Module 4. Competition and training

Unit 4.1 Characteristics of Training and Competition

Introduction

In this unit, we will review concepts related to: athletic training, technique, tactics, psychological training and competition. In addition, we will introduce the processes that athletes go through when starting out until achieving high performance in order to provide a conceptual and theoretical context.

From the field of sports psychology and training, both coaches and psychologists jointly develop a plan to improve an athlete's performance. Coaches pursue the optimization of physiological, biological and biomechanical variables, information processing and decision-making, etc. Psychologists, on the other hand, seek to improve the variables that are detrimental to athletic performance, such as stress, anxiety, concentration, etc. They both must understand the context in which athletes train and develop themselves in order to offer training plans that adapt to the subjects and their environment.

The variables that influence athletic performance, and which are part of a coach's planning, will be reviewed with the goal of offering the world of psychology a reference for uniting the two disciplines.

4.1.1 Athletic Training

Athletic training is an organized teaching method aimed at improving the structures that shape athletes and that have been differentiated in various ways over time. These are: physical, intellectual, psychological-emotional.

Gonzales Badillo defines the concept of training as:

A continuous process that seeks optimal development of a subject's physical and mental qualities to achieve maximum athletic performance. This is a systematic, planned process of morphofunctional, mental, technical, and tactical adaptation, achieved through increasing functional loads, in order to obtain the individual's maximum performance in a particular sport or discipline.

According to Platonov (1988), the state of training is a process of complex biological adaptation with the objective of improving performance.

The most up-to-date, modern understanding of athletic training applies a transformative element that uses the specialized scientific-pedagogical method, aimed at improving the above-mentioned variables for a given athlete. Athletic training cannot be understood without bringing together disciplines such as pedagogy, psychology and the sciences of physical activity.

In recent years, the evolution of training has been affected by the need to adapt to contextual demands. This has changed the methodology applied to training athletes.

The primary influences that have caused changes to training methods are:

- The number of competitions in a season.
- The competitive activities.

This is due to the prevalence in the market that views sports as a unit of consumption. These demands are summarized in:

- Increased vying to televise competitions.
- The interests of sponsors and companies.
- The development of organizational structures such as the IOC (International Olympic Committee) and national federations.
- New technology geared toward sports and the need to make sports a consumer product.
- In this scenario, an athlete who is successful can dominate the resources related to the sport itself and, in addition, conquer a series of psychological and mental abilities that allow him to face the reality in which he must live. A successful athlete is immediately exposed to the media spotlight.

Athletic training is constantly evolving and cannot be understood outside of a multidisciplinary structure.

Next, we will define some of variables of sports psychology that comprise part of a coach's work.

4.1.2 Strategy, Tactics and Technique

Strategy

Strategy is a phenomenon seen in every context in which the subject is involved. These may be social, economic, athletic or other areas.

It is defined as the plan or program that is developed to achieve a certain objective. Any plan developed with the goal of achieving any kind of objective is a strategy.

Characteristics

1. When establishing objectives, it is necessary to have certain variables, such as: What do we have? What situation are we facing? Under what conditions will the process take place? With this framework, work plans are developed and the implementation or strategy model is designed. The above questions can be answered in the following table.

Figure 1: Strategy

What do we have?	What situation are we facing?	Under what external conditions will the confrontation take place?
Physical condition Technical level Tactical level Theoretical knowledge Psychological characteristics Somatotypical characteristics. Competitive results at different levels Athletic experience Material and economic conditions that are available for training and competitions Others These indicators must be answered objectively, since the data is available	Physical condition Technical level Tactical level Theoretical knowledge Psychological characteristics Somatotypical characteristics. Competitive results at different levels Athletic experience Others This is answered according to previous competitions and practice games	It is important to know: Where the event will be held The weather conditions Timezone differences. Competitive system Level of the event. Characteristics of the refereeing Etc. These indicators can be answered objectively as the data is known before the competition through meetings and other means of dissemination.

Source: Belloda, 2002.

2. All members of the sports environment can apply the strategy (president, coaches, athletes, etc.).
3. Anyone who applies a strategy must familiarize themselves with all the elements related to the complexity of the sport, the context and the subject.
4. A strategy is evaluated by comparing the results with the stated goals.
5. It requires coherent and logical planning, according to the institutional and sports reality, and immediate results should not be expected.

Tactics

Tactics represent a set of elements or abilities that are implemented with the purpose of overcoming a series of situations during training or competitions. They are directly related to an athlete's ability to take advantage of an opponent's mistakes.

Characteristics

- They arise from opponent's actions.
- They only appear when an opponent must be defeated.
- They pursue the achievement of a specific and partial objective that arises in a certain situation.
- They are evaluated based on the effectiveness achieved.
- They appear in team sports.
- They require immediate resolution.

As noted, tactics are related to an athlete's ability to process information. To the extent that motor skills are trained and can better read the environment, the tactic will be perfected.

Technique

Technique refers to a set of structural movements that follow tempo-spatial patterns to guarantee efficiency.

Features of sports technique:

- It is applied by athletes.
- It relates to temporal and spatial movement factors.
- It seeks to execute functional structures.
- It is based on a structural model, which can be observed while movement patterns and results are fulfilled.
- It appears in all athletic disciplines, especially in individual sports where technique is often valued, judged and assessed.

Figure 2: Strategy, Technique, Tactics

Indicators	Strategy	Tactics	Technique
It is determined by	A preliminary characterization	Actuate the opposite	The functional structure model
It can be applied by	All members of the sport	The athlete under opposition conditions	The athlete
The person who completes it is related to	The whole of the aspects	The opponent	Time-spatial factors
The goal is	To achieve the prognosis	To achieve partial objectives	To execute functional structures
It is evaluated by	Fulfillment of the prognosis	Effectiveness	The number of errors made during execution
It appears in	In all sports	All combat sports and sports games	All sports, but is established in the competitive art group
It requires	A logical plan without immediacy	Immediate logical actions	Execution under a determined structural pattern
Word that sums up the term	Projection	Solution	Fulfillment

Source: Belloda, 2002.

Psychological training is added to the concepts reviewed above as a complement to the variables that involve coaches and psychologists. It seeks to create interaction between the two roles since many sports institutions do not yet have professional psychologists.

Sports psychologists should work from the terms and concepts used in the training environment to build a theoretical frame of reference. In this way, if they have the theoretical resources related to sports, they can conduct more specific interventions and improved psychological training.

4.1.3 Psychological Training in Athletic Training

Psychological training as applied to the field of athletic training includes three phases: psychological interview, test application and orientation, as well as individual and group counseling.

The psychological resources used in a clinical environment should not be the same as those used in sports. Generally, the clinical environment is orientated towards subjects with mental health issues that require treatment. In the sports environment, the psychologist must identify the variables to work on with the athlete and draft an

intervention plan. Sometimes, sports psychologists will be called In to work on particular cases, due to the demands that sports place on subjects.

A modern understanding of sports psychology considers subjects to be dynamic beings, in constant interaction with an environment that shapes their behavior. This implies a more complex study of the situation when subjects are brought into the sports environment.

Psychological interventions should aim to complement technical, tactical and strategic training. The cognitive and emotional aspects of athletes are generally neglected in psychological training models and these are the variables that should be focused on.

> *"Psychological preparation must be integrated into an athlete's overall preparation as an additional element that must interact appropriately with the physical, technical and tactical elements" (Buceta, 1998, p. 18).*

Ucha (2004) suggests that the main objective of psychological preparation is to guarantee the optimal state of athletes, take advantage of their physical and psychological stores and improve the psychological variables that influence performance during competitions.

According to Ucha, athletes must master the ability to self-regulate.

In summary, psychological intervention in sports seeks to:

- Plan and improve the mental capabilities of subjects involved in training and competitions.
- Maintain an appropriate level of demand on athletes in accordance with the actual demands of training or competition.
- Stabilize behavior and emotions during training and competitions.
- Enhance psychological recovery processes so that athletes can use their mental abilities in competitions and training.

So far, we have discussed elements involving sports coaches and psychologists. The variables mentioned, both in terms of athletic training and psychology, are those that subjects experience during their athletic development and formation. That is, from the initiation stage to the professional stage. At each of these stages, psychological intervention techniques and training models are applied, adapted to subject's characteristics and the context in which athletes develop.

Athletic development is a long-term process that involves different stages. Each stage brings together a series of its own characteristics that must be paid attention to and studied.
Next, we will review some characteristics of the stage that starts the athletic development process: initiation.

4.1.4 Sports Initiation

Sports initiation starts by establishing a subject's primary potential, which are: physical, psychological, motor and organic. A child's degree of demand or interest towards athletic activity must be taken into account. It is not enough to bring together optimal conditions in terms of the variables mentioned. The subject must want to play the sport. The initiation stage corresponds to playing a game; the sport is fun and enjoyable and the first experiences with the sport shouldn't be demanding.

Psychological age

A analysis should be completed based on the modifications in behavior and personality that the subjects manifest. In this regard, behaviors observed include: self-worth, perseverance, competitive spirit, reflection and motivation to play the sport. These are indicators of psychological age for sports initiation.

According to Gordillo (1992), psychological orientation in sports initiation must be guided by the following characteristics:

- **Subject's relationship with results:** the subject is aware of the need to improve personal athletic performance.
- **Subject's relationship with sports competition:** the subject compares personal results with those of other athletes.
- **Subject's relationship with social approval:** this refers to their relationship with their peers based on the obtained results and performance.

These three characteristics are manifested differently at various ages: between 8 and 10 years old, motivation is focused on social approval and improving performance. Social support is available from family members and the coach. From 11 to 13 years old, motivation is focused on improvement for competition: the need to improve individual performance by perfecting skills in the competitive environment. Between 13 and 17 years old, subjects only work to compete and improve their abilities through constant training.

The initiation stage is where everything begins. Giménez and Sáenz-López (2000) define it as the time to socialize, acquire abilities, make contact and teach-learn. It is subject to

psychological, pedagogical, biological and motor factors that work together to support the athlete's growth.

The initiation stage is where the basic motor and cognitive patterns are put in place, which is the foundation for constructing learning and decision-making (Hernández, et al., 2000). Sports practice during initiation must invite reflection, understanding and the creation of motor habits. This practice responds to a subject's needs, interests and potential, especially when starting out. Results should not be immediately required and errors should be seen as part of the initiation process.

There are three variables that define success in teaching:

- The optimal time to learn.
- The time spent at optimal levels of motor difficulty.
- The quantity and variability of experiences.

Consistency based on these criteria affirm an athlete's motor patterns. What differentiates one subject from another in sports terms is related to practice time and experience obtained within a framework of continuous care and adaptation.

Baker and Côté (2003) argue that during the sports training process, tasks must develop intelligence and creativity. Motor experience must be accumulated under these two premises.

Based on this, we suggest a series of criteria that should define tasks during the initiation stage:

- Propose specific tasks aimed at acquiring specific knowledge.
- Manage time dedicated to intentional learning and control time for intensive work.
- Tasks must include components that train psychological capabilities.
- Tasks should be carried out in situations that require problem-solving in a way that enables information processing.
- Vary task activities and requirements to enrich the basic experience in terms of the diversity of situations explored.

For Baker (2003), competition is the mother of all activities, and it is during competition where variables can be identified for later further training. Therefore, creating situations similar to competitions is one of the most-used resources in training. Decontextualizing learning through training sessions leads to complications when competing.

Regarding social psychological factors, Hamilton (2000) says, "What athletes think of themselves and what others think of them can create an aura that makes them invincible".

The main psychological variables are: motivation, anxiety and concentration. They are fundamental to starting out in sport and to achieving success.
Regarding culture and the initiation stage, it is argued that:

- The influence of sports in society is demonstrated in the media and successful athletes are considered heroes. This implies that sports is an important part of national identity.
- The type of sports facilities will determine whether subjects participate or not in a sport. This translates into concrete participation in sport.

Studies confirm that the typical age for the initiation stage ranges from 6-7 to 14-15 years old. Within this range, there are some more sensitive times than others for the acquisition of specific learning. During sports development, there is a relationship between the evolutionary-maturing process and the capacity to learn. The terms learning, development, and refinement correspond to a process that is divided into three stages (Bengue, 2005):

- Initiation, familiarization, preparation, overall presentation, initial or fundamental education, and cognitive phase.
- Development, intermediate, formation, configuration, implementation, specific learning, associative phase.
- Refinement, training, competition, learning consolidation, specialized learning, final, automatic phase.

According to the reviewed literature, the results of teaching and learning during the initial stages indicate the following stages:

1. The first stage should be aimed at forming psycho-motor patterns and basic physical education abilities. This is directed at laying the foundation for future learning to be built on.
2. Progress to a second stage is related to learning the requisite foundations of one or several sports. The technical and tactical foundations of a sport are established.
3. In this case, knowledge acquired in previous stages is consolidated. Abilities obtained in a specialized manner are perfected and become instinctual. Athletic activity takes on a specific nature.
4. Once the initiation stages have been completed, subjects proceed to specialization and high athletic performance. Initiation is also viewed in terms of the expected results of this stage. Thus, there are three different perspectives:
    a. Methodological: the process or the product is prioritized.
    b. Sport-specific: training is specific or non-specific.

c. Based on the context or the environment where the athletic activity is developed: recreational, health, educational-training or high-performance competitive.

Figure 3: Sports Initiation

6-8 years old	Educational or generic	Coordinative, basics and generic skills Games
8-10 years old	Pre-sport, multi-sport or iniciation	Basic elements of one or several sports on a global level
10-12 years old Specific sports schools	Specific to initiation. Refinement	Tactical-technical and knowledge of each sport. Training in the corresponding sport
12-14 years old Specific sports schools	Specific to initiation. Refinement. Elite	Technical-tactical and knowledge of each sport. Training in the sport Selection of athletic talent
14-16 years old Specific sports schools	Specific to initiation. Refinement. Elite	Technical-tactical and knowledge of each sport Training in the corresponding sport Selection of athletic talent
All ages	Leisure. Recreation	Creating habits. Sports for everyone. Participation. Enjoyment of the activity

Source: Granados, 2001.

According to Contreras Jordan (2001), two types of orientations for sports initiation must be differentiated: one focused on competition and the other on recreation. In the former, sports training sessions are oriented to winning, to refining motor skills, to applying training methodologies that are aimed at improving performance. In the latter, this makes reference to sports practice aimed at the joy of movement, the body's health in general, and sharing leisure time with others.
Romero Granados (2001) suggests that sports initiation is the interaction with sports in any context, provided that the psychological and pedagogical conditions for overall development are observed.

This process can occur in different entities. These are:

- **Sports training schools:** these are linked with traditional schools and are governed by their rules and codes. Like in a traditional school, the objectives are governed by pedagogical goals.
- **Competitive sports schools:** the objective of these institutions is to achieve maximum performance in the sports they focus on. Competitions at these sports centers are governed by the federation rules for each athletic discipline.
- **Leisure and recreation sports schools:** these are centers where sports are open to anyone interested.

Sports can be played in many ways, not always focused on with performance. Children choose which type of physical activity to participate in based on their motivations.

The concept of sports initiation is taken as a point of analysis because it is the time when children start out in what may end up becoming their lifestyle. For subjects oriented toward the type of initiation aimed at athletic performance and competition, sports may end up becoming their livelihood.

The most important factor during sports initiation, according to the analysis of the authors reviewed, is that subjects chose the sport based on personal interests.

For educational institutions, sports initiation takes on an exploratory nature. Physical education as a school subject establishes the teaching of movement in its curriculum, which initiates students into the different sports that are practiced in society. For extra-curricular institutions and those linked to sports federations, initiation occurs with children seeking a relationship with sports beyond school activity.

Education is compulsory in all societies and athletic activity is part of education. This indicates that, at some point in their lives, all children will participate in a certain sport in some way.

Comprehensive athletic development must be a process supervised by coaches, managers and a team of sports psychologists. The goal is to lay the theoretical groundwork that offers a context for subjects to engage in a process of initiation. These theoretical tools serve the team of psychologists to build their intervention strategies with young athletes and guide coaches during initial training. Understanding how to manage psychological variables associated with early ages and the theory behind sports initiation are important for approaching work.

From the sports environment, aspects to be taken into account for initiation are summarized:

- Start with general work with the objective of building motor foundations.
- Create practical plans with content that exercises decision-making.
- Take into account the personal characteristics of subjects during initiation and provide them with as much time as possible to practice.
- Adapt trainings and activities to the reality of the subjects according to their experiences.
- Vary activities as a strategy to gain experience.
- Maintain optimal levels of motivation throughout the entire athletic development process.
- Be aware that the parents of athletes are important agents during the initiation stage.

With the criteria mentioned above, optimal plans for sports initiation can be created, adapted to a subject's characteristics and taking into account the variables that characterize this stage.

Unit 4.2 High Performance and Professionalization

Introduction

In the next unit, we will study how a high-performance athlete is trained, including how their work is covered by the law and the variables that must be in place around the subject which make up part of professional sport.

The development of an athlete's professional career goes through multiple stages. Each one must be understood and studied by the coach and the team of sports psychologists. Each moment prioritizes different aspects of life. Depending on when their development is noticed, attention will be paid to working with the parents, relationships with peers (both in an out of the sports environment), emotions during adolescence, etc. Each stage of professional development requires the coaches to focus on the most important sensitive variables.

The path to professionalization is complex and requires support from the subject's entire environment. This includes legal protection and the corresponding jurisdictions at the federation level, emotional support from family and peers, and professional support through training with their coaches using training plans adapted to the subject's individual characteristics.

Specific explanatory models that focus on the definition of vocational identity and on the vital, professional construction of high-performance athletes attend to situations and conditions of individuals in a general way. The need arises to create a model that addresses an athlete's individual characteristics.

In the professional training process, that is to say, on the road that one must take to get to the elite level, the variables that must be kept in mind are both complex and numerous. A professionalization model that draws every aspect together is needed.

The social cognitive model for professional career development proposed below is a starting point.

4.2.1 Approach and Model

This is an approach based on the idea of self-efficacy, outcome expectations and the goal system. This model pursues the objective of designing training programs aimed at the high performance athlete in such a way that their career meets the necessary conditions for the construction of their athletic identity, and which adapts to their competencies, abilities, knowledge and aspirations as an athlete.

The vocational development model of subjects who are dedicated to sports and aspire to reach the elite level has been explained from the viewpoint of different theoretical trends.

The purpose is to understand how both the process of vocational maturity and professional plans of a high performance athlete are constructed. From there, the coaches, sports psychologist, directors and the family group can intervene in the way that is least likely to damage the subject's sports career.

The proposed model for understanding sports careers and vocational training should be multidimensional in nature and based on various disciplines, without disregarding an integrated, holistic and globalized perspective.

Lent, Brown and Hackett (2000) maintain that human beings are dynamic and capable of controlling their behavior. These authors propose a model with a cognitive and social focus. They also argue that development and vocational training should stem from the combination of contextual and cognitive variables, thus the name "social cognitive".

This model is based on the concept of self-efficacy, understood as the subject's capacity to understand their possibilities and limitations in light of specific tasks that must be done. In concrete terms, self-efficacy is a person's ability to understand whether or not they are capable of performing a specific action.

Another component of this model refers to outcome expectations, in which the subject does the work of identifying possible outcomes prior to their interventions. Self-efficacy as well as outcome expectations lead to the goal system, which includes defining the interests, objectives and actions of the subject's professional and life plan.

The interests from which the subjects develop their professional plan are based on the aforementioned variables.

The social cognitive model places athletes in a state of permanent analysis to identify whether their achievements correspond with their self-efficacy. Not only this, they also reflect on whether the objectives achieved in their professional training process correspond with the proposed goals according to their intervention capabilities. The relationship between what is desired and what is obtained is the result of the analysis that the subject must undertake.

In this sense, the subject acquires competencies which allow them to adapt to circumstances based on the results. This is achieved through planning ability and the opportunity to define and redirect the athlete's life plan.

People with appropriate adaptation levels have been properly trained during their process. One of the definitions of emotional intelligence revolves around an individual's ability to adapt to circumstances.

Figure 4: Adaptation Competencies

Dimension	Definition	Associated competency
Concern for the future	Refers to the feeling that individuals have to prepare for the future and develop planning capabilities	Planning
Self-control	The belief that subjects have about being able to regulate the construction and definition of their own career, being responsible for making decisions autonomously and appropriately handling problems that come up	Decision-making
Curiosity to explore possible scenarios	Motivates individuals to better understand the environment in which they operate, thus allowing a better fit between what they expect to achieve and what they are truly capable of doing	Exploration
Confidence to consider challenges and overcome obstacles	Implies using abilities and capabilities to solve a specific problem with certain guarantees of success	Problem solving

Source: Savickas, 2005.

4.2.2 New Theoretical Trends

These new theories propose the need for a more holistic view of development within the professional training of subjects since, over the years, factors have been neglected in an athlete's life that are external to sports but important for understanding development. This is why it is important to adopt new ways of understanding professional development. The main neglected variables that stand out are family relationships, work and training.

Alvarez (2011, p. 117) maintains that the high-performance athlete should not be seen only as an athlete but also as a person with psycho-social, emotional and academic/vocational development.

Holistic view refers to the understanding that self-efficacy, outcome expectations and the solidification of professional interests are determined by personal or social variables and the various roles taken on by the subject throughout their life. When a subject is involved in different learning situations, this creates different life experiences. These variables support the athlete to create their professional identity. Athletes do not merely perform a skill, they are also made up of a web of diverse experiences which define their cognitive structure.

Training combined with experience results in a high-level athlete. The holistic view is nothing more than looking at an athlete's development in a global way, paying attention to all of the variables that make up a subject's life beyond the sports environment.

4.2.3 The Professional Athlete

In this section we will look at how an athlete is covered by the law when practicing sport at a professional level and how they are involved in the work force. This legality occurs under a special employment relationship. The word "special" indicates that it has a different legal framework than that of an ordinary labor relationship.

As the name indicates, a professional athlete receives payment as a result of being a professional. The club is the entity that handles the resources produced by the athlete in exchange for remuneration.

In these terms, a professional athlete is an athlete who receives remuneration for their work within the institution. This term is not used for athletes who play a sport without pay. The professional athlete makes sport their job and receives money via a salary regulated by a legal framework.

Based on what has already been mentioned, it can be said that:

- There must be a relationship between the athlete and the club or athletic institution. This relationship is based on a work contract with rules and roles which must be adhered to. In this sense, both parties are bound by the contract objectives.
- Dedication to playing the sport must be voluntary.
- The institution's workday will be defined in the contract. This way, the player will be present for the hours necessary for their training, plus anything extra that may or may not be included in the contract.

As can be seen, a high-performance athlete who turns professional enters the work environment in a formal and legal way. On many occasions these matters are not managed correctly by people surrounding the athletes, who end up making errors due to a lack of understanding that ultimately damages an athlete's performance and career.

It is important to understand how to manage professionalization in a way that does not affect the subject's performance; this way they can dedicate themselves exclusively to their training.
Once the professional training model and the legal framework that governs athletic careers have been incorporated holistically, it can be seen that there is another variable involved in high athletic performance.

Situational Context

During their training, from the very beginning and throughout adulthood into professionalization, the athlete moves through stages that shape their personality and character. This training process is studied through the lens of various theoretical trends, out of which the holistic model, due to the inclusive approach of its theories, comes closest to understanding what really takes place for athletes. The more variables that are taken into account throughout a person's life, the better the analysis of their reality will be.

The legal framework which applies to sports professionals has also been studied. Athletes find themselves covered by a system of laws that guarantees their economic stability while they are within the professional environment.

One final variable to keep in mind in terms of high performance will be discussed next: an athlete's mental preparation. The athlete, if they are supported and guided appropriately during their training, will only need to worry about issues related to training and focusing on improving their performance. In this sense, the mindset that is needed to face this commitment should be practiced and studied by the athlete, the coaches and the team of psychologists. While parents and peers have the role in the emotional part of the process, coaches and athletes should focus on performance.

The mental workload of a high-performance athlete is very high, and for this reason it is recommended that those around them understand what it means to be a professional athlete and thus play their role in helping them to optimally achieve this.

O'Donnell and Eggemeier (1986) define mental workload as the volitional allocation of resources in response to the demands imposed by the tasks to be performed. They are the resources invested in relation to what is available. Which, on one hand, depends on the effort made and, on the other hand, how difficult the task is.

The load of a task can be regulated so as not to mentally overwhelm the athletes. A task load can be decreased by lessening its complexity.

Mental workload is understood as the cost to the subject in terms of using their available mental resources in order to perform a task (Didomenico and Nussbaum, 2008).

There are specific emotional factors that exist which contribute to this phenomenon. In this sense we can use the term "emotional task load". Emotions can either interfere with the task or facilitate it, which will impact the resources that may come into play at the time of execution.

In this way, mental workload has two dimensions: cognitive and emotional. Physical workload requires careful planning so as not to fatigue or overtrain the athletes. Mental workload has the same requirements; it must be planned correctly so as not to negatively impact an athlete's performance. If the workload is too high, it could cause athlete burnout and emotional fatigue.

The task takes a leading role, since the way in which it is proposed will result in what happens to the athlete. In this sense **task entropy** is introduced: the more disorder and instability a system creates, the higher its entropy.

Another aspect to consider regarding task is that the more complex it is, the higher the amount of memory, concentration and emotional demands placed on the athlete. This information is not only necessary for planning the tasks presented to the athletes, but also so that the team of psychologists have theoretical tools when it comes time to speak with athletes and coaches. Many times the reasons for an athlete's declining performance are unknown. In this case there is an analysis variable which is directly related to the level of complexity of a task and the consequences at the mental and emotional level.

Entropy has a double dependency: the environment on one side and on the other the individual themselves. In the first case this refers to the elements that surround an activity, and in the second case to the individual's personal resources used for resolution.

When the environment brings too much uncertainty and the athlete's resources are not sufficient, negative entropy dominates. The mental workload can be managed and the impact of the task on the emotional load experienced by the subject can be regulated. Uncertainty is directly proportional to the increase in emotional instability. If the opposite occurs, the same thing happens: the less uncertainty a situation creates, the higher the emotional stability (Golman & Loewenstein, 2013).

To the extent that the subject exposes themselves to uncertain situations, this can create adaptations over time which will reduce levels of negative entropy. This work is done by the cognitive system since these are the learning mechanisms responsible for creating responses that adapt to changing and uncertain contexts.

Based on the above, in order to reduce the level of entropy we must:

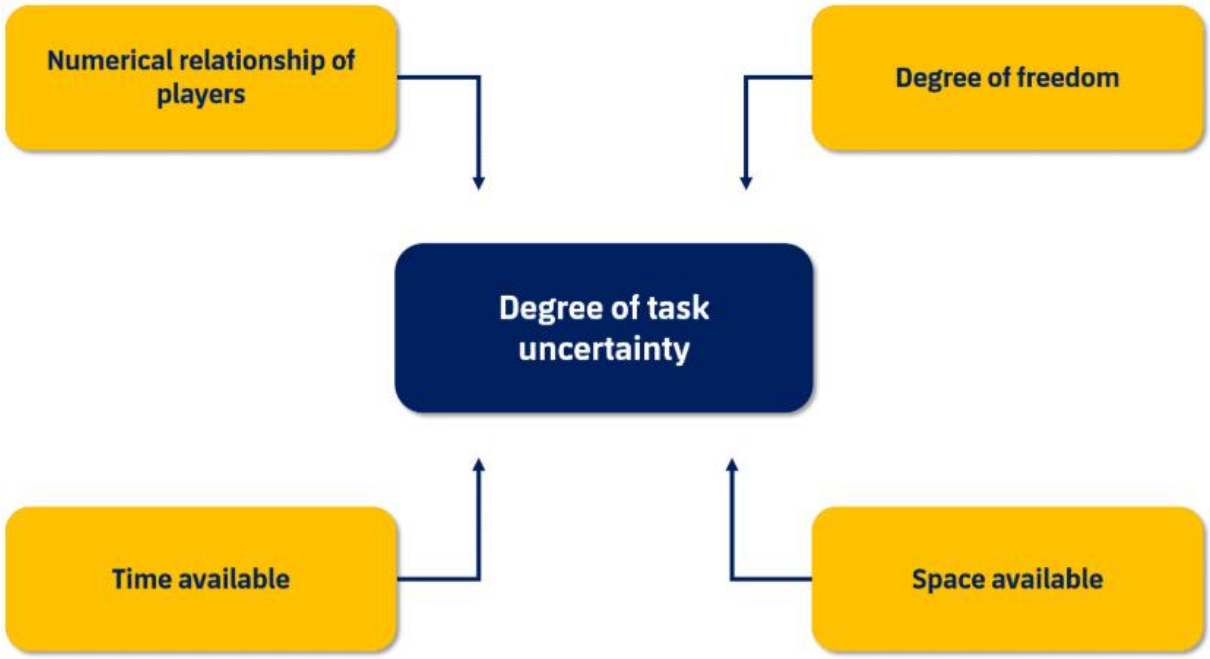
- Know what elements make up a task and how to modify them.
- Individualize work plans in order to create the correct stimuli.

Task Design Based on Mental Workload

Catena (2012) identified that the same areas of the brain are activated in both decision-making and mental workload situations. Clearly decision-making is a variable that affects the mental structures of the nervous system. The link between the degree of uncertainty and emotional load is something that has been researched for some time in the field of sports science.

In athletic activities, the more unstable the elements that make up the sport, the more uncertainty they create. Parlebas (1981) suggests that the factors which create uncertainty are the context in which the athlete develops action and their internal instability.

Figure 5: Task Uncertainty



Source: Anton, 1998.

As seen in this figure, Anton (1998) proposes that there are components that influence the level of uncertainty, namely the spatial, temporal and motor characteristics of the task.

In the case of team sports, one variable that affects the uncertainty level is the field of play. Changes to this variable can increase or decrease levels of uncertainty.

Another element that influences uncertainty levels is the temporal element. The time that is available for decision-making and performing analyses relevant to the environmental conditions will be inversely proportional to the level of uncertainty.

Lastly, uncertainty will rise based on the degree of freedom given to the athlete. In this case, establishing norms that will make certain actions impossible will reduce uncertainty levels.

As previously mentioned, entropy has emotional properties that could be stimulated as a consequence of decisions made during task execution. The consequences of behavior exhibited in training can bring up positive or negative emotions. The coach should be prescribing tasks in which the athlete needs to make decisions and take action so they are able do this in a way that establishes an appropriate emotional state. These actions are taught in an intentional way so that the athlete can adapt to situations where they must make decisions without this affecting them negatively.

This task manipulation controls the emotional load. In this way, the athlete learns to master their mental workload during training.

4.2.4 Individualizing Mental Workload During Training Sessions

The coach and the psychologists should identify strategies that allow the athlete to regulate their internal load. The sports psychologist will guide this process since they have more tools and expertise regarding the psychological variables intended for emotional control. The coach has mastered the external load variables, i.e. context management to reduce levels of uncertainty within the task.

In this case, tools can be used that assess mental and psychological workload on a scale. These elements should not only be sensitive to cognitive variable measurements, but to emotional variables as well.

Hogarth (2001) claims that human beings learn to manage mental workload via the acquisition of automatisms and heuristics that reduce the difficulties of the task. Along the same lines, Lehrer (2009) suggests that experienced athletes are capable of making quick decisions in changing contexts by reducing intuitive mechanisms which makes it possible, through simple observation, to choose the best option out of all of those available.

Heuristics arises as a result of training within changing contexts where decisions are continuously being made in a gradual way based on complexity.

Some authors suggest that there is a possibility that uncontrolled mental workload will negatively impact the athlete's physical load (Marcora, Staiano and Manning, 2009).

Below we will review a concept that relates to what we have worked on up until this point. We speak of the depletion of the ego, which is understood as the decrease in motivation that results from sustained effort over time, be it a physical or mental task or both.

Regardless of this term being related to psychological issues, it is observed that it influences the increase in brain glucose consumption. The depletion of the ego can influence physical performance in two ways:

- Directly: this depends on neural mechanisms related to task load and physical fatigue.
- Indirectly: in this case it is metabolic and relates to the depletion of brain resources.

It has been observed that fluctuation in blood glucose levels directly influence a reduction in athletic performance. Thus, when the difficulty of the task and decision-making is increased, the brain requires more energy expenditure resulting in an increase in mental workload and a decrease in performance.

Mental Workload and Planning

The coach is responsible for managing the training processes and deciding which elements will make up the tasks. This planning process is supported by their knowledge of the variables that make up the training.

As Parlebas (2001) states, it is recommended to develop training strategies that contain elements that will appear during competition in order to ensure learning is transferred and to achieve optimal athletic performance. The game dialectic is built on physiological, motor, cognitive and emotional capabilities. Traditionally, athletic training was only considered to be associated with physiological factors and the importance and influence of psychological aspects for improving athletic performance was neglected.

Based on this analysis, training stimuli should not only be interpreted quantitatively, but also qualitatively. Improvements in emotional stability and thus in mental workload control will occur based on the extent to which psychological variables are involved. This will improve athletic performance as a result.

Mental workload should be introduced as a training variable alongside the other abilities that have historically been focused on. In this sense, planning takes on a multidimensional approach since it involves areas such as psychology that have previously been pushed to one side. The coach and the psychologist plan the training loads and consider all variables in order to optimize practice and competition results.
It is not an easy to bring together criteria from different fields. This process needs to begin with making a list of common objectives and later employing the relevant approaches.

What needs to change is the concept of an athlete: they need to be understood as dynamic beings in continuous interaction with their environment, which in turn influences them and determines the relationships that they establish during their formation. The correct interpretation of emotions will allow for the development of training models that consider these variables.

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