Ozolin, 1983).

- **Specificity principle:** training-induced adaptations would be closely related to the stimulus received, in regard to both physical condition as well as decision-making in team sports. Coaches often say "we play the way we train". Therefore, training must meet the following requirements for its effect to be significant, according to Verkhoshansky (1996):

    - That it exposes the athlete's body to a work stimulus equal to the competition conditions.
    - That it generates an increase in the athlete's physical capabilities, always keeping in mind that these should be specific in relation to the discipline practiced.

This author proposes the following rules to achieve a better effect through training (Verkhoshansky, 1996):

- respect the movement structure of the competition exercise;
- promote development of the specific functional and motor capability;
- use the most suitable load organization;
- promote positive load interaction;
- determine the most suitable load succession.

- **Training components alternation principle:** refers to the combination of different training components and order and way of developing physical qualities. This interaction may result positively or negatively. That is, the order or moment a physical quality is stimulated with respect to another, will have a particular effect on the athlete's performance.

Unit 1.2 New methodologies for training program

1.2.1 Tactical periodization. Concept and model of play

Tactical periodization is a training methodology whose origin is related to systemic thinking and dynamic systems theory. It considers the Soccer game as a whole, as a product of the way in which the parts that compose it relate.

In this sense, nothing assures us that we can improve the game components if we train them separately or in isolation, whether they may be components related to physical, technical or decision-making aspects. All these qualities should be enhanced and improved within the specific ways in which we want to develop them. When we refer to the ways, in this case we refer to the sport, trying to imitate in the best possible way the game's real situation, in order to enhance any particular characteristic both individually as well as collectively.

Therefore, tactical periodization analyzes the object in its totality and within a determined context.

Based on this, the entire training process must be influenced by the game model. Bearing in mind that the activities that will be proposed will involve real game components, they should have some objective purpose based on what we want the players to be able to perform when competing.

The existence of a game model is based on the premise that everything that happens in the game must be constructed. And in that construction we will always find the inclinations, first of the coach, and then of the players, towards a model or way of playing. Based on this, the training process will be planned and executed.
It is important to note that, as stated above, the game model will be also influenced by the players, not only because of the imprint they can leave on the game, but because, at the time of planning a model, the coach must keep in mind first and foremost the characteristics of the players that make up the squad, and the resources that are available to carry out this process and face the competition.

The model is under constant change, not in its fundamental idea, but in its adaptation to the reality and everything that happens over the course of the competition. These modifications take place at all levels within this complex system that is the team. We can talk about the changes in the game model due to a disadvantage or advantage during a match, or due to changes in the position tables during the championship; there may also be changes in this regard due to the expulsion of one of our own players or a rival player, injuries, etc. That is, there are a number of situations that can affect the game model. That this model is sustainable over time and suffers the least amount of modifications in its essence as a result of external and internal stimuli will depend on the way the team and coach work.

In his book "What is "Tactical Periodization"?" Xavier Tamarit refers to some game model definitions that we consider correct to explain the statement above:

"A Game Model is something that identifies a particular team. It is not just a Game System, nor the positioning of the players, but the way in which those players relate to each other and how they express how they view soccer." (Portolés, 2007)

"The game model will be richer the more it enables players to expand their own creativity and talent in the game, without altering the premises of the model." (Freitas, 2004).

"The game model as a final objective should be constantly put into consideration, that is, keeping the future as a causal element of behavior." (V. Frade, 1985)

"The game model are the behaviors that the coach intends his team to manifest in a constant and systematic way during the four recognized game moments, offensive organization, defensive organization, and the two transition moments of passing from one state to another." (Tamarit, 2013)

With regard to the above, it is worth noting that Periodization Tactics is NOT a game model, but a training methodology. That is, a way of working to be able to reflect the work of the week in the match or competition through training. Not all teams that use Tactical Periodization as a training methodology have the same game model necessarily; however, anyone using Tactical Periodization must have a game model defined as a principle of action.

The elements that influence the model of play's conformation are:

- The culture of the place where we want to propose the idea of play.
- History and culture of the club.
- The Club structure and objectives.
- The coach's game idea.
- The game system or systems that we are going to use.
- Player characteristics and level.
- The club's championship history.

Not taking these elements into account when designing the game model, will imminently make it fail.

Once the model is designed, the implementation starts, and that's where it begins to undergo changes. The constant modification of the game model is the foundation on which it is based, since, stemming from systemic thinking, it considers the reflection that can occur as trainings and matches take place, resulting from the influence of the events.

One of the first steps in the construction of the game model is to wean individual response patterns among players, which they bring with their own motor history, to create common response patterns, based on each game situation. The objective is to achieve that, under a certain stimulus, the response is the same or under the same game concept, for the greatest amount of players and in the shortest time possible. According to Tamarit (2013),

these tactical response patterns we try to create or construct in our team are called Game Principles and Sub-Principles, and they can be:

- Collective.
- Intersectoral.
- Sectoral.
- Group.
- Individual.

Thus, if for the implementation of periodization tactics we need to start from a game idea that is planned within a game model, and we are going to program the training based on them and from them, we must first know that two teams with radically opposite game philosophies will also have (should they also work with this methodology) radically opposite Periodization Tactics.

Furthermore, this training program model will attempt, through work, for these patterns of tactical response to be transformed into habits. It is in this way that the tactical aspect is where development of all other areas is deduced, collectively as well as individually. Physical abilities would be contingent on the tactical and would be developed by "drag" as well as technique and even strategy; always keeping in mind that the concept of "tactical" here does not refer simply to decision-making and general behavior, but to other specific issues that make up the game model. In this regard, Vitor Frade proposes a "need for emergence of the tactical-technical dimension at the expense of the physical dimension." (Resende N. 2002).

From a "logical" point of view it is impossible to expect that two teams that have radically opposite game models and systems work on the development of their players' physical abilities in the same way, just as within a team, it makes no sense to physically prepare two players with different functions in the same way, such as a forward and a defender, or a center forward and a left wing. Through individual and collective behaviors the game model will determine the physiological, bioenergetic, mechanical and even technical needs each player requires based on the team and his position. So, the question would be: How can we train our team players in the same way if we expect different behaviors from them during the game?

1.2.2 Specificity, tactical concentration, intensity, morphocycle pattern

Now that we have developed the game model characteristics, we will focus on the principles under which we work to be able to reflect this in our game.

To get a better understanding of them we will first deal with the structure on which the training process is built, called the morphocycle pattern. This consists of the time we have between one match and another and it depends, obviously, on the days there are between them.

"The main purpose of this morphocycle is preparing the next match. In this sense, training is the main way to create the competition and game we want. And the competition gives

us indications to constantly reformulate what we have to do in training" (Oliveira, 2006 cited in Tamarit, X. 2013).

Therefore, during this time period, we must train the game idea, principles, sub-principles, correct errors, promote virtues and develop what we want the team to do in the next match. In other words, during the morphocycle we must work on game-related variables produced by the team, the game the team had, and the game that we want the team to have. Exercises always have to do with the way I expect my team to play.

Returning to the principles, these are aimed at creating contexts, emotions and feelings that allow us to transform some response patterns into habits. This is the reason why the tactical dimension dominates all the other aspects developed in the training process.

- **Specificity Principle:** this is the one that includes the three fundamental principles for game model construction. It is contextualized based on the way of playing, in other words, everything that is trained has to do with our game idea. For this purpose, I must work on the individual, group, intersectoral, sectoral and collective scales, that is, not only work on the formal game, but also on the expanded small side and small sided game without losing the "specificity" of the game idea. With this latter point we aim at that not all small sided games will necessarily be specific, but will only be so if the objectives of the exercise coincide, and therefore do not contradict the patterns that I want to become habits in my players, both individually and collectively, if the players understand what the purpose is, or how the concept worked on in an exercise is inserted in the formal game.

Another fundamental aspect to make an exercise become significant when we develop our game model, is that participants maintain their "concentration" during the entire work time. This aspect is known as maintenance of maximum relative intensities and makes all execution significant for the purposes of the game idea. If I manage to keep the player focused on each of his executions during training, they become habits. Thus, during the competition, the player should not waste energy or time on issues that have to do with the principles of team play and can be more attentive to small details in the context-specific execution modes according to each situation.

Should the player aim at certain behaviors during exercise, and these are not the expected behaviors, this ceases to be specific and this is where the coach must intervene. The inverse process can also happen, where unexpected situations arise but which can be beneficial to the game idea and that, therefore, can be incorporated in to the methodology or training process.

- **Propensity principle:** that what we expect occurs a great number of times. This principle addresses systematic repetition, not unconscious repetition. Therefore, I must create a context that will allow the responses that I expect from my players, always starting from the premise that the exercises must be "specific", i.e., they will be given in contexts of similar situations to those played in the match. This is where the concept of "reducing without impoverishing" appears, which refers to the possibility of reducing spaces and removing players, in relation to the formal game, but without allowing this to modify the logic of the game. This entails maintaining

its fundamental characteristics such as the unpredictability and constant changes of the state of the game.

- **Complex Progression Principle:** emerges from the premise of soccer as a complex phenomenon and the need for this phenomenon to adapt to the training process. As a first step I must pose an increase in complexity in game acquisition by ranking its principles and sub-principles, give more importance to development of some collective and individual qualities over others and promote the development of certain habits over others, according to the main needs of the team. This also refers to the complexity in the physical, motor, and technical demand of the exercises and trainings. The work that is proposed to the player or group must be adapted to their possibilities and their training condition or performance capabilities at that moment , i.e. I cannot expect performance, from any dimension, for which the subject is not prepared. This is because, first of all, the focus and specificity of the exercise is lost, since the execution is not as expected, and secondly, because if the progression from the physical demands is not consistent with the player's physical condition, there are serious risks of injury, or at least of working with predominance of an energy system that was not the one in mind when planning the exercise, which will lead to the player being unable to respect the times and intensities proposed.

Now we will talk about short-term progression, i.e., complexity control and management during a morphocycle. This is based on the fact that one of the major aspects that should be worked on is the coming match, therefore, the rival's weaknesses, strengths and game model. Thus, in terms of the game model with which we work, we must emphasize the unknown, to give more importance to patterns we believe will be repeated more often in the next match.

Returning to the premise that exercises must be done with absolute concentration during the entire execution, we must also look at the progression in this sense, since fatigue can also be tactical, and we must not allow drops in concentration during the most important moments of the morphocycle. Therefore we must promote recovery above all other variables, to get to the next match in top physical condition, but also concentration, bearing in mind that recovery is regarded as part of training.

- **Horizontal Alternation Principle in Specificity:** It is related to physical qualities. The intention is to provoke alternations in dominances during the morphocycle, to avoid "pattern dominances", and thus prevent states of fatigue. It is important to stress that this is not understood in terms of conditional abilities separately, such as strength or endurance (as Periodization Tactics is based on systemic thinking, that level of separation of qualities is never reached). The analysis, then, would have the following logic: in every quintessential movement there must be a muscle contraction and the way in which that contraction is performed, according to its three components, will be the one that determines to which of the three energy systems the action leans, always being aware that the three pathways participate in the soccer game, but with changes of predominance. Thus, each game model will have a metabolic pattern that will determine the metabolic profile of our athletes.

The components of muscle contraction to which we refer are the intensity (degree of tension), duration and speed at which the muscle contracts. There is an interaction between these three components in every movement. Regarding the principle of Horizontal Alternation in Specificity, we will try to make these exercises alternate the predominance of these three elements, without losing specificity in relation to the game, with the objective of maximizing performance for the match.

Returning to energy pathways, the predominance of one of the three previous components means that the participation of one or another above the other two is required. Generally, actions that involve the Anaerobic Alactic energy system are those that determine athletic success. These are responsible for the most powerful, explosive actions and therefore, it is desirable that the team´s metabolic pattern be alactic. To achieve this, I must order my exercises according to space, work time, and the number of players, in order to obtain adaptations of Anaerobic Alactic system metabolic predominance. Finally, if the exercise suffers modifications towards a larger volume or a shorter pause, I'm adapting the player to a stimulus which he will not find in the competition.

So, the importance of discontinuity in the training lies in respecting the recovery, to make the metabolic pattern the one we intend during training, without any need of running the risk of injury due to fatigue, or adapting to another metabolic pattern by using speeds, volumes, or pauses that are not appropriate.

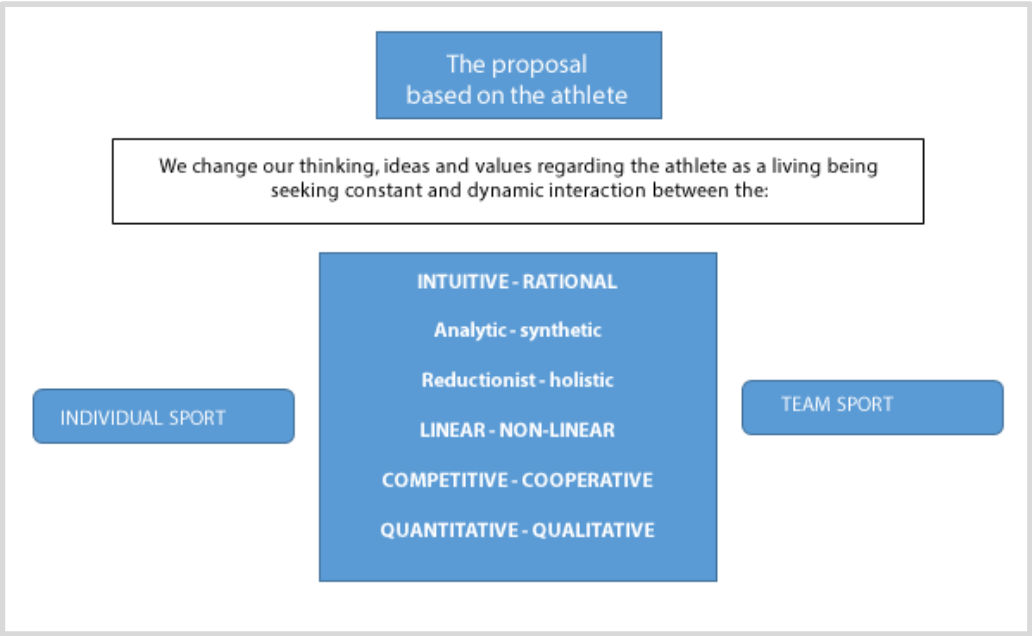
1.2.3 Structured training

This is a new paradigm that allows the athlete to be interpreted as a "Hypercomplex Structure" formed by different dissipative structures, which in turn are made up of complex dynamic systems, the functionality of which is determined by interactions and retroactive effects between those structures by means of the systems that conform it. (Seirul.lo, 2002)

According to the new paradigm, it is important that we focus on who the athlete is as a person, in what is the conception we may have of that athlete. What is important is the individual who practices the sport.

Systems theory, the mother of structured training, collaborates and provides the foundation when it introduces the concept of structure. This is, different structure complexity levels to understand what the human being is, who is always composed of interactions and retroactive effects between the structures that comprise him as a being; conditioning, coordinative, socio-affective, etc.

Figure 6. Structured Training



Source: Seirul.lo Vargas, 2002

To talk about structured training is to talk about a new perspective, since up to now the classical paradigm has dominated physical education practice and sports in terms of formation.

The new perspective of sport should be developed through the athlete's overall development. This has always been sustained, but at the moment of actual practice it has never been so. We have always constructed analytical exercises. For instance, "The pedagogical progression for throwing the...", "The application exercises for...".

Under this new perspective, teaching and training constitute a unique process of optimization of the athlete. (Seirul.lo 2002)

Figure 7. New paradigm

Source: Prepared by the author

Auto-Structuring:

- The establishment of technical-tactical skills in which the player demonstrates certain competencies.
- The observation of the impact that competition has on the player.

- The player's constant acquisition of new knowledge regarding the game, training and himself.
- The formation of his own social image.

We must consider, unlike traditional training, some premises that the new paradigm establishes:

No. 1: Establishing technical-tactical skills on the potential or competencies shown by the individual: progress comes from the individual, not from the ideal model.

No. 2: Observing the impact that competition has on the player: not the player adapting to the competition, but studying its impact on him in order to solve it.

No. 3: The player's constant acquisition of new knowledge regarding the game, training and himself: if the coach is the one who acquires this knowledge, it is useless. The coach already knows what he has to do, but he does not perform it. The player is the one who has to be familiar with it in order to perform it.

No. 4: Forming his own social image with regard to existing social interaction situations.

Following this new trend, we must begin to view the athlete as a Hypercomplex Structure configured by interactions and retroactive effects between structures. These are:

- **Cognitive Structure:** In charge of collecting and processing the stimulus that the player receives from their surroundings to identify the possibilities for action. The significant information must be recognized and interpreted to be able to respond efficiently and effectively to the contextual variants that are constantly presented. (Pol, 2012)
- **Coordinative Structure:** It is responsible for the execution of movement in the desired way. This would be the preferred coordinations that appeal to the system. Motor action control has to be coordinated, with the integration of spatial and temporal control of the same action, in the mentioned perception-action cycle. (Pol, 2012)
- **Conditioning Structure:** It is the structure that must provide physical support to develop the player's activity. Its most representative values are related to the classical concepts of strength, speed and endurance. More recently, Seirul.lo (2009) stated the difference between bioenergetic structure (the action's energy support) and conditioning structure (muscle contractions that permit the action), although when generally speaking of conditioning structure based on the proposal of Seirul.lo, the first definition is referenced. (Pol, 2012)
- **Socio-Affective Structure:** The socio-affective structure is formed by sets of various systems that through diverse interactive and retroactive processes of their components provide the subject with the possibility to propose, interpret and evaluate any interpersonal relationship situation observed or experienced in the multiple events shared with members of the sports teams in which he participates. (Seirul.lo, 2009)

Each individual optimizes his socio-affective structure whenever he experiences situations in which he is emotionally committed to the other individuals with whom he must cooperate or compete. This affective over-valuing is always present since under each interaction there are latent interpersonal feelings that pervade all life situations with each of the individuals involved in the game. (Seirul.lo, 2009)
Personal and group assessment of these experiences is performed immediately after they have been experienced, in regard to the balance between what was individually desired and the real impact on the group (Seirul.lo, 2009)

- **Emotive-Volitional Structure:** It is the personal identification of oneself. If the player does not believe in the training process he is executing, a negative feedback loop is produced, which will hinder or prevent his progress, which is why the player's positive involvement in this process must be attained. Conviction predisposes the nervous system to tackle the path to follow. (Pol, 2012)
- **Creative-Expressive Structure:** It refers to the projection of the personal self in each sports activity. It is when each athlete brings his share of different individuality to the task performed.

We must consider each structure as the expression of an underlying process, processes, an entire network of dynamic connections between systems, is expressed through what we call structures. And, what we traditionally call capabilities are just forms of sectoral evaluation of part of the processes that occur in a system that conforms a determined structure. (Seirul.lo, 2002)

"When using a VO2 max. test to measure Aerobic Capacity, what we really do is no more than a small type of very sectoral and very analytical assessment of part of those processes that relate various interaction processes of two or three structures or systems of a determined structure. This knowledge allows us to observe the human being and give a real value to each of the specific aspects since we sometimes consider them to be more important than they really are for the progress of the individual, and the truth is that the athlete's progress will only take place when all the structures progress in balance". Seirul.lo (2002)

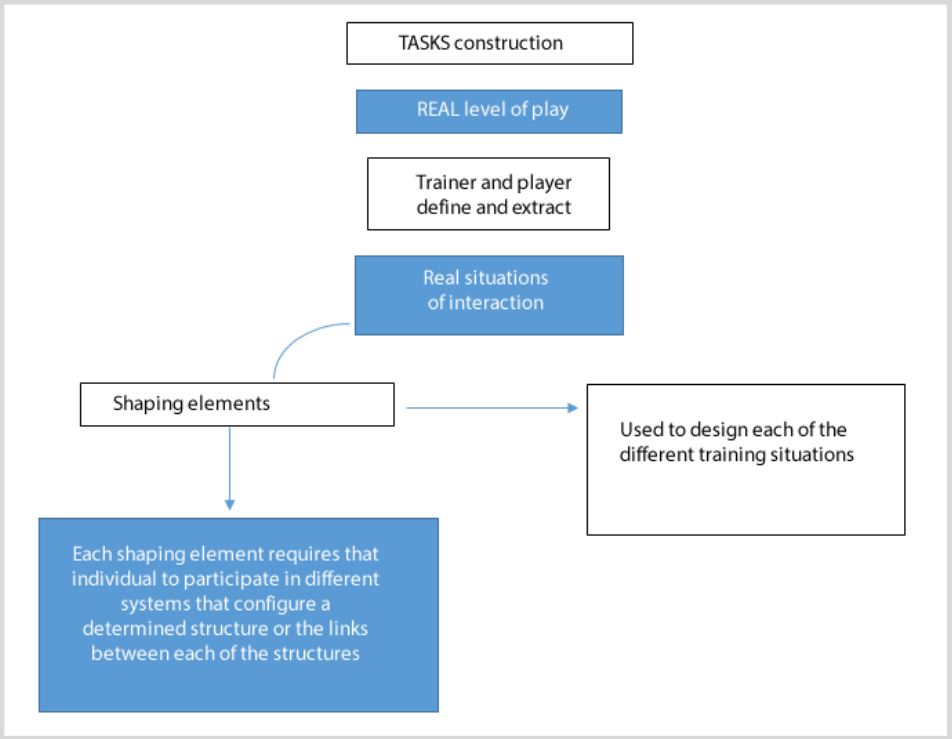
This shows us that it is a network of production processes, in which the function of each component is to participate in the production or transformation of the other network components. In this way, the network is constantly building itself, this being another property of living organisms that allows the process result to be its own organization.

Learning does not take place by repeating the same situations but by sequences of situations that provoke the development of interaction processes between systems. (Seirul.lo, 2002)

To better analyze this methodology, we will develop some concepts considered fundamental:

Task: simulated game situation, modified and accepted to contribute to certain aspects of our players or team that we want to improve. We will use this method of naming each activity that takes place as part of the training. The task is composed of a content, which would come to be the exercise itself, and of the conditions that are going to determine its execution, that is the intensity, reps, length of the pause, instructions, etc. According to the similarity of the task to the game, we will know its specificity.

Figure 8



Source: Seirul.lo Vargas, 2002

We have different kinds of tasks, detailed below:

- **Generic tasks:** totally different from the competition in the fundamental aspects of their nature and load organization. They are usually given in the transition period, aimed at improving some conditional capability or skill in particular.
- **General tasks:** the nature and load organization is similar to that of the competition, but decision-making is absent.
- **Targeted tasks:** they include specific coordinating elements and unspecific decision-making. Mainly applied to technical circuits that include the stimulus of one of the player's physical capabilities.
- **Special tasks:** the nature and load organization is similar to that of the competition, and decision-making is specifically related to it. They are also known as Small Sided Games.
- **Competitive tasks:** are composed by competition contents with specific tactical principles. They are also known as Expanded Small Sided Games. These are considered the step prior to the formal game.

- **Preferential simulated situations:** real interaction tasks in which, to solve them, the optimization of one of these systems, of one of these structures with respect to the others, will be needed.

1.2.4 Planning process based on structured training

The microcycle is considered the fundamental time unit in training planning. It is usually related to the training week because of the similarities in its time structure. The fact is that the microcycle marks the time between one match and the next, in a period close to 7 days. When there are matches during the week, they are considered part of the microcycle and the load distribution will be carried out accordingly.

The variables of microcycle load control, as well as of the training sessions and tasks will be volume, which will be determined by the total training time, and intensity, which will depend on the content specificity.

This structure has different moments that will be put in order according to the athlete's (or the team's) needs at the time of managing athletic performance in view of the next or coming encounters and depending on what happened previously.

- **Recovery Phase:** it aims, as its name states, to physically and mentally recover players from the previous match. Therefore, both components, volume and intensity, will be low.
- **Stimulating Phase:** here the volume is high and the intensity level is moderate. The goal is activation of the adaptive process. Intensity is increased by the biological response to the stimulus, but there is not a high specificity level. This is achieved by means of general or targeted tasks.
- **Performance Optimization Phase:** The goal is the physical overcompensation state, the tactical component stimulus. There is a decrease in volume and an increase in intensity, by means of increasing the specificity of the contents while the mean heart rate is maintained or even decreases.
- **Competitive Phase:** It is on game day. Reaching this moment with an optimal activation level is intended to obtain the maximum athletic performance level. There is a drastic drop in volume and intensity in the session prior to activation, which usually takes place in the morning if the match is scheduled at night.

As we mentioned previously, the structured microcycle responds to the team needs to face the upcoming match depending on what happened previously, that is, the needs and possibilities of the team are contextualized to distribute the training loads. Based on this, we find different microcycle models:

- **Preparatory:** There is a prevalence of generic or general sessions during the regenerative stage, but during the preseason we find more general and targeted sessions and some special ones.
- **Targeted Transformation:** There is a predominance of targeted and special sessions. They are used as of the second week of the preseason start, until the last microcycle before the first competition week.

- **Special Transformation:** Here special and targeted sessions predominate over competitive ones.
- **Maintenance:** A combination of targeted and special sessions, as well as competitive ones. This microcycle model is the one most used during the competitive period.
- **Competition:** Here we have a clear dominance of special and competitive sessions. They are mostly used in weeks where the encounters are very important or weeks that have midweek matches.

References

Bompa, T. (2016). Periodización del entrenamiento deportivo [Periodization of Sports Training]

Dantas, E. H. M. (2003). A prática da preparação física [A practice of physical preparation]. 5th ed. Rio de Janeiro: Shape.

Grosser, M. (1992). Entrenamiento de la velocidad [Speed Training]. Ed. Martínez Roca, Barcelona.

Massafret, M. (1998). Preparación física en los deportes de equipo [Physical preparation in team sports]. Unpublished

Matveev, L. (1985). Fundamentos del entrenamiento deportivo [Fundamentals of Athletic Training]. Lib Deportivas Esteban Sanz.

Ossorio Lozano, Fernández Sanchez (2011). Orientaciones sobre la psicología del deporte [Orientations on the psychology of sport].

EFDeportes.com, Digital Magazine. Buenos Aires, Year 16, No. 163

Ozolín. (1983). El entrenamiento en el sistema contemporáneo actual [Training in the current contemporary system]. La Habana: Científico Técnica

Rafael Martín Acero, F. S.-l. V., Carlos Lago Peñas and Carlos Lalin, & Novoa. (2013). Causas Objetivas de Planificación en Deportes de Equipo (I): Estado de Forma y Calendarios [Objective Causes of Team Sports Planning (I): Physical Conditions and Calendars]. Rev Entren Deport. 27(1).

Roca, A. (n.d.). El proceso de entrenamiento en el fútbol MCsports [The process of training in MCsports soccer].

Seirul.lo, F. (1993). Classification of endurance in team sports. Master en Alto Rendimiento Deportivo [Training planning in team sports. Master in High Performance Sports]. Madrid: C.O.E.-Universidad Autónoma de Madrid

Siff, M. C., Verkhoshansky, Y. (2002). Superentrenamiento [Supertraining]. Paidotribo, Spain.

Solé, J. (2003). Entrenamiento de la Resistencia en los deportes colectivos. Master Profesional en Alto Rendimiento. Deportes de Equipo [Endurance training in collective sports. Professional Master in High Performance. Team sports].

Tamarit, X. (2007). ¿Qué es la periodización Téctica? : MCsports [What is Tecnical Periodization? : MCsports]

Verkhoshansky, Y. (1996). Componentie structtura dell'impegno explosivo di forza [Component structures of the explosive force engagement]. Rivista di Cultura Sportiva. Year 15. 34:15-21