Module 1. The player as a unit

BARÇA INNOVATION HUB
Universitas

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1. Introduction

The athlete is the main actor in the sporting event. For many years, in learning in general, and in sports learning and sports training in particular, the integral conception of the athlete has prevailed. The progression of the athlete is not based on the development of only one area of performance, not even all of them separately, but of all its aspects in a unified and integral way. This conception considers the different dimensions of the athlete: physical, cognitive and affective. These are elements of a single indivisible unit. Consequently, the athlete is conceived as an active element that creates and constructs his own learning.

In this module, you will review the different aspects related to the athlete as a subject of learning. The common element of all these aspects is an integral perspective of the athlete and the processes that involve him.

First of all, you will learn about the main characteristics of the different evolutionary stages of an individual, focusing on the physical and cognitive areas, which are the most important in sports

performance and, therefore, the most relevant in the assessment of a football player.

You will also learn about the characteristics of meaningful learning, a theory based on the constructivist approach to learning. This theory is the most widely accepted in teaching in general and, in sport pedagogy in particular.

Finally, and from a more training-related perspective, you will learn about two training theories that are more widely accepted in the current world of football. Both share the integral training model, although with differences, and both are based on the philosophical trends that define the individual as a unit, and on the psycho-pedagogical trends that stem from constructivist learning theories.

This introduction will help you to have a general, but sufficient idea of the evolutionary aspects and the most current theories on sports learning and sports training, including their implications in the assessment of the football player.

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2. Developmental stages

In the monitoring and evaluation of a player undergoing training, there are several aspects that can help us to predict his evolution. Any assessment made of a player must take into consideration the developmental stage he is in, as this will indicate what timeframe is ahead to improve, and for the player to complete his training up to a point where he can be considered qualified (or not) to be a first team player at the club.

Human development sciences confirm the existence of several stages defined by the starting age and the end age, at the end of which the individual-football player gradually incorporates both physical and cognitive abilities that favor a positive evolution in sports performance. These stages are what we call **developmental stages.**

Although the variability in the evolution of a player (a person, after all) is extensive, it is accepted that genetically all people go through the same evolutionary stages at approximately the same ages. However, some people reach these evolutionary stages earlier and

others later, and this explains why some people reach their sporting performance goals earlier than others.

These differences in evolutionary development that may occur at some stages, leads you to hear about “biological advantage”. This is the typical example of a player who completes the evolutionary stages of his physical development before other players of his age, and becomes more competitively relevant. Another example is the situation of young players who reach a degree of cognitive comprehension before others and understand the fundamentals of the game before others, giving a higher performance in tactical aspects than other teammates who have not yet reached that stage.

It is important to point out that we speak of stages in a general way, but then individual differences will mean that at the end of each stage not all players will have reached the same capabilities, nor will they have done so at the same level. These individual differences are difficult to predict.

The different areas of evolution are somehow interconnected, and the progress in one of them has a favoring effect on the others. However, you will study them separately in order to understand them better.

The nature of the developmental stages as far as sport is concerned, are basically of two types:

- **Physical/psychomotor development.** Mainly determined by the maturation of bone and muscle structures.
- **Cognitive development:** It is determined by the maturation of the structures of the nervous system, and by the teaching-learning processes.

Below, you will take a look at each of these individually and the implications they have for the scouting work.

2.1. Physical/psychomotor development

The soccer scout has neither the obligation nor the need to be an expert in evolutionary development, nor in growth. It is enough to know the basic characteristics of each stage and how it affects sports performance.

This knowledge is useful because it allows the scout to evaluate the football player according to his age and to analyze, fairly closely, if his developmental stage is in accordance with his chronological age, or if he is behind or ahead of it.

To summarize, we present a table with the main physical and psychomotor characteristics of each of the developmental stages.

Table 1: Characteristics of maturational development by stages

6-8 years	
Morphological and physical characteristics	- Excellent flexibility. - Low running time. - They get tired quite fast, but they have a fast recovery capacity.
Psychomotor characteristics	- Problems to detect the ball. - Difficulty with the technique. - Each child plays in his or her own way, at his or her own pace.

8-10 years	
Morphological and physical characteristics	- Very good flexibility. - Low resistance and power.
Psychomotor characteristics	- Better ball detection. - Better coordination.

10-12 years	
Morphological and physical characteristics	- Still keeps a very good flexibility capacity. - Principle of muscle development.
Psychomotor characteristics	- The control of the ball is better directed. - Good coordination. - Start playing well as part of a team.

12-14 years	
Morphological and physical characteristics	- The flexibility decreases. - Rapid growth of body size. - Speed and flexibility are reduced (it is useless to work on them because the muscles are in the process of growing). - Susceptible to injury due to puberty (growth).
Psychomotor characteristics	- Body growth may decrease coordination. - On a technical level, there will be little progress.

15-18 years	
Morphological and physical characteristics	- Harmonious body growth. - Allows the highest workloads in terms of power and resistance.
Psychomotor characteristics	- Coordination, technique and ball control are recovered.

Source: Prepared by the authors based on Martín Barrero and Camacho Lazarraga, 2020.

Table 2: Physical/psychomotor development areas

Physical and psychomotor development areas	
Neuromotor characteristics	The development of the nervous system favors the possibilities of acquiring new skills related to movement.
Bone characteristics	Bone development results in increased height. Physical activity stimulates an increase in bone density and thus promotes a stronger body structure.
Muscular characteristics	Muscle development has genetically defined phases, but the rate at which these stages are reached may vary from one individual to another, producing differences in the performance of some athletes with respect to others during the growth phases, mainly in strength related actions.

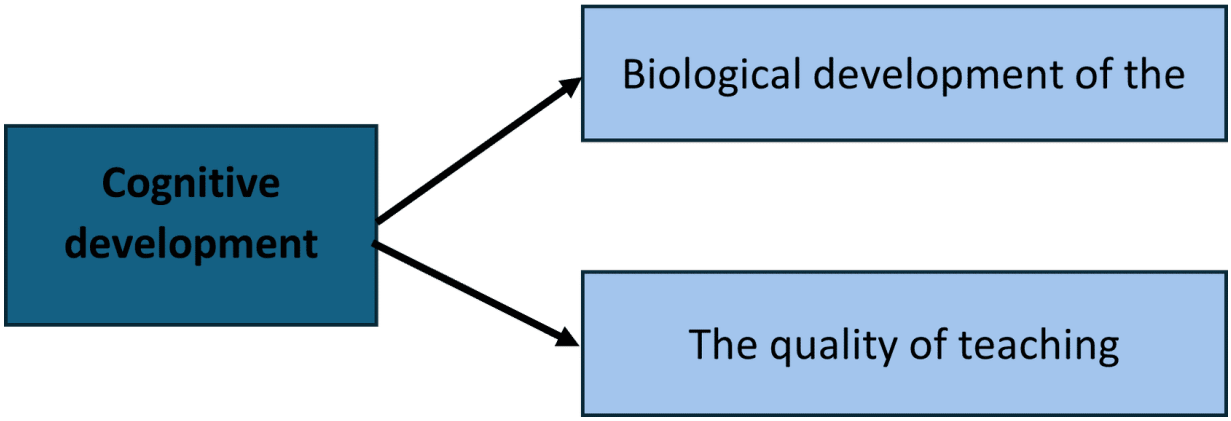
Source: own elaboration.

2.3. Cognitive development

Unlike the physical and motor evolution, the cognitive evolution allows the learning of concepts related to the game as a whole. In soccer, this has to do primarily with tactical behavior.

Cognitive evolution is determined by genetic factors (development of the nervous system) and environmental factors (learning).

Figure 1. Factors involved in cognitive development



Source: own elaboration.

In relation to cognitive evolution, the two key evolutionary concepts that you will study, because of their influence on the player's ability to correctly perceive complex game situations and decision-making ability, are the concepts of *centration and decentration.* These terms were developed by Piaget in his constructivist theory of learning.

- **Centration.** The child focuses on only one aspect of the situation he perceives. He is not yet able to perceive the game as a whole, nor the relationship between the different elements of it. The child is in this stage at approximately 6 to 11 years of age.

- **Decentration.** From the age of 11-12, the child is able to perceive and process the different elements of a situation. Progressively, their ability to solve more complex problems improves and their decisions become more accurate. It increases, therefore, their ability to cope with the most complex situations that arise in the development of the game.

The theory of the learning process most widely accepted by education professionals in general, and sports education in particular, as the most suitable for producing stable and permanent learning over time, is that of meaningful learning, based on the constructivist theory of learning. Let us consider both concepts.

2.3.1. Constructivist learning

The constructivist theory of learning, developed by Piaget, basically postulates that learning is a process of interaction in which the individual perceives stimuli, assimilates them according to his previous knowledge and thus builds new cognitive structures that allow him to better adapt to increasingly complex situations. The two main characteristics of the constructivist perspective on learning are, therefore:

- The **interaction** of the individual with the stimuli presented to him.
- The idea that learning is **constructed** by the individual from this interaction.

In other words, learning does not depend exclusively on the individual's capacity, nor on the quality of the environmental stimuli, but learning is constructed by the interaction between the two. Both are important and both have an influence.

Constructivism is opposed to behaviorist theories. The latter give much more importance to the environment and experience, and give less relevance to the individual's cognitive participation in learning.

2.3.2. Significant learning

The so-called **significant learning** arises in relation to the constructivist theory of learning and its implications for it, and is now accepted as the ideal learning model for academic curricula in educational centers.

According to Abraham Maslow, the ultimate phase of significant learning is to reach the so-called **unconscious competence.** In this phase, the player incorporates a certain action into his repertoire and

performs it without having to pay special attention to its execution, he performs it fluently and almost effortlessly. This allows him to focus on other stimuli that are more complex and require more attention.

Observing that a player performs a technical action fluently in different circumstances of the game is an indication that he has reached that degree of unconscious competence which is a very encouraging parameter in terms of predicting his future performance.

Conclusions

To summarize, we have to know that:

- The player goes through different evolutionary phases in the physical, psychomotor and cognitive aspects throughout his sporting life. Each stage imposes temporal limitations on learning capacity.
- Each child grows at his or her own pace and the developmental stages are only general guidelines. Sports learning should be adapted to the individual capabilities and needs of each athlete according to his or her level of physical and cognitive development.
- The assessment of the player undergoing training must take into account the possibility that when a player does not master

certain aspects or does not reach an optimal performance in some of the actions of the game, it may be because his evolutionary development still has not allowed him to achieve it.

- Learning is not a precise science. internal and genetic factors (biological maturation of the nervous system, genetically marked evolutionary stages) and by external factors such as the quality of the teaching process and the player's environment. Both factors have a margin of variability that means that we do not learn the same things or at the same pace.

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3. Current trends in sports training

3.1. The player as a complex structure (Francisco Seirul-lo)

Francisco Seirul-lo is a recognized expert in sports performance planning. He is known for his focus on the complex structure of the game. Seirul-lo stresses the importance of understanding and analyzing all the elements involved in a game situation, considering physical, technical, tactical, mental and emotional factors. His approach encompasses the dynamic interaction of these elements and how they influence decision making and performance during competition.

Seirul-lo advocates comprehensive planning that takes into account the complexity of the game and the preparation of athletes to provide solutions to different situations in a changing and unpredictable environment. His point of view promotes the development of tactical intelligence, rapid adaptation to different scenarios and effective decision making in real time.

According to Seirul-lo, we can understand the athlete as a hypercomplex structure configured by interactions and retroactions between structures.

Figure 2. The structure that composes the athlete in the theory of Francisco Seirul-lo

Source: own elaboration based on Barça Innovation Hub, 2019.

3.2. Tactical periodization (Vítor Frade)

Tactical periodization is a soccer training methodology created by Portuguese professor Vítor Frade.

The main characteristic of this way of looking at football training is the prevalence of tactical aspects and the model of playing over the rest of the training areas. Therefore, everything related to training, both in the short and long term, is guided by the game model that the team must develop in competition.

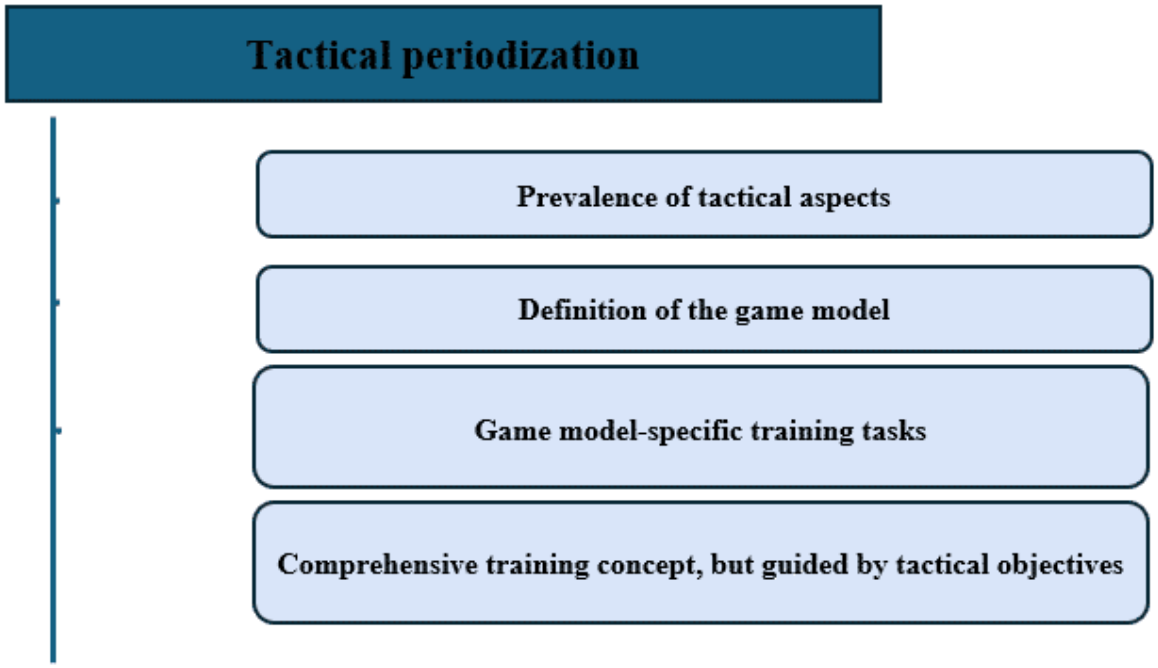
Due to the specific nature of the theory, training tasks are always developed specifically for the intended game model, i.e., they are always contextualized in it. According to this theory, it does not make sense to prepare tasks that do not develop specific actions (at different levels of specificity) of the model we intend to apply in the competition.

The game idea is divided into hierarchical principles and subprinciples, and from there the training is structured for its development. The other areas (technical, physical, psychological) are integrated into the training so that they respond to the specificity of the tactical model.

In any case, and although the tactical dimension is the guide for planning, the theory of tactical periodization uses the same criteria and moves within the same philosophy of those theories that

consider football as an indivisible set of different factors. Therefore, training is not conceived in an analytical way, the activities are developed in an integrated manner, but the tactical objective, the technical actions and the physical requirements will be specific to the game model implemented.

Figure 3. Key features of tactical periodization



Source: own elaboration.

4. Other player classification types

The characteristics of the player observed will guide us in their possibilities for future development. Within these characteristics we will classify them according to their stage of development. We can categorize players in many and varied ways, but we will choose to do so according to their physical, technical, tactical and psychological capabilities. The development of these will be evaluated according to the moment in which they are developed through a specific classification for each stage:

- Initiation or learning (7 to 12 years old).
- Improvement (13 to 18 years old).
- Competition (> 18 years old).

4.1. Evaluation of physical aspects

When evaluating physical aspects, you must differentiate between conditional capacities and psychomotor capacities.

Conditional capacities are the parameters related to general physical condition. They are, basically:

- Speed, in its different forms: displacement, execution, reaction, decision, among others.
- Strength, in its different expressions.
- Resistance.
- Flexibility.

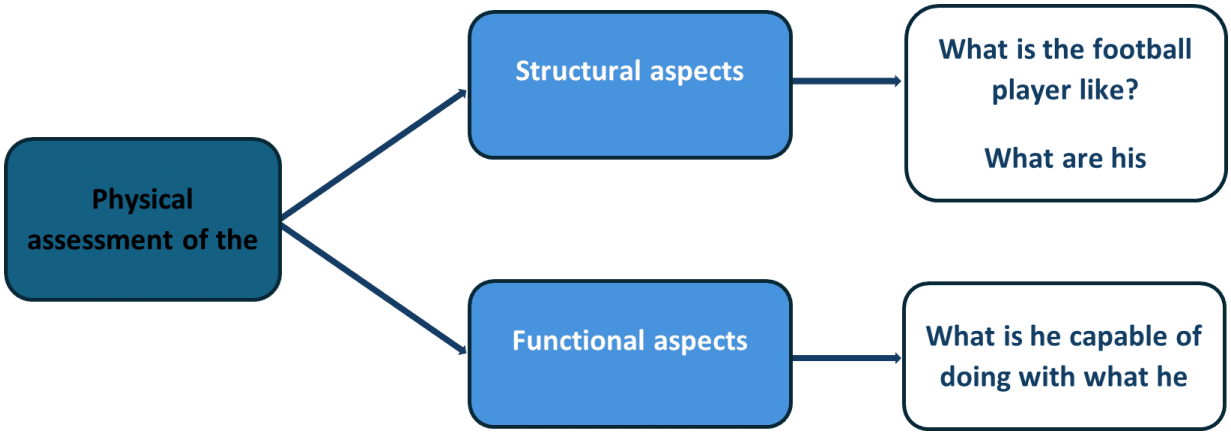
On the other hand, psychomotor skills are fundamentally related to movement control and precision. They are, basically and summarized:

- General and segmental coordination.
- Static and dynamic balance.

When you analyze a player, the first thing you see, because it is the first thing that jumps out even before the player enters the game, is his physical characteristics, the **structural aspects.** In the second place, once in the game, the **functional aspects**, what he is able to do, which is determined by his physical capacities (conditional

functionality) and by his psychomotor capacities (psychomotor functionality).

Figure 4. Physical assessment of the player: general aspects



Source: own elaboration.

Any assessment of the physical aspects, both structural and functional, must be given a relative value depending on the age of the player. Experience shows that the room for change in the physical development of a young player is very wide and sometimes surprising.

Structural aspects

Besides the observation of physical aptitudes, the physical structure of the player is also observed: height, muscular condition, general constitution.

Height is a basic conditioning factor for players performing their tasks, especially as goalkeepers, central defenders and center forwards. This is also a changing factor, as the player's growth and development can lead to error. If you see a young player who is 180 centimeters tall, you can get the impression that this player is in early development and that he will not grow much more in the following years.

Thus, it is necessary to set the basis for understanding what is the normal development of players and, from there, to identify those who stand out from this normal development. There are several factors that can help you predict the player's future physical development such as foot growth, femur length, hip width, long legs, shoulder width, long arms, physical structure of first- and second-generation parents, physical structure of older siblings, among others. All these details will be useful when assessing the player and will help you predict his physical evolution. However, there is always a wide margin of error, because none of these parameters provides a reliable basis.

Functional aspects

As mentioned above, the first thing to do is to describe the player in terms of his structure. Then, during the development of the game, you will evaluate the **functional aspects,** where both conditional and coordinative factors are involved. The physical demands in football are extremely high nowadays. From a physical point of view, if you consider the ideal football player as a model, his profile would be that

of a complete footballer: fast, strong, resistant and coordinated. In other words, the perfect athlete. It is not possible to expect so much, but you can be sure that the higher the player's level in these skills, the more promising his adaptation to elite football is. The observation of these skills will determine the degree of validation of the player, the evaluation will be more positive the more skills the player has.

In terms of **physical condition,** we will assess:

- **Speed,** in all its forms, is a fundamental aspect in football, probably the most decisive, as well as being a quality that can be conserved over time. In the player's training stage, it is one of the most important skills that differentiates players. There is no mention here of the analysis of the limitations that genetics may impose on speed, nor in the analysis of the most trainable and less trainable factors, but we do want to make it clear that, as scouts, you must know the importance of this factor in the performance of the player and, therefore, you have to make a thorough assessment of the level that the player develops in terms of the different forms of speed. Among the different types of speed, in order to classify a player, the speed of execution and the speed of movement are the most decisive. The speed of execution is a very important ability in every aspect of the game and can be applied to all types of players. When a player loads his leg quickly or needs little space to execute the action, he has a decisive role in the game. The speed of movement is a highly

valued ability in any sport and even more so in soccer. Any position needs fast players, those who can run fast and know how to run fast, with and without the ball, in order to overcome the opponent or anticipate game situations. It is also very important to assess the player's ability to accelerate and decelerate, as well as the changes of pace and direction.

- **Strength** is one of the other abilities to be observed, since a player with good muscle mass can be a powerful player, with great ease of acceleration and structurally strong in the close combat in both defensive and offensive facets. Otherwise, he can be a player with an athletic body, who handles both his body and the ball in an easy and decisive way, shooting the ball to the goal effortlessly and powerfully.

- Another ability to classify is **resistance**. Games are very demanding and it is essential to have players who maintain a high physical level during the course of the match. Resistance allows to maintain physical and mental capacities to develop the game. It is clear that the most resistant players are those who develop the greatest physical effort, being the midfielders or inner players the ones who run the longest distances and who have the least recovery time in the game. Therefore, we must observe both the ability to maintain the same physical level during the match and the player's ability to recover.

- **Flexibility,** which is basically the extent to which the different joints can move. Greater flexibility allows for greater joint amplitude and, therefore, greater range of motion and a lower rate of muscle and joint injuries.

These factors, speed, strength, resistance and flexibility can be contradictory and it is difficult to find a player who combines all four at a high level. It is difficult to find a fast player who maintains the same speed for a long time with no recovery time.

Regarding the **psychomotor condition,** the following will be assessed:

- **Coordination:** this ability allows movements to be performed more efficiently and with greater precision. Movements are better observed when they are more complex and performed without excessive difficulty.
- **Balance:** ability to control the position of the body and to maintain stability in postural situations of varying difficulty.

4.2. Evaluation of technical aspects

The technical factors of the player can also help you rate them. The technical aspects linked to the player's qualities allow you to get a picture of the player very close to the game. Abilities such as the use

of both legs, directional control, ball striking, dribbling, aerial play, passing, among others will allow you to have an insight into the player you are observing and the technical knowledge he has.

4.3. Evaluation of tactical aspects

Other factors that will allow you to evaluate the player will be the tactical ones. A physically and technically outstanding player without a good conception of the game may not develop skills that can lead him to play professionally. The defensive or offensive skills depending on the player's position will determine the terms you use to classify the players observed. In terms of defense, you can classify the player who calculates distances correctly, who anticipates, who disputes, who recovers, who watches and/or covers. In terms of offense, the player who has vision, who gives balance to the team, who combines, who progresses, who completes a play.

4.4. Evaluation of psychological and attitudinal aspects

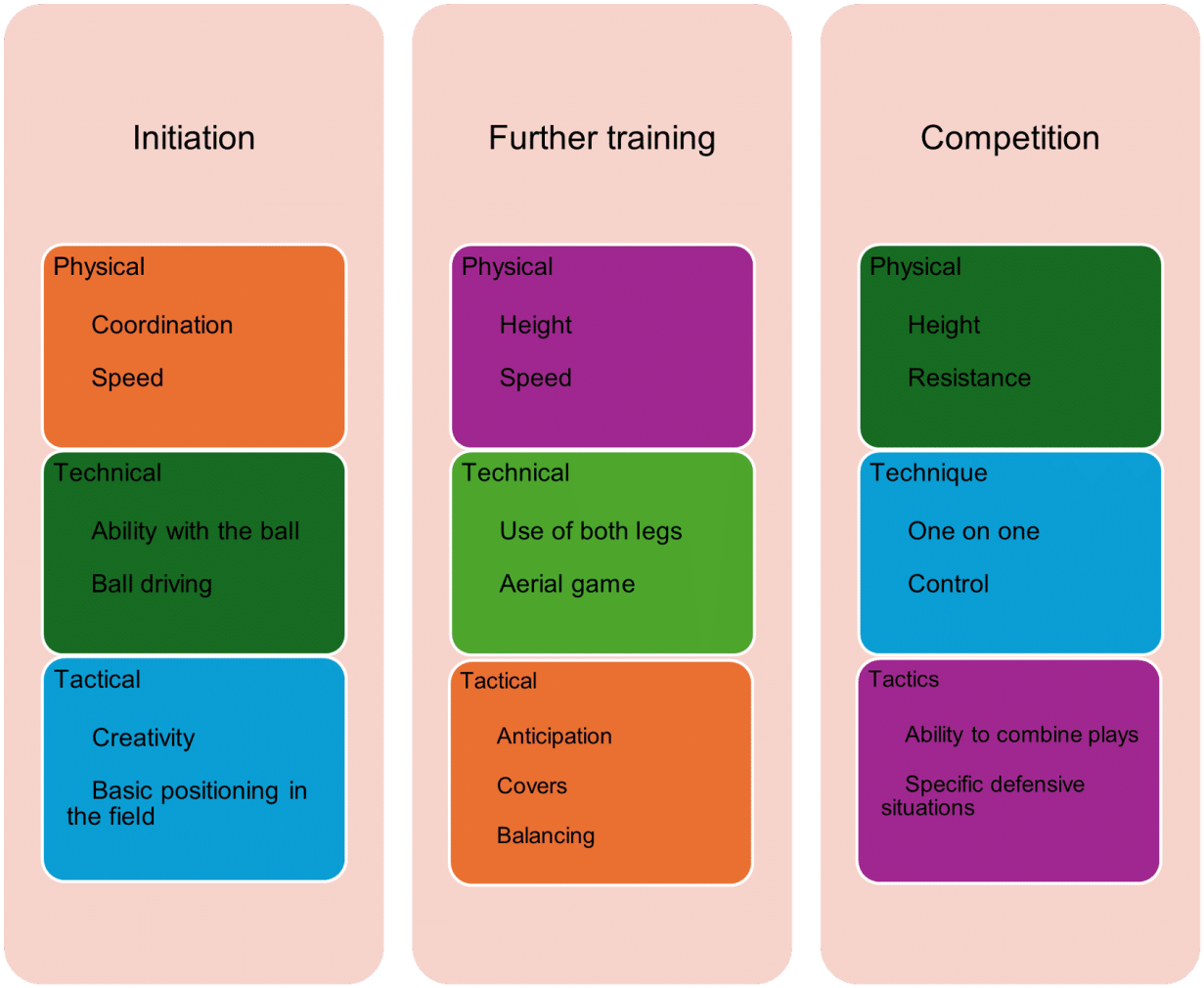
You could also include psychological or other external factors close to the player that also lead to player classification. The player's maturity, the way he solves situations, the way he behaves with

teammates, opponents, referees and fans, and other factors can increase the level of classification of the players observed and will provide you with very important information when evaluating him.

All the factors observed, physical, technical, tactical and psychological, are organized according to the stage of development of the athlete. These stages, mentioned above, will give greater or lesser importance to the factors depending on the time at which you carry out the evaluation. Assessing the tactical aspects of a player in the early stages may provide you with little information, since these aspects depend a lot on the player's learning throughout his sporting life. However, a higher technical level can be a significant differentiation: these technical aspects at this stage will give you more information, since, although they can also be improved, a premature mastery of a technical action can be a sign of an innate ability for certain actions or that the player has acquired a degree of premature learning, dominating an action before the others, which will give him a significant advantage within his generation.

The following table summarizes the aspects that should be evaluated according to the stage of the athlete.

Figure 5: Summary of parameters to be observed at each training stage



Source: own elaboration.

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