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**WINNING RELATIONSHIPS: A PSYCHOSOCIAL  
APPROACH TO TALENT DEVELOPMENT**

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*A me,*

*Per la determinazione, la perseveranza e la passione che mi hanno accompagnata nei momenti belli e soprattutto in quelli più difficili.*

*When you think all is forsaken*

*Listen to me now,*

*You need never feel broken again*

*Sometimes darkness can show you the light*

*(from the song "The light", by the Disturbed)*

*"Allora dovresti dire quello a cui credi», riprese la Lepre Marzolina.*

*"È quello che faccio", rispose subito Alice. "Almeno credo a quello che dico, che poi è la stessa cosa".*

*"Non è affatto la stessa cosa!" disse il Cappellaio. "Scusa, è come se tu dicessi che vedo quello che mangio è la stessa cosa di mangio quello che vedo!"*

*(from "Alice in Wonderland")*



*Where everything started...*

On 17<sup>th</sup> August 2004, watching the Olympic Games of Athens, I admired one of my sporting idols Federica Pellegrini get on the podium of the 200m freestyle at her first participation at the Games: she beat more experienced athletes (like the World Champion Franziska Van Halmsick and the pluri-medallist Dana Vollmer), and lost the gold medal for only 19 hundredths. Thanks to this extraordinary result at 16 years she became the youngest Italian athlete to win a medal at the Olympic Games and when she returned to Italy she left her home near Verona and moved to Milan to improve her training in the Federal Centre. After this huge change in her life she experienced very serious problems with food and cannot gain the same results for a period. She could only overcome such problems by returning to training in her home city, near her family and with a new coach. She considered Alberto Castagnetti a second father and when he suddenly died in 2009 she experienced other difficulties. I was a swimmer too and I was curious about Federica Pellegrini's personal story and her athletic career, often asking myself: "What could happen in the mind of an athlete after winning a so prestigious competition? What are the sensations and consequences? How can she reach such goal and many other athletes not?" Swimming, like many other sports, is not a question of seconds, but of one-tenths, hundredths... so, I asked myself: "What allows a coach to select an athlete based only on hundredths? Is there anything else that supports an athlete to reach the greater results, over training and sacrifices?". That was the first time I met sport psychology, but I didn't have an answer.

Many years after those questions I began to study psychology applied to sport and then, adopting a psychosocial approach, I understood that the environment that surrounds an athlete is even more important than his personal results or technical skills in reaching high level status. I understood, both personally and with my studies, that sport is much more than a result: it's made of the emotions and feelings that athletes experience in training and competitions but also in their personal life and relationships. Many times, we only see successes or failures of athletes, without considering the process that brings them there, that could be characterized by mistakes, injuries, or wrong relationships that influenced negatively their development. Many times we heard about wasted talents, but very little time we spend time to understand why they have been lost or how their loss occurred. At the end of this PhD and as a sport psychologist, I think that it's necessary to apply a psychosocial approach to talent development, since current literature stresses the importance of the social environment and its interactions with athletes' individual characteristics, and also because it allows a more complex vision on such complex social processes, like the developmental path of athletes.



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## Introduction

From a sociological point of view current reality is described as a fluid, changing and challenging context, with sudden and fast modifications, that are often difficult to face by human and humankind (Bauman, 2000). Bauman changed the way we look at the World by comparing reality to a fluid and describing our lives as “liquid lives”, with “liquid” loves and relationships (Bauman, 2003), where bonds changes their meaning and importance in people lives. Bauman compared post-modern society and all its constituent aspects - like love, bonds, work, organizations, cultures - to liquids, like water, as they cannot easily hold their shape for long. While solids impose their shape, liquids adapt their shape to their container; while solids don't mind time as they are always the same, liquids evaluate the flow of time more that the space they occupy in each moment, as an incessant movement of change (Bauman, 2000). In the post-modern reality even relationships become liquid, forcing people to change them repeatedly in their lives. Relationships create a solid link between two or more people, allowing them to influence, help and support each other; if such link becomes liquid its power becomes less strong and permanent.

In such post-modern reality sport is a growing phenomenon, as it's more and more important in influencing society and individuals' life. Let's just think about how much Olympic and Paralympic Games can help in shaping or re-shaping a Country (i.e.: like Brazil after Rio de Janeiro Games), supporting local populations in developing under the social, economic, cultural and sporting points of view.

From a psychological point of view, sport is a complex phenomenon which brings out emotions and generates experiences that can be lived in many ways. It generates different expectations, meanings and functions, both at social and individual level. Sport is also an intrinsically social phenomenon: athletes train with a coach, many sport-mates and in a specific place. If they become famous, they have supporters. There are many journalists that work specifically in sport. Athletes also have a family of origin and their own family, partners and friends. Therefore, sport can be defined a *complex relational space* (Gozzoli, 2005; Sanchez-Martin, 2003; Manzi & Gozzoli, 2009), where relationships occupy a central place in athletes' career.

But what happens to relationships in sport if we consider the post-modern liquid reality described by Bauman?

It seems that Bauman tells us that in the post-modern reality relationships cannot be hold for long time and undergo continuous changes; moreover, it seems that in post-modern reality there are no spaces for strong, deep and long-lasting bonds between people. Despite post-modern society's liquidity described by Bauman current theories and models of talent development in sport underline the importance of the social environment in the developmental path of young athletes, establishing the necessity to support young athletes growth through an ecologic-holistic approach, that means considering all the aspects of their growth and all the contexts of their life (Henriksen, Stambulova, & Roessler, 2010; Wylleman, 2004) and looking at sport talent

as the outcome of a complex process of interactions between the individual and environmental constraints (Araujo & Davids, 2011).

Considering talent development under a psychosocial point of view means keeping in mind that young athletes are continuously involved in relationships with many different actors and that such relationships interact with their individual characteristics, influencing the developmental trajectory and developmental experiences both within and outside sport (Larson, McHugh, Young & Rodgers, 2019). For young athletes sport is an important context to develop some parts of their identity, in particular during adolescence: sport obliges young athletes with the necessity to set goals, learning and sharing rules, decision taking, emotion management, manage parental expectations, dealing with competitions demands, face hard moments (like injuries), the necessity to learn new abilities, but also understanding and managing team dynamics, creating friendships or hostility, adapting to coaching styles and relationship and many other relational situations that impact and shape their developmental path.

Moreover, current approaches and theories on talent development in sport are becoming multidisciplinary, that means they consider concurrently physical and physiological, tactical, psychological and relational aspects within the development of young talented athletes. They also underline that considering just one of these aspect without considering the interaction with the others is reductive, as both performance and psychological aspects alone cannot explain the complex path of talent emergence. Nor only psychological characteristics nor physical abilities can explain the development of superior performances of athletes: the point is considering their interaction within a relational framework, as the impact of coach relationship, parental support or team dynamics are assumed as fundamental elements in the effective developmental path of athletes.

In the present work we would like to analyse the impact of different kind of social relationship on the psychological wellbeing of young athletes. We start from some considerations from literature: first, that performance at young age cannot be considered as a reliable indicator of a future one, thus it's necessary to find new indicators of athlete's potential; second, that talent is always more and more considered by multidisciplinary approaches as the outcome of a complex interaction between many environmental constraints; and third, that current theories underlines the importance of relationships in the developmental path of young athletes. Therefore, we propose to use a psychosocial approach to talent development, considering relationship as one of the most impacting variables in the developmental path of athletes.

Many times, and in many sports, we hear about "*wasted talents*": athletes that seem to be promising in their sport at a very young age, but that within time get lost in their performance results and disappear from the national or international scene. Starting from the three abovementioned considerations, we hypothesize that such "loss of talents" can be due to: a selection process that evaluate too much early performance as indicator of future performance and that believes too much on one-side indicators of performance (i.e.: physical abilities or physiological indicators only) without considering their interaction with the right psychological skills, and

finally, a selection and development process that doesn't consider the role of social relationships in young athletes developmental path.

Considering that such negative outcomes in the development of talented athletes are more and more frequent, they could be due to the logic of the globalized sport, that often stress young players to debut earlier in national and international competitions, to increase their economic value on market or to show how good they are at always young age. Such approach is often dangerous for those athletes that are not ready to face such challenges and pressures and that if not effectively supported, lost their potential and waste the possibility to develop their talent.

Adopting the vision of Bauman, such "liquid sport" often impede young athletes to establish strong relationships by challenging them with always increasing demands, like more and more hours of training and competitions, the necessity to leave house at always earlier age, or to lead an "adult life", during a period of life which is particularly delicate for both their personal growth (physical and psychological) and in their athletic career development.

Considering such circumstances challenging but delicate, we hypothesize that psychological wellbeing could be considered as a ground-basic condition to develop effectively young athletes, being the result of the interaction between the relationships in which an athlete is involved and the individual psychological characteristics. Following a psychosocial approach, we choose psychological wellbeing as outcome variable of the complex interaction between relationship and psychological characteristics, as it seems to be associated with a more positive individual development, both as athletes and as person, a long term involvement in sport, intrinsic motivation and better coping strategies (Cheval, Chalabaev, Quested, Courvoisier & Sarrazin, 2017; Adie, Duda & Ntoumanis, 2012; Ivarsson, et al., 2015), which are fundamental conditions for developing an high level performance.

Current researches on wellbeing in sport have been carried out mainly by Carolina Lundqvist, which assumes that psychological wellbeing involves a psychological functioning, behaviours, needs and cognitive patterns that are important for long-term personal growth of the person (Lundqvist & Raglin, 2015). Starting from the both the hedonic (Diener, 2009) and the *eudaimonic* (Ryff, 1989) visions of wellbeing, Lundqvist studied wellbeing in elite sport (Lundqvist, 2011), and then examined the ways athletes describe their wellbeing both on general and sport plan (Lundqvist & Sandin, 2014). Her researches underline that wellbeing of athletes is characterized by a set of elements that make it a particularly effective situation for the personal and sporting development of the athlete.

Having briefly analysed the overall approach that the present work assumes as a basis, the overall goals and structure of the thesis will be presented. The main goal of the present work is to establish the existence of a link between the characteristics of relationships within and outside sport context, some psychological characteristics and the psychological wellbeing of young talented athletes, where the former is considered as

a ground-basic situation where athletes can effectively develop their talent. Such link shows the importance of adopting a psychosocial approach when doing research and working with young talented athletes, where relational dimensions and individual aspects interact in a unique way to create the foundation for developing athlete's potential.

Adopting a psychosocial approach in studying talent development means to consider the continuous interaction and reciprocal influence between the individual (e.g.: with a specific personal history, motivations and experiences, expectancies and values), and the relationships he/she is involved, considering in particular the meaning such relationship acquire for actors involved, the changes within time, expectations and values transmitted in the relationship, and the overall quality of such bond.

Specifically, we define relationship following the relational-symbolic model (Scabini & Cigoli, 2012), that consider relationship as a fundamental pillow of human experiences. Exploring the etymology of this word, the systemic-relational model defines relationship as:

- a *mutual link among people*, that can be both a *constraint* and a *resource* for people engaged, and is generated within the exchange among people (from the Latin expression *re-ligo*, that means *bonding*);
- a *search of meanings* that orient the actions of people within the relationship (from the Latin expression *re-fero*, that means to link something to a set of meanings).

Therefore, following this definition, we underline how bonds among people are never created in a “void”, but are strongly linked to personal history, values, and meanings that people bring with them and give to relationship, but also to the contexts where they are set up.

Following this definition, a relationship is more than a simple interaction among people, as it assumes that people not only create something in or by the relationship, but that they also give meanings, bring expectations and express values in their relationship that are expressions of personal characteristics. This is what differentiate adopting a psychosocial approach to talent development: to focus not only on the number or the presence/absence of certain actors in the developmental experience of athletes and not only consider what they create in terms of competencies, performance or results. It means to consider the *meanings* mutually created by the individual, his peculiarities and all the people that surround him in his developmental path, thus the *quality* of their relationship.

After having specified our general approach, we present the aims of the work, that are:

1. retrace and analyse the historical development of theories and models in talent development in sport to identify the main key-points of the most recent theories and compare them with the psychosocial perspective;
2. describe the variables that have been identified and studied as most effective in talent development, both under the individual (i.e.: psychological characteristics) and the relational point of view (i.e.: relationship within and outside sport);

3. studying the interaction between the individual and relational variables, their impact on the psychological wellbeing - considered as a ground basic condition for effective development of young athletes following the psychosocial approach – and the eventual variation of such interaction between competitive levels and age groups.

In Chapter 1, after explaining the origin of the word and the development of the scientific studies on talent within time, the main theories and models of talent identification and development in sport will be retraced with its focus of attention. At the end of the Chapter, there will be presented a reflection about the underlying approach of the theories on talent development.

In Chapter 2, there will be described the main variables that at individual and relational level are associated with young talent development in sport. Therefore, a specific section will be dedicated to motivational orientation and self-regulation, that are two individual characteristics that have been found as the most correlated to an effective talent development; other sections will be dedicated to relationship with parents, coach and teammates, as they are the most important relationship within the developmental sporting experience of athletes. A dedicated section of Chapter 2 will describe the psychological wellbeing and how it could be considered as a ground-basic condition for effective development following a psychosocial perspective. The Chapter will be closed by a section about the importance of a sport-specific approach when dealing with talent development.

Finally, in Chapter 3, there will be explained the research that involved over 400 young soccer players from Youth Academies of professional, semi-professional and amateur Italian Soccer Clubs with the specific aim to study the interaction between the individual characteristics identified as most important for talented athletes, the characteristics of the relationships they are involved and psychological wellbeing.









# Chapter 1. Talent: definitions, models and theories

## 1.1 *The origin of the word*

The word talent comes from the Greek term “*tàlanton*”, which indicates the inclination of the weighing scale plate used by Greeks for economic exchanges; subsequently, it transitioned to indicate the weighed object, and then the gold or silver coins that were used to pay. The more money a buyer put on the scale, the more goods he could buy. Thus, the more *tàlanton* one possessed, the richer he was: that’s why “to have a talent” or “to be talented” had become an expression to indicate one who could be distinguished from other people, or who belonged to a particularly high social class that was above others.<sup>1</sup> Grinder (1985) located the origin of interest in talent in ancient Roman and Greek population, who believed that talent was a present from God as they were theocentric, and believed that many phenomena originated from God’s will. The idea that talent is something innate has its origin in those ancient beliefs and persisted for many years. This initial interpretation allows us to understand that talent has always been considered something that distinguishes people from one another almost as if there was an intrinsic element that allowed for this distinction.

The word talent evolved with time thanks to the “Parable of talents”, a tale told in the Gospel according to Matthew, 25, 14-30. The story narrates that before leaving for a long trip, a rich vendor leaves all his goods (talents, or *tàlanton*) to his three servants. The first one receives five talents, the second one receives three talents and the last one only one talent. The first two servants doubled their talents by investing what they had received, while the third one buries his and doesn’t earn anything from it. On the way back, the vendor appreciates the actions of the first two servants, while he punishes the third one. Indeed, the vendor valued the servants who were able to make a profit from what was given them, unlike the third one who, out of laziness or fear, did not want to take a risk and did not gain anything more from his talent. Avoiding any kind of religious interpretation of the tale, it is possible to remark that from the original meaning of “exclusivity”, the word “talent” has changed to indicate a sort of gift that should be “fostered”, and not just something that is received or innate. The latter meaning puts great importance on the possibility of developing what a person receives, to flourish and grow what is possessed, and to transform it into something better and bigger than the starting point.

The distinction between the two etymological meanings essentially lies in the approach one has to talent: the first one considers it as fixed and immutable, which distinguishes the rich from the poor, something someone has or doesn’t. On the other hand, the second one suggests the possibility of developing an even greater richness starting from an effective use of initial resources. The same ambiguity characterizes the research on talent in sport, which is one of the many fields where talent has been studied. To better understand the nature of current theories on talent, it’s necessary to reconstruct studies on giftedness, from which the scientific study

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<sup>1</sup> The historical evolution of talent is well documented by Bruno Migliorini in the work “Polysémie des latinismes dans le vocabulaire européen” (Interlinguistica. Sprachvergleich und Übersetzung. Festschrift zum 60. Geburtstag von Mario Wandruszka, 1971, Tübingen, Max Niemeyer, pp. 75-86).

of talent originated. Before presenting a brief excursus on the scientific study of talent, we present an analysis of the words that are currently used as synonyms of talent:

- *aptitude, disposition, inclination*, which underline a propensity toward something;
- *capacity, genius, intelligence*, which highlight the presence of an extraordinary ability towards something;
- *champion, expert, phenomenon*, which allows the “possessor” of a certain skill to be considered as above all others.

Ziegler, Ziegler and Stöger (2012), made a distinction between the following terms:

1. a *talent* denotes a person that in the future could achieve excellent results;
2. a *highly gifted person* is a person that will probably achieve excellent results;
3. an *expert* indicates a person that has reached excellent results;
4. an *underachiever* is a person that is clearly below his abilities.

In general, talent has been defined in many ways, like an “*individual ability (i.e.: potential) for particular achievements (i.e.: performance)*” (Fischer-Ontrup & Fischer, 2017, p.84) is one of the most recent definitions of talent in sport, but within theories, definitions differ a lot. Heller considered giftedness in sport as: “*an individual’s ability potential for excellent achievements*” (Heller, 2000, p. 241). The abovementioned definitions share the focus on *potentiality* rather than the simple *possession* of a specific ability or skill of the talented.

Simonton instead placed great emphasis on the genetic heritability of certain characteristics and defined talent as: “*any innate capacity that enables an individual to display exceptionally high performance in a domain that requires special skills and training*” (Simonton, 1999, p. 436), like a portfolio of diverse individual-difference variables that possess non-trivial heritability (Simonton, 2007), whose usage is not limited to only one area (i.e.: sport, art, music), but is applicable to many different fields depending on the importance they have in each (i.e.: height is beneficial in the game of basketball or in fashion, but not in studying).

By defining talent as “*a dynamically varying relationship captured by the constraints imposed by the tasks experienced, the physical and social environment, and the personal resources of a performer*”, Araújo and Davids (2011, p. 24) emphasize the complex bond between the athlete and the environmental constraints in which a performance takes place. As we will see, a lot of what is done/how one acts towards the individual who is considered talented depends on how talent is defined.

## 1.2 *The scientific study of talent*

The scientific study of talent – although still at an embryonic level – began with the work of Sir Francis Galton, who is often identified as the initiator of the modern studies of talent. In the 1860s, inspired by Darwin's theory of hereditariness, Galton (1869) collected data on the genealogy of contemporary figures that had become particularly known in many different fields (science, maths, literature). This way he demonstrated how excellence often manifested itself in individuals that were related and concluded that the gift was hereditary. These early studies allowed talent to become a topic of interest to science, that started to develop a scientific approach to an issue initially considered as a gift from God. Immediately after having supported a strongly innatist position, thanks to observations made by some contemporaries, Galton realized that some environmental factors could have an impact on talent development, and thus initiated the *nature-nurture* debate. He continued his studies on talent by examining the developmental trajectories of twins to demonstrate the importance of the innatist position on talent.

Since Galton's early studies the scientific community began to consider intelligence as an indicator of giftedness, especially thanks to the work of teachers and psychologists. In 1908, Alfred Binet and Theodore Simon created the first tool to assess intelligence in children (called Binet-Simon Scale) to identify the "slowest" ones at schools, but the tool was deeply revised in the following years by Lewis M. Terman, one of the most famous psychologists from Stanford University. In 1921, the revised Binet-Simon Scale, called Stanford-Binet Scale, was used by Terman for one of the most important longitudinal research projects in the field of intelligence (called the Genetic Studies of Genius, described in three volumes edited in 1925, 1947 and 1959). In 1916, William Stern introduced the term Intelligent Quotient (IQ) to indicate the personal intellectual capacity, but many years after he changed the definition of intelligence defining it as an "*individual ability to employ purposeful cognitive means to confront new challenges*" (Stern, 1928, p. 344). Afterward, other psychologists and scholars used IQ to measure intelligence, considering it as the main indicator of outstanding giftedness. Intelligence was strictly linked to logical-mathematical abilities, which, seeing as it was easily assessed through specific tests, constituted a simple way to detect extremely gifted children and children in serious difficulty. The innatist influence can be seen within this first approach to talent, since it was considered as a gift inherited from birth that should be detected as early as possible; nevertheless, this didn't allow for the explanation of how other outstanding abilities not specifically ascribable to logical-mathematical ones, such as playing an instrument, are learned.

It is exactly on this point that Howard Gardner, a Harvard professor, challenged the existence of a single type of intelligence, in favour of a broader and more dynamic conception of the construct. With his Theory of Multiple Intelligences - created from studies on patients with severe brain damage or deficits, who were able to make up for the deficit by learning new skills or modifying existing ones - Gardner hypothesized the existence of several fundamental independent manifestations of intelligence that originated in different areas of the brain. They are: linguistic, logical-mathematical, spatial, bodily-kinaesthetic, musical, intrapersonal, interpersonal, naturalistic and existential intelligence. Bodily-kinaesthetic intelligence refers to the use of one's body, or parts of it, to solve problems or perform specific tasks that require coordination of body movements.

Athletes, dancers, artists, and all those who make the most of their body, or very specific parts of it, to work or perform certain tasks, have developed this intelligence. Gardner (1983) hypothesized that intelligence was the product of the intersection of multiple abilities (defined as *expression of intelligence*) and that, from their intersection individuals can solve problems, create objects or perform a job. Gardner's theory is one of the first ones that allows us to confirm that athletes and artists develop something distinctive in terms of physical performance, but it does not help us to understand the origin of this ability.

### *1.3 The first models on talent and giftedness*

Based on the abovementioned theories it can be remarked that depending on the theoretical definition that one chooses to adopt there are many different methods that one could use to identify, and measure talent and its development. Theories based on a psychometric perspective like Stern's study talent through a single indicator (e.g.: the IQ score for the IQ theory) and use assessment tools that measure and compare each subject with one another to define who is above and who is below the acceptable threshold. However, these models don't consider cognitive differences between people. For example, they don't measure how cognitive resources are used to solve problems and don't deal with scenarios that differ from logical ones (like art or sport). In the wake of Gardner, who first identified the existence of different types of intelligence, scholars developed the so-called *multi-components models of giftedness* (Fischer-Ontrup & Fischer, 2017). These models are based on the following concepts:

- *potential*: the specific set of characteristics which distinguish some people from others;
- *learning*: the process that allows improving from a particularly advantageous initial condition to real exceptional result;
- *support factors*: conditions that make transformation possible or not.

There are three kinds of *multi-component models of giftedness* (Fischer-Ontrup & Fischer, 2017):

#### 1. **Constituent models**, that identified the main components of giftedness:

- The Renzulli Model of Three Rings (1986), that considers giftedness as something that emerges from the crossing of three personality factors: *above-average abilities, task commitment, and creativity*;
- Mönks' Model of Giftedness (1996), which is similar to Renzulli's but defines the three key components as *excellent abilities, creativity and task commitment*, and introduces environmental variables in the development of giftedness (e.g.: school parents, peers); according to the author these variables that can transform a specific gift into an exceptional performance.

2. **Moderators Models:** models that introduced moderating variables between giftedness and exceptional performance.

- Heller's Model (2000, 2005), which first distinguished between *predictors* (excellence conditions in a specific area), *moderators* (psychological or environmental variables) and the consequent excellent results;
- Gagné's Differentiated Model of Giftedness and Talent (2008; 2013), which defines the process of talent development as the systematic transformation of natural abilities spontaneously expressed by an individual (called *giftedness*), in a set of strategically developed and expressed skills (in different areas, such as music, art, or sport, called *talents*), through the agency of a set of intrapersonal and interpersonal *catalysts*, within a specific *process* of development;
- Ziegler's Actiotope Model of Giftedness (2005), which considers the developmental path of talent as a process in which a gifted person fills the gap between his current abilities and a set of more evolved skills through a learning process.

3. **Integrative Giftedness and Learning Process Model: proposed** by Fisher (2012) who tried to overcome the critical issues present in previous models and merge their strengths. The Model divides the giftedness areas in intellectual (e.g.: verbal, numeric, spatial), and non-intellectual (e.g.: musical, artistic, socio-emotional), combines the respective areas of exceptional performance (e.g.: verbal gift = writing, poetry, acting), and integrates environmental factors (following Gagné's catalysts) in a learning process and development that goes from giftedness to excellent performance.

All these early models have been developed mainly to explain talent in the specific context of intelligence (specifically, in the education area responsible for the study of gifted children). Among these, only Gagné's Model has also been applied in the context of sport. Gagné (1985, p. 87) was the first to suggest a distinction between *giftedness*, "*competence distinctly above average in one or more domains of ability*", and *talent*, "*performance distinctly above average in one or more fields of human performance*". Below, the main theories that have studied talent and its development in sport over the years will be presented in order to identify the main developmental paths that have characterized scientific studies in the past years. These theories, moreover, were also a guideline for the empirical analysis proposed by this thesis.

## *1.4 Theories and approaches in talent development in sport*

When retracing the historical development of theories that have dealt with talent and its development in sport, it's possible to note that scholars passed from a talent *discovery* approach – which is based on the notion that there is an innate reservoir of talent and that systematic assessment and selection of talented athletes results in a more efficient use of resources (Howe, Davidson, & Sloboda, 1998) – to a talent *development* approach – which instead places more emphasis on the quantity and quality of training that athletes need to reach top-level performance (Côté, Lidor, & Hackfort, 2009).

From the will to identify the main dimensions that distinguish talented people, scholars started to investigate the best ways to support its development, up until the newest theory of ecological and holistic-ecological approach, which consider talent identification and development as a dynamic and persistent continuum (“*Talent Identification and Development – TID*”; Abbott, & Collins, 2004).

### *1.4.1 Talent as an inherited and traceable ability*

The early theories on talent consider it as an innate characteristic that should be identified as soon as possible in the form of particularly outstanding abilities and skills, considered as forerunners of a future high-level performance. For example, Réigner (1993) established that the process of identification and selection of talented athletes should undergo a set of procedures focalized in choosing who has the possibility to reach a high level of athletic performance in little time, in a specific period in the athletic career. Models inspired by such vision were focused on the identification and selection of those young athletes that showed a series of characteristics considered to be essential to reach a high level of performance (Abbott, Collins, Martindale, & Sowerby, 2002; Abbott & Collins, 2002), such as speed, strength or resistance. These models were the first to be applied in sport sciences, but today we know they are biased by the so-called Relative Age Effect (RAE), which means that they don't consider the difference between biological and chronological age, nor the effect of early maturity in the measurement of youth performance level. Thus, they don't consider the trajectories of development, nor the fact that early-born athletes are advantaged in physical development compared to the later-born ones, and that such advantage disappears with age.

#### *Between the '70s and the '80s: the first models of talent identification and development in sport*

In a first analysis of talent identification and selection models made by Regnier, Salmela, and Russell (1993), it's possible to observe that many of the earlier theories on giftedness and talent in sport shared Reigner's vision of talent selection mentioned above.

Bar-Or (1975), was one of the first scholars to suggest a mathematical process of talent selection, based on 5 key passages: a) evaluation of morphological, physiological, psychological parameters; b) weighting of the



result according to a "development index" based on biological age; c) training reaction test; d) evaluation of family history; e) using the previous result in a multiple regression model to predict athletic performance.

Gimbel (1976), highlighted the multi-component nature of talent; his model included physiological and morphological factors, trainability and motivation in the selection process, considering them as potential factors for an exceptional performance. On the other hand, Gimbel recognized the difficulty to predict the final performance level of an athlete by solely basing on his markers and underlined the necessity to train such abilities as long as possible to develop them at their best. Montpetit and Cazorla (1982), and Bompá (1985) extended Gimbel's model identifying performance markers as: motor skills, physiological abilities, and morphological attributes.

Geron (1978), was the first author who distinguished the characteristics that define an elite athlete from the skills necessary to become one, suggesting the former should be identified in young athletes' selection. Once more, a lot of people possessed many of those characteristics and the model resulted inconsistent. In 1982, Harre too proposed one of the most complete models of identification and selection of talent, which affirmed that young athletes should be selected based on a set of distinctive motor abilities essential to develop a high-level performance in adult age. However, this model didn't consider the role of the environment as a potential source of influence in the development of what is innate, even if it underlined the "developmental potential" of athletes, measured through the reaction to training programmes. Havlicek, Komandel, Komarik and Simkova (1982) suggested a model that introduced a multidimensional vision of performance where talent is made up of a number of innate markers (e.g.: height), some trainable genetic skills (e.g.: speed or resistance), and other trainable ones (e.g.: mental skills or motivation).

Over the years, many researchers tried to study the hereditariness of physiological, anthropometric, and psychological characteristics (Starkes, Deakin, Allard, Hodges, & Hayes, 1996) to identify the so-called "single gene as a magic bullet". The most famous example is the attempt to identify sprinters and resistance runners based on different alleles of a single gene, known as Alpha-Actinin-3 (Yang et al., 2003; Coghlan, 2003). These studies have been widely criticized for their deterministic view of a phenomenon whose nature is inherently complex and procedural such as human growth and development of exceptional performance.

#### 1.4.2 Multicomponent theories on talent: between hereditariness and development

Multicomponent theories tried to combine the genetic side of talent identification and selection with the environmental variables that allow potential to become talent.

##### ***Differentiated Model of Giftedness and Talent, Gagné - 1985***

With the *Differentiated Model of Giftedness and Talent* (known as DMGT), Gagné introduced many innovations in talent research, the most important of which concerns the distinction between *giftedness* and *talent*:

- **Giftedness** indicates a “*competence which is distinctly above average in one or more domains of ability*” (Gagné, 1985); definition that was recently updated to: “*the possession and use of untrained and spontaneously expressed outstanding natural abilities or aptitudes (called gifts), in at least one ability domain, to a degree that places an individual at least among the top 10% of age peers*” (Gagné, 2013);
- **Talent**, on the other hand, defines a “*performance which is distinctly above average in one or more fields of human performance*” (Gagné, 1985), definition recently updated to: “*the outstanding mastery of systematically developed competencies (knowledge and skills) in at least one field of human activity to a degree that places an individual at least among the top 10% of ‘learning peers’*” (Gagné, 2013).

DMGT described the process of talent development as the transformation of above average natural *abilities*, spontaneously possessed by an individual (called *gift*), into systematically developed expert *performance*. Such transformation is possible thanks to the operation of some *catalysts* connected to: *interpersonal aspects* (e.g.: motivation, interests, habits), *environmental variables* (e.g.: socio-demographic factors or the influence of parents, coach or peers), specific *structures* and *programmes* of talent development, or *fate* (Gagné, 1985). Figure 1 describes the model in its original version of 1985, but with time the model has been updated several times (Gagné, 2004 and 2009) until its last version in 2013. In 2009, Gagné also updated his definition of talent development process to:

“*the systematic pursuit by talentees, over a significant and continuous period of time, of a structured program of activities leading to a specific excellence goal*”, where *talentee* indicates “*anyone participating in a systematic talent development program, whatever the field*” (Gagné, 2009).

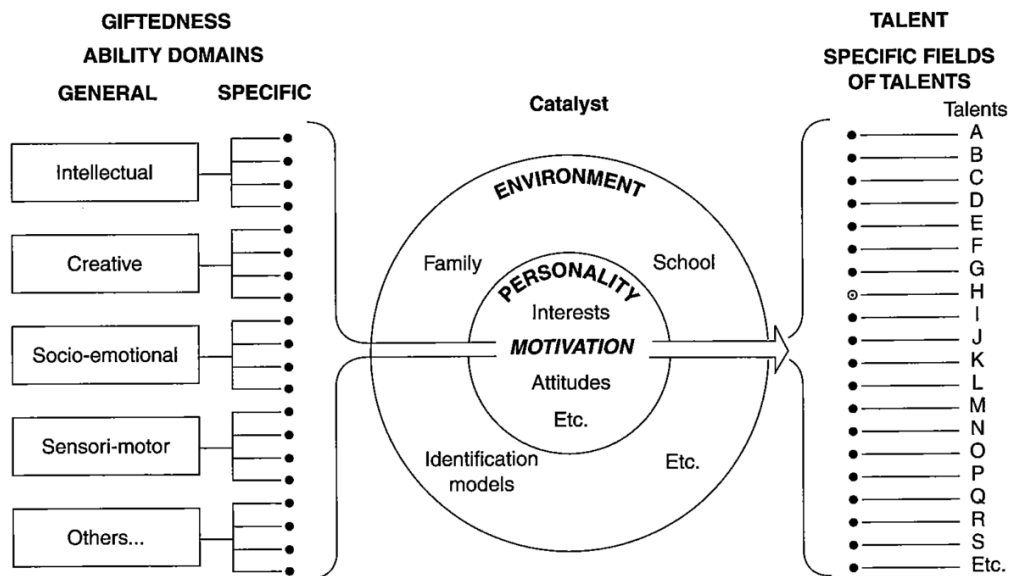


Figure 1 - Differentiated Model of Giftedness and Talent (Gagné, 1985)

In the 2013 updated version of DMGT Gagné added two important changes (Gagné, 2013):

- The first concerned the *biological underpinnings* of DMGT, or the *genotypic foundations of gift*, which influence both the *physiological endo-phenotype* - a set of non-externally-visible but measurable physical characteristics, like aerobic capacity -, and the *anatomical exo-phenotype* – the external and visible set of characteristics which influence abilities and behaviours (e.g.: resistance or agility). Gagné underlined that there is no direct connection between the biological underpinnings of giftedness and the expression of giftedness itself, but rather, it's mediated by the action of catalysts. Introducing the *biological underpinnings of giftedness*, Gagné described the *Developmental Model of Natural Abilities* (known as DMNA), which explains how giftedness results from the process of transformation of biological underpinnings;
- Moreover, Gagné introduced the *Expanded Model of Talent Development* – EMTD (Figure 2), which integrates the DMGT with DMNA, to obtain a complex model of talent development. It begins with the emergence of giftedness from its biological underpinnings and finishes with the expression and development of a specific talent, through the action of a set of catalysts. DMNA and DMGT are not clearly divided, nor occur in the same way for everybody because a lot depends on the action of catalysts and on the specific area of talent (e.g.: time of maturation in sport can be very different than in science, literature or medicine). Thus, Gagné concludes that:

“Talent development results from a complex series of interactions between the four groups of causal components; it becomes a choreography unique to each individual” (Gagné, 2013).

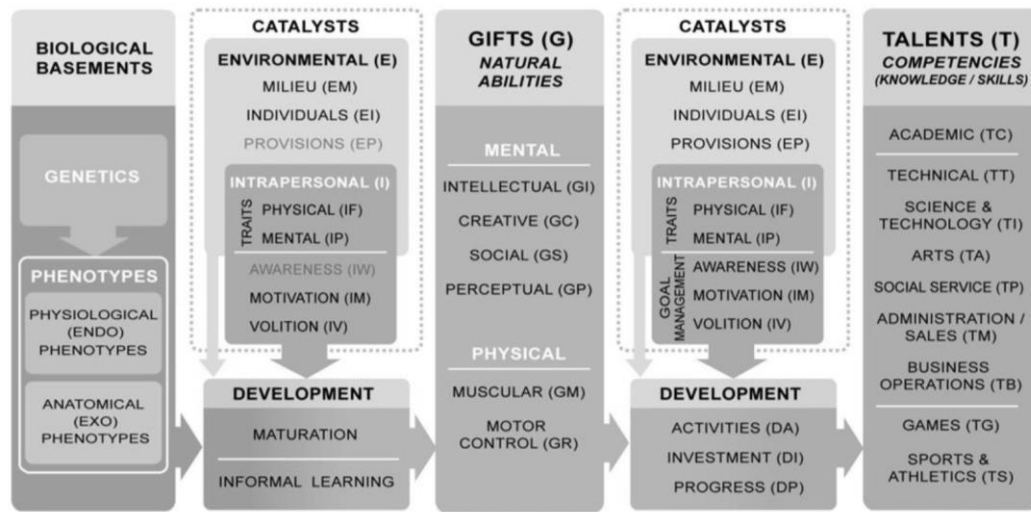


Figure 2 - Expanded Model of Talent Development (Gagné, 2013)

### ***Ericsson and deliberate practice - 1993***

Alongside Bloom’s model of three stages (Bloom, 1985, see p. 15), the theory of deliberate practice in the acquisition of expert performance by Ericsson and colleagues transformed the scientific study of talent and influenced all theories that followed (Ericsson, Krampe, & Tesch-Romer, 1993; Bruner, Erickson, McFadden, & Côté, 2009). Ericsson and colleagues assumed that there is no innate form of talent that can be predictive of an expert performance, nor some characteristics to be sought in young athletes that can predict their future performance, but that an excellent level of performance is achievable through extensive involvement in an act of *deliberate practice*, alongside certain characteristics of the individual, such as motivation and perseverance (Ericsson, et al., 1993). Ericsson and Charness defined expert performance as: “*a consistently superior performance on a specified set of representative tasks for the domain that can be administered to any subject*” (Ericsson & Charness, 1994, p. 731);

To reach such level of performance an essential role is played by the engagement in specific deliberate practice activities, defined as: “*the engagement with full concentration in a training activity designed to improve a particular aspect of performance with immediate feedback, opportunities for gradual refinement by repetition and problem solving*” (Ericsson, 2013, p. 534). However, *deliberate practice* alone is not sufficient to achieve an expert performance, since it must be combined with the individual’s hereditary characteristics (such as height or strength for certain types of sports) useful to carry out such activities. In sport, the characteristics of deliberate practice (DP) which distinguish it from other activities are:

- The focus on improving the level of performance;
- A certain effort and commitment by who is carrying it out;
- The fact that it is not necessarily fun.

Therefore, DP differs from activities of performance maintenance (since it requires less concentration than DP), from the game (since it's fun), and from the competition (since it doesn't allow improvement in performance) (Krampe & Ericsson, 1996).

Ericsson highlighted that persevering in an activity for many years - or for a certain number of hours, as suggested by the "famous" 10,000 hour rule, erroneously attributed to the scholar, that he himself rejects (Ericsson, 2013; Ford, Coughlan, Hodges, & Williams, 2015, p. 351) - is not enough, but rather, it's the quality of actions carried out over time that supports the development of expert performance, alongside genetic factors and maturity (Ericsson, 2013). Some of his work hypothesized that genetic characteristics can influence the possibility of being involved in deliberate practice, as they influence motivation and pleasure in some domain-specific activities (Ericsson, 2013). In this sense, Ericsson's theory tries to combine the part of performance development supported by the individual's characteristics, with the part that can be developed through a set of domain-specific activities. Ericsson defines expert performers as: "*individuals who exhibit reproducibly superior performance on representative, authentic tasks in their field*" (Ericsson, 2006, p. 688), and the main characteristic of their expert performance is the possibility to identify and reproduce the path that generated it and compare their performance, for example in competitions.

*"A complete understanding of the structure and acquisition of excellence will be possible only in domains in which experts exhibit objectively superior performance, in a reproducible manner, for the representative activities that define the essence of accomplishment in a given domain"* (Ericsson, 2006, p. 689).

The basic hypotheses of the deliberate practice theory are (Ericsson, 2006):

1. an extensive experience in domain-specific activity is the prerequisite for achieving an expert performance, without time constraints in terms of a starting moment or a total amount of hours;
2. only certain types of activities (specific domains) lead to a real improvement in performance such as those that work on weaknesses, muscle strengthening, repetitiveness or very complex skills.

Ericsson's theory of DP has not been ideated in the field of sport, since it originated from studies on expert musicians; nevertheless, it has widely spread within this context and has been embraced by the supporters of the early engagement in sport hypothesis. The issue of deliberate practice is quite debated in literature and recalls other important reflections:

- DP is often confused with other aspects of training due to incorrect definitions by researchers or misinterpretation by athletes in research. Since training often represents an occasion in which social interactions are many and pleasant, the pleasure that comes from carrying out heavy or boring activities (as those of deliberate practice may be) alongside other athletes influenced the evaluation of the

activity itself (Ericsson, 1996), and when athletes are asked to evaluate their training they often hardly distinguish DP specific activities from the other moments of the training.

- The age at which one can effectively be involved in deliberate practice varies from sport to sport, and from individual to individual, since many characteristics of sports cannot be developed before a certain age, (e.g.: resistance in long-distance running or some expertise of track and field) and skills development could be influenced by the maturation: therefore it's hard to identify a unique moment in the lifetime in which it's better to be involved in deliberate practice (Law, Côté, & Ericsson, 2007). In sport, the theory of deliberate practice has often been interpreted as the importance of starting to specialize in a sport as soon as possible (*early specialization hypothesis*; Helsen, Starkes, & Hodges, 1998; Hodge & Deakin, 1998; Hodges & Starkes, 1996; Starkes et al., 1996). Such hypothesis has been demonstrated as unfounded firstly by Ericsson and colleagues (1993, p.369) and then by many subsequent studies, and even more recent agreements (Côté, Baker, & Abernethy, 2007; LaPrade, et al., 2016; Bergeron, et al., 2015; Jayanthi, Pinkham, Dugas, Patrick, & LaBella, 2013). Early specialization, in fact, is often linked to premature injuries, overtraining stress and burnout syndrome resulting in dropout from sport (Li, Wang, & Pyun, 2017; DiFiori et al., 2014; Strachan, Côté, & Deakin, 2009a; Baker, Cobley, & Fraser-Thomas, 2009; Law, et al., 2007; Baker, 2003; Wiersma, 2000). Generally, before starting DP activities it could be useful to experience different sports to generate pleasantness and enjoyment with sport or motor practice itself, as it's presumed that the choice of one preferred sport derives from trying different ones (Côté, J., Lidor, R., & Hackfort, D.; 2009). The *differentiation* (as it's called the possibility to try different sports) can be more fruitful as it allows to develop motor, cognitive and social abilities that can be valuable in other sports as well (Wright, & Côté, 2003; Fredricks, & Eccles, 2006).
- The issue of the so-called windows of optimal development, or more precisely, “sensitive periods”, that are “*those limited periods during which experience has a particularly strong effect on development*” (Knudsen, 2004, as cited in Anderson & Mayo, 2017), is currently one of the most debated in the literature on talent development, even if quite new in this field (Anderson & Mayo, 2017). In their recent contribution, Anderson and Mayo (2017), analyse the issue of sensitive periods in sport, studying the effects of both premature and later starting in sport and the effects on physiological, psychological and skill acquisition processes. They concluded that both early and late specialization have implications for the development of young's potential, but remark that more research would be recommended in this field before building theories and models on it. Moreover, considering that the most recent research in the field of talent development claims for an integrated approach, where physiological, psychological and skill acquisition elements must be considered together, research in the field of sensitive periods in talent development should be faced from a multi-dimensional approach.

In the end, Ericsson recalls the theory of Bloom (1985), underlining the importance of the family and its support in the DP and expert performance engagement:

*“The role of early instruction and maximal parental support appears to be much more important than innate talent, and there are many examples of parents of exceptional performers who successfully designed optimal environments for their children without any concern about innate talent”* (Ericsson, 1994, p. 729).

### ***Epigenetic-emergenic model, Simonton - 1999***

Simonton’s model aims to keep together both the innate and the developmental components of talent within a single causal network where physical, physiological, cognitive and dispositional components are involved (Simonton, 2014). The model is very similar to Gagné’s, since there are *genetic* variables (which are the main ones responsible for the learning speed of certain abilities; Simonton, 2007), and *environmental* variables, which are initially uncorrelated. Genetic and environmental factors impact on the development of physical (e.g.: speed, strength, height), and psychological abilities (e.g.: personality, resilience, values, motivation), which together influence engagement in DP activities (Ericsson, et al., 1993) leading to athletic performance (Simonton, 1999; Simonton, 2017, p.48). Moreover, Simonton (1999), introduced the following distinction:

- *determinants of performance*, which are those factors necessary to obtain a high level of performance within a competitive context;
- *determinants of skill acquisition*, which, on the other hand, are those factors (usually genetic or psychological) that prepare individuals to acquire the necessary skills to reach a certain level of performance or improvement; this means that the latter are the base for the first determinants.

To explain why the relationship between genetics, psychological and physical factors is a *product* and not a mere sum, Simonton used the concepts of *epigenetic growth* and *emergensis*. Epigenetic growth considers how the different parts of talent emerge with time, depending on neurological, muscular, skeletal, physiological, psychological, social, cultural, and environmental variables. Epigenetic growth explains the temporal nature of Simonton’s model, which assumes that the complete expression of the phenotype doesn’t occur all at once but follows different trajectories and that it is possible to observe the entire growth and expression of genes (genotype) only at the end of the entire developmental period.

*“Talent development must instead entail some form of epigenesis. That is, starting with a relatively undifferentiated state, the various traits slowly appear and differentiate over time”* (Simonton, 1999, p.442).

The emergenic aspect assumes that to obtain the full expression of ability, an entire set of genes must be transmitted; if only one genetic trait is missing, the full expression of physical, mental, physiological characteristics will be weakened or softened.

*“An individual's potential becomes actualized through evolutionary interaction of innate capacities and 'ecological niches' available in family, school and workplace” (Simonton, 1999, p. 454).*

The main point of Simonton's model is that the different parts of talent act in a multiplicative way, originating different forms of talent within the same area. Moreover, since the final components' configuration emerges at different times for each component, it is possible to have a premature or a later expression of some abilities or skills depending on different environmental and personal conditions (like parental support, acceptance by peers, presence of siblings that act as role models, availability of structures or opportunities, etc.).

Simonton (2007) underlines that talent has a clear genetic component – that accounts for 30% of the entire variability of a certain ability –, but it cannot be identified and selected only by its presence/absence at a specific time, as it can emerge later in development. Talent, instead, should be considered as the complex integration of many different components, where its specific form is different from person to person, even within the same area: all the main talented athletes in sport, or scholars in science, literature, art and so on are very different even if they possess the same level of skills and abilities within the same field. This is because they all have different personal characteristics, went through different developmental paths, underwent different environmental conditions and possess different genetic compositions.

#### *1.4.3 Talent as nurtured within a series of transitions*

Simultaneously to Gagné, Ericsson and Simonton's models, a series of theories regarding two particular important variables in talent were developed: the first one is the temporal dimension within talent development, and the second one is the effect of environmental factors on physical, physiological and psychological variables implicated in performance. Such theories started a new field of research on talent focused on the different developmental phases experienced by athletes, with the relative difficulties, changes, and resources. The focus of these theories is on career transitions and on the most effective ways to support athletes in such delicate moments.

#### ***3 Stages of Development Model, Bloom - 1985***

In 1985, Bloom first proposed an holistic approach to talent development, which was ideated following an extensive research on athletes, artists, musicians, scientists and high level mathematicians; the main result of this extensive study was a model in which the different phases of development are defined not by chronological age, but rather by the completion of certain tasks - e.g.: the development of certain relationships or a specific



level of skill. Bloom was the first to suggest two important issues that influenced the theories on talent that followed:

- career transitions derive from the completion of tasks and goals;
- the importance of relationships, both in the athletic and personal life (e.g.: with the coach or parents).

In terms of sport context, the model splits athletic career into three phases:

1. in the first phase, called *initiation*, parents and/or coaches/teachers notice in the child a good attitude toward a certain ability or motor skill, not yet structured into a specific sport; enjoyment and pleasantness characterize such phase, where coach and parents are focused on developing motor abilities rather than achieving results and performance. The transition between the first and the second phase is characterized by the development of an early “athletic identification” as the child recognizes himself as an athlete (“I’m a swimmer” and not just “A child that swims/takes swimming courses”), and starts a more sport-specific training which brings the desire to improve and learn more (initial achievement motivation).
2. In the second phase, called *development*, the young athlete approaches sport activity more seriously, the coach is more focused on the improvement of technical skills and the first competitions serve to evaluate the work done in training. Parents are a financial, logistic, and practical support, and help the athlete combine sport with other areas of development (e.g.: school or friendships). The transition to the following phase is characterized by an increase in expertise in the practiced sport and by the desire to excel, which often requires the athlete to change coach or Club.
3. In the third phase, *perfection*, the athlete is fully responsible for his development and growth as an athlete (sometimes professional). Parents stop being a practical support, but remain a relational and emotional source of assistance, while the coach becomes the technical and emotional core of the athlete’s development. The athlete is often “obsessed” with sport practice and competitions, and all his daily actions are oriented toward reaching the best level possible.

Bloom’s model was the first that focused on qualitative changes in relationship within and outside sport context and on athlete’s investment in pursuing his career goals. Despite its limitations (e.g.: was created in the American system, which is very different from the European one, didn’t consider the difference between single and team sports, and was built from retrospective interviews, which don’t consider the ongoing experience of people), it can be considered as the first model that shifted attention from the *indicators* used to establish if the athlete is talented or not, to the specific trajectories of development without delimiting them to specific timelines, but by anchoring them to the specific personal time of the athlete. One of the main limitations of

this model is that it only considered the trajectories of elite level athletes, without taking into account alternative paths of development, as the ones of those athletes that don't specialize at a young age but remain within recreational sport for more years and get into competitive sport later in life.

Some years later, Cooke (1997) created the *House of Sport Model of athletic development* (Figure 3), which introduced the alternative developmental trajectories missing in Bloom's model. These trajectories aimed to describe the path of those athletes that, after the period of initiation, choose (voluntarily or not) to remain at a recreational level of sport, or that reach a competitive level at a later point. This model accounts for the possibility of athletes shifting from a recreational to a competitive level and vice versa, which is plausible especially for those sports that don't require early specialization.

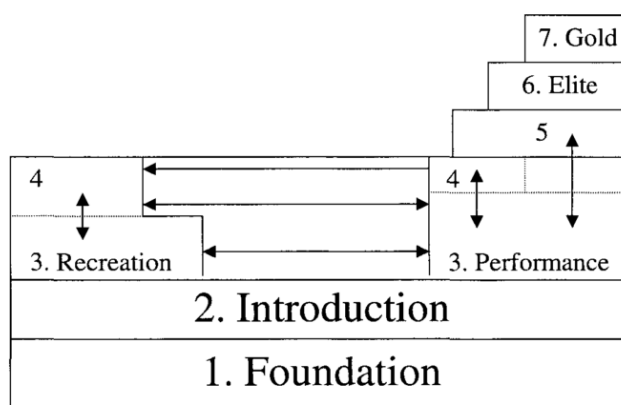


Figure 3 - House of Sport Model of Athletic Development (Cooke, 1997)

Cooke's model is one of the many empirical models of talent development (for a complete review see Abbott et al., 2002), meaning it comes from the national practices of talent studies and systematization in different countries. The model seems to be a pioneer for the ones that followed, which were inspired by Bloom's Transitions Model and by the importance of social relationships with different people in sport. In the next theories, talent development is strictly linked to career development and the deriving models are strongly linked.

**Four Stages of Sport Career Model, Salmela - 1994**

This model derives from Bloom's (1985), with whom it shares the first three phases of development (*initiation, development, perfection*) to which the authors added one more phase, called *discontinuation*. In this last phase, the athlete slowly diminishes his participation in high-level competitions and starts taking part in amateur ones. Côté (1999; cf.. pg. 19) also put this phase in his model but named it *recreational phase*, where the athlete develops other areas of his identity (e.g.: worker, parent, coach) and the athletic one remains one of them.

Salmela was the first to introduce career termination as phase, which was one of the most investigated for many years.

### ***Analytical Athletic Career Model, Stambulova - 1994***

Alfermann and Stambulova (2007, p. 731), defined athletic career as: “*a multi-year sport activity voluntarily chosen by the person and aimed at achieving his/her individual peak in athletic performance in one or several sport events*”. Based on such definition, Stambulova (1994, 2009) proposed a model of career progression that is made up of 5 phases:

1. *Preparatory stage*: moment when the child is not engaged in a structured sport context, but simply takes part in some courses of motor activity;
2. *Start of specialization*: moment when the child starts to practice one or more structured sport. The coach/educator’s approach is oriented toward enjoyment and learning of basic and specific motor skills. There is no competition and parents are the main promoters of sport participation;
3. *Intensive training in chosen sport*: phase coinciding with the beginning of the specialization in a single sport; coach behaviour and training begins to focus more on improving sport-specific skills, the mastery of sport specific elements and competitions begin to intensify. Parents are still the main source of support in terms of logistics, economic and practical support, but the coach becomes more and more important;
4. *Culmination*: here the athlete is an expert in his/her sport and reaches the top of his performance level and physical preparation; this phase has a variable duration period depending on the kind of sport and the athlete’s characteristics;
5. *Final stage*: the last step of the athletic career, where usually he/she retires from a competitive or professional sport and begins a new kind of life, as an amateur athlete or coach.

Next to the Analytical Model of Career Development Stambulova created a Career Transitions Model. Based on the definition of transition given by Schlossberg, that is: “*an event or non-event which results in a change in assumptions about oneself and the world, and thus requires a corresponding change in one’s behaviour and relationships*” (Schlossberg, 1981, p. 5), Stambulova analysed the coping strategies adopted by athletes to face career transitions. According to Stambulova (1994), a transition implies a change from a current situation to a new/desired situation and the efficacy of coping strategies is defined by the equilibrium between the athlete’s

resources – personal, social and environmental – and the difficulties that the transition implies. A positive transition result defines the athlete's ability to progress in his career or, conversely, to live a crisis.

Moreover, Alfermann and Stambulova (2007) identified 6 *normative* transitions (which consist in the relatively predictable changes that occur during career development, such as the progression between a category and the following one), and several *non-normative* transitions (which on the other hand are unpredictable changes and modifications in the athlete's experience, like injuries or unexpected change of a coach).

### ***Developmental Model of Sport Participation, Côté - 1999***

Based on Ericsson's et al. theory of deliberate practice (1993), Côté's model (1999) focused on the role of the family in the development of sport participation and athletic career. Côté created a model to describe the athletic career made up of the following steps:

1. *Sampling years* (6-13 years old): parents are the main sport providers for their children, giving them several occasions to try different sports or physical activities; their approach, as well as the coaches/instructors', is focused on enjoyment and learning without any focus on performance.
2. *Specializing years* (13-15 years old): during these years the diversification of sports practices diminishes, and the young athlete starts to practice one or two sport at a competitive level. Training and competitions are focused on the development of sport-specific skills and improvement of outcomes, goals are more focused on making progress and the sense of enjoyment in practices and competitions may diminish. Parents and siblings are still important figures in the athlete's life since they represent a support from a practical and relational point of view and also monitor the other sides of personal development such as school and friendships.
3. *Investment years* (starting from 16 years old, or in any other moment of the athletic career): age can vary from sport to sport, but in this phase, the athlete has to choose whether to continue to practice sport at a recreational level (i.e.: recreational years) or at a competitive elite level. From this decision there are different subsequent approaches toward sport that one could take: if it is practiced at a recreational level, the focus is still on enjoyment and amusement, while if the athlete decides to train and compete at an elite level the focus must be placed more on competitive goals, with training becoming more focused on deliberate practice to reach the maximum level in performance, both on a national and international level. Family supports the athletic career with greater economic investments, in terms of competitions and training needs, but also with emotional and relational closeness, especially during injuries or other difficult periods.

4. *Recreational years* (starting from 16 years old, or in any other moment of athletic career): it occurs if the athlete decides to remain at an amateur level of sport practice, where the main focus is enjoyment and competitions and training remain at a local or regional level.
  
5. *Maintenance year*: Durand-Bush (2002) added this additional step to describe the years when the athlete reaches international level (or the maximum level in his/her sport) and must maintain such level of performance. These years are characterized by great pressure from the media, sport organizations, coaches, other athletes and the athlete himself (e.g.: the will to win again or to reach a higher level). The level of training and competitions are always higher and more demanding, parents and families remain as relational support, as the athlete can be economically autonomous or may have his own family. This phase terminates with the decision to end the career.

***Developmental Model of Transitions faced by athletes, Wylleman and Lavallee - 2004***

This last model of career development focuses on the *holistic* perspective, integrating athletic development with those phases and transitions that occur in other domains of athletes’ development such as psychological, social, academic and financial (Wylleman & Lavallee, 2004; Wylleman, Alfermann, & Lavallee, 2004; Wylleman, Reints, & De Knop, 2013). Wylleman and colleagues suggested the following definition of athletic career:

*“a succession of stages and transitions that includes an athlete’s initiation into and continued participation in organized competitive sport and that is terminated with athlete’s (in)voluntary but definitive discontinuation of participation in organized competitive sport”* (Wylleman, Lavallee, & Theebom, 2004, p. 511).

AGE	10	15	20	25	30	35	
<b>Athletic level</b>	Initiation		Development		Mastery		Discontinuation
<b>Psychological level</b>	Childhood		Puberty Adolescence		Young adulthood		Adulthood
<b>Psychosocial level</b>	Parents Siblings Peers		Peers Coach Parents		Partner Coach Support staff Teammates Students		Family (Coach) Peers
<b>Academic/ Vocational level</b>	Primary education		Secondary education		(Semi-) professional athlete Higher education		(Semi-) professional athlete Post-athletic career
<b>Financial level</b>	Family		Family Sport governing body		Sport governing body Government/NOC Sponsor		Family Employer

*Figure 4 - Developmental Model of Transitions faced by Athletes (Wylleman & Lavallee, 2013)*

Mainly based on Stambulava's Athletic Analytic Career Model, Wylleman's model (see Figure 4) gives a clear overview of the development and transitions that occur in other athlete's areas of life, such as psychological (e.g.: passage from infancy to adolescence), social (e.g.: from parents to coach and peers as role models), academic (e.g.: from primary to secondary education), and financial (e.g.: from being supported by parents to being one's own source of earning). The authors emphasize the need to not only consider the "athletic side" of the athlete, but to contemplate the influence that other life events have on athletic performance, introducing a "whole person approach" (Alfermann & Stambulova, 2007) which strongly supports the influence of the environment in the development of young athletes.

Although there is little evidence that supports identification-inspired theories (section 1.4.1 of the present Chapter), and a lot in favour of developmental ones (sections 1.4.2 and 1.4.3 of the current Chapter), the sports' world is still very focused on the early identification and selection strategies of young talents to include in development programs, ignoring many of the *biases* that a similar process has which have been identified by present literature. Some of these *biases* are, described below.

- A first *bias* is represented by the *Relative Age Effect (RAE)*, which is an effect that, as shown in many national and international studies - such as: Hancock, Adler, & Côté, 2013; Andronikos, Elumaro, Westbury, & Martindale, 2016; Baker & Horton, 2004; Wattie, Schorer, & Baker, 2015; Baker et al., 2010; Cogley, Baker, Wattie, & McKenna, 2009; González-Víllora, Pastor-Vicedo, & Cordente, 2015; Brustio, et al., 2018 - refers to the phenomena that those who are born in the first half of the year (specifically the first 3 months) are more physically ready for sport if compared to those born in the second half (or in the last 3 months of the same year).
- A second *bias* concerns young performance as an indicator of adult success (Vaeyens, Lenoir, Williams, & Philippaerts, 2008, p.56): authors show that often the selection of young athletes simply concerns anthropometric parameters (e.g.: height), or performance in specific physical tests (e.g.: strength or speed) or junior competitions, selecting those that are more mature. According to the authors, this can't be considered a reliable process of selection, since recent research shows that only a small part of athletes who achieve success at a youth level maintain this level of performance in adulthood (Barreiros, Côté, & Fonseca, 2012; Fraser-Thomas & Baker, 2012). This could be explained by the effect of biological maturity of some athletes (e.g.: RAE effect), which doesn't represent a real gift and that with the passing of the time decreases more and more until it disappears in adolescence when late-born athletes also reach the same biological maturity. The problem occurs because early-born athletes that are selected at an early stage of their career are involved into youth centre of training and development and benefit from more professional training techniques, while non-selected youth athletes (e.g.: late-born) often drop out from sport or experience difficulties in coming back to an elite level.

- A third *bias* concerns the place of birth, with its specific sport culture (Elgar, Arlett, & Groves, 2003; Côté, MacDonald, Baker, & Abernethy, 2006; Balish, & Côté, 2014; Pennell, Cassidy, & Gilbert, 2017) and sport-specific importance within the Country's culture that influences national policies and economic investment in sport (Davids, & Baker, 2007). A greater amount of economic investment in one or some sports could impact on the availability of sport structures or sport popularity in a certain area: therefore, the number of practitioners, coaches or sports organizations would be higher in that area, impacting the possibility of identifying talented athletes in that sport. Examples of that bias are ice-hockey in Canada, rugby in New Zealand or football in European Countries, where such sports are more widespread, and their basin of potential athletes is higher.

#### 1.4.4 Ecological approaches to talent

According to complexity sciences, reality is made of many dynamic systems that originate from the intersection of different elements with environmental constraints (Davids, Araújo, Vilar, Renshaw, & Pinder, 2013; Araújo, & Davids, 2009). Thus, complexity sciences study all the multifaceted phenomena like animal migrations, weather, or mass events, till the most complex of all: humans and their development. Dunwoody (2006) states that research didn't consider the effects of environmental factors on people and vice-versa and that this step is necessary to evaluate the dualism nature-humankind in order to better understand real-world events. Therefore, Dunwoody underlines the necessity to apply a complex perspective to reality, to better understand the link between events and individuals, both at a micro and macro-analytical level (Dunwoody, 2006).

Starting from this perspective, Davids and Baker (2007) suggested that it's not just environmental constraints, nor genetic disposition that explains the emergence of performance in sport, but rather their dynamical union. Therefore, it's necessary to have a new paradigm that explains sport performance and its emergence that is different both from the innatist and development perspectives of previous theories, but that, rather, integrates them (Davids & Baker, 2007).

The following theories and models of talent development, that we categorized as ecological approaches to talent development, first focus their attention on the specific cognitive processes that the athletes use to develop their mental abilities. Since Gagné (1985), Ericsson (1993) and Simonton (1999) theories and models, scholars have underlined the importance of personal and psychological variables in the development of talent, but they mainly consider motivational aspects, volition, or personal attitudes as source of support for athletes' development of talent. Transitions' theories instead focus more on personal strategies to face challenges of specific transitions, like coping strategies and social support, that athletes use to progress in their career.

The following theories (Abbott & Collins and David's' in particular) stress much more than the previous ones the role of specific cognitive processes in supporting the development of potentiality and talent. The concepts of *psycho-behaviours* and *intrinsic dynamics* are central in these theories, as they underline the complex interaction between the athlete's cognitive processes and the environment in the development of potentiality

and talent. Holistic-ecological approach instead underlines the importance of the interaction between the environment and the individual in the development of specific psychosocial skills that support athletes in developing talent (Henriksen, 2010).

Overall, these theories stress that talent and potential development is a complex process, as it implies many different aspects both on micro-level (such as the individual itself) and at the macro one (such as sport organization's culture or the relationship), and that it changes continuously over time, underlining the dynamicity that characterizes the interactions between all these aspects.

### ***Talent as complex dynamical system and the importance of psycho-behaviours, Abbott & Collins - 2002***

Abbott and Collins (2004) were the first that introduced the need to re-define talent and its selection criteria: they demonstrated that current models of talent identification and development failed to predict performance in adulthood from youth performance results as they were based on a *static* idea of talent, while it's intrinsically a *dynamic* concept (Abbott et al., 2002; Abbott & Collins, 2002). These authors claimed that traditional theories and models of talent identification and development were generally focused on a small number of variables, like indicators of physical (e.g.: speed, jump height or strength) and motor performance (e.g.: coordination), assuming them as indicators of adult high-level performance, without considering the instability that characterizes developmental phases, like adolescence. Moreover, Abbott and colleagues suggested that many indicators of exceptional performance usually don't appear until late adolescence, and it's consequently impossible to predict whether and when they will appear (Williams & Franks, 1998; Abbott & Collins, 2002). Thus, they support that early selection criteria are influenced by RAE *bias*, which favours the early born athletes at the expense of late-born ones. This is what Abbott and colleagues considered a *static* idea of talent. The authors, in addition to providing empirical documents that proved the absence of validity of identification models based on physical indicators (Abbott & Collins, 2002), underline how, already in the '70, Kunst and Florescu, (1971) demonstrated how the scores obtained in physical tests at a certain age were not predictive of future high-level performance even though these models are still the most used in sport.

Starting from Simonton's Multicomponent Model (1999) and its epigenetic growth concept, Abbott and colleagues suggested the following definition of talent:

*“a complex dynamical system in which future behaviours emerge from an interaction of key performance determinants such as psychological behaviours, motor abilities, and physical characteristics”* (Abbott, Button, Pepping, & Collins, 2005, p. 61)

Abbott and colleagues (2005) take over the distinction made by Simonton between determinants of performance and determinants of skill acquisition, which show the inconsistency of static approach to talent and their lack of future reliability. Their model started from the empirical observation that within the developmental path, athletes go through many different changes on many levels (physical, psychological and social), and if selection procedures occur before or during such changes, they can't really identify potential or



talent, but mere physical maturation. Today, the RAE effect is well known by scholars and practitioners, and it's starting to be widely taken into consideration, but the issue that the authors raise is much greater as they highlight the need of a new model and new indicators for "potential for development" selection. Therefore, Abbott and Collins (2004) suggested the first dynamic vision of talent where the athlete develops within time a series of particularly effective behaviours in supporting his/her developmental process through his/her physical, psychological and social resources to adapt to environmental and situational constraints.

Authors suggested adopting a "*talent identification and development approach (TiD)*" based on the changing interaction of determinants of performance and determinants of skill acquisition within time, which allows the athlete to adapt to constraint and requirement in different situations. They stated:

*"talent identification and development processes need to consider the interplay between determinants of performance (physical, anthropometric and psychological), the environment (opportunities, parental support) and determinants that underpin the capacity to exploit the opportunities available and to develop within a sport (self-regulatory learning strategies/psycho-behaviours)"* (Abbott & Collins, 2004, p. 399).

The theory proposed by Abbott and colleagues is innovative in the field of sport sciences and represents the natural evolution of modern theories of talent which had introduced the need to consider talent as a complex multi-component concept (Gagné, 1985; Simonton, 1999), that emerges and develops in time thanks the involvement in focused deliberate practice (Ericsson, 1993) with the support from significant others throughout the main phases (Bloom, 1985; Côté, 1999) and as a result of the resources used to face transitions (Stambulova, 1994; Wylleman & Lavallee, 2004). In the end, Abbott and colleagues' model was the first to be created specifically for the context of sport, as the previous ones were created for other contexts of expertise. By giving a complex (multi-component) and dynamical (changing over time) vision of talent, Abbott and coll. suggested considering the selection phase not as a unique moment, but as a continuous process over time in which athletes are always monitored in their developmental changes and skill acquisition.

The authors hypothesized that the disposition to learn new skills and face new challenges leads athletes to be more task-oriented and develop a more intrinsic motivation, which allows them to remain engaged in sport for a longer period and develop more effective coping skills during transitions and crisis (Abbott & Collins, 2004; Abbott et al., 2005). A particularly interesting aspect of this proposal consists in the introduction of psychological variables - and in particular dispositional behaviours as selection criteria - and in the establishment of *psycho-behaviours*, that have been defined as:

*"meta-activities that refer to both appropriate attitudes and the adoption of effective strategies within the learning environment as key to the development process"* (Abbott & Collins, 2004, p. 398).

In this definition, authors suggested that the use of metacognitive strategies in learning environments is crucial to develop the individual's potential. In terms of the attitudinal variables mentioned, motivation is identified

as the most important which allows for engagement in deliberate practice (Ericsson, et al., 1993), and supports a long-term engagement in sport.

The meta-cognitive strategies, on the other hand, represent those strategies that allow effective learning which consists in the ability to evaluate one's own skills, personal strengths and weaknesses, plan goals to overcome difficulties and reach certain levels of performance, and finally monitoring the overall results. Altogether, such abilities are called *self-regulatory strategies of learning* (Abbott & Collins, 2004, p. 399), and are defined as "*strategies that reflect on cognitive processes*" (Flavell, 1987, as cited in Abbott & Collins, 2004, p. 399). Therefore, self-regulatory skills lead the athlete to develop those *psycho-behaviours* that are particularly effective when facing environmental constraints and demands, since they lead to the development of effectively specific motor and psychological skills (e.g.: the mental approach to competition, injury or non-sport related crisis).

*Psycho-behaviours* are key elements in facilitating the interaction between the individual and the environment as they allow for an effective link between psychological abilities and athlete personality with environmental constraints and requirements (e.g.: in competition or in training) and allow the athlete to identify and learn the necessary skills to face a specific situation.

The relationship between *psycho-behaviours* and environment is intrinsically bilateral since they interact and influence each other: environment should be made up in the best possible way in order promote skill acquisition and the emergence of *psycho-behaviours*, which conversely influence the level of environmental requests, essential to increase the level of performance.

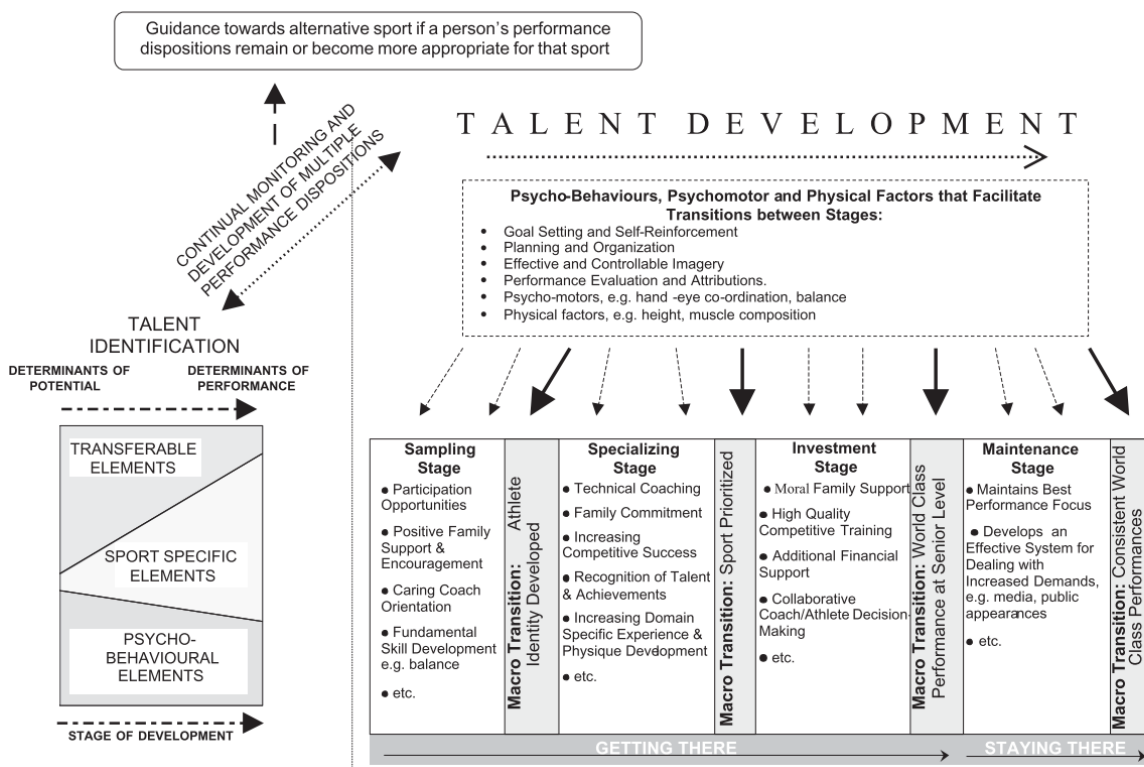


Figure 5 - Talent Identification and Development model (Abbott & Collins, 2004)

Figure 5 shows the model of talent identification and development by Abbott and Collins (2004), in which there are three key elements:

1. *Talent identification step*: where there is a distinction between determinants of potential and determinants of performance. In the early years, *transferable elements* are the most important determinants of potential, as they are transferable skills that can be learned in many sports and moved from one context to another (e.g.: from one sport to another) like basic motor abilities, perceptual abilities, tactical abilities and physical abilities (e.g.: flexibility). Next to transferable elements, another aspect of great importance in the initial talent identification moment is psycho-behavioural elements. Finally, in this step of talent identification, sport-specific elements have the less importance, as they are developed only with time. With the passing of time, the importance of these three elements changes and sport-specific elements become more important than transferable elements and psycho-behavioural ones.
2. *Talent development phase*: based on Côté's model (1999), the authors describe the developmental changes and transitions that occur in athletic career alongside technical and personal support that is important in every moment; moreover, they underline that an athlete shows effective potential development when he/she can effectively face the transitions from one phase to the following one, until he/she reaches his/her maximum potential, regardless of the competitive level or the environmental constraints. In this transition process, authors underline the importance of *psycho-behaviours* and *self-regulatory strategies*.
3. The third and last key element of the model concerns the need to emphasize the actual application and development of psycho-behaviours. They are indeed considered crucial to go through the process of talent development as they facilitate the transitions from one phase to the next and therefore promote the learning of sport-specific skills.

The main aspect of uniqueness of this model is that the variables used to identify and select young talented athletes are also the ones that are monitored and supported in all the process of development therefore assuring the highest coherence between identification and development.

### ***Holistic Ecological Approach, Henriksen - 2010***

The Holistic Ecological Approach (HEA) is one of the most innovative theories of talent as it starts with the study of the most effective environments – Clubs and sport organizations – which are the most effective in supporting young athletes in becoming elite athletes thanks to the support they give in the development of specific psycho-social and sport abilities. This new approach derives from the union of three main theories:

- The ecological model of human development by Bronfenbrenner (1979), which considers the importance of the links between the individual and the surrounding environment formed by a series of *nested* environments;
- The systems theory by Lewin (1936), that studies the complexity of systems in which individuals are embedded;
- Cultural psychology of Hofstede (1997), that highlights the importance of culture as a collective mind.

HEA defines talent as “*a set of competences and skills developed on the basis of innate potential and of multi-year interactions with the environment, as well as the ability to exploit the strengths and compensate for the weaknesses of the environment and to contribute to its development*” (Henriksen, 2010, p. 161).

Thus, the process of talent development is: “*the progressive mutual accommodation that takes place between an aspiring athlete and a composite and dynamic sporting and non-sporting environment, that supports the development of the personal, psycho-social and sport-specific skills required for the pursuit of an elite athletic career*” (Henriksen, 2010, p. 160).

HEA changes the definition of talent and talent development as it focuses on why and how some contexts are particularly effective in developing young talented athletes and taking them to an elite level. HEA hypothesizes that such contexts are characterized by certain elements that effectively help young athletes to develop specific skills – both in sport and personal life -, useful to transit to elite level competition (Henriksen et al, 2010).

One of the most innovative aspects of HEA’s perspective is that it refers to two working models to analyse the sporting contexts (Henriksen, 2010). The first one is the Athletic Talent Development Environment (ATDE), which can be considered as the structural model used to describe the sport organization and all its elements, both on a *microanalytical* (means near the individuals, like parents, coach, other athletes) and *macro-analytical* level (e.g.: Club, Federation, social culture, educational system), that surround the athlete (Figure 6). ATDE displays the environment like a circle divided into two domains that include sporting (e.g.: Club, managers, Federation, coach, teammates, etc.) and non-sporting contexts (e.g.: School, family, culture, etc.). Each one of these two domains have two levels: *microanalytical level*, which includes all the people which daily live in the sport environment (e.g.: athletes, parents, peers, school and teammates, coach); the *macro-analytical* level, which includes all the organizations and institutions which surround sport organization and indirectly influence it (e.g.: educational culture, sporting culture, Federation or Sporting Club).

Both levels influence, directly or indirectly, the development of psychosocial competencies and skills of the athletes involved, and each context differs from the other in the specific configuration of the level and its actors.

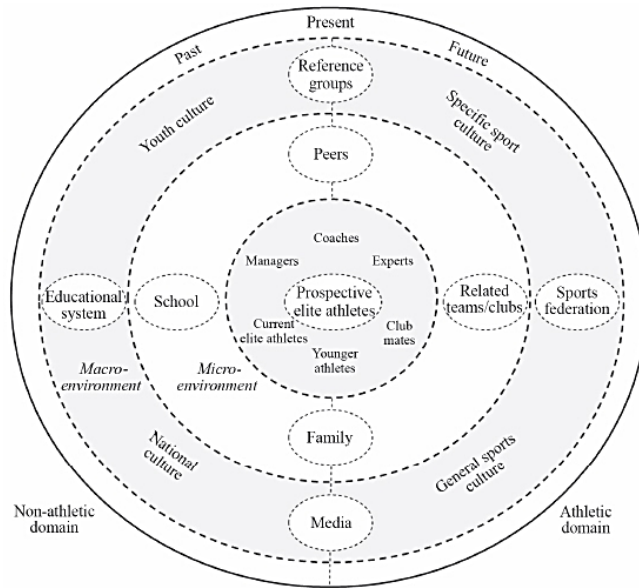


Figure 6 - Athletic Talent Development Environment (ATDE) - (Henriksen, 2010)

The second working model is called Environmental Success Factors (Figure 7) and describes the link between specific elements of the context and the outcomes of athletic development. These elements are: environmental preconditions (e.g.: materials, facilities, economic and human resources), the daily process in which such preconditions operate and develop specific skills (e.g.: training, competitions, camp), and finally, the organizational culture, made up of basic assumptions, values, norms, and artefacts (Schein, 1990). The result can be seen both in single athletic outcomes and on a team level (in case of a team sport) and is described as the psychosocial skills useful to progress from the junior level to the elite one (Henriksen, 2010; Henriksen, et al., 2010).

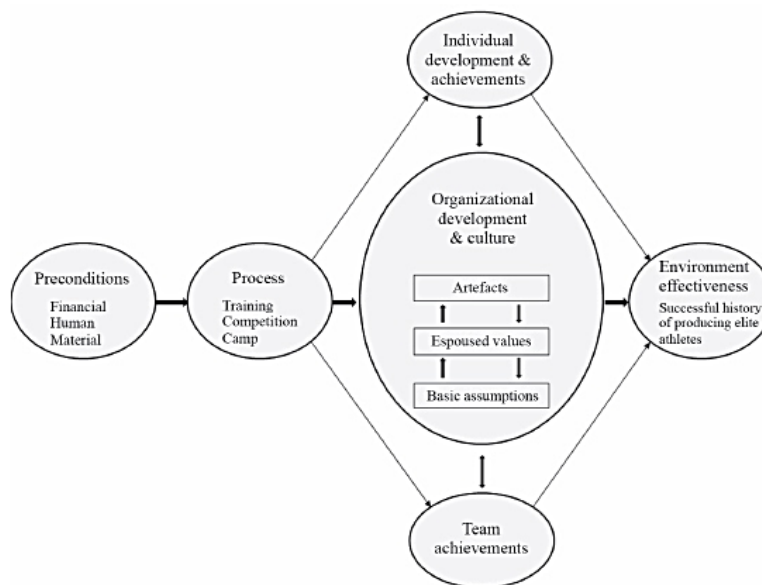


Figure 7 - Environmental Success Factors (ESF) - (Henriksen, 2010)

Henriksen (2010) considers a particularly effective environment one in which a sport organization brings many young athletes to senior level (at national or international level); such athletes hold a specific set of skills, both in sport and non-sporting contexts, that can help them not only in the transition to senior levels but also in the normative or non-normative transitions that follow (Stambulova, 2009). Henriksen's proposal is innovative since it allows to understand how each context should be considered as effective or not by considering the specific configuration of its elements. The model is also a useful tool for applied psychologists as it helps them in understanding the complex dynamic of sport contexts and has a more holistic view of them (Henriksen, 2015).

### ***Ecological – dynamic theory, Davids – 2010***

The ecological-dynamic theory originated from different disciplines, like ecological psychology, complexity science and evolutionary sciences, and assumes that to understand the process of talent development it is necessary to consider both the microstructure of training and macro-structure of the athlete (e.g.: his/her developmental history, or time in deliberate practice or play) at the same time (Davids, Güllich, Shuttleworth & Araújo 2017). To understand the idea of talent in the ecological-dynamic theory, it's necessary to understand how it defines human movement and the process of skill acquisition (more on ecological-dynamic theory in Davids, Araújo, Hristovski, Passos, & Chow, 2012 and Davids, et al., 2017).

In the complexity theory human movement is defined as a complex system that uses environmental constraints to adapt effective motor behaviours to specific required tasks (see Kelso, 1995 and Kelso, 2012). This means that over time people learn which are the most effective movements needed to perform specific environmental tasks (e.g.: run in different ways during a soccer match, defend or attack, vary the intensity or speed as required by the specific sport situation) thereby undergoing a skill acquisition process. As Bernstein suggested, learning coordination is: "*the process of mastering redundant degrees of freedom of the moving organ, in other words, its conversion to a controllable system*" (Bernstein, 1967, p. 127). According to this definition, to learn more specific movements it's necessary to go through a process of reduction of the body's degrees of freedom, in order to control an initial open system and to create adaptive behaviours that are focused on an objective.

Starting from this definition, movement acquisition in sport consists in learning the most effective movements and gestures to face the tasks required by the different sporting situations (or constraints), from the more basic (e.g.: shoot the ball) to the most complex ones (e.g.: shoot the ball into a specific place, like the soccer goal), to reach the best possible performance level (Travassos, et al., 2012; Bernstein, 1967). The concept of *constraint* is fundamental in ecological-dynamic theory since athletic skill acquisition emerges in the relationship between the performer and the environment, or more specifically, *environmental constraints*. They are like boundaries that constrain the interactions of system components (Newell, 1986) and are divided in:

- Organism-related (e.g.: height and body index, genetics or experience);
- Task-related (e.g.: the different steps of a specific jump in track and field);
- Physical-environment-related (e.g.: facilities and tasks organization).

Following this model, athletes adapt the degrees of freedom of their body from an initial open and not structured situation, to a more and more close and structured situation, depending on the constraints that the sport imposes them, to create a series of *intrinsic dynamics*. Such dynamics are defined as behavioural tendencies developed to face the constant interaction with the constraints imposed by the specific sport, in order to effectively learn its movements and tasks (Phillips, Davids, Renshaw, & Marc, 2010). The ability to modify such dynamics determines the flexibility of the athlete's learning skills, and therefore the possibility to develop functional adaptive behavioural patterns in increasingly demanding contexts. The faster the adaptive behavioural pattern is, the better the athlete's adaptation process to constraints will be. Davids and coll. (2013) showed how the skill acquisition process and the creation of intrinsic dynamics are the result of the performer's decision-making skills, which help him choose the more effective movement to face a specific situation.

Based on all these concepts Phillips and coll. define the athlete as: “a *complex neurobiological system, composed of many components or degrees of freedom on many system levels (e.g.: neurons, muscles, joints, segments, perceptual systems) [...] which self-organize under constraints*” (Phillips et al., 2010, p. 286).

Athletes are considered as pleiotropic systems, composed of many neurobiological systems that allow different movement solutions, and that work according to the principle of neurobiological degeneracy. Such principle allows different structural components to coordinate in a unique complex behaviour (Phillips et al., 2010). Following this principle, motor behaviours and high-level performance originate in many different ways, since each athlete can develop skills and intrinsic dynamics based on specific constraints, he/she faces during development (Davids, et al., 2017). The ecological-dynamic theory defines expertise as: “*the individual's capacity to functionally interact with key constraints (i.e.: task and environmental) in order to exploit them to successfully achieve performance aims*” (Davids, et al, 2013, pp. 23-24).

Therefore, following the ecological-dynamic approach, talent is:

*“a dynamically varying relationship captured by the constraints imposed by the tasks experienced, the physical and social environment, and the personal resources of a performer”* (Araújo & Davids, 2011, p. 24).

This definition suggests the following implications for practitioners:

- selection should not be based on the notion of optimal performance (e.g.: using physical tests or morphological characteristics of the athlete as indicators of future performance), but should rather

emphasize the individual nature of path of development, identifying which constraints have more influence on the development of the performance of each athlete;

- according to the principle of *functionality*, programs of talent development should support the young athlete's ability to face task constraints (Davids, et al., 2017), where environmental and task constraints help athletes in effective development and adaptation process to dynamically changing situations;
- *affordances* should be the main principle of talent development process, represented by functional relationships between the athlete and the environment, where the athlete uses his/her resources and abilities to solve situations (e.g.: training tasks). This means finding situations as similar as possible to competitions in order to develop the skills necessary to face competitive moments;
- finally, it would be crucial to identify the "window of optimal performance" in which the system is more prone to be subject to change demanded by internal and external constraints; therefore, it would be easier to develop new intrinsic dynamics which allow athletes to learn new skills in a more effective way (Phillips et al., 2010).



## *1.5 Overcoming the nature-nurture debate: from a dichotomous fixed mindset to a complex growth mindset*

The debate between the innate vision of talent and the development approach, known as nature-nurture debate, is of primary importance in sport context as it has deeply influenced theories on talent.

The term *nature* refers to an individual's innate characteristics that support his performance, while *nurture* indicates all those qualities that emerge from experience and learning (Davids & Baker, 2007). The question whether talent is innate or nurtured has characterized its scientific studies since its origins (Galton, 1869), and scholars have now concluded that it's necessary to overcome this dualist approach and adopt a more integrated one in which both innate and developed characteristics are considered.

In a recent work by Baker and coll. (Baker, Schorer, & Wattie, 2018), authors claim that personal beliefs about what talent is considered to be, models people's behaviour. Starting from the theory of growth mindset by Carole Dweck (Dweck, 1999; 2009), Baker and coll., affirm that every sport actor has his own concept of what talent is, and such beliefs orient the actions and behaviours they express toward people that are considered talented. Thus, if someone has an innatist vision of talent, his/her behaviours will be oriented by such beliefs and will cause certain reactions within the talented person.

Dweck (2009) suggested that there are two kinds of mentalities: the first one is called *fixed* mindset, and characterize those people that believe that abilities and skill are innate and cannot be changed (e.g.: a teacher with such mindset usually believes that students possess a certain level of intelligence and will always reach the same level of performance, thus he/she wouldn't behave in a way that allows them to improve). Opposed to this fixed mindset, there is a *growth* mentality, that characterise people that believe intelligence or ability can be modified with time, through a set of incentives or tasks (e.g.: a teacher who believe students can improve will behave in order to favour their improvement, adopting teaching strategies to their necessities). Therefore, starting from the premise that mindset is not linked to an initial level of ability and could be modified, Dweck suggested the 3 "*mindset rules*":

1. in a fixed mindset, the first main principle is "*be or appear good at something no matter what*", while in a growth mindset is "*learn something you like*", which underlines the desire to learn something because it's considered interesting. The first mindset leads to the desire to be better than other, while the second one leads people to learn something they are interested in, with enjoyment and no pressures to obtain certain results.
2. the second rule regards training: in a fixed mindset it is declined as "*don't train too much*", since something that requires too much effort implies the possibility to fail, which is considered as absolutely negative; in a growth mindset the principle states "*work or train with passion and commitment*", as the possibility to fail is considered a part of the learning process and it doesn't matter how much time or effort are required to improve;

3. the last rule regards mistakes: in a fixed mindset, they must be hidden, while in a growth mindset they are considered as part of the process and a requirement to improve.

Dweck believes that mindset can be instilled in other people through actions, behaviours and feedback: if outcomes that didn't require much effort are rewarded by positive feedback and awarding behaviours, this will transmit a fixed mindset, as the person might be more preoccupied to maintain such level of performance in order to gain further rewards and approvals. Conversely, if improvement outcomes and effort toward learning are rewarded positively, the person will learn that he/she could improve more and more to gain more and more feedback and will live errors as part of the process and not as a failure.

Wattie and Baker (2017) adapt Dweck's theory to sport context, analysing the consequences of a fixed or growth mentality on young athletes, such as Wulf and Lewthwaite (2009). Authors suggest that learning motor skills in sport implies two kinds of beliefs about abilities which are very similar to Dweck's mindset. The first one is the *inherent ability belief* (IA), and characterizes people that believe abilities are innate and cannot be modified. Such beliefs are reinforced by feedbacks focused on performance outcomes, that place importance on skill itself (e.g.: "*You are/are not very good at drawing*"). People with this kind of mindset usually are afraid to make mistakes, because they believe errors show a reduction in their ability level. Consequently, they set easy goals in order to reach them without much effort and feel they are competent in their ability or use *self-handicapping strategies* (Ommundsen, 2001). Fixed mindset doesn't distinguish the *personal skill level* from the *skill* itself, deleting the possibility to learn. This process leads people to develop negative thoughts and emotions about themselves and their abilities or abandon the activity to avoid failing again. Usually, people characterised by such a mindset have an ego-oriented motivation, that is often linked to excessive stress, burn-out, injuries, and over-training (Biddle, Wang, Chatzisarantis, & Spray, 2003).

The second mindset, on the other hand, is called *acquirable skill beliefs* (AS), and like Dweck's growth mindset, assumes that skills can be learned and improved through different strategies and behaviours. Such beliefs are reinforced by feedbacks and remarks that stress skill improvement and not on the person (e.g.: "*You've done a better drawing than last time, you've improved*"). People with this mindset usually set mastery goals to improve their competence and consider mistakes as part of the learning path (Wulf and Lewthwaite, 2009; Wattie and Baker, 2017). Many studies show that such mindset is often linked to more enjoyment and pleasure in skill acquisition and mastery (Biddle, et al., 2003): thus, if linked to a talent development process, such a mindset could support a mastery-oriented approach, long-term development and less stress for early performance (Côté, 2003, 2007, 2014; Baker, 2017b; Bergeron, et al. 2015; LaPrade, et al. 2016; Gledhill, Harwood & Forsdyke, 2017).

Since either mindset can be influenced by feedback received (Dweck, 2003; Wulf & Lewthwaite, 2009), it's essential that every sport actor – like coaches and parents - is aware of the impact actions and behaviours have on the athlete's approach toward learning in sport. Thus, it is necessary to set a dialogue on mindset within

sport and in particular in sport organizations which are specifically focused on talent development, to support a better approach toward learning and athletic well-being.

Theories exposed in section 1.4.1 of the current Chapter seem to be characterized by IA beliefs regarding talent as they consider talent as the possession of a higher level of a specific ability that is considered an indicator of adult performance. Therefore, such theories developed identification and selection procedures that focused on the young performance level rather than the potential for improvement and often overlooking many other variables that could support talent development in the long run. The following theories, and in particular the one from Abbott & Collins' model of talent identification and development, seem to be characterized by a growth mindset/AS beliefs as they consider the learning potential and focus on long-term development as a better indicator of effective athletic development.

### *1.6 Literature and mindset: conclusive considerations*

The literature review of talent development and the considerations on mindset bring some considerations:

- Except the earlier models, which was mostly inspired by the early identification of talent, theories from '80 -'90 years (cf.. Analytical Model by Stambulova, Model of Career Development by Wylleman, DMSP by Côté, ATDE-ESF Model by Henriksen and the ecological-dynamic theory by Davids and coll.), highlight the importance of some key actors in talent development process: parents (which belong to non-sport domain, but give a fundamental contribution especially in the earliest stages of the athletic career, being responsible for the approach toward sport and an effective relational and practical support throughout all athletic career) (Keegan, Spray, Harwood, & Lavalée, 2010), coach (which represents the main sport-specific actors responsible for a good within sport career, both under the athletic side and in the personal one) (Côté, Bruner, Erickson, Strachan, & Fraser-Thomas, 2010), and finally peers, teammates and siblings (that can function as role models or companions of experience within sport) (Baker, et al., 2003);
- Career development models, which cross talent development models (cf.. Analytical Model by Stambulova, Model of Career Development di Wylleman, DMSP by Côté), highlight that early years in athletic career should be characterized by learning and improvement focus, next to the development of transferable skills, both in athletic and relational side (LaPrade, et al., 2016);
- Multi-component theories (cf.. Gagné and Simonton) and ecological theories (HEA by Henriksen and Davids ecological-dynamic theory) stress the importance of the interaction between athlete and environmental constraints for the development of specific learning strategies, useful to reach a longer career within sport and better performances;

- Ecological perspective allows the identification of the mechanisms in the interaction between the individual and the environment in the development of certain psychosocial skills, necessary to progress in sport and life. Such theories don't reject the previous ones, but integrate them, trying to hold together the genetic factors that can facilitate athlete in skill acquisition, the environment – social and contextual -, with all its characteristics that support athletes in the developmental process. Ecological-dynamic theories strongly suggest the adoption of a growth mindset across all sport actors, to provide a better sport experience and a holistic wellbeing for athletes.
- To conclude, the ecological-dynamic perspective justifies the importance for the individual to be an active creator of own experience of development and growth, both as an athlete and as a person. Such a process is possible thanks to the interaction between personal characteristics, social support and overall sport environment where it takes place, that should support a skill acquisition rather a performance orientation.





## Chapter 2. Psychosocial factors associated with talent development

### 2.1 The socialization hypothesis

Since the beginning of the 21<sup>st</sup> century theories and models on talent have emphasized the complexity and dynamicity of its development, describing it as the result of the interaction between many elements, which pertain to both athletic and psycho-relational area (Abbott & Collins, 2004; Wikman, 2015; Macnamara, Button, & Collins, 2010a; Mills, Butt, Maynard, & Harwood, 2012).

The most recent theories such as the Ecological-dynamic theory on talent (Davids, et al., 2017) strongly stress the importance of the interaction between the individual and the constraints of its environment, tasks and abilities while the Holistic-ecological approach (Henriksen, et al., 2010) support the importance of the individual dispositions that support athletes in learning a set of psychosocial skills useful to effectively progress to senior elite level (Larsen, Alfermann & Christensen, 2012), highlighting the importance of the psychological skills in talent identification and selection process (Durand-Bush & Salmela, 2001). Unlike the *mono-dimensional* models of talent identification (see Chapter 1, paragraph 1.4.1), recent *multi-dimensional* theories assume that psychological aspects involved in athletic talent and that their development is somehow supported by the social environment surrounding the athlete. According to what Elbe and Wikman (2017, p. 239) call the “*socialization hypothesis*”, the development of personality and the social learning process take place *in and through sport*.

Finally, the latest theories emphasize an holistic view of the individual, considering the balance between all the spheres of life as crucial for an effective global development of the athlete (Wyllemann & Lavalley, 2013). Therefore, introducing the importance of social environment in supporting the young athlete and the importance of the holistic balance between all aspects of development, current literature seems to underline the importance of *psychosocial factors*, that are:

*“pertaining to the interrelation of individual psychological characteristics with social influences and to the ways in which these may shape or guide behaviours”* (Gledhill, et al., 2017, p. 93; Martikainen, Bartley, & Lahelma, 2002).

This definition highlights how elements from social environment, both from sport and personal context, interact with psychological characteristics (e.g.: motivation), influencing athlete’s behaviours (e.g.: practicing deliberate practice), and impact on the development of psychosocial skills, which are useful to progress in athletic career and to develop talent.

Based on this definition of *psychosocial*, we will briefly present: the main psychological characteristics that have been studied as characterizing youth elite athletes, the core social elements which have been found as most supporting in the development of young athletes, and the psychological well-being, that we consider as a ground-breaking basic condition for an effective youth athletic development.

### 2.1.1 Psychological factors involved in talent development

Despite the fact that their importance is now established (Gould, Dieffenbach, & Moffett, 2002; MacNamara, Button, & Collins, 2010b), one of the most complex aspect of introducing psychological factors in the development of sport talent was the difficulty in identifying, defining, evaluating and then selecting the most important ones, accompanied by the struggle of verifying if they really are predictive of an effective development or high level performance (Abbott & Collins, 2004; Morris, 2000).

Over time, many authors have studied psychological factors involved in talent development, but different psychological factors have been identified, opening some issues: it is probable that psychological factors are likely to differ from sport to sport, or in different career stages (MacNamara, Button, & Collins, 2010b); again, they can be defined differently in each research, or their definition could depend on the athletes involved (ie, 'élite' vs 'expert' athletes; Swann, Moran, & Piggott, 2015); finally, they could be culturally oriented and hardly comparable (Dohme, Backhouse, Piggott, & Morgan, 2017).

In order to set up a coherent analysis on psychological factors implicated in talent development, it's necessary to be clear on the words and definitions used. After widely analyzing researches on psychological factors implicated in talent development research, Dohme and coll. (2017) suggest a general classification to solve the ambiguity between psychological traits, characteristics, skills, abilities or competences:

1. *Psychological characteristics (PC)*: those qualities of the mind which are innate predispositions or personality traits, whose development can be influenced by environmental stimuli or performance challenges. (e.g.: motivation, self-confidence, sport intelligence). PC distinguish élite and non-élite athletes and facilitate performance. Moreover, they enable effective talent development by allowing athletes to negotiate challenges (i.e.: career transitions), providing competences to fulfill their potential. PC help athletes stay committed in sport and facilitate behaviours that underpin effective learning and development. Finally, PC can be strengthened by psychological *skills*;
2. *Psychological skills (PS)*: a set of skills of the mind that allow an individual to use learned strategies to accomplish specific results, or to regulate and develop psychological characteristics (e.g.: goal setting, reflection, self-talk). PS are taught explicitly or implicitly by the context and can be used individually or in combination.

Authors suggest that such classification can be used to understand if an article examines a characteristic or a developed skill, and, ultimately, distinguish the characteristics from developed abilities. Below, we will briefly synthesize the historical development of studies on psychological characteristics in talent identification and development.

From the 50s, many scientists have studied the psychological characteristics of talented people in sport: their studies followed the early theories and models on talent and their innatist approach (see Chapter 1 of the



present work) and were mainly based on personality traits. The main result of such researches concerns the impossibility to identify a unique pattern of personality which characterizes elite athletes, since athletes with different personalities can reach the same results (Abbott & Collins, 2004; Elbe & Beckmann, 2006). According to Elbe and Wikman (2017), such approach can be defined as the “*selection hypothesis*”, an innatist idea which suggests that people practice sport and remain engaged until they reach high level results because they are characterized by a certain personality pattern.

During the 90s, coherently with the development of sport psychology and mental training, the study of elite athletes focused on the psychological characteristics implied in their performance (Thomas & Thomas, 1999; Gould, Eklund, & Jackson, 1992; Gould, Jackson, & Finch, 1993). Such studies established the importance of psychological characteristics in performance, underlining that they could be trained through mental training techniques within and outside the field, thereby contrasting previous researches on personality which stressed the importance of inherited personality traits.

The change of paradigm from innatist to developmental theories in sport psychology marked the beginning of researches on psychological abilities of elite athletes, originating however the cited confusion between psychological skills and characteristics. One of the research *bias* in the field of psychological dimension in talent development concerned the sample involved: to understand which psychological characteristics or skills were needed to reach the elite level in a certain sport, adult athletes and their characteristics were used, believing that adult traits and abilities should be found in young ones.

With the Abbott and Collins’ theory on talent identification and development (Abbott & Collins, 2004), scientists have determined that the most important variables in selecting young athletes were the learning predisposition, the metacognitive strategies to face difficulties within and outside the field of sport, and motivation.

Recently, in examining the most important psychological factors in talent development, Elbe and Wikman (2017, pp. 236-237) identified that self-regulatory strategies and motivation have been recognized as being fundamental by all theories and research on talent. Specifically, authors claim that motivation and self-regulatory are necessary to keep up training over many years which is essential to achieve top-level athletic success. Therefore, such psychological characteristics allow individuals to learn effectively and to be particularly dedicated to sport activities and, combined with environmental factors, could lead the young athlete into a wellbeing state that seems to be particularly effective for athletic development.

Below, we will briefly describe motivation and self regulation that we consider to be the most important individual variables for an effective talent development path.

### *Individual motivation*

Motivation has been defined as a force or influence that causes someone to initiate and engage in an action for the expected positive outcome of this action (Heckhausen, 1988).

The most important theoretical frameworks on motivation in sport are Self Determination Theory (SDT) by Deci and Ryan (2000) and the Achievement Goal Theory (AGT), by Nicholls (1984).

Self Determination Theory (SDT) assumes that basic psychological needs of autonomy, relatedness and competence influence the motivational behaviours and goals of people. The need for competence is supported when individuals have the opportunity to seek challenges and express their capacities, relatedness is seen as a sense of belonging with others and the community and it is achieved through interpersonal connections and reciprocal care with others, while autonomy is when an individual act in ways that are congruent with his or her own interests and values. Deci and Ryan (2000) described varied types of extrinsic motivation, from the least self-determined (external, introjected) to the most self-determined (identified, introjected), based on the level of basic need satisfaction that the activity have. In the end there is the intrinsic motivation, that is the form of motivation where the motivation for acting derives from satisfactions found in the behaviour itself.

AGT instead, states that motivation is generated by two basic processes, namely the subjective perception of competence and the subjective ideas of success. Subjective perception of competence – that is very similar to self-efficacy (Bandura, 1997) - is defined as the self-evaluation that one has about his own level of competence in a specific area. It's different from the real level of competence because it's situational and not stable over time, thus it can change even within a match or during a training practice.

The subjective idea of success regards what a person considers to be a successful result in a specific activity, determining the meaning and importance given to such result and consequent emotions. Perception of competence and subjective idea of success are the basis of the individual *motivational orientation* that is fundamental to commit in a specific activity.

According to AGT, there are two kinds of non-mutually exclusive motivational orientations, named *Ego involvement* and *Task involvement*. In the first case, ego involvement leads an athlete to be focused on always being the best and on winning at any cost: the perception of competence and subjective idea of success are hetero-referred, and as such are mainly based on the comparison with others. In the second case, task involvement leads an athlete to be focused on improving skill competences: the perception of competence and subjective idea of success are self-referred because they are based only on the subjective comparison between the previous level of competence and focused on individual improvement in a specific task.

The combination of ego and task involvement originate 4 possible combinations of motivational orientation: high ego/high task orientation; high ego/low task orientation; low ego/low task orientation and low ego/high task orientation (Nicholls, 1984).

The motivational orientation of an athlete results from individual characteristics and situational elements: the subjective perception of ones' ability is linked to past experiences, cognitive reorganization strategies used after these experiences and feedback received from others. Experiences within different contexts (family, sport or school) influence the individual subjective perception of competence, leading people to develop specific

individual learning dispositions (Cox, 2002). Thus, parents and siblings, coaches or mates, teachers or peers can influence the subjective perception of competence through their feedback within a specific field of learning, leading the individual toward a more ego or task involvement. This kind of influence is called motivational climate, it's induced by significant others and indicates behaviours that reward victory or learning in a specific field, influencing individual motivational orientation (White, Kavussanu, & Guest, 1998; Eccles & Harold, 1991; Keegan, Harwood, Spray, & Lavallee, 2009; Allen & Hodge, 2006; Vazou, Ntoumanis, & Duda, 2005).

Individual motivational orientation - and motivational orientation induced by others - influences the kind of goals an athlete sets himself: an athlete with high ego and low task-orientation generally sets easy-to-reach goals in order to achieve them easily and win, or extremely hard-to-reach goals in order to be justified in case of failure from the objective difficulty of the activity. In both cases, the athlete will maintain his/her self-perception of "a not failing athlete" as he/she will safeguard his/her ability level from both an improvement or a failure.

Conversely, an athlete with high task and low ego orientation generally sets challenging but reachable goals that can be achieved with hard training and effort as they are proportionate to the current level of competence. In this case the athlete will gain a self-representation of being a "working athlete" which could fail but improve at the same time (Nicholls, 1989). The type of goals that an athlete sets himself influence his/her developmental path: too much emphasis on victory can lead to excessive stress, burn-out and drop-out from sport (Isoard-Gauthier, Guillet-Descas, & Duda, 2013; Eklund, & Cresswell, 2007; Cresswell, & Eklund, 2005; Lemyre, Hall, & Roberts, 2008); on the other side, exclusive attention on improvement can lead the athlete not to be satisfied with his/her results and maniacally search for perfection, without thinking of performance.

### *Self-regulatory skills*

Self-regulation (SR) was firstly defined as "*self-generated thoughts, feelings, and behaviors that are planned and cyclically adapted based on performance feedback*" (Zimmerman, 1989); more recently, it has been reformulated to indicate the degree of engagement in one's own learning process, to improve and master a specific task, thus:

*"a set of metacognitive, motivational, and behavioural processes that interact to allow the learner to be proactive in the learning process"*(Zimmerman, 2006, p. 705).

SR has been studied in many fields of learning, among which sport (Cleary, Zimmerman, & Keating, 2006; Chen & Singer, 1992). According to the social cognitive model proposed by Zimmerman, (Kitsantas & Zimmerman, 1998; Zimmerman & Kitsantas, 1996) self-regulatory processes are connected to self-efficacy beliefs, attributions, and self-satisfaction reactions (for an overview of all the SR models, see Panadero, 2017). SR is composed by two kinds of cognitive processes: motivation and meta-cognitive strategies.

Motivation concerns the intensity of an athlete's desire to pursue his/her sporting career or goals. It's influenced by self-efficacy beliefs and determines the athlete's commitment toward goals and performance (see the previous paragraph). Motivation is necessary for the athlete to engage in self-regulatory strategies as it expresses personal interest and passion for what is learned (Kitsantas & Kavussanu, 2011, p.221).

Meta-cognitive strategies concern the awareness of one's learning goals, the ability to monitor the overall learning process and to reflect on the adequacy of one's learning level in order to adjust it if necessary. The meta-cognitive part of SR is made of three phases:

1. Forethought: which precedes task practice and implies planning the necessary actions to perform it;
2. Performance evaluation and control: which occurs during task execution and implies monitoring the actions and comparing their adequacy with initial plans;
3. Self-reflection: which concludes each practice effort and implies the ability to evaluate the accuracy and effectiveness of what has been done to reach the task goals. Self-reflection processes influence forethought as it impacts on self-efficacy beliefs.

These three cognitive phases are strictly connected since a modification in one of them causes a modification in the other two (Kitsantas & Kavussanu, 2011, p.225). This meta-cognitive part of SR includes strategies widely studied in psychology like planning, self-monitoring, evaluating, reflecting (Zimmerman, 2006). Such processes, either individually or collectively, allow athletes to control their thoughts, feelings, and actions, helping them override counterproductive behaviours, difficulties or adjusting actions and behaviours during training (Toering et al., 2011). Over time, however, different SR constituent processes have been identified. For example, Young & Medic, (2008) identified four key SR processes:

1. goal-setting, useful to identify aspects of performance and skills that need to be improved and plan strategy implementation;
2. monitoring of strategy implementation in practice, to assure that they are correct;
3. monitoring of outcomes in training, to identify whether these strategies are improving the performance or if they should be corrected;
4. self-evaluation of training outcomes, to adjust behaviours in light of their outcomes. This last step can reinforce or readjust the current goals.

Toering, Jordet, and Visscher (2009) on their part identified six SR key processes, namely: planning, monitoring, evaluation, reflection, effort and self-efficacy. The first four describe processes similar to the ones identified by Young and Medic (2008): planning is similar to goal setting (point 1), monitoring and evaluation are similar to points 2 and 3, and self evaluation is similar to reflection, since it occurs after the end of the performance execution. Self-efficacy and effort on the other hand, mainly refer to the motivational aspects of SR, as they describe the type and intensity of engagement in a specific execution of a task during training and

the self-referred evaluation of competences and skills. Overall, these processes pertain to self-controlled cognitive aspects during an athlete's daily practice and by engaging in such processes athletes are able to improve positive practice behaviours and understand which actions they should avoid as they would have detrimental outcomes and ones they should improve as particularly effective for their practice learning (Young & Medic, 2008). This information on learning processes can be used to orient subsequent training goals, strategies or efforts (Baker & Young, 2014) and impact on self-efficacy beliefs.

One of the most used theories in the study of SR is Ericsson's deliberate practice theory (see Chapter 1), since athletes with higher levels of SR abilities are more facilitated in remaining engaged in training and competitions for a longer period of time and in facing growing challenges, with the desire to improve their abilities (Zimmerman, 1998). Recent studies show that SR supports engagement in deliberate practice, that in turn leads to improvement of specific skills (Baker & Young, 2014; Cleary, Zimmerman, & Keating, 2006; Ericsson & Charness, 1994), and in the development of expert performance.

Zimmerman (2008) pointed out that SR strategies allow learners to transform their mental abilities into performance skills, helping them to learn more effectively (Zimmerman, 2006) and regulate their own motivation and long-term goal striving efforts (Young & Medic, 2008). It has been hypothesized that highly self-regulated learners tend to attribute their outcomes to the specific learning strategy they used in learning situations (i.e.: training): this way, they are facilitated in selecting more adaptive strategies to overcome failures or difficulties during learning scenarios like training (Cleary & Zimmerman, 2001). Thanks to their higher levels of SR, expert self-regulated athletes could also be able to better understand the specific requests of a learning situation and apply a better strategy to face it, by understanding and planning their goals effectively, monitoring and evaluating their progress during execution or eventually applying some changes.

Moreover, Williams and Reilly (2000) claimed that a talented football player possesses personal characteristics that facilitate learning in training and competition, and SR can represent such skill since it allows individuals to develop their skills more effectively (Zimmerman, 2006). Thus, SR may be associated with faster performance improvement and better performance outcomes, which in turn leads to higher possibility to be selected for a youth team of a professional soccer club which increases the chances of becoming a professional in the future (Gledhill, Harwood, & Forsdyke, 2017; Toering, et al., 2009).

Over time there have been a lot of studies on elite athletes' SR processes and the majority of them have focused on understanding if SR is a feature that distinguishes competitive from amateur athletes (Cleary, et al., 2006; Toering, et al., 2009; Jonker, Elferink-Gemser, & Visscher, 2010; Kitsantass & Zimmerman, 2002; Bartulovic, Young, & Baker, 2017): all of them have shown that SR level helps differentiate between amateur from competitive young athletes as the former possess an higher level of SR skills.

Elbe and Wikman (2017) suggest that self-regulatory skills seem to support more possibility for development and talent enhancement during adolescence, which is also the most fruitful period for athletic development, just before the junior-to-senior transition. Therefore, it seems that SR is essentially a learning ability of elite young athletes, that over time can turn itself into more sophisticated psychological skills.

Being a dispositional characteristic – or a psychological characteristic -, SR is naturally possessed by individuals at different levels, but it can also be trained through specific cognitive strategies, or enhanced via educational strategies used by parents or coaches. Literature suggests that before one can be self-regulated one must be other-regulated: this means that SR skills are developed through instructions and feedback provided by others, such as coaches and teachers, which is largely the case in sports (Jonker, et al., 2010; Pintrich & Zusho, 2002), even if it's not an easy task (Chen & Singer, 1992; Zimmerman, 1986).

### *2.1.2 Environmental social factors*

In sport contexts, effective support from significant others (e.g.: coaches, teammates, parents, or siblings) has been identified as one of the most important resources for athletes' development (Côté, 1999). Better quality of relationships is linked to better recoveries from injuries, positive sport participation, increased self-confidence and better performance outcomes, and as a consequence, lower levels of burn-out (Rees, 2007; Sheridan, Coffee, & Lavallee, 2014; Larson, et al., 2019). This evidence led an increased awareness of the importance of social support in sport (Jowett & Lavallee, 2007) and consequently its promotion within sport contexts.

Studies on the influence of relationships in the development of athletes have begun “recently”: in 2000, Wylleman explored literature and found a lack of empirical research on measurement tools, opening the way for research in the field (Wylleman, 2000; Sheridan, et al., 2014). In the following years, the role of social environment and relationships in the development of young athletes become one of the most investigated topics in the field of sport psychology – see Chapter 1.

Holistic-ecological approaches and ecological-dynamic theories on talent development shifted the research focus on the personal side of athletes' development next to the athletic one, particularly taking into account the relationships with significant others as one of the most important variables for an effective personal and sporting development. Relationships with the coach, teammates, parents and siblings have been considered as the most influential relationships in the developmental path of young athletes. The conciliation between school and the athletic career (named dual career) is a hot emerging topic (Kuettel, Boyle, & Schmid, 2017; Debois, Ledon, & Wylleman, 2015; Henry, 2013), but it's not considered in this work.

Below, there we will described the main results of studies on the role of relationships in the development of young athletes, considering that parents, coach and teammates are the most important sources of motivation induced by others and consequently can impact on the expression of individual abilities and motivation and on the wellbeing of the athlete (Vazou, Ntoumanis, & Duda, 2006).

#### *Parents*

Parents play a fundamental role in the development of young athletes, as demonstrated since the early theories on talent development of Bloom (1985), and Côté (1999), which inspired the following researches (Duda & Horn, 1993; White, 1998; Gould, et al., 2002; Baker, Horton, Robertson-Wilson, & Wall, 2003; Wuerth, Lee,

& Alfermann, 2004), until the most recent holistic-ecological approach which considers parents as one of the micro-environmental factors that influence sport experience and development of young talented athletes (Henriksen, et al., 2010; Wylleman & Lavallee, 2004; Araújo & Davids, 2011). Sheridan and colleagues (2014) identified five variables associated with a good athlete–parent relationship, including: athlete task motivation, higher possibilities of elite sport participation, positive and effective athletic development, and reduction in drop-out risk.

Young athletes recognize the value of parents' involvement in their sport experience, as they provide emotional, but also logistic, economic and material support, that influence their motivation, enjoyment, and involvement in sport (Fredricks & Eccles, 2004; Knight, Dorsch, Osai, Haderlie, & Sellars, 2016; Knight, Boden, & Holt, 2010; Sagar & Lavallee, 2010). Research on parenting in sport regards three main themes: the quality of relationship between athletes and parents, the motivational climate induced by parents and the kind of parental involvement in sport.

Ullrich-French and Smith (2006) show that youth soccer players' perception of the quality of relationship with their parents was associated with a range of positive psychological outcomes, such as: self-esteem enhancement and supportiveness, loyalty and intimacy, companionship and play and conflict resolution. Results revealed that a better quality of parent-child relationships predicted higher levels of player enjoyment, perceived competence, self-determined motivation and lower levels of stress.

The motivational climate induced by parents was identified as a factor that strongly impacts on athlete's motivational orientation. Researches find that a parent-initiated motivational climate focused on task orientation has a positive influence on athlete task motivation and resulted in task-oriented goals (Kavussanu, White, Jowett, & England, 2011; Ullrich-French & Smith, 2009) that promote learning disposition. Atkins, Johnson, Force and Petrie (2013) found that parent-initiated task climate were significantly related to higher self-esteem, better sport competence, greater enjoyment, and in general on athlete's wellbeing. Other studies show that athletes perceiving their parents as less task and more ego orientated were more likely to drop-out from sports, underlining the negative impact of parents in influencing the decision to progress in sport career (White & Duda, 1993; White, 1998; Le Bars et al., 2009; Salguero, Gonzalez-Boto, Tuero, & Marquez., 2003; Fraser-Thomas, Côté, & Deakin, 2008).

Finally, other studies like Knight et al., (2016) underline the importance of recognizing the type of parental involvement in sport to understand its influence on children's behaviour. They used Eccles' model on parental influences on children's motivation and achievement (Eccles, 1993; Eccles, Wigfield & Shiefele, 1998) and applied it to sport context. The model asserts that parents' personal beliefs and behaviours influence children's beliefs, values, goals, and performance, together with a series of other socio-economic indicators. Knight and coll. (2016) suggest that parental involvement in sport could be associated with: the sport environment where sport is practiced and its focus on achievement, the kind of relationship between parents and other actors in

sport - like coach or other parents - parental knowledge of the specific sport (e.g.: personal experience as athletes, coach, or parent of older athlete), and their expectations toward their child's outcomes. Parental involvement can influence young athletes' experience in sport, determining whether they will continue or drop-out from it. Other studies found that parental behaviours that can influence children's experience in sport are linked to: emotional responses and reactions to stressful situations (Knight & Holt, 2013; Harwood & Knight, 2009; Harwood, Drew, Knight, 2010), past experiences within the same or a different sport (Dorsch, Smith, & McDonough, 2009; Dorsch, Smith, & McDonough, 2015), or the kind of support they provide during competitions (Dorsch, et al., 2015; Knight, et al., 2010).

In a recent review of potential sociological talent predictors in soccer, Reeves, McRobert, Littlewood and Roberts (2018) suggest that research on parenting in sport is currently focused on the experience lived by parents. For example, they cite Clarke and Harwood (2014) work on parents of young soccer players in the UK, examining the three socialization processes they underwent when entering the youth academy, which are: facing a new culture, enhancing their parent identity and the increase of their parental responsibility. Afterwards, Clarke, Harwood, Chris and Cushion (2016) found that families of young soccer players have a greater sense of closeness and a temporal significance of transitions in soccer. The cited studies underline that parents of young athletes experience a change in their parental-identity when their child enters a youth elite academy, also perceiving pressure from the elite context. Such results highlight the importance of taking into consideration this kind of experience when doing research on parenting and talent development and in applied practice within youth sport organizations.

In a recent position paper on parenting in sport Harwood and Knight (2015, p. 25) define parenting expertise as:

*“an involvement that increases the chances for children to achieve their sporting potential, have a positive psychosocial experience and develop a range of positive developmental outcomes”.*

Such kind of involvement should consist in:

1. selecting appropriate sporting opportunities and providing functional social support, during all career stages and transitions (e.g.: avoiding negative pressures on performance or early specialization, and proactively develop strategies to ensure they are able to support their children's needs) (Knight & Holt, 2014);
2. using an *authoritative* or *autonomy-supportive* parenting style (Maccoby & Martin, 1983), as they have been found to result in better outcomes for young athletes (e.g high level of mastery oriented goals, or higher satisfaction with sport involvement) (Juntumaa, Keskiivaara, & Punamäki, 2005);



3. managing the emotional demands of sport settings and serving as emotionally intelligent role models for their child. Parents that cope effectively with their emotions - such as anxiety, anger, fear of failure, disappointment, worry and all other emotions that occur in a competition, injury or after training (Omli & LaVoi, 2012; Knight & Holt, 2013; Dorsch et al., 2009) - are effective emotional models for their child;
4. maintaining a healthy relationship with significant others in the sport environment, such as coaches (Smoll, Cumming, & Smith 2011) or other parents (Knight & Holt, 2013). For example, Jowett and Timson-Katchis (2005) illustrated how parents can facilitate an effective coach-athlete relationship for their child by being a “psychologically-significant network member” within the coach-athlete-parent triad, maintaining an effective communication with the coach and helping his work, like supporting the athlete in healthy behaviours, such as rest and eating (Gould, Lauer, Rolo, Jannes, & Pennisi 2006);
5. managing the organizational and developmental demands they have as stakeholders in youth sport: recent studies suggest a more parent-centric stance in examining the effects of youth sport on families (Harwood & Knight, 2009; Lally & Kerr, 2008). Such studies suggest that parents have to cope with demands from a lot of points of view (e.g.: financial, emotional, logistic) to help their child’s athletic career, often altering the family daily life to cope with the necessary investments (Horn & Horn, 2007; Lauer, Gould, Roman, & Pierce, 2010). These changes could cause conflicts in the parental couple or between siblings, and parents should find a solution to not to damage the athletic career and preserve the family’s equilibrium (Fraser-Thomas, et al., 2008), without forgetting the educational and personal development of the athlete (Harwood & Knight, 2009; Harwood et al., 2010);
6. adapting their involvement and support to different career stages of their child’s development, as parents themselves experience some sort of transitions (i.e.: transition to elite centre of training, maybe at a very young age, or when it’s necessary to go abroad to train for very long periods and parents are not the only ones responsible for their child’s development) (Lally & Kerr, 2008; Lauer et al., 2010; Harwood et al., 2010).

To conclude, even if there is a lot of evidence on the impact of parenting style and behaviours in sport experience of athletes, very few studies are focused on how this impact happens. Moreover, many researches investigated parental experiences of supporting elite athletes retrospectively, but very little focused on strategies, actions or the perceived quality of relationship to support their children, or to reach such high levels of positive support (Taylor & Collins, 2015).

## *Coach*

Over the years, there have been different definitions and theories about *coaching* in sport (Poczwardowski, Barott & Henschen, 2002; Lyle, 2002; Jowett & Cockerill, 2002; Jowett & Poczwardowski, 2007; Jowett, 2007), and it has been conceptualized and studied through different frameworks: chaos, orchestration, holism, and/or integration (Jowett, 2017). From the first studies on coaching by Chelladurai (1990) and Chelladurai and Riemer (1998), that examined coaching from a leadership perspective, experts understood that it was missing the dimension of social relationship that coaching constitutes.

One of the most innovative approach in the socio-relational dimension of coaching was the one by Lyle (2002) that firstly stated that coaching is “*a process... dependent on the integration of the whole being greater than the sum of its parts*” (Lyle, 2002, p.97 as cited in Jowett, 2017), underlining the necessity to consider not only the people involved and their interactions, but also the outcomes of such interactions, that goes over the boundary of the simple relationship.

Starting from the definition of Lyle, Jowett and Ntoumatis (2002) defined coaching as an interpersonal process where the coach and the athlete are mutually engaged and the effectiveness of this link can be understood through the quality of the connections they develop. Specifically the coach-athlete relationship is considered:

*“a social situation continuously shaped by interpersonal thoughts, feelings and behaviors of the coach and the athlete” (Jowett & Ntoumatis, 2002, p. 249)*

According to Jowett and Poczwardowski, the quality of the coach-athlete relationship impact both on performance enhancement and psychological wellbeing (Jowett & Poczwardowski, 2007).

More recently Jowett and Shanmugam (2016) forge the concept of *relational coaching*, by which authors assume that the very heart of sport coaching is the interpersonal relationship between the coach and each single athlete or team member. Within such relationship the coach can establish a personal link with each athletes, knowing their strenghts and weaknesses, set individual goals of improvement, establish a one-to-one dialogue on goals and so on. The very center of the relational coaching is the relationship between the coach and the athlete, as neither one should gain results (in terms of performance, learning, improvement or record) without the other. In the “Model of 3C+1”, originally created by Jowett and Chaundy (2004), and then more and more developed till Jowett and Shanmugam (2016) work, the coach-athlete relationship is composed by four different aspects:

1. Closeness, that reflects interpersonal feelings generated by mutual respect, support and appreciation;
2. Commitment, that indicates the desire of maintaining a relationship over time;
3. Complementarity, which indicates mutual behaviors of co-operation during training or competitions;
4. Co-orientation, the “fourth C”, that describes the interdependence between the coach and athlete’s consideration about the quality of their relationship.

The quality of the coach-athlete relationship is the essence of coaching and defines its effectiveness: if it's made of respect, trust, and commitment, it can be labeled as a good or positive, relationship that supports the coach and the athlete in reaching their shared goals. On the contrary, when it doesn't contain such ingredients, the coach and the athlete are not engaged with each other and hardly share goals of development: such relationship is a negative one. Coaches are crucial in influencing the experiences of young athletes, impacting on enjoyment, motivation and the development of sporting skills and performances (Jowett, 2017; Côté & Fraser-Thomas, 2007). Sheridan and coll. (2014) identified the following variables as associated to a positive coach-athlete relationship:

- Athlete's motivation (Isoard-Gauthier, et al., 2013; Taylor & Bruner, 2012; Smith, Balaguer, & Duda, 2006; Adie & Jowett, 2010; Mata & Da Silva Gomes, 2013), satisfaction (Lafrenière, Jowett, Vallerand, & Carbonneau, 2011; Lorimer & Jowett, 2009) and positive development (Gould, Flett, & Lauer, 2012; Philippe, Sagar, Huguet, Paquet, & Jowett, 2011; Wylleman, De Knop, Sloore, Vanden Auweele, & Ewing, 2003); these studies underline the link between coaching – when it promotes a mastery climate - and athlete's feelings of autonomy and competence, the importance of supporting athletes through specific instructions and goals, the use of empathic and autonomy-supportive behaviors which help athletes to feel more satisfied of their results and more engaged in improvement and learning;
- Encouragement and support in elite sport participation (Le Bars, Gernigon, & Ninot, 2009), which underlines the importance of motivational climate created by coaches as a predictor of sport continuation at elite level, for example in the transition from recreational to elite level;
- Reduction in the level of stress and burn-out, a positive impact on coping skills development (Gould, Tuffey, Udry, & Loehr, 1996; Strachan, Côté, & Deakin, 2009b; Isoard-Gauthier, et al., 2013; Nicholls, et al., 2016) and reduction of drop-out (Le Bars, et al., 2009; Salguero, et al., 2003). In particular, a coaching climate focused on early performance, with ego-involving and mastery avoidance goals leads athletes to higher stress levels by consequently increasing their risk of burn-out or drop-out from elite sport, without reaching their full potential.

All these results support the importance of coaching behaviors and the quality of coach-athlete relationship in the effective development of the athlete, where it's possible to identify two main aspects:

- The relationship should be based on strong relational support and mutual respect between the two, and
- it should promote a mastery-oriented climate, focused on self-referred improvement, continuous learning and individualized goal setting.

Both those aspects seem to be the two most important dimensions in the relationship between an athlete and a coach, and the most effective in helping the athlete progress in his career. Thus, coaches must be aware of the

crucial role they play in the development of young athletes, next to the importance of establishing effective relationship with parents.

A great part of the athletic outcomes depend on the approach of an athlete toward goals, training and competition. Athletes who adopt mastery-approach goals are more likely to view difficulties (e.g.: transitions, injuries, failures) or demanding situations (like the increase of training volumes and demands) as challenging situations that must be faced by developing new skills; instead, athletes who endorse mastery/performance-avoidance or victory outcomes are more likely to experience threat in difficult situations (Nicholls, Earle, Fiona, & Madigan, 2017). Such findings means that athletes that consider stressful situations as a part of their career are more likely to use their coping skills and personal resources to find a solution and build new skills, both in sport and personal life, having the opportunity to grow up and being more competent (Adie & Jowett, 2010; Nicholls, Perry, & Calmeiro, 2014; Isoard-Gauthier, Trouilloud, Gustafsson, & Guillet-Descas, 2016; Nicholls et al., 2016).

Therefore, coaches who are able to create a mastery-involving environment by establishing a positive relationship with athletes provide them with direct psychological and behavioral benefits since they set up a learning-enhancement environment that is very effective for the athlete's psychological wellbeing. Coach behaviors like positive reinforcement and encouragement, mistake-contingent encouragement and technical instructions create a mastery-oriented climate which may lead to a reduction in performance anxiety levels and an increase in self-esteem among adolescent (Smith, Smoll, & Barnett, 1996), prosocial behaviour (Boardley & Kavussanu, 2009; Boixadós, Cruz, Torregrosa, & Valiente, 2004), intrinsic motivation (Newton, Duda, & Yin, 2000), and satisfaction with their level of improvement (Balaguer, Duda, Atienza, & Mayo, 2002).

#### *Peers or teammates*

The role played by peers or teammates in the development of young talented athletes has been always more considered in recent years, thanks to the introduction of complexity and holistic-ecological approaches (see Chapter 1). In 1987, Duda introduced the role of significant others in athlete's motivational orientation (Duda, 1987). However, it was only in the following years that studies started to specifically focus on peers, siblings and teammates' impact on motivational orientation and motivational climate (Vazou, et al., 2005; 2006; Duda & Balaguer, 2007; Keegan, et al., 2010) and on the decision to continue in elite sport (Le Bars et al., 2009). Such researches underline that the influence of peers positively impacts on the development of young athletes. Researches on peer motivational climate are often conducted together with studies on motivational climate induced by the coach, since they are seen as connected (García-Calvo, et al., 2014). Although the two actors can be considered as connected, recent studies show that the motivational climate induced by peers/teammates should be considered independently from coach-induced climate, since it has an autonomous influence on athletes' development, like sport participation, pre-competition anxiety and effort (Vazou et al., 2006; Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012), and team cohesion perception (Paskevich, Estabrooks, Brawley, & Carron, 2001; Bruner, Eys, Wilson, & Côté, 2014; García-Calvo, et al., 2014; Holt, Black, Tamminen, Fox, & Mandigo, 2008; Fry & Gano-Overway, 2010).

For what pertains motivational climate induced by peers/teammates, researches also show that like individual motivational orientation and motivational orientation induced by parents, a task-oriented motivational climate leads individuals to appreciate improvements, increasing effort and considering errors as a part of the learning process and growth, both of the team and of the single athlete, leading everyone to be more satisfied with their outcomes in competitions and remain engaged in sport. Conversely, a motivational climate focused on victory and success (i.e.: ego-oriented) leads to intensify the intra-team competition and comparisons between team members, considering errors as harmful for the team's victory or growth; such climate leads athletes to perceive a greater level of stress, to be less satisfied with their personal improvement, increasing the risk of burn-out (Boixadós et al., 2004; Balaguer, Castillo, & Duda, 2003; Balaguer, et al., 2002).

Motivational climate induced by peers can also influence the athlete's satisfaction with sport participation, influencing the decision to continue or drop-out from sport and consequently, the possibility to develop his full potential (Smith, 2003). In their review of factors associated with motivational climate, Sheridan et al., (2014) find that athletes with more positive relationships in sport were more likely to be motivated in continuing sport experience and avoid drop-out, felt more supported when entering an elite level of sport and have the possibility to experience friendships within the context of sport. Sport is a demanding and all-encompassing context and athletes often have difficulties in creating bonds and friendship outside of it, which is a dangerous aspect that can affect their personal and social development. Thus, the possibility to create positive relationships in a context where they spend lot of time and put a lot of effort, and the opportunity to share such effort and energy has a priceless value for a positive development of the athlete, even when marginal. These results show how group dynamics influence both the individual and the overall group developmental path, highlighting its interactive nature: individual behaviours and mutual relationships generate the group's motivational climate, and can also bring benefits to the individuals' development.

## 2.2 Wellbeing

Wellbeing is a complex multidimensional concept, that has been studied mainly from two perspectives, namely *hedonic* and *eudaimonic*; they can be considered two different parts of the same general concept of wellbeing, but their origin are very different (Huta & Ryan, 2010; Sirigatti, et al., 2009).

The hedonic perspective defines wellbeing from a subjective point of view (subjective well-being or SWB; Diener, 2009), considering the cognitive and affective evaluation that people have about their lives and consider being fundamental for their wellbeing, stressing in particular on contingent happiness, needs satisfaction and pleasantness of life as main elements on which wellbeing is based. This concept therefore implies a short term timeframe in the evaluation of wellbeing (Diener, Lucas & Oishi, 2002).

The eudaimonic perspective, on the other hand, introduces the concept of psychological wellbeing (Ryff & Keyes, 1995), which refers more to the possibility to reach human potential and to the resources necessary to reach an optimal level of functioning in the long term (Ryff, 1989). Carole Ryff is the main reference author of eudaimonic psychological wellbeing (or PWB): she affirms that wellbeing is based more on the

psychological abilities that people need to develop which will help them in effectively facing life challenges and crises (Ryff & Keyes, 1995). This particular point of view of wellbeing is based on the aristotelic idea of *highest human good* that could be reached not by the immediate satisfaction of personal needs and desires, but rather by actions, inspired by the mottos of “Know yourself” and “Become who you are”. This way it’s possible to understand the personal *daimon*, that is the inner nature inside everyone and bring it into the light (Ryff, 2013). Eudaimonic perspective on wellbeing is based on the union of different theories:

1. the process of individuation, by Jung (1933);
2. the model of psychosocial stages, by Erikson (1959);
3. the formulation of maturity, by Allport (1961);
4. the description of the fully functioning person, by Rogers (1961);
5. the theory of self-actualization, by Maslow (1968).

From the union of these theories and concepts, the authors created the *Multidimensional Model of Psychological Wellbeing*, which includes six dimensions (Ryff, 1989; Ryff & Keyes, 1995):

1. *self-acceptance*, a positive attitude toward oneself and one’s past life and experiences;
2. *positive relations with others*, which is the ability to have an open and satisfying relationship with others;
3. *autonomy*, or a sense of independence and self-determination in one’s own life;
4. *environmental mastery*, the competence to manage daily activities;
5. *purpose in life*, or the belief of a unique meaning of one’s life;
6. *personal growth*, a positive attitude toward new experiences and openness of mind.

In a revision of studies on wellbeing in elite athletes, Lundqvist (2011) noticed a confusion in the conceptualization of wellbeing in elite sport which resulted in a lack of studies on this topic and a difficulty in comparing the results of the few researches conducted. For this reason, Lundqvist suggested a model of wellbeing in elite sport which is based on the union of subjective and psychological wellbeing on both general and sport aspects of development (Lundqvist, 2011). The model lies on the awareness that athletes have two main areas of development - a “non-sporting/personal” area and a “sporting” one – and thus can experience a different kind of wellbeing in each. Therefore, Lundqvist tried to connect SWB and PWB both in sporting and non-sporting areas of athletic development, obtaining interesting results that have been organized into a model of wellbeing in elite sport (Lundqvist, 2011).

Later, Lundqvist and Sandin (2014) involved a group of elite athletes to explore more in depth which aspects characterize their wellbeing, both in sport and in their personal life, and which are the most important psychosocial factors that support them in wellbeing building. The study reveals that athlete’s personal history – made of behaviors, cognitions, emotions, cognitive self-schemas, life rules and social skills built throughout

life – had an impact both in sporting and non-sporting individual wellbeing. Moreover, the study shows how personal wellbeing in non-sporting contexts is viewed as a basis for sport-related wellbeing and as a protective factor when facing obstacles in sport. Athletes of the study described subjective and psychological wellbeing in the specific context of sport as follows:

1. Subjective wellbeing (SWB), is described as the interest in sport and in sporting practice itself that is strongly linked to satisfaction with results and the absence of negative situations (e.g.: injuries) that are considered as fundamental for the athletes to remain engaged in elite sport;
2. Psychological wellbeing (PWB) is made up of 6 different dimensions identified by Ryff (1989):
  - Self-acceptance, that in sport has been identified with: self-awareness of strengths and weaknesses, realistic evaluation of current performance level and future achievements, and acceptance of the difference between the person and the athlete's results;
  - Positive relations with others, specifically parents, siblings, peers for non-sporting contexts, and coach, teammates, and managers for sporting contexts. Athletes state that both contexts are important for their overall development and serenity, and that negative events in one of them also often generate negative consequences in the other one. For what concerns the coach, the main aspects of the relationship with this figure are: the feeling of security that comes from the relationship, engagement in personal and athletic development, the possibility to share personal thoughts and feelings and the sensitivity during moments of difficulty. Friendships within sport context are very important for athletes, since they often are the only ones that can be nurtured;
  - Autonomy, that is considered as the ability to regulate everyday behaviours and making decisions without the help of others or their direct request, as well as the awareness of the responsibilities of being an athlete;
  - Environmental control, that is seen as the ability to identify and use environmental resources to face everyday challenges (e.g.: combine school and training), or unexpected ones (e.g.: injuries);
  - Meaning in (athletic) life, that implies the effort to be devoted to a specific and higher life-goal through sport;
  - Personal growth, that concerns both athlete and the person, and implies the possibility to develop holistically, trying to connect all life's areas and feeling that each area brings positive effects on the rest.

This innovative study showed once more the necessity to adopt an holistic perspective on athlete's wellbeing, considering their sporting and non-sporting areas of development as strictly connected in influencing their

development and growth as a person and an athlete. Lundqvist's study clearly supports ecological theories on talent development as it underlines the connection between personal and sporting development, highlighting their reciprocal influence and the support that each one gives to the overall developmental experience of the athlete (Araújo & Davids, 2011). This consideration allows us to consider wellbeing from a psychosocial point of view as a ground-breaking condition for the effective development of young talented athletes.

The most recent theories on talent development assert that youth performance outcomes or maturation indexes are not reliable indicators of adult level of performance – also because of all the biases that influence it - (Baker, 2003; Vaeyens et al., 2008; Koz, Fraser-Thomas, & Baker, 2012; Balish, & Côté, 2014; Pennell et al., 2017). Starting from Abbott and Collins' model of talent identification and development, and proceeding with ecological-dynamic theories and holistic-ecological approaches, current literature suggests that talent indicators should be re-thought, since they should be able to identify behaviours and psychological skills useful to develop a learning disposition and allow a positive developmental experience of young athletes. Ivarsson et al. (2015), suggested that players who perceive their environment to be supportive and have a focus on long-term development are less likely to suffer from stress and experience greater well-being. Finally, psychological wellbeing, as formulated by Ryff and adapted in sport context by Lundqvist (Lundqvist, 2011; Lundqvist, & Sandin, 2014), seems to be a ground-breaking condition for a positive and effective development of young athletes, as it helps them in having a better awareness of strengths and weaknesses, creates positive links with others, and helps perceive a sense of meaning in life and a personal growth in sport that also supports them in their psychosocial development.

### *2.2.1 The link between psychological wellbeing and psycho-social factors implicated in talent development*

The previous paragraphs underline how athletes' wellbeing outcomes can be linked to the interaction between individual and social element: motivation and self regulatory skills are useful to set goals of improvement and performance, while social support from the coach, peers and parents seems to be linked to a mastery-oriented motivational climate, which is the essential ground for long-term involvement and learning experiences in and throughout sport, avoiding an excessive focus on performance and winning in the short term that can lead the athlete to stress and drop-out from sport. The importance of relationship in shaping the developmental path of young athletes is currently an emergin issue and their importance is increasingly been affirmed (Larson et al., 2019).

We assume a specific definition of relationship, which is inspired by the systemic-relational model (Cigoli & Scabini, 2012) and that defines relationship as both a mutual bond among people, that can be a constraint and a resource for them, and the set of personal meanings, values and expectancies people give to the relationship they are involved in. We believe that such approach give an added value to the current literature on talent, helping to deepen the understanding of positive or negative developmental path of young athletes.



In studies on wellbeing in competitive athletes based on the achievement goal theory (Nicholls, 1992; Harwood, 2008), researchers have investigated the association between a mastery- or performance-oriented climate and wellbeing. A mastery-oriented climate is characterized by an emphasis on personal improvement, a focus on cohesion and cooperation in team sports and is associated with a large number of wellbeing indicators, like:

- Decrease in the level of performance anxiety (the environmental mastery in Ryff PWB model)
- reduced distress toward the coach (positive relationship with others in Ryff PWB model)
- greater perceived competence (the personal growth in Ryff PWB model)
- higher sport satisfaction (self acceptance in Ryff PWB model)
- intrinsic motivation (purpose in life in Ryff PWB model)
- more positive affect and basic needs satisfaction (positive relationship with other in Ryff PWB model).

In a longitudinal study, a task-oriented parent-initiated motivational climate was positively linked to a decrease in anxiety over the competitive season (O'Rourke, Smith, Smoll, & Cumming, 2011). Moreover, the coach and peer induced task-oriented motivational climate has been positively related to athletes' moral attitude and wellbeing (Ntoumanis, et al., 2012).

Therefore, a positive social environment appears to be crucial for young elite athletes' wellbeing and effective development (Fraser-Thomas et al., 2008; Ivarsson, et al., 2015). Having better social relationships with significant others seems to be also related to a more positive development in other areas of life, such as personal development, education or friendship. Parents are the most important figures that help the athlete to develop also in other spheres beyond sport (e.g.: school), while peers are necessary to build social skills and friendships, both within and outside sport. The coach on the other hand, seems to be one of the most important figures in sport, being a mix between a “sporting parent” and a “sporting friend”, which should be able to build a positive relationship with the athlete, understand the athlete’s needs as person and his athletic potential, but also be able to create the right motivational climate by using the most effective behaviours and words. In contrast, a performance-oriented climate is characterized by rivalry, comparisons of performance among athletes, and a focus on success and results (Ullrich-French & Smith, 2006; Trenz & Zusho 2011; Smoll, Cumming, & Smith, 2011; Alvarez, Balaguer, Castillo, & Duda, 2012; Kipp & Weiss 2013; Lundqvist & Raglin, 2015), components that are all indicators of a lack of wellbeing, both from a subjective and a psychological point of view.

It seems that wellbeing, and specifically psychological wellbeing, can be considered as a particularly positive condition in which the athlete has the possibility to develop holistically. This means that from the aspects of personal growth, the athlete may develop higher self-acceptance and a greater sense of accomplishment in life, while from the athletic side he could be supported in the development of learning skills, positive motivational orientation and long-term involvement in sport.



## 2.3 *The importance of a sport specific approach in talent development*

From the first chapter, we can deduce that there is no unique or consensual definition of talent, since much of what is done to support its development is oriented by its theoretical or operational definition (Schorer, Wattie, Cogley, & Baker, 2017; Baker, Schorer, & Wattie, 2018; William & Reilly, 2000). Moreover, across sports the most talented athletes are defined by different indicators, but the majority of selection processes are *biased* by the indicator of “better performance than their peers”. Thus, it’s impossible to establish a single model of talent selection or development, or to find identical indicators of a better/worse developmental path. As Baker et al. states:

*“scientific evidence suggests that if it does exist, we don’t know what it looks like, and there are poor indicators of athlete’s potential”* (Baker, Schorer, & Wattie, 2018, p.59).

Therefore, we can only identify a series of characteristics and elements that support athletes in facing athletic and non athletic challenges, helping them in progressing from one step to the following one, in a general condition of wellbeing.

From this second chapter, we deduce that the most recent theories on talent development put a great emphasis on the concept of individual *potential to develop*, and on the notion of holistic approach to talented athletes. Talent development programmes should focus on understanding whether an athlete could benefit from such programme at a specific age or if it’s better to wait for his/her readiness, or on identifying which conditions better support the development of each young athlete’s potential.

Moreover, when selecting young athletes it’s necessary to understand the kind of relationships he/she is involved in, both in sport and out, in order to understand his/her ability to create positive links with others and the kind of support he/she receives from the significant others. Overall, we could deduce that talent identification and development is a rather complex, intricate and without a single answer process, in which many different approaches can be used (Sarmiento, et al., 2018).

Following Sarmiento and coll. (2018), soccer players’ performance emerges from a complex interaction of physical, technical, tactical and psychological skills that are influenced by the specific dynamics of the 90-minute game and by the specific gamers’ position in the field (Sarmiento, et al., 2018). In this last section we will present a brief overview of the main theories on potential predictors of talent development in soccer, since it’s the sport considered in our empirical research (see Chapter 3).

### 2.3.1 *Models of potential predictors of talent in soccer*

One of the first models of talent development in soccer was proposed by William and Reilly (2000) which assumed that talent identification is the process of recognising the potential to become elite players in sport.

The model analysed the 4 main phases of talent identification and development (detection, identification, development and selection), and the potential predictors of talent, (Figure 8), namely:

- physical predictors: include anthropometric characteristics of stature, mass, body composition, bone diameter, muscle girth, somatotype, growth and biological age;
- physiological predictors: include aerobic capacity, anaerobic endurance and anaerobic power;
- psychological predictors: divided into perceptual motor-skills (attention, anticipation, decision making, game intelligence, creativity and technical skills) and personality (self-confidence, emotional control, motivation and concentration)
- sociological predictors: include parental support and coach interaction, socio-economic status, education and cultural background and hours of practice (deliberate practice).

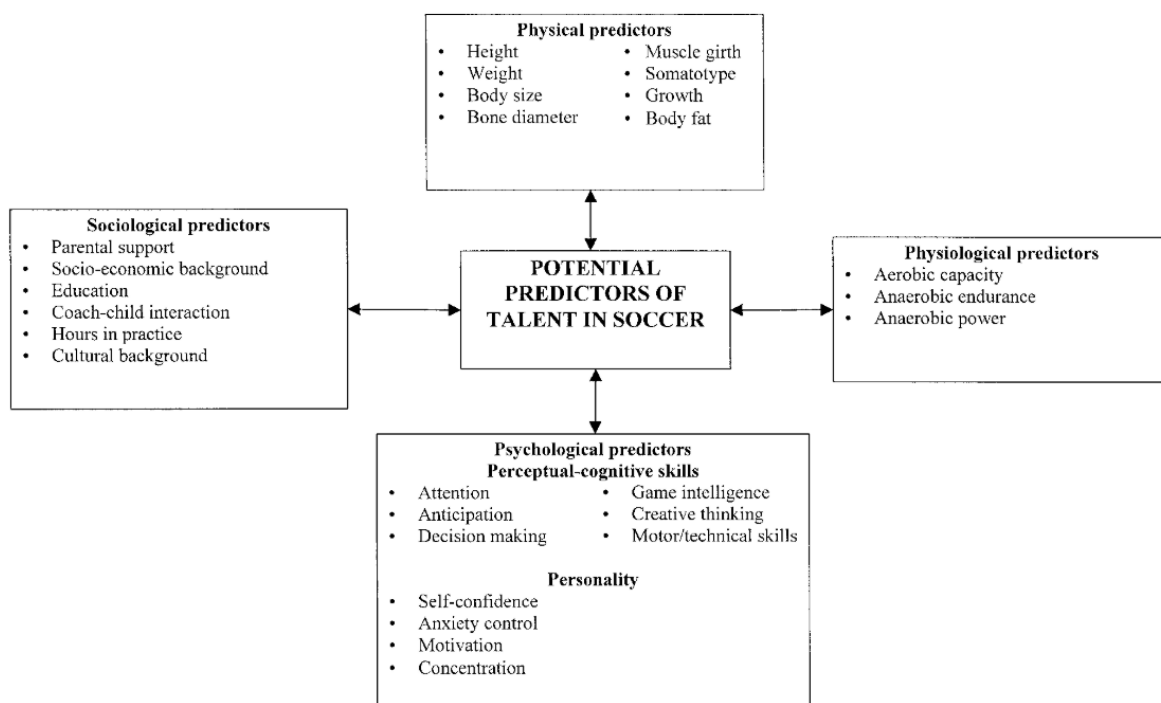


Figure 8 – Potential predictors of talent in soccer (Williams & Reilly, 2000)

This first attempt of systematizing knowledge on talent predictors in soccer has been recognized as not ultimate nor reliable at all, since the authors recognize that within athletic career there could be many kinds of changes, accidents, transitions (e.g.: injuries, moving from the club, changing of the coach, personal problems outside sport context and so on), or also particularly positive environmental conditions that make talent development a sort of gamble. Neither physical-physiological, nor psychological or sociological predictors have been found as ultimately reliable as the developmental path of each player is unique, and what can be seen as a weakness in a specific phase of their career can be transformed into a strength, or also what is seen as a particularly exceptional characteristics in an early phase can be lost with time if not adequately nurtured.

Despite the apparent lack of strong predictors of talent in soccer, Williams and Reilly suggested some possible directions of research, like a multidisciplinary approach to talent identification and development, a more holistic view of the athlete, an age-based criterion and longitudinal design of research in order to monitor the changes with time, having a gender approach and a final, fundamental focus on ethical and educational issues in selecting athletes for competitive elite levels, as their wellbeing and positive development should always be.

In 2012, Unnithan and colleagues presented a more holistic framework for talent identification and development, inspired by the newborn holistic-ecological and systemic theories of talent development (Abbott & Collins, 2002; Vaeyens et al., 2008; Henriksen, et al. 2010). Their work is inspired by Burgess and Naughton's model (2010), which specifically concerns team sports: authors started from the assumption that soccer is a complex sport, where the required skills must be performed in a rapidly changing environment under tiring conditions (Williams, 2000). Thus, they suggest that *small-sided games* and *real-task games* (e.g.: exercises that reproduce the real games' situations in a small space and stress the ability to read and solve the situation in a brief time) better indicate the cognitive and physical speed that a player possesses in facing such rapidly changing and challenging conditions. In such circumstances, all the abilities and skills of a player can emerge, as in real-task games all the dimensions of performance can be displayed (e.g.: physical, physiological and psychological). The main benefit of small-sided games is that players acquire skills useful in real match situations, within a smaller situation (Jones & Drust, 2007); thus, smaller-game approach could be used as a holistic mechanism to achieve this objective. The main weakness of this model is that it doesn't consider the psychological impact of small-sided games on players, since it only considers the technical and physiological sides of performance.

More recently, Sarmiento and colleagues (2018) systematically reviewed literature in talent identification and development in soccer, adopting an ecological dynamic approach (see Chapter 1, page 31). Authors gather that the most successful players show technical, tactical, anthropometric, physiological and psychological advantages that don't change with time or playing position. Moreover, they underlined that the majority of studies were focused singularly on task constraints, performer constraints and environmental constraints, with a minority of studies using a *multidimensional* approach (e.g.: the interaction between performer and environmental constraints).

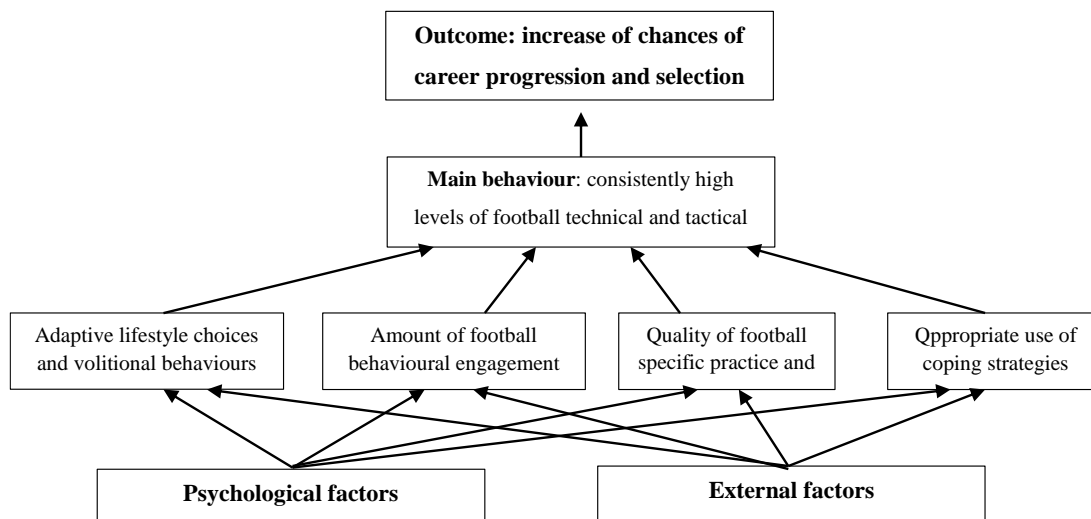
For what concerns the performer's psychological constraints, they find that the most successful players seem to display higher levels of motivation, discipline, resilience, concentration and commitment in sport, are more effective in finding more efficient stress-coping strategies, and have better sources of social support (Sarmiento et al., 2018).

The main weakness of previous researches and systematic reviews is that they simply provide a comprehensive analysis of the literature on talent development in soccer, identifying all the main issues and themes related to it, not really looking for a causal relationship between them. The work of Gledhill and colleagues (2017) on

the other hand, did not merely investigate the main psychosocial factors implied in talent development in soccer, but also tried to find links and establish a rank between more and less important factors.

In their work, the authors used the following frameworks: the holistic-ecological approach to talent development (Henriksen, 2010), researches on psychosocial factors in talent development (Holt & Dunn, 2004; Larsen, et al., 2012; Den Hartigh, Van Yperen & Van Geert, 2017) and career transition theories, which consider junior-to-senior as the most difficult transition in an athlete's developmental path (Stambulova, 2016; Larsen, et al., 2014; Stambulova, 2009; Wylleman et al., 2013). Gledhill and coll. created a conceptual map where they placed all psychosocial factors they found to be associated with talent development in soccer and linked them together, identifying some main categories between them.

Authors state that an increase in chances of career progression is the main outcome effect of a particularly effective talent development programme/path (e.g.: the possibility to face the transition from junior to senior, which often corresponds to the entrance in elite level of competition or selection by a coach or a scout). Such outcome is possible thanks to a complex interaction between athlete's psychological factors (eg., discipline, self-control, motivation, self awareness, determination, commitment, self-regulation, grit, and so on), environmental factors (eg., parental support and motivational climate, siblings and peers relationships, coach autonomy supportive leadership, and so on) and player specific behaviours, namely: adaptive lifestyle choices and volitional behaviours, amount of football behavioural engagement, quality of football specific practice and play, appropriate use of coping strategies and consistently high levels of football technical and tactical performance. To synthesize the complex content map of Gledhill and coll., we propose the following scheme:



It's clear that athlete's behaviours originate from a complex interaction between the individual's personality dimensions and the support received from significant others, and such observable behaviours can lead them to career progression as they influence coaches or talent scout's overall perceptions and lead the athlete to career progression (Gledhill, et al, 2017). Career progression, especially from junior to senior level, is recognized by literature on talent development as the most important outcome of effective talent development environment,

like Youth Academies (Henriksen, et al., 2010), that particularly support athletes in developing specific psychosocial skills, that help them in career progression and in the subsequent career phases (Larsen, et al., 2012).

### *2.3.2 Conclusive considerations about the importance of adopting a psychosocial approach to talent development*

Recent theories and models of talent identification and development focus on the need to adopt a psychosocial approach with young potential athletes, where individual aspects (e.g.: psychological characteristics) are influenced by the surrounding environment and influenced it. In a such complex context, it's necessary to pay attention to the individual wellbeing of the athletes, more than to his/her current performance level, as it's recognized as an optimal ground-breaking condition for effective personal and athletic development. This means adopting an holistic point of view on talented athletes, considering personal history, personality, dispositional skills of learning, motivation, as well the relationships he/she is involved in, both within and outside sport context, that impact the individual's psychological wellbeing.

Holistic-ecological approach on talent development allows to consider the environmental variables involved in talent development, while ecological-dynamic approach believes that talent is the result of *a dynamically varying relationship captured by the constraints imposed by the tasks experienced, the physical and social environment, and the personal resources of a performer* (Araújo & Davids, 2011, p. 24).

Following a psychosocial approach, we define a relationship not only as the bond that is created among two people, but also a set of meanings, values and expectations that they bring in and built together within the relationship. Therefore, in our vision relationships are not simply made of sharing moments, goals or results but also meanings, values and expectations that people bring to and co-build together in the relational space. We hypothesize that it's possible to introduce the concept of psychological wellbeing to describe the specific outcome generated by the interaction between individual resources and relationships that surround young athletes, which lead to a particularly effective condition in supporting talent development of young athletes.









## **Chapter 3. The research on the interaction between individual and relationship characteristics' and psychological wellbeing of Italian young soccer players**

In this Chapter we will analyse the influence of the interaction between personal and relational variables on the psychological wellbeing.

Firstly, it will be explained the research project that have been set up, with its methodological choices of participants measurement and procedures (sections 3.1.1 – 3.1.3); then there will be described the different analysis conducted, splitting them into four distinct studies (Study I, II, III and IV).

The first study deals with the reliability analysis of the scales used in data collection; the second study deals with the impact of the characteristics of players' relationships on their psychological wellbeing, while the third study analyses how personal characteristics mediate the impact of relationship's characteristics on psychological wellbeing. The last study deals with comparing how the variables in the model change within the competitive levels and age groups of players.

### *3.1 Methodology*

#### *3.1.1 Sample*

Using a purposive sampling methodology, the participants in this research were 417 male young soccer players from 2 professional (Serie<sup>2</sup> A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs, mainly situated in the north Italian regions. Their age varied between 14 and 20 years, with a mean of 16,2 years. Most of them were born in the first (N=148, 35%) and second (N=108, 25,4%) trimester of their year.<sup>3</sup> For more details see Tables 1 and 2.

381 players (91%) were born in Italy, while the remaining 36 (8,4%) were foreign: their nationalities were different and some of them indicated a double nationality (N=10).

Players' parents were also of Italian nationality (N=344, 82%), but many indicated a double parental nationality. Parental education was mainly a Higher Diploma (mothers N=198, 47% and fathers N=188, 45%), following by Degree (mothers N=101, 24% and fathers N=69, 16,5%).

Finally, most players lived with their parents (N=366, 87,6%), while a minority in a specific residential structure provided by the Club (N=28, 6,7%), or with one parent (N=18, 4,3%). For detailed information, see the Appendix B.

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<sup>2</sup> "Serie" = League

<sup>3</sup> 1 player didn't answer the all the questionnaire and his data were removed from the database, therefore the total sample consists in 417 players

<b>Age groups</b>			
	<b>Age</b>	<b>N</b>	<b>%</b>
Valid	14	58	14.1
	15	81	19.4
	16	89	21.6
	17	92	22.1
	18	41	9.8
	19	31	7.4
	20	5	1.2
	Total	398	95.4
Missing	999	20	4.8
Total		417	100%

*Table 1 – Age grouping of the sample*

<b>League groups</b>			
	<b>League</b>	<b>N</b>	<b>%</b>
Valid	SERIE A	60	14.4
	SERIE B	67	16.0
	SERIE C	162	38.8
	AMATEURS	128	30.6
	Total	417	99.8
Missing	999	1	0.2
Total		418	100%

*Table 2 – League grouping of the sample*

Other information about players and their families:

- Most players indicated that in their family people usually practice sport (75,4%);
- 112 (27%) players indicated that in their family there have been an athlete, specifically father (12,4%), grandfathers (4,3%), siblings (6,2%) or cousins/aunts (10,3%);
- 86% of players have at least 1 brother or sister, but only 14,6% of them practiced sport;
- 55,3% of respondents have practiced another sport in their life;
- On average, players have been playing soccer for 9,6 years;
- On average, players play in their current Club for 3,6 years;
- 59 players (14%) of the sample have played in the Youth National team of the respective category;
- 22 players were injured at the time of data collection.

### 3.1.2 Measurement

To collect a large amount of data in short time we created a multi-scale questionnaire titled “ME AND SOCCER” (see Appendix A). Next to a series of scales from literature, the questionnaire is structured in the following sections:

- a) personal information (e.g.: month of birthdate, gender, player’s nationality, parent’s nationality and educational level, domicile);
- b) sport specific personal questions (e.g.: “*Have you ever practiced other sport?*”, “*How long have you been playing football?*”, “*Have you ever played with the Youth National of your category?*”);
- c) sport specific family questions (e.g.: “*In your family do people practice sport, next to you?*”, “*In your family there are, or there have been, other high-level athletes/players? Who?*”, “*Do your siblings practice sport?*”);
- d) a final section about the subjective perception of the environmental support, with the following two questions:
  - “*How much do you feel supported in your development as player by the following people: parents, coach, teammates, school mates, friends, girlfriend, etc*” where players indicate their evaluation for each actor on a Likert Scale 1-5 (1= not at all, 5=very much);
  - “*Which picture best represent your Club?*”, where players could choose between 6 pictures that show different situation, (e.g.: a team hugging each other or an empty field with no one training or playing).

Between the abovementioned sections, were included the following scales:

1. Ryff’s Psychological Well-Being Scale (Ryff, 1989; Ryff & Keyes, 1995; Ruini et al., 2003), that has been adapted into Italian by Sirigatti and colleagues (2009);
2. Task and Ego Orientation in Sport Questionnaire (Duda et al., 1995), that has been adapted into Italian by Bortoli & Robazza (Bortoli & Robazza, 2005);
3. Parent – Initiated Motivational Climate Questionnaire (White, & Duda, 1992);
4. Self-Regulation of Learning Self-report Scale for Sport practice (Bartulovic, Young & Baker, 2017);
5. Coach – Athlete Relationship Questionnaire (Jowett, 2004);
6. Peer Motivational Climate in Youth Sport Questionnaire (Ntoumanis & Vazou, 2005).

Items were scored on a 5-point Likert-scale, ranging from (1) ‘Not at all’ to (5) ‘Very much’, except for Psychological Well-being Scale, which was scored on 4-point Likert Scale, ranging from (1) ‘Completely disagree’ to (4) ‘Completely agree’. Each scale was presented by a short sentence that introduced the main theme of the scale: e.g.: “*Think about your parents and how they behave towards your sport activity...*”.

To respect the scale's original meaning, a back-translation process was realized by the author of the present thesis and checked by a bilingual English-Italian translator (Brislin, 1986) for the following scales: Parent-initiated Motivational Climate, Self-Regulation of Learning Self-report Scale for Sport practice, Coach – Athlete Relationship Questionnaire and Peer Motivational Climate in Youth Sport Questionnaire. First the author translated each sentence of the scales, and contemporarily asked to the bilingual translator to do the same and compared the two versions. During cross-cultural translation process is fundamental to pay attention not just to linguistic aspects, but also to sample's psychological dimensions and cultural characteristics of the context where data will be collected. Thus, in order to verify the proper comprehension of the contents, a pilot data collection was planned with a small number of young soccer players. After making some minor modifications to the tool, the main data collection started. Some guidelines (Fowler, 2002) were followed in the construction of the questionnaire:

- Use validated scales whose reliability has been shown in previous studies.
- Limit the use of open-ended questions.
- Use a Likert scale with at least five steps to maximise the variance.

It also important to highlight that all the measure proposed in the questionnaire are self-report and based on individual perception even when concerning group and relational dimensions

### *3.1.3 Procedures*

After gaining the approval for the present research from the Ethical Commission of the University, professional, semi-professional and amateur Soccer Clubs involved in the research were contacted in different ways. Professional and semi-professional Clubs were contacted by a formal call by the Supervisor and Co-Supervisor of the thesis, which knows the managers of the Youth Academy or other technical figures. Amateur Soccer Clubs were contacted by personal knowledge of the authors of the thesis, as the contact and dialogue are easier in this former case.

A presentation of the research was created (e.g.: a brochure with the main aims of the research, technical information about the duration of the data collection and the contacts of the author), and sent by e-mail after the formal acceptance or telephonic contact. The brochure could be used by the manager to explain parents and coaches the main aims of research and the total duration of the data collection.

Before data collection the managers collected the informed consent from players' parents or from players themselves, if they were adult (18+). All participants agreed to take part in the research. See Appendix D for the full document of consent.

After informed consents were gained, a session of data collection was organized for each team, before or after one of the weekly training. Data collection sessions were organized in changing rooms or in meeting rooms, depending on the availability of each Club. Each team filled in the questionnaire in the same time and the researcher/author was always present during data collection sessions, together with coaches or some managers of the team.

Before each data collection session, the main aims of the research and the main tasks required were briefly presented to players by the researcher (e.g.: “*To investigate the experience players were living in their development as soccer players and to understand the involvement and role of significant others*”). The total duration of each data collection session was between 30 and 45 minutes.

A total of 428 questionnaires were collected and were firstly entered by an optical reader, that transformed data from the paper format into an Excel database. 10 questionnaires were discarded because they were collected in a female team, that would be non-representative for the research aims. Missing data were not considered for the relative analysis.





## *Study I – Reliability study of the scales used in the research*

After collected and entered the data, we conducted reliability analysis in each scale. In this preliminary study we runner Confirmatory Factor Analysis (CFA from now on), which is a theory driven confirmatory technique that belongs to Structural Equation Modelling (SEM) statistical methodology and is used to study the relationships between a set of observed variables and a set of continuous unobserved/latent factors (Schreiber, et al., 2006). CFA and SEM results can be interpreted based on the goodness of fit indices of the whole model and on the basis of the statistical significance of each parameter (Corbetta, 1992; Hu & Bentler, 1999). The model adaptation indicators are a measure of reliability, as they provide an approximate indication of the lack of fit between the theoretical model and empirical data (Browne & Cudeck, 1993). About the overall goodness of fit of the model, in this study different indices relating to the entire model and the individual parameters were considered:

<b>Model fit index</b>	<b>Description</b>	<b>Acceptable value for model fit</b>
<b><i>Chi-square statistic (<math>\chi^2</math>)</i></b>	The higher the probability associated with $\chi^2$ , the closer the fit between the hypothesized model and the perfect fit (Bollen, 1989)	p<0.05 / p< .0001  Note: $\chi^2$ is sensitive to the sample size, and with big sample size is highly probable to have a p-value <.05 even if the model fits the data (Corbetta, 1992).
<b><i>RMSEA (Root Mean Square Error of Approximation)</i></b>	Considers the error of approximation in the population (Byrne, 2006).	RMSEA<0.050 = GOOD 0.05<RMSEA<0.10=ACCEPTABLE RMSEA>0.10= NOT ACCEPTABLE (Lai & Green, 2016)
<b><i>CFI (Comparative Fit Index)</i></b>	Derives from comparison between the hypothesized and observed models.	CFI>0.950 = GOOD 0.900<CFI<0.0950 =ACCEPTABLE CFI<0.0900 = NOT ACCEPTABLE (Lai & Green, 2016)
<b><i>SRMR (Standardized Root Mean Square Residual)</i></b> <b>(used with continuous variables)</b>	Is based on average differences between observed and predicted correlation matrices. It represents the average value across all standardized residuals and ranges from zero to 1.00.	SRMR <.08 = GOOD MODEL FIT  (Hu & Bentler, 1999)
<b><i>WRMR (Weighted Root Mean Square Residual)</i></b> <b>(used with categorical variables)</b>	The WRMR has been tested with categorical variables; WRMR is also highly appropriate for data that are not distributed normally (Muthèn & Muthèn, 1998-2017).	WRMR <.1 = GOOD MODEL FIT  (Muthèn & Muthèn, 1998-2017)
<b><i>Factor Loading</i></b>	It refers to the fit of individual parameters in the model.	FL values >.05 indicate good fit Hair et al. (2004)
<b><i>Composite reliability</i></b>	It refers to the internal reliability; in other words, it shows if all the items have a good internal consistency.	

<b><i>Aikaike Information Criterion (AIC)</i></b>	It's an estimator of the quality of a model: it estimates the relative information that are lost by the model when it represents the data. It's a good choice when it's necessary to compare two or more models and decide which is better, since it deals with the simplicity of the model	Smaller is better: thus, when it diminishes the model is improving it's fit with data
<b><i>Bayesian Information Criterion (BIC)</i></b>	It's very close to the Akaike indices, since it is based on the likelihood function.	Smaller is better: thus, when it diminishes the model is improving it's fit with data

Table 3 - Model fit Indices with a brief related descriptions and acceptable values for model fit

The CFA were performed with Mplus 7.11, developed by Muthèn & Muthèn (1998-2017), while other analysis was performed by IBM SPSS 20 (Statistic Package for Social Sciences).

### **Brief explanation of McDonald Omega**

To estimate the factorial internal consistency in our CFA we used McDonald Omega instead of Cronbach Alpha, since it appears a more reliable indicators of consistency following the most advanced theories (Dunn, Baguley, & Brunnsden, 2014). Dunn and colleagues (2014) demonstrated that Alpha is used to measure internal consistency only when the assumptions of *tau-equivalent model* (McDonald, 1999), or “true-score equivalent” are met. Such models assume constant item variances for the true scores, allowing both the true score means and the error variances of the items to vary. Assuming the true score variance is constant across all items is exactly where Alpha runs into problems, as the possibility of a scale resulting in equal sensitivity across all items is unrealistic in social sciences research. Therefore, Dunn et coll. suggest different models to overcome Alpha in psychological research - including McDonald Omega - starting from the observation that *congeneric models* seem more suitable for such measures. Congeneric models allow means and variances of the true scores and the error variances to vary, that is more suitable for psychological measurement methods. Congeneric models differ from other models because it assumes that each item measures the same latent variable with possibly different scales (Graham, 2006). To conclude, McDonald Omega can be defined as the proportion of total score variance that can be attributed to all factors, group and general factors: its values are between 0 and 1, and the best values are higher than .60.

### *Ryff's Psychological Well-Being Scale (Ryff, 1989; Ryff & Keyes, 1995) - RPWB*

The original RPWB Scale had 120 items that describe the 6 constituent dimensions of psychological wellbeing following Ryff model: self-acceptance, positive relations with others, autonomy, environmental mastery, purpose in life, and personal growth (for a detailed explanation of the factors, please see Chapter 2, pgg.66).

The RPWB Scale have been adapted into Italian first by Ruini and coll. (Ruini et al., 2003), and then used with a sample of adolescents by Sirigatti and colleagues (2009).

The Italian version of RPWB Scale by Ruini and colleagues (2003) consisted in an 84 items self-rating inventory assessing the six dimensions of psychological wellbeing. Sirigatti and colleagues started from the Ruini and coll. Italian version of RPWB Scale (2003) and studied its psychometrics properties with the aim of analysing its reliability into a sample of young adolescents and compare different versions (54, 42 and 18 items). Their results were uncertain, as they provided some further confirmation to the previously reported factorial structure of the original version of the scale, in particular for the 18-item built on the base of the literature suggestions, but they weren't able to select the best model between the tested ones.

The 18-item version of the scale is the most criticized in literature (Springer & Hauser, 2006; Clarke, Marshall, Ryff & Wheaton, 2001; Van Dierendonck et al, 2008), but it seems to be the strongest one, despite its weaknesses (Sirigatti et al., 2009; Clarke, Marshall, Ryff & Wheaton, 2001; Springer & Hauser, 2006; Lindfors, Berntsson, & Lundberg, 2006). One of these weaknesses is an overlap between some factors of the scale and high correlations between all of them, that may suggest the presence of a second order latent factor (Burns & Machin, 2009; Sirigatti et al., 2009; Springer & Hauser, 2006). Such results lead us to be cautious in using this scale, but also justify our difficulties in obtaining a result similar to literature. Below we will present the analysis we have conducted on RPWB Scale.

#### *Sample*

The sample of this analysis were 416 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16,2 years. From the overall 417 participants 1 player did not answer to all the questions of the scale and were removed from the analysis.

#### *Measurement*

We use the RPWB Scale 18-item version, as proposed by Ryff & Keyes (1995) and studied into Italian context by Sirigatti and coll. (2009). It measures 6 constituent dimensions of psychological wellbeing by 3-items each dimension, specifically:

- Dimension 1: self-acceptance (SA), (e.g.: “*In general, I feel confident and positive about myself*”);
- Dimension 2: positive relations with others (PR), (e.g.: “*I often feel lonely because I have few close friends with whom to share my concerns*”);
- Dimension 3: autonomy (AU), (e.g.: “*It’s difficult for me to voice my opinions on controversial matters*”);
- Dimension 4: environmental mastery (EM), (e.g.: “*I am good at juggling my time so that I can fit everything in that needs to get done*”);
- Dimension 5: purpose in life (PL), (e.g.: “*I am an active person in carrying out the plans I set for myself*”);
- Dimension 6: personal growth (PG), (e.g.: “*I think it is important to have new experiences that challenge how you think about yourself and the world*”).

Items were scored on a 4-point Likert Scale, ranging from (1) ‘Completely disagree’ to (4) ‘Completely agree’. To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

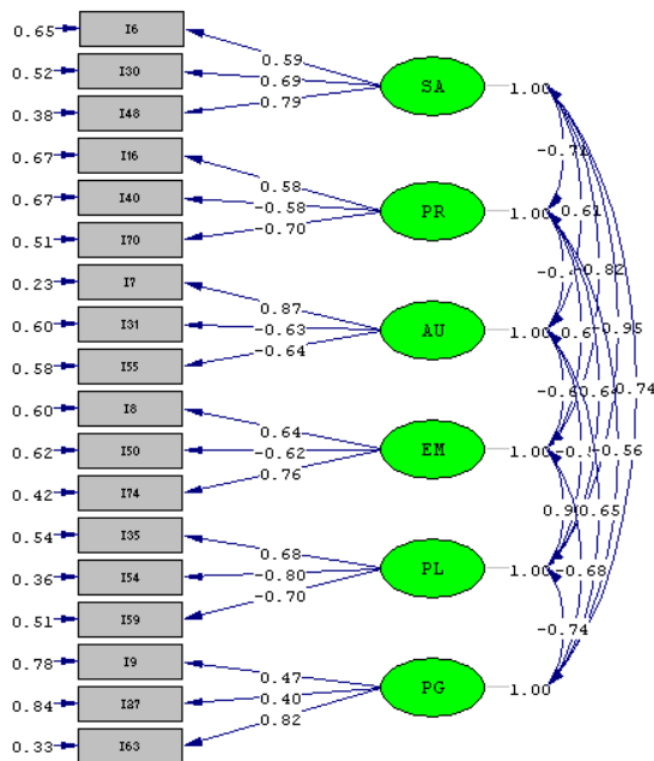


Figure 9 - Factorial structure of the Ryff 18-Psychological wellbeing Scale from Sirigatti et al. 2009

### Analysis

Using SPSS.20, we tested items’ scores for normality that shows a non-normal distribution in responses (see Appendix E). This could be imputed to the 4-point Likert Scale, which could lead to a positive-negative

polarization of responses, found also in other works (Sirigatti et al., 2009); therefore, we treated factors as categorical when running the subsequent analysis. Skewness and kurtosis were analysed for each item and show that only item 5 show problems (skew: 1,650; kurt: 1,960). After creating factors following literature suggestions, we calculate mean and standard deviation for each, that are reported below (Table 4), together with the McDonald  $\omega$ . Mean values can vary between 3 and 12, as suggested by authors (Ryff & Keyes, 1995), the score at each factor is calculated as a sum between the three constituent items.

<b>Factor</b>	<i>Mean</i>	<i>sd</i>	<i>McDonald <math>\omega</math></i>
<b>Self-acceptance</b>	9.49	1.31	.529
<b>Positive relationship with others</b>	9.92	1.55	.588
<b>Autonomy</b>	9.31	1.52	.459
<b>Purpose in Life</b>	9.46	1.70	.476
<b>Personal Growth</b>	9.99	1.34	.409
<b>Environmental mastery</b>	9.18	1.56	.430

Table 4 - Mean and standard deviation

Then we ran Confirmatory Factor Analysis (CFA) using Mplus 7.11 (Muthèn & Muthèn, 1998-2017), following the original 3-item 6-factors solution (Sirigatti et al., 2009), using WLSMV (Weighted Least Squares Mean and Variance Adjusted) as model estimator, as it's more suitable for categorical distribution (Li, 2016; Muthén, duToit & Spisic, 1997). Also, the variables were standardized to have a mean of 0 and a standard error of 1.

## Results

**Model 1: original 18-item 6-factors.** We first ran the CFA as suggested by Sirigatti and coll (2009) and Ryff & Keyes (1995). The result underlines a problem with the latent variable covariance matrix for factor “Personal growth”, that emerged as problematic<sup>4</sup>, and must be removed from the model. Moreover, CFI was under the edge of acceptability (>0.90) and WRMR was over 1.

**Model 2: no “Personal growth” factor.** We remove “Personal growth” factor from the model and re-ran the CFA, obtaining an improvement in model fit indexes (CFI arrives to the limit threshold of 0.900, but WRMR still exceeds 1). Exploring the Standardized Results section, we noticed a high correlation between the following factors:

- “Environmental mastery” - “Self-acceptance”: .801;
- “Environmental mastery” - “Purpose in Life”: .892.

Too much correlation between two or more factors could indicate a difficulty in discriminating between different dimensions, therefore we decide to remove from the model also the factor “Environmental mastery”, as it is over-correlated with the others two.

<sup>4</sup> Mplus Warning is: The latent variable covariance matrix (psi) is not positive definite. This could indicate a negative variance/residual variance for a latent variable, a correlation greater or equal to one between two latent variables, or a linear dependency among more than two latent variables.

**Model 3: no “Personal growth” and “Environmental mastery”.** After removing both problematic factors, we obtained the best solution in model fit indexes (Table 5 and 6): all goodness of fit indices is in their respective acceptable-good threshold and Chi-square value clearly diminishes: it’s possible to conclude that this is the solution that best fits our sample. Items factor loading of the remaining factors is between .30 and .77, ( $p < .0001$ ).

Model n°	$\chi^2$ (df)	RMSEA	CFI	WRMR	p***
<b>M1 18-items, 6 factors</b>	262.285 (120)	.053	.880	1.069	.0001
<b>M2 15 items, 5 factors</b>	186.296 (80)	.057	.901	1.038	.0001
<b>M3 12-items-4 factors</b>	100.635 (48)	.051	.924	.912	.0001

\*\*\* $p < 0.05$  /  $p < .0001$

Table 5 - Models and related fit-indices

Factor correlations M3	1	2	3	4
<b>Self-acceptance</b>	1			
<b>Positive relationship with others</b>	.30**	1		
<b>Autonomy</b>	.25**	.20*	1	
<b>Purpose in Life</b>	.53**	.21**	.60**	1

\*\* Correlation is significative at 0,01 (2-tails).

\* Correlation is significative at 0,05 (2-tails).

Table 6 - Factor correlations of Model 3

## Discussion

McDonald  $\omega$  shows quite low values in the internal consistency of the factors, as they are all under the cut-off value of .60. In reading such result, it’s important to keep in mind that each factor is composed by only three items, which is under the common number of items in a factor. Moreover, we should consider that we use a 4-point Likert scale, which limits the variance in responses (an important assumption when calculating the reliability, see the explanation of McDonald Omega at pg. 6). It’s also important to keep in mind that RPWB Scale is the only scale in our questionnaire which doesn’t belong to the sport context and it has been little used in such context. Therefore, it’s possible that a more sport-related Psychological wellbeing scale would result in a more accurate measurement. Therefore, even if the remaining factors have an average internal consistency, we decide to maintain them in our model.

CFA also indicates that not all factors are suitable in our sample to measure players’ psychological wellbeing but that only four of them do. Specifically, it seems that *self-acceptance* (that is a positive attitude toward oneself and one’s past life), the ability to create *positive relationships* with others, *autonomy* (that is a sense of independence and self-determination in own’s life) and a *sense of purpose in life* (that means having a belief of a unique meaning to one’s life) constitute the psychological wellbeing of our sample of players. Therefore, in the following analysis we will consider them as the constituent dimension of the psychological wellbeing.

## *Task and Ego Orientation in Sport Questionnaire (Duda et al., 1995; Italian version by Bortoli & Robazza, 2005)*

Duda (1989) and Duda and Nicholls (1992) converted Nicholls' Achievement Goal Theory from the academic domain to the sport domain and produced the Task and Ego Orientation in Sport Questionnaire (TEOS-Q), that measures individual differences in proneness for emphasizing task and ego involving criteria for defining success in athletic settings. TEOS-Q showed acceptable psychometric properties within Countries and has been used in the sport context since the late 1990's (Lochbaum et al., 2016; Castillo, et al., 2010). In Italy, Bortoli and Robazza contributed to the validation of the TEOS-Q in Italian language (Bortoli & Robazza, 2005) and then to its application obtaining interesting results (Bortoli, Bertollo, & Robazza, 2009; Bortoli, et al., 2011). It has always shown good reliability values and therefore we consider it a valid tool for motivational orientation measurement in Italian context.

### *Sample*

The sample of this analysis were 417 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years.

### *Measurement*

We use the Task and Ego Orientation in Sport Questionnaire (TEOSQ), as proposed by Bortoli and Robazza (2005), which consists in 13-items and 2 scale tools, that assess:

- Ego Orientation, (e.g.: *"I feel successful in sport when the others can't do as well as me"*);
- Task Orientation, (e.g.: *"I feel successful in sport when I work really hard"*).

Items were scored on a 5-point Likert-scale, ranging from (1) 'Not at all' to (5) 'Very much'. To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

### *Analysis and results*

Using SPSS.20, we tested items' scores for normality, but it shows some problems in skewness and kurtosis of items 2,7, 8,10 and 13, underlining a non-normal distribution of the responses (see Appendix E). Therefore, in conducting the CFA analysis, we use MLR (Maximum Likelihood Robust) estimator. After creating factors following literature suggestions, we calculate mean and standard deviation values for each, that are reported below (Table 7), together with the McDonald  $\omega$ .

<b>Factor</b>	<i>Mean</i>	<i>sd</i>	<i>McDonald ω</i>
<b>Ego</b>	3.22	.85	.826
<b>Task</b>	4.29	.54	.812

Table 7 - Mean and standard deviation

We first ran CFA following literature suggestion, with standardized variables to have a mean of 0 and a standard error of 1, but the resulting model didn't fit the data well (M1): CFI was too low and SRMR was over its threshold of acceptability (SRMS <.80) (Table 8).

As the two factors were consistently robust and internally coherent - factor loading is between .61 to .78, ( $p < .0001$ ) - and result section didn't report any warning or error in the model, we look at the modification section to find useful indication to improve model fit. Therefore, we find that the correlation between the following item 6-4; 10-2; 13-8; 9-4; 10-8; 9-6 would improve the model fit significantly. Before adding items correlations, we checked that the items shared similar meaning or belong to the same factor. Then we add correlations and re-ran the CFA analysis (M2), which resulted in huge improvement in model fit indices (Table 8). All goodness of fit indices improves and reach the respective threshold of acceptability: thus, to choose the best model we compare AIC-BIC values, that are threshold free and indicates the better model between more only by lower values. We decide to choose M2 as more suitable for our sample, as suggested by AIC-BIC comparison. The correlation between two factors is .35.

<b>Model n°</b>	$\chi^2$ (df)	<i>RMSEA</i>	<i>CFI</i>	<i>SRMR</i>	<i>p</i> ***	<i>AIC</i>	<i>BIC</i>
<b>M1 - 13 items, 2 factors</b>	295.171 (64)	.093	.826	.097	.0001	13309.376	13470.699
<b>M2 - 13 items, 2 factors + correlations between items</b>	164.967 (58)	.067	.920	.084	.0001	13159.431	13344.953

\*\*\* $p < 0.05$  /  $p < .0001$

Table 8 - Models and related fit-indices



*Self-Regulation of Learning Self Report Scale for Sport-practice (SRL-SRS) (Bartulovic, Young & Baker, 2017)*

Current researchers in talent development suggest that differences in self-regulation in learning contexts support individuals in maximizing sport practice (Baker & Young, 2014; Cleary, Zimmerman & Keating, 2006), as they involve specific mental processes - such as planning, self-monitoring, evaluation, reflection, effort and self-efficacy (Toering, et al. 2012) - that allow athletes to be active, meta-cognitively, motivationally and behaviourally in their own learning (Zimmerman, 2008).

Toering, et al. (2012) developed the Self-Regulation of Learning Self-Report Scale (SRL-SRS), which is a dispositional tool that measures self-regulated behaviours in young athletes, inspired by Zimmerman's theory of self-regulated learning (2002). This 48-item scale was created by combining other existing tools, which are:

- Self-Regulatory Inventory by Hong and O'Neil Jr. (2001), for Planning and Effort subscales;
- Self-Regulation Trait Questionnaire by Herl et al. (1999) for Self-monitoring subscale;
- Generalized Self-efficacy Scale (Hong & O'Neil Jr., 2001; Schwarzer & Jerusalem, 1995) for Self-efficacy items;
- Evaluation subscale of the Inventory of Metacognitive Self- Regulation (Howard et al., 2000), for the Evaluation items;
- Reflective Learning Continuum (Peltier et al., 2006) for Reflection subscale.

The resulting tool shows a good construct validity, as the hypothesized model fitted the data well and the constituent factors were well correlated, and a good time stability (Toering, et al., 2012).

Bartulovic, Young & Baker (2017) studied the SRL-SRS properties in a sample of American athletes to understand tool's validity and to understand whether both constituent factors and composite self-regulation score differ in three skills groups. Their analysis resulted in a refined 31-items, that still reflect the 6 Self-Regulation factors, called SRL-SRS for Sport Practice (Figure 10).

They calculate an SRL-Composite score, assuming that each subscale has the same weight in the overall process of self-regulation, and test if there are differences between skill groups. Results shows also that both Composite SRL and some constituent factors (Self-Monitoring overall) predicted the skill group of athletes, with more elite athletes having higher levels of self-regulation skills.

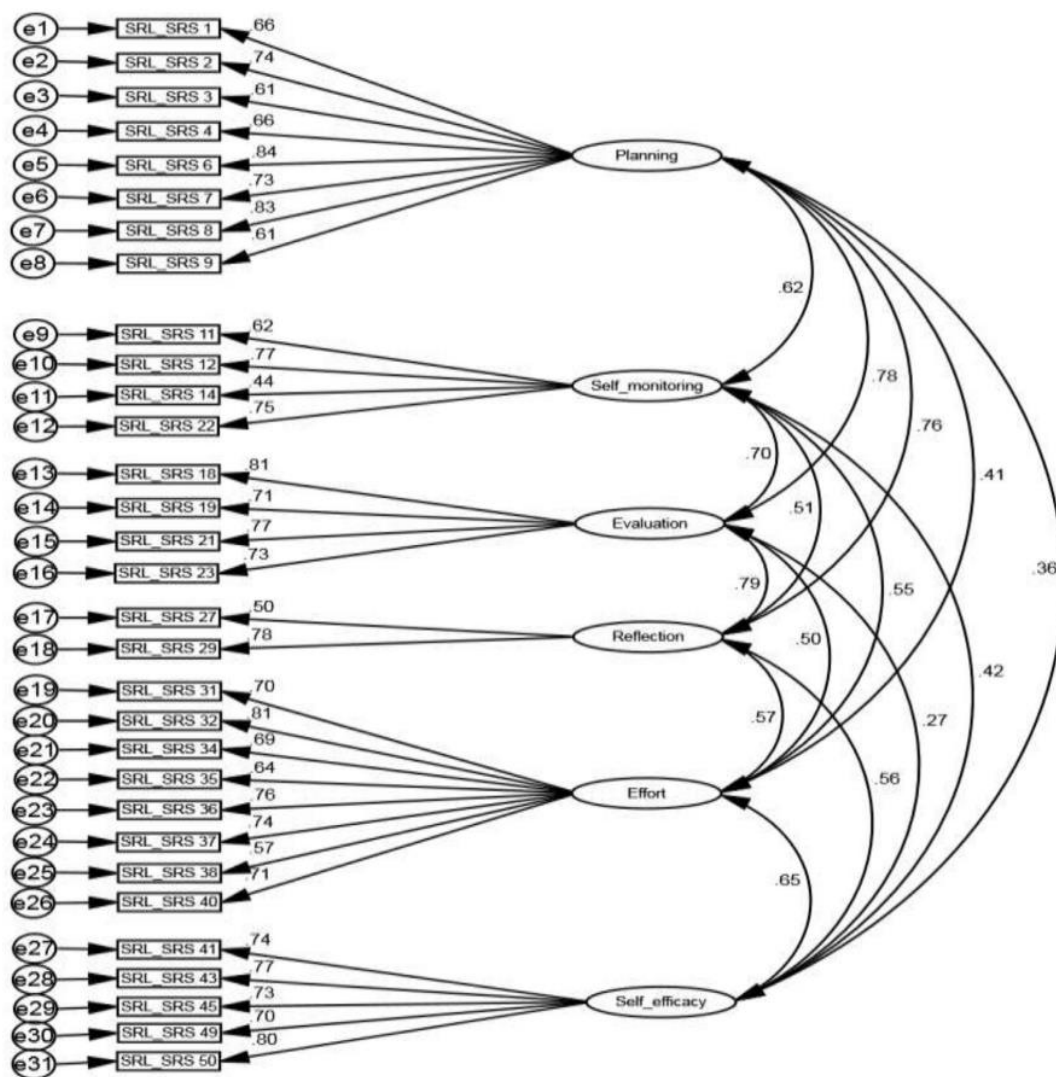


Figure 10 - Self Regulation of Learning Scale Self- Report Scale factor structure by Bartulovic and coll. 2017

### Sample

The sample of this analysis were 415 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years. From the overall 417 participants, 2 players did not answer to all the questions of the scale and were removed from the analysis.

### Measurement

We use the Bartulovic, Young & Baker (2017) SRL-SRS for Sport Practice, that is composed by 31 items that measure the following self-regulatory skills:

- Planning, (e.g.: “I determine how to approach a practice task before I begin”);
- Self-Monitoring, (e.g.: “I check aspects of my workout while doing it”);
- Evaluation, (e.g.: “After finishing, I look back on the practice task to evaluate my performance”);

- Self-Reflection, (e.g.: “When thinking about my training, I often reflect about my strengths and weaknesses”);
- Effort, (e.g.: “I keep working hard even when sport training tasks become difficult”);
- Self-Efficacy, (e.g.: “I know how to handle unforeseen situations during practice, because I am resourceful”).

Items were scored on a 5-point Likert-scale, ranging from (1) ‘Not at all’ to (5) ‘Very much’. The subscale was preceded from the following introductory sentence: “Please read the following statements and choose the number that best describes the way you act when approaching challenges, difficulties, and/or tasks in your sport training. Think about a challenge or difficulty you might face during practice. Think about when you have to overcome a difficult practice task. What do you do before you start? What do you do while you work out? What do you do after difficult practice tasks? And how often you act like this when approaching practice tasks? There are no right answers - please describe yourself as you are, not how you want to be or think you ought to be”.

To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

#### *Analysis and results*

Using SPSS.20, we tested items’ scores for normality, and the analysis shows some problems in skewness and kurtosis of items 2, 7 and 9 (see Appendix E). Therefore, in conducting the CFA analysis, we use MLR (Maximum Likelihood Robust) estimator, that is used with non-normal distribution variables. After creating factors following literature suggestions, we calculate mean and standard deviation values for each, that are reported below (Table 9), together with the McDonald  $\omega$ .

<b>Factor</b>	<b>Mean</b>	<b>Sd</b>	<b>McDonald <math>\omega</math></b>
<b>Planning</b>	3.61	.64	.816
<b>Self-Monitoring</b>	3.58	.67	.605
<b>Evaluation</b>	3.84	.76	.767
<b>Reflection</b>	3.77	.77	.492
<b>Effort</b>	4.06	.67	.880
<b>Self-Efficacy</b>	3.50	.60	.718

*Table 9 - Mean and standard deviation*

All factors except Reflection show a good McDonald  $\omega$  value, however Reflection is made of two items and this could explain its lower value. Then, we ran Confirmatory Factor Analysis (CFA) (Maximum Likelihood Robust) estimator, using Mplus 7.11 (Muthèn & Muthèn, 1998-2017). Also, the factors were standardized to have a mean of 0 and a standard error of 1.

The original structure of the scale (M1) shows some problems with the subscale Self-Efficacy<sup>5</sup>, with the latent variable covariance matrix (see also RPWB scale analysis, that show the same problem with factor Personal growth), even if goodness of fit indices were acceptable. Therefore, we remove the Self-Efficacy factor, obtaining an improvement in fit-indices (M2) (Table 10).

Comparing AIC and BIC indices between M1 and M2, we decide that the best model to fit our data is M2. Factor loading in the remaining factors is between .22 and .78 ( $p < .0001$ ). Correlations between factors is between .69 and .90 ( $p < .0001$ ), underlining that constituent factors of self-regulation are highly correlated (Table 11).

Model n°	$\chi^2$ (df)	RMSEA	CFI	p***	SRMR	AIC	BIC
<b>M1 31 items-6 factors</b>	653.687 (419)	.037	.929	.0001	.052	30885.195	31320.249
<b>M2 26 items-5 factors</b>	447.879 (289)	.036	.944	.0001	.048	25994.801	26349.289

\*\*\* $p < 0.05$  /  $p < .0001$

Table 10 - Models and related fit-indices

Factor correlations	1	2	3	4	5
<b>M2</b>					
<b>Planning</b>	1				
<b>Self-Monitoring</b>	.85**	1			
<b>Evaluation</b>	.82**	.90**	1		
<b>Effort</b>	.64**	.84**	.81**	1	
<b>Reflection</b>	.70**	.74**	.81**	.69**	1

\*\* Correlation is significant at 0,01 (2-tails).

Table 11 - Factors correlations of Model 2

### Self-efficacy

As Self-Efficacy is a constituent dimension of self-regulation following Zimmerman's conceptualization, we decide to remove Self-Efficacy factor from the SRL-SRS Scale and to create a separate variable (called Self-Efficacy), that will be included in the following Structural Models (see Study II and III). Therefore, we conducted a CFA between the constituents' items, obtaining good fit-indices (Table 12). Items show a good items-loading, between .42 and .56 ( $p < .0001$ ).

	$\chi^2$ (df)	RMSEA	CFI	SRMR
<b>5 item Self-Efficacy Scale</b>	15.676 (5)	.072	.955	.033

Table 12 - Model and related fit-indices of Self-Efficacy Scale

<sup>5</sup> Mplus Warning is: The latent variable covariance matrix (psi) is not positive definite. This could indicate a negative variance/residual variance for a latent variable, a correlation greater or equal to one between two latent variables, or a linear dependency among more than two latent variables.

### *Coach – Athlete Relationship Questionnaire (Jowett, 2004)*

In the sport context the relationship between a coach and an athlete plays a central role in athletes' physical and psychosocial development (Jowett & Cockerill, 2002). By a series of qualitative case studies Jowett and colleagues investigated the nature of the coach – athlete relationship from a relational perspective (Jowett & Poczwadowski, 2007; Jowett, 2017), defining it as the specific situation in which coaches' and athletes' emotions, thoughts, and behaviours are mutually and causally interconnected (cf. Kelley et al., 1983). Therefore, they deduce the three main dimensions of the coach-athlete relationships, namely Closeness, Commitment and Complementarity (cf. Chapter 2, pp.62).

Based on such qualitative studies, Jowett & Ntoumanis (2004), created the Coach-Athlete Relationship Questionnaire (CART-Q), a self-report tool that assesses the nature (e.g.: quality and quantity) of the coach – athlete relationship. The questionnaire has been used in many studies to investigate both psychometrics properties (Yang & Jowett, 2012; Jowett, 2009) and its relationship with other variables, like parental influence (Jowett & Timson-Katchis, 2005), attachment and wellbeing (Felton & Jowett, 2013), team cohesion (Jowett & Chaundy, 2004), achievement motivational orientation (Nicholls, et al., 2017) and personality traits (Yang, Jowett & Chan, 2015). These studies show that: parents opportunities and emotional support provided to athletes influenced the quality of the coach-athlete relationship, the perceptions of the coach–athlete relationship remained stable over time and it predicted the achievement of mastery goals orientation of young athletes; personality traits impact on the relationship quality, and that the mediation effect of athletes' satisfaction of psychological needs between personal attachment styles and wellbeing was greater within the parental relational context than within the coaching relational context.

In the original validation (Jowett & Ntoumanis, 2004) authors concluded that the coach – athlete relationship is best represented in either a first-order three-factor model or in a second-order model, where the “3Cs” are subsumed under a second-order factor. The psychometric properties of the CART-Q have been extensively examined (Yang & Jowett, 2013; Yang & Jowett, 2012), and the results provide tenable evidence to support the 3C's as distinct yet interconnected components of the coach-athlete relationship (Jowett, 2009). The factorial structure of the tool proposed by the authors is reported in Figure 11 below:

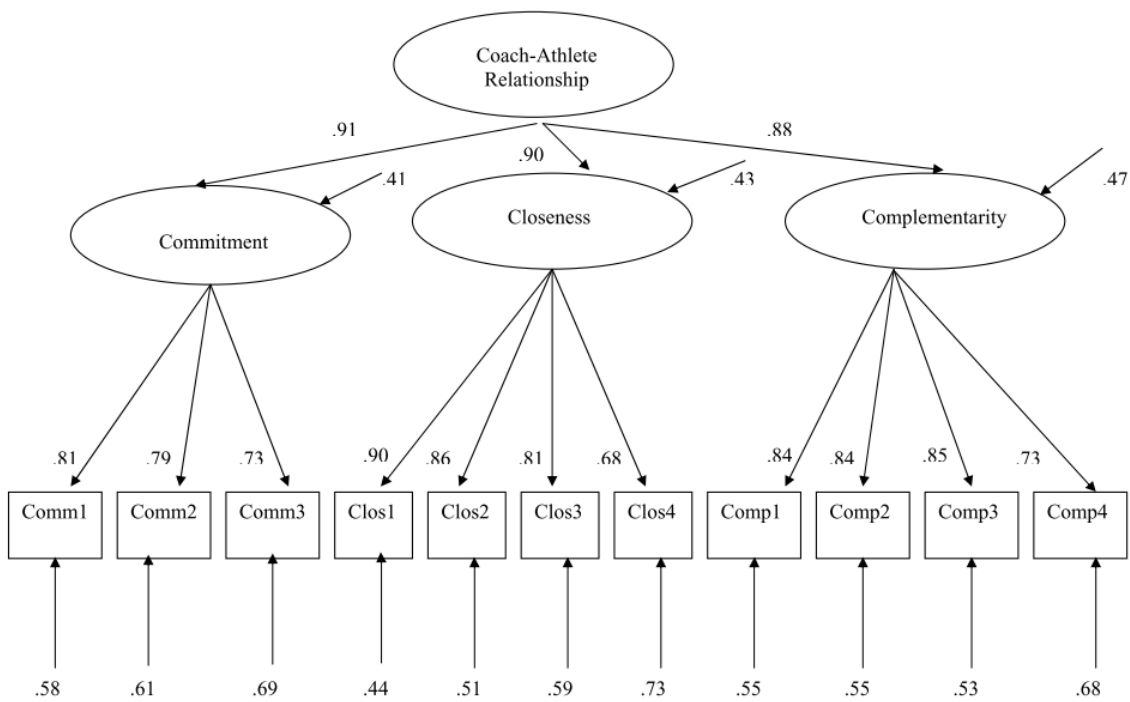


Figure 11 - Factorial structure of Coach-Athlete Relationship Scale from Jowett & Ntoumatis, 2004

### Sample

The sample of this analysis were 413 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years. From the overall 417 participants, 4 players did not answer to all the questions of the scale and were removed from the following analysis.

### Measurement

We use the Coach-Athlete Relationship Questionnaire (CART-Q), that is made of 11 items that measure:

- Commitment, or the cognitive component of the relationship (e.g.: *"I am committed to my coach"*);
- Closeness, or the affective component of the relationship (e.g.: *"I like my coach"*);
- Complementarity, or the behavioural component of the relationship (e.g.: *"When I am coached by my coach, I am responsive to his/her efforts"*).

Items were scored on a 5-point Likert-scale, ranging from (1) 'Not at all' to (5) 'Very much'. To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

## Analysis and results

Using SPSS.20, we tested items' scores for normality and the analysis shows some problems in skewness and kurtosis in item 3 and 7 (see Appendix E). After creating factors following literature suggestions, we calculate mean and standard deviation for each (see Table 13), together with the McDonald  $\omega$ . Therefore, we ran a CFA, using MLR (Maximum Likelihood Robust) estimator, obtaining the results reported in Tables 13 and 14 below. Factors were standardized to have a mean of 0 and a standard error of 1. CFA analysis show a good internal consistency for this scale. Factor loading is between .78 to .83 ( $p < .0001$ ).

Factor correlation is between .93 and .97 and this should indicate problems with collinearity between factors: as suggested by literature and examined at page 91, many times the three dimensions of this tool are highly correlated, and many studies try to validate a single factor structure, without obtaining satisfactory results. Therefore, aware of this issue, we decide not to conduct more analysis on this scale and keep in mind possible problems of collinearity between the dimensions.

Factor	Mean	sd	$\omega$	$\chi^2$ (df)	RMSEA	CFI	SRMR
<b>Commitment</b>	3.46	.86	.800				
<b>Closeness</b>	4.03	.78	.836	136.473 (41)	.075	.940	.043
<b>Complementarity</b>	3.75	.76	.782				

Table 13 - Mean, standard deviation and model fit-indices

Factor correlations	1	2	3
<b>Commitment</b>	1		
<b>Closeness</b>	.93**	1	
<b>Complementarity</b>	.97**	.96**	1

\*\* . Correlation is significative at 0,01 (2-tails).

Table 14 - Factor correlations

### *Peer Motivational Climate in Youth Sport Questionnaire (Ntoumanis & Vazou, 2005)*

Intra-team interactions and relationships are particularly important in youth sport as they contribute to the quality of youth sport experiences (Smith, 2003; Holt, et al., 2008; Keegan, et al., 2009; Bruner, et al., 2014; Atkins, et al., 2014). Literature on peer relationships in sport has increased in size and diversity (Sheridan, et al., 2014; Ntoumanis, Vazou & Duda, 2007), and today peer acceptance and its relationship to physical and personal, emotional and moral development are some of the topics that have been investigated in this area. Children under 10 years rely more on adult feedback to judge their competence, while in late childhood and early adolescence they are more focused on peer comparison as a source of competence acquisition and self-efficacy (Horn & Weiss, 1991). Inspired by the Achievement Goal Theory, that offers a theoretical framework useful to understand children's achievement motivation in sport (Duda & Hall, 2001) and to understand how peers affect children's motivation in sport, Vazou and colleagues (2005) conducted a qualitative study with young athletes from both individual and team sports, identifying 11 dimensions of peer climate from the interviews, that can be distinguished into task- and ego-involving climates (Vazou, et al., 2005). A task-involving motivational climate promotes athlete cooperation, encourages individual initiative, supports autonomy and relatedness, while an ego-involving climate limits task choice and athlete initiative, and doesn't support athlete autonomy (Vazou, et al., 2005; Ntoumanis & Vazou, 2005).

In developing and validating the Peer Motivational Climate in Youth Sport Questionnaire (PMCYS-Q), Ntoumanis and Vazou suggested a double solution for the questionnaire: a first solution with 5-first order factors (named: Improvement, Effort, Relatedness Support, Intra-team competition and Intra-team conflict), which shows the same goodness of fit indices of a second-order two-factors structure ("Task-Climate" composed by Improvement, Effort and Relatedness support and "Ego-Climate", composed by Intra-team competition and Intra-team conflict) (Ntoumanis & Vazou, 2005). Both solutions were used in following investigations and shows good reliability in both structures (Ntoumanis, et al., 2012; García-Calvo, et al., 2014).

### *Sample*

The sample of this analysis were 412 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years. From the overall 417 participants, 5 players did not answer to all the questions of the scale and were removed from the analysis.

### *Measurement*

We use the Peer Motivational Climate in Youth Sport Questionnaire (Ntoumanis & Vazou, 2005), that is made of 21 items measuring different aspects of the motivational climate created by teammates, namely:



- Focus on improvement, (e.g.: “*On this team, most athletes... help each other to improve*”);
- Relatedness support, that means fostering the feeling of being part of a group as well as the creation of a friendly atmosphere in the team (e.g.: “*On this team, most athletes... care about everyone’s opinion*”);
- Effort, or the degree to which team members push their teammates to give their best and try harder when failing (e.g.: “*On this team, most athletes... encourage their teammates to try their hardest*”);
- Intra team competition, or the promotion of inter-individual competition by the members of the group (e.g.: “*On this team, most athletes...look pleased when they do better than their teammates*”);
- Intra team conflict, that implies negative and unsupportive behaviours toward teammates (e.g.: “*On this team, most athletes...make negative comments that put their teammates down*”).

Items were scored on a 5-point Likert-scale, ranging from (1) ‘Not at all’ to (5) ‘Very much’. To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

#### *Analysis and results*

Using SPSS.20, we tested each items’ scores for normality and the analysis show no problems in skewness and kurtosis (see Appendix E). After creating factors following literature suggestions, we calculate mean and standard deviation values for each, that are reported below (Table 15), together with the McDonald  $\omega$ .

<b>Factor</b>	<b>Mean</b>	<b>sd</b>	<b>McDonald <math>\omega</math></b>
<b>Improvement</b>	3.49	.74	.760
<b>Relatedness support</b>	3.59	.77	.749
<b>Effort</b>	3.79	.67	.755
<b>Intra team competition</b>	3.29	.69	.664
<b>Intra team conflict</b>	2.82	.86	.748

*Table 15 – Mean and standard deviations*

After the explorative analysis we conducted a CFA using Mplus 7.11 (Muthèn & Muthèn, 1998-2017), in 2 different solutions suggested by authors (5-first level factors and 2-second level factors), obtaining interesting results, that are reported in the Table 16 below. Also, the factors were standardized to have a mean of 0 and a standard error of 1.

In the first solution (M1), the output shows that the factor named Relatedness support had a strong correlation with factor Improvement, and it should be deleted from the analysis as their correlation matrix was not positive, causing problems with the following model (see also RPWB Scale and Self-Regulation scale reliability analysis). Therefore, we removed the factor Relatedness support and re-ran the analysis (M2), obtaining a very

similar result as M1, with an improvement in  $\chi^2$  value, but still no improvement in CFI, even if there are no other warning about factors over-correlation.

The results showed that it was possible to improve the model fit, thus looking at the modification indices section we noticed that by adding a correlation between some items the model fit would improve a lot (in particular: 1-3; 16-1; 17-16; 20-19; 20-5; 16-6; 20-10). We decided to correlate these items as they show similar meaning, that could indicate that items from Task-motivational climate and Ego-motivational climate share some similarities. We obtained a great improvement in model fit, as shown in M1.2 in Table 16 below. Moreover, when comparing AIC and BIC the model M1.2 results the best for our sample.

Then we ran the second model (M2: 2-second order factors, named Task and Ego climate with all 5 factors), but we had some problems, in particular when running the analysis including Relatedness support, as the software couldn't arrive to a definite solution, as number of convergence was exceeded; then we removed Relatedness support from the second order analysis, but the model resulted as non-identified, as the constituent factors (Improvement and Effort for the Task-second order factor, and Intra Team competition and Intra Team conflict for the Ego-second order factor) were too high correlated on their respective second order factor, and therefore the second order factor is not a valid solution for this sample. Even if the goodness of fit indices indicate that also solution M2 could be valid, the excessive correlation of the two constituent factors on the second-order latent one suggest it couldn't be a good solution.

The definitive solution for this scale was M1.2, that is a 4-first order factors including Improvement, Effort, Intra-team competition and Intra-team conflict. Factor loading is between .35 and .75 ( $p < .0001$ ), while factors correlations are reported in Table 17 below.

Model n°	$\chi^2$ (df)	RMSEA	CFI	p***	SRMR	AIC	BIC
<b>M1</b> <b>5-first order factors</b>	458.705 (179)	.062	.873	.0001	.079	22047.946	22341.481
<b>M1.1</b> <b>4-first order factors (no Relatedness support)</b>	357.950 (129)	.066	.863	.0001	.080	19322.813	19564.074
<b>M1.2</b> <b>4-first order factors + correlations between items</b>	220.649 (122)	.044	.941	.0001	.069	19162.055	19431.464
<b>M2</b> <b>2-second order factors (4 factors)</b>	267.579 (124)	.053	.914	.0001	.095	-	-

\*\*\* $p < 0.05$  /  $p < .0001$

Table 16 - Models and related fit-indices

Factor correlations M 1.2	1	2	3	4
<b>Improvement</b>	1			
<b>Effort</b>	.93**	1		
<b>Intra-team competitiveness</b>	.33**	.41**	1	
<b>Intra-team conflict</b>	-.80	-.68	.60**	1

\*\* Correlation is significative at 0,01 (2-tails).

Table 17 - Factors correlations of Model 1.2

### *Parent – Initiated Motivational Climate Questionnaire (White, Duda & Hart 1992)*

As well as peers and teammates, parents create a motivational climate toward different learning and/or achievement contexts, like sport or School. Perceptions of the motivational climate in achievement situations reflect the goal structure deemed to be prevailing in that environment or the degree to which an individual view the setting as task- or ego-involving promoted by significant others (Gurland & Grolnick, 2005; Ullrich-French & Smith, 2006; Brustad & Partridge, 2002). Parents are a fundamental figure in the developmental path of young athletes (see Chapter 1 of the present work), and their influence in what athletes believe about their learning experience and achievements is huge. Parents beliefs about the importance of learning or winning affect the child's perceptions about what is salient in these situations (White, Duda & Hart, 1992) and pressures the child perceive about reaching such goal. Till '90 years, the influence of the family in sport was little considered (see Bloom and Côté' model of talent development and sport participation, in Chapter 1), but later researchers begun to consider how task- and ego-orientations are reflected and generated in social situations, including academia and sport (Papaioannou, 1994; Seifriz, Duda, & Chi, 1992; Walling, Duda, & Chi, 1993; White, 1996; Keegan et al., 2009). This led researchers to create different tool to measure it, one of which is the Parent-Initiated Motivational Climate (PIMC-Q), grounded in the Achievement Goal Theory and developed by White and colleagues (1992), upgraded in the PIMC-Q2 (White & Duda, 1993). This tool measure three different kind of motivational climate promoted by parents, that are: Learning/Enjoyment, Success without effort and Worry Conductive climates, that recall the Task and Ego motivational orientation established by the AGT.

The PIMC-Q and PIMC-Q2 have been used in many studies in relation with many other constructs, in particular with individual motivational orientation, showing contrasting results. In many studies, the Learning/Enjoyment climate promoted by parents was clearly related to individual Task orientation (Waldron & Krane, 2005; White 2007; Kavussanu, et al., 2011; Vesković, Valdevit & Đorđević-Nikić, 2013; Atkins, et al., 2014; Ullrich-French & Smith, 2006), but results about Worry conductive and Success without effort climates are contrasting, with some indicating a connection between these climates and individual Ego orientation (White 2007; White et al., 1998; White, 1998), and others that cannot find a clear connection (Waldron & Krane, 2005); despite the contrasting results, studies show a strong connection between motivational climate induced by parents and individual motivational orientation and it's possible to support this position.

### *Sample*

The sample of this analysis were 417 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years.

## Measurement

We use the Parent-Initiated Motivational Climate (PIMC-Q)<sup>6</sup> (White, Duda & Hart, 1992), that is made of 28 items divided for father (14) and mother (14), measuring different aspects of the motivational climate created by parents, specifically:

- Learning/Enjoyment climate, (e.g.: "I feel that my mother/father... encourages me to enjoy learning new skills");
- Worry Conductive climate, (e.g.: "I feel that my mother/father... makes me worried about performing skills that I am not good at");
- Success without effort climate, (e.g.: "I feel that my mother/father... believe that it is important for me to win without trying hard").

For all 28 items players responds to the stem "I feel that my mother/father...", and items were scored on a 5-point Likert-scale, ranging from (1) 'Not at all' to (5) 'Very much'. To check the degree of adequacy of the scales with respect to the sample participating in the study, we conducted a Confirmatory Factor Analysis (CFA).

## Analysis and results

Using SPSS.20, we tested each items' scores for normality and the it shows that items 1, 9, 14 for father and 1, 2, 4, 9, 14 for mother have problems in skewness and kurtosis (see Appendix E). After creating factors following literature suggestions, we calculate mean and standard deviation values for each, that are reported below (Table 18) together with the McDonald  $\omega$ .

Factor	Mean	sd	$\omega$
Learning/Enjoyment climate father	3.81	.56	.544
Worry Conductive climate father	3.37	.67	.584
Success without effort climate father	2.34	.69	.661
Learning/Enjoyment climate mother	3.82	.60	.646
Worry Conductive climate mother	3.46	.71	.619
Success without effort climate mother	2.40	.81	.737

Table 18 - Means and standard deviations

After the explorative analysis we conducted a CFA using Mplus 7.11 (Muthèn & Muthèn, 1998-2017), using MLR (Maximum Likelihood Robust) estimator that is used when variables have a non-normal distribution. Also, the factors were standardized to have a mean of 0 and a standard error of 1. We also hypothesize a correlation between each item and each factor in the two sub-scales, as each player have to answer the same

<sup>6</sup> We must use the first version of the tool since we cannot find the updated version, neither writing to the author nor on other published articles.

questions for both parents, and this could lead errors to be correlated; therefore, we add correlation between each item and each factor in the two sub-scales.

Results of the first CFA (M1= original factorial structure) show bad goodness of fit indices (*M1 3 factors each parent* in Table 19): looking at the standardized model results section we realize that, even if all factors were internally strong and coherent with their respective items (factor loading is between .20 and .78), “Learning/Enjoyment” and “Worry Conductive” factors have no correlation with “Success without effort” factor while have a good correlation between them (see Factors Correlation M1 in Table 20).

Therefore, we remove the “Success without effort” factor from the model and obtained a huge improvement in the model fit indices (*M2 2 factors each parent* in Table 19), as all indices are in their threshold acceptable value (Table 21). By comparing AIC and BIC indices between M1 and M2 (Table 19), we consider the M2 as the best solution for our sample and for the following model, as their values were significantly lower.

Model n°	$\chi^2$ (df)	RMSEA	CFI	SRMR	AIC	BIC	Sample BIC
<b>M1</b> <b>3 factors each parent</b>	676.112 (321)	.052	.886	.082	28431.729	28887.467	28528.888
<b>M2</b> <b>2 factors each parent</b> <b>(no “Success without effort”)</b>	282.513 (154)	.045	.934	.062	20429.485	20736.000	20494.831

Table 19 - Models and related fit-indices

Factor correlations M1	1	2	3	4	5	6
<b>Learning/Enjoyment climate father</b>	1					
<b>Worry Conductive climate father</b>	.51**	1				
<b>Success without effort climate father</b>	.12	.50	1			
<b>Learning/Enjoyment climate mother</b>	.65**	.43**	.05	1		
<b>Worry Conductive climate mother</b>	.32**	.73**	.16	.53**	1	
<b>Success without effort climate mother</b>	-.01	.09	.80	.04	.18	1

Table 20 - Factor correlations of Model 1

Factor correlations M2	1	2	3	4
<b>Learning/Enjoyment climate father</b>	1			
<b>Worry Conductive climate father</b>	.52**	1		
<b>Learning/Enjoyment climate mother</b>	.65**	.43**	1	
<b>Worry Conductive climate mother</b>	.32**	.72**	.53**	1

\*\* Correlation is significative at 0,01 (2-tails).

Table 21 - Facotr correlations in Model 2



## *Study II - A structural equation model between the characteristics of players' relationships and their psychological wellbeing*

### *Aim*

In this study we analyse the impact of the characteristics of players' relationships and their psychological wellbeing, to establish a possible influence and, eventually, to identify which variables most impact on it.

### *Sample*

The sample of this analysis were 417 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years.

### *Measurement*

After analysing the reliability of the scales used in data collection (Chapter 3, Study I), we build a model with the resulting factorial structures to study the impact on psychological wellbeing. To facilitate the reader, we'll reassume the factorial structure we obtained for each scale from the CFA analysis presented in Study I, with the related abbreviation used in the analysis.

- **Ryff's Psychological Well-Being Scale** (Ryff, 1989; Ryff & Keyes, 1995; Italian version by Sirigatti et al., 2009): from our CFA analysis only 4 factors emerged as reliable in our sample, that are:
  - Self-acceptance (PWB\_AC), a positive attitude toward the oneself and one's past life and experiences;
  - Positive relationship with others (PWB\_RE), that is the ability to establish satisfying relationship;
  - Autonomy (PWB\_AU), a sense of independence and self-determination in own's life;
  - Meaning in Life (PWB\_ME), or the belief of a unique meaning to one's life.
  
- **Coach – Athlete Relationship Questionnaire** (Jowett, 2004): from our CFA analysis all three constituent factors (Closeness, Complementarity and Commitment) resulted important and reliable in our sample, therefore we maintain all of them (COA\_COMM, COA\_CLO and COA\_COMP).
  
- **Peer Motivational Climate in Youth Sport Questionnaire** (Ntoumanis & Vazou, 2005), from our CFA analysis only 4 factors of 5 resulted reliable for our sample, therefore we only considered the following constituent factors:

- Focus on improvement (TEAM\_IMP), that means supporting each other to improve in abilities and skill acquisition;
  - Effort (TEAM\_EFF), that is the degree to which team members push their teammates to give their best and try harder when failing;
  - Intra-team competitiveness (TEAM\_COMP), the promotion of inter-individual competition by the members of the group;
  - Intra-team conflict (TEAM\_CNF), that implies negative and unsupportive behaviours toward teammates.
- **Parent – Initiated Motivational Climate Questionnaire** (White, Duda & Hart 1992): from our CFA only two motivational climates emerged as reliable in our sample, therefore we only consider a double factorial solution, composed by:
    - Learning/Enjoyment climate (by father and by mother), that means supporting a climate of learning, where errors are considered as part of the learning process and enjoyment is the main outcome of the sporting experience (LEARN\_F/M);
    - Worry Conductive climate (by father and by mother), that means instead to create a climate of concerns about making mistakes or when it's necessary to show underdeveloped abilities (WORRY\_F/M).

The overall model we want to test is described in Figure 12 reported below, that shows a Structural model made by two latent variables (namely “Characteristics of the relationships” and “Psychological Wellbeing”) and their direct effect, which are composed by different observed variables (measurement model), that we analysed in Study I.



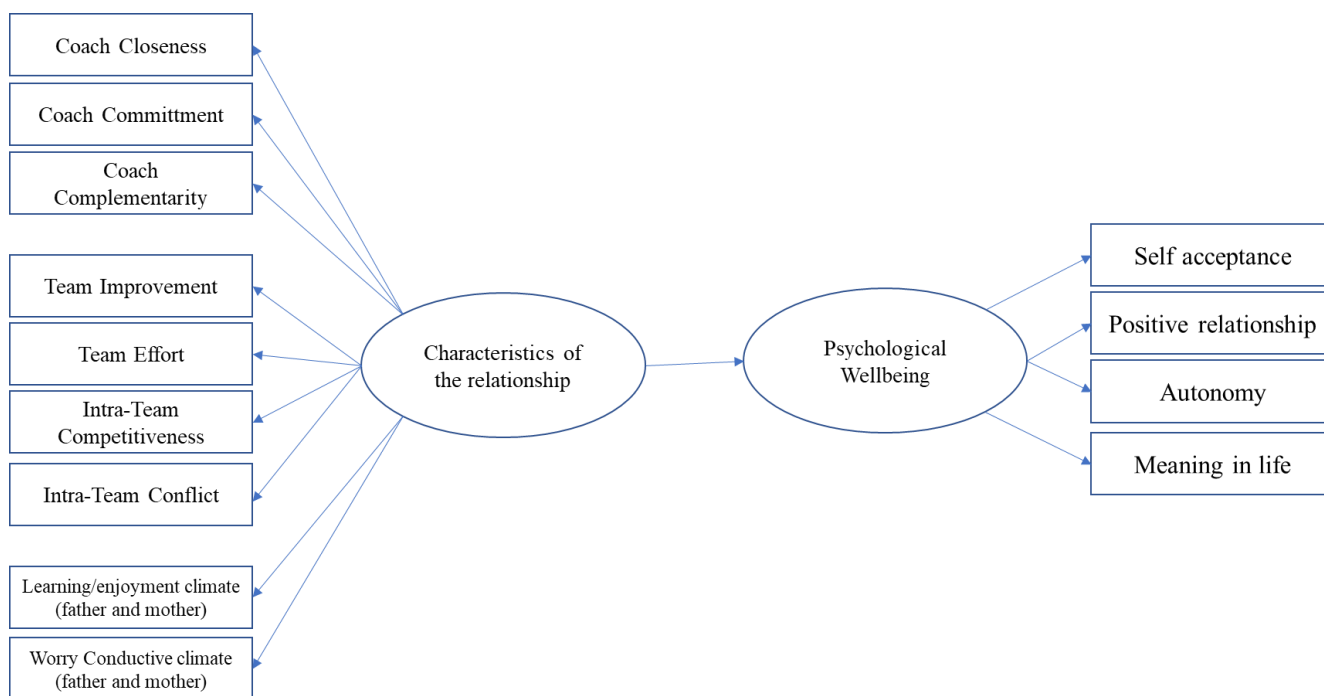


Figure 12 - Proposed model of structural equation between the characteristics of relationships and psychological wellbeing of players

### Data analysis

Structural Equation Model (SEM) represent one of the most common methods used in the analysis of behavioural data as they make it possible to study the interrelationships between different latent and observed variables. SEM, like Confirmatory Factor Analysis, is a set of statistical analysis used to reduce the number of observed variables into a smaller number of latent variables by examining the covariation among observed ones. Specifically, a SEM is a combination of exploratory factor analysis and multiple regression (Ullman, 2001), that's why SEM is more of a confirmatory technique. SEM extends the relationships between latent variables, involving two components: a) the measurement model (basically, a CFA model), that shows the pattern of observed variables for the latent factors, that b) a structural model, that displays the interrelations among latent factors and observed variables. Therefore, the main aim of SEM is to establish relationships among hypothesized latent constructs (Schreiber et al., 2006).

The structural equations are particularly suitable for testing complex models, in which the interactions provide for the inclusion of multiple variables and the presence of latent variables that cannot be measured directly. As regards the overall goodness of fit, in this study were considered different indices (for a detailed description see Chapter 3, pg. 91): goodness-of-fit statistics (Chi-square statistic), Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA) and Factor loadings.

## Results

*Preliminary analysis.* As Psychological Wellbeing factors had means values which differ from other factors (see the section dedicated to the Psychological Wellbeing Scale, pg. 93, where the mean values for the scale was ranged from 3 to 12), we first transform the factors' mean values into a value like the ones of other scales. Therefore, we calculate the mean value for each factor by dividing each factor value for 3 (e.g.:  $PWB\_self\ acceptance\_original/3 = PWB\_self\ acceptance\_mean$ ). Also, factors were standardized to have a mean of 0 and a standard error of 1.

When running the SEM model using Mplus 7.11 (Muthèn & Muthèn, 1998-2017), we obtained also factor's means and standard deviations, that are reported below in Table 22. The analysis of missing data patterns show that the model considers only 302 subjects.

Factor	Mean	sd
Coach Commitment	3.45	.86
Coach Closeness	4.03	.78
Coach Complementarity	3.75	.76
Team Improvement	3.49	.74
Team Effort	3.79	.66
Intra-Team Competitiveness	3.30	.68
Intra-Team Conflict	2.82	.86
Learning/enjoyment climate (father)	3.80	.56
Learning/enjoyment climate (mother)	3.82	.60
Worry Conductive climate (father)	3.37	.67
Worry Conductive climate (mother)	3.46	.71
Self-acceptance	3.16	.43
Positive relationship	3.30	.51
Autonomy	3.10	.50
Meaning in life	3.15	.56

Table 22 - Means and standard deviations

The model fit information is reported in the Table 23, while the standardized model result of factor loading is reported in Table 24 and 25, and factor correlations in Tables 26, 27 and 28. The impact of latent factor "Characteristics of relationships" on "Psychological Wellbeing" is .667 ( $p < .0001$ ).

Model fit information	$\chi^2$ (df)	RMSEA	CFI	p	SRMR
	142.917 (74)	.047	.963	.0001	.049

Table 23 - Model and related fit-indices

Psychological Wellbeing Latent factor	Estimated factor loading	p
Self-acceptance	.508	.0001
Positive relationship	.321	.0001
Meaning in life	.504	.0001
Autonomy	.329	.0001

Table 24 - Factor loading of Psychological wellbeing factor

Characteristics of relationships	Estimated factor loading	<i>p</i>
<b>Latent Factor</b>		
Coach Commitment	.436	.0001
Coach Closeness	.575	.0001
Coach Complementarity	.520	.0001
Team Improvement	.559	.0001
Team Effort	.661	.0001
Intra-Team Competitiveness	.155	.038
Intra-Team Conflict	-.124	.127
Learning/enjoyment climate (father)	.389	.0001
Learning/enjoyment climate (mother)	.462	.0001
Worry Conductive climate (father)	.105	.155
Worry Conductive climate (mother)	.152	.045

Table 25 - Factor loading of Characteristics of relationships factor

Factor correlations in the model	1	2	3	4	5	6	7	8	9	10	11
Coach Commitment	1										
Coach Closeness	.67**	1									
Coach Complementarity	.72**	.68**	1								

Table 26 - Factors correlations between Coach-Athlete Relationship Scale variables

Team Improvement	-	-	-	1						
Team Effort	-	-	-	.60**	1					
Intra-Team Competitiveness	-	-	-	.11	.16*	1				
Intra-Team Conflict	-	-	-	-.10	-.09	.55**	1			

Table 27 - Factors correlations between Team Motivational Climate Scale

Learning/enjoyment climate (father)	-	-	-	-	-	-	-	1			
Learning/enjoyment climate (mother)	-	-	-	-	-	-	-	.54**	1	.28**	.30**
Worry Conductive climate (father)	-	-	-	-	-	-	-	.34**		1	
Worry Conductive climate (mother)	-	-	-	-	-	-	-	.18**		.715**	1

\*\* . Correlation is significant at 0,01 (2-tails).

Table 28 - Factors correlations between Parent-initiated Motivational Climate scale

Figure 13 below reported the resultant diagram of the model, where we only show the significant values. Team conflict and Worry Conductive Climate resulted non-significant for father, while Worry Conductive Climate has a very little factor loading for mother (.152,  $p < .05$ ), as well as Team Competitiveness (.155,  $p < .05$ ).

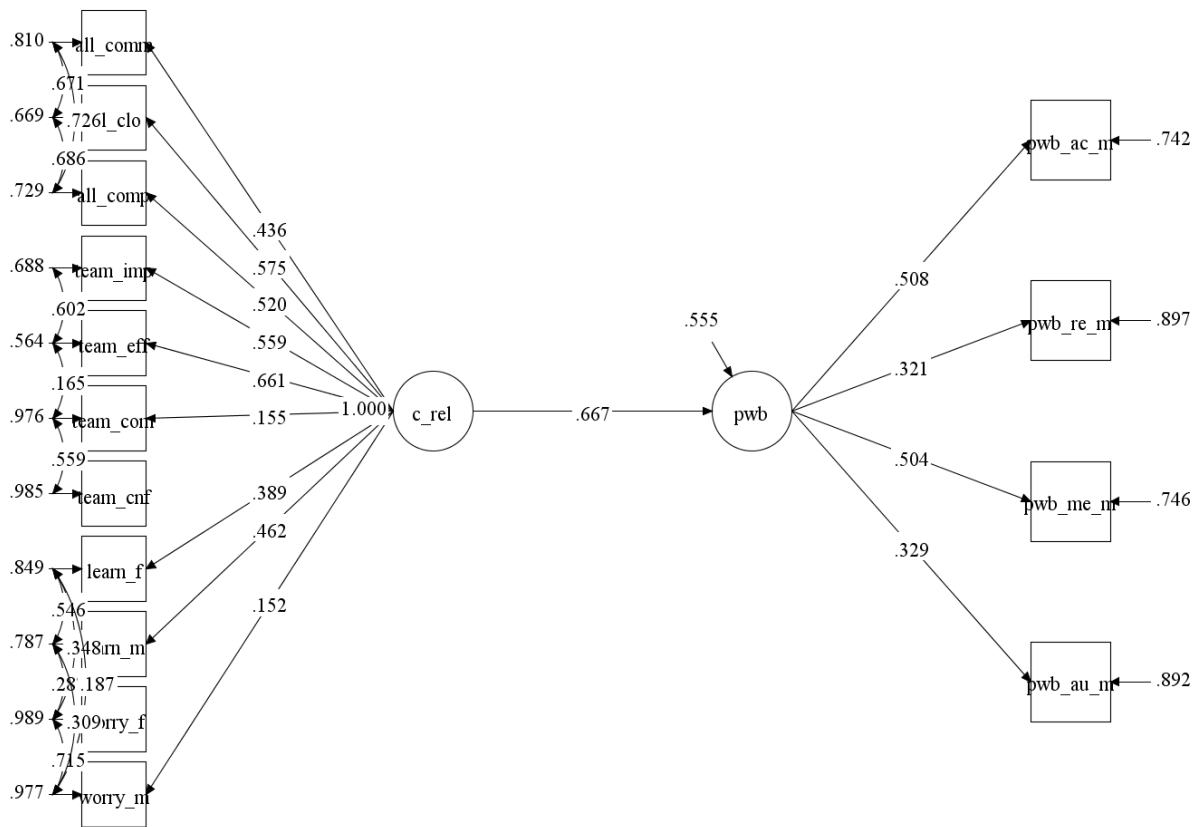


Figure 13 - Results of the tested model of structural equation

## Discussion

The overall model show a good fit with our sample, expressing optimal goodness of fit indices (in parenthesis the ideal values of acceptability, see also pag.6): CFI=.963 (>.95), RMSEA= .047 (RMSEA<.05), SRMR= .49 (SRMR<.80), with good factor loading within each latent variable (between .32 and .50 for Psychological Wellbeing latent and .15 and .61 for Characteristics of relationships latent). The overall impact of the Characteristics of relationships (C\_Rel) on Psychological Wellbeing (PWB) is .667, that is a quite strong positive impact. Such results allow us to support the thesis of the impact of some features of relationships where athletes are involved on their psychological wellbeing, specifically on the Self-acceptance and Meaning in life dimensions. In Figure 13 there are reported the constituent observed variables of C\_Rel latent factor that most impact on PWB are, in order of importance:

- Team Effort (.661) and Coach Closeness (.575)
- Team Improvement (.559) and Coach Complementarity (.520);
- Learning/Enjoyment Climate Mother (.462)
- Coach Commitment (.436) and Learning/Enjoyment Climate Father (.389).

The aspects that characterize the relational environment of players impact specifically on PWB dimensions of self-acceptance, that is the positive attitudes toward self and past experiences, and the perception to have a

purpose in own's life of players. Such result seems interesting if we analyse it using the study from Lundqvist (2011), that described self-acceptance in athletes as a self-awareness of strenghts and weaknesses, the realistic evaluation of current performance level and future achievements and the acceptance of the difference between the person and the athlete's results. Meaning in life, instead, has been described as a sensation that implies the effort to be devoted to a specific and higher life-goal throught sport.

Perceiving effort and focus on improvement wintin the team, having a close and committed relationship with the coach and the specific attitudes from mother toward learning, seem to impact positively on the players self-evaluation both on the present and future achievement, level of skills and, most importantly, on the ability to diferenciare the person from its results; such impact could lead players develop a motivational orientation toward learning, the ability to evaluate objectively the current level of competence and to set goals of improvement. Such ability, in turn, could lead athlete to be more satisfied with his results, remain engaged in sport longer.

Relational characteristics influence players' perception to have an aim in their life that they are devoted to and could reach through sport, and this could help players to constantly set increasing goals in order to reach it, avoiding the sensation to "being arrived" at an early age, remaining enrolled in sport for more time and increasing the chances to develop the potential. Self-acceptance and meaning in life as declined by Lundqvist (2011) seem to be very close to a mastery-approach toward sport, as they both stressed self-evaluation of strenghts and weaknesses, the importance of goals of improvement, and overall the focus on the person and not on the victory. It seems that there is a correspondence between mastery-approach and psychological wellbeing of athletes, as they share many characteristics (Nicholls, Earle, Fiona, & Madigan, 2017).

The overall results of the present study underline an important aspect: young players strongly emphasise the importance of teammates motivational climate in their developmental path, more than current research seems to have investigated. Studies on peer influence in talent development are quite recent (Sheridan et al., 2014; Bruner, Eys, Wilson, & Côté, 2014; García-Calvo, et al., 2014; Holt, Black, Tamminen, Fox, & Mandigo, 2008; Fry & Gano-Overway, 2010) and most of times the impact of peers have been studied as related – or a consequence of - coach-induced climate. Our results seem to show that young players consider the effort and focus on improvement shared within their team as the most supporting elements from their relational environment, even more important than the relationship with the coach or the role of their parents. Such findings support the importance of studying the role of peer motivational climate in the development of young athletes, especially in team sport (Ntoumanis, Taylor, & Thøgersen-Ntoumani, 2012; Ntoumanis, Vazou & Duda, 2007) considering it as unbinded from the coach created one.

A task-oriented motivational climate leads athletes to appreciate improvements, increasing effort and considering errors as a part of the learning process and growth, both of the team and of the single athlete, leading everyone to be more satisfied with their sporting outcomes and remain engaged in sport for longer. This element seems to be particularly important in a team sport like football, where the improvement of one player could lead to improvement of the overall team, supporting also the development of leadership and social

skills (i.e.: the ability to develop effective relationship with others). The ability to stay focused on improvement and showing effort are also important when facing difficulties or important changes in life, like career transitions from junior to senior, specifically as a resource within sport context and as part of coping skills of relying on social support (Čačija, 2007). Moreover, peer initiated motivational climate has been found an important precursor of moral development (Miller, Roberts & Ommundsen, 2005), as perceiving a more performance-oriented climate within the team is linked to lower levels of morality and to higher legitimacy of physical intimidation, and athlete's satisfaction with the participation in the team (García-Calvo et al., 2014). In their study, Bruner and colleagues (2014) show how a higher levels of task and social cohesion lead to more positive youth development, specifically in greater personal and social skills, initiative, goal setting, personal and social skills, cognitive skills, and lower levels of negative experiences. Such aspects show how participation in a more task-oriented team could impact on the holistic development of the athlete: moreover, the abovementioned skills that are developed by team task-orientation are very close to some aspects of psychological wellbeing, like the ability to create positive relationship with others, autonomy and self-acceptance.

The presence of conflict within the team seems to be non-significant in the psychological wellbeing of athletes since it has no significant impact in the model (therefore their factor loading is deleted in the diagram) while surprisingly, competitiveness among the teammates have an impact, even if limited. It seems quite obvious that when players perceive a conflictual climate among teammates, they feel uncomfortable in their development, and results from other studies usually find that intra-team conflict and competitiveness as strongly associated (Jõesaar, Hein, & Hagger, 2011) in causing elevate stress and drop-out. Our results show that competitiveness among teammates could impact positively, even if partially, on the wellbeing of athletes and this represent an interesting issue. Following the most recent ecological-dynamic theory, competitiveness in team sport is defined as: "a constraint on sports performance which influences emergence of a performer's competitive behaviours" (Passos, Araújo, & Davids, 2016, p.1). Authors suggest an evolutionary psychological perspective on competitiveness dynamics: starting from the concept of constraints, to which athletes and team need to adapt to solve different tasks during training or competitions, they analyse how team members continuously shape and re-shape their behaviours and environmental resources in order to continuously co-adapt their behaviours to reach their goals. This way each athlete push himself beyond the limit of his performance, in order to gain improvement under the athletic point of view, but also a social status within the team or selection from the coach. According to Passos and colleagues, competitiveness becomes a feature of the team itself, that determine how athletes can co-adapt their resources and constraints to the resources and constraints of the environments they are involved and are able to gain their shared goals, like performance improvement or victory. They also underline that competitiveness should be trained during team training, as it is not something inherited, but strongly educated by environments.

Team variables are followed by the feeling of emotional closeness and behavioural complementarity with the coach, underlining the importance of such figure in the developmental path of adolescent athletes. Having a positive relationship with the coach influence both the performance (Jowett, Shanmugam, & Caccoulis, 2012) and the psychological wellbeing of athletes (Jowett & Poczwardowski, 2007; Jowett, & Shanmugam, 2016; Davis, Jowett, & Lafrenière, 2013), but it should also be balanced between the three constituent variables - closeness (emotional), commitment (cognitive) and complementarity (behavioural). In our analysis the emotional dimension seems to be the the most impacting among the three, allowing us some reflections. If on one hand emotional closeness, respect and support are needed by young athletes (that sometimes also made the function of a second-father), such aspects could change within age, with youngest players that may look for more nearness than older ones as they are in different phase of their psychological development. Moreover, it is important to note that being too much close to a coach could also not be so good when the athlete has not the possibility to spend more than one year with him. In general, the effectiveness of coach-athlete relationship has been found as more effective within a long term time-frame: thus, the longer the relationship, the better results are (Jowett & Nezelek, 2012). In the Clubs where data were collected – and in general in Italian football Clubs -, coaches change the team they train every year, thus both players and coaches need to develop the ability to create positive relationship within a very little frame of time. If such ability could be easier for adults, this could not be the same for adolescents, that need to be supported in such aspect of development, especially in early adolescence (Wyllemann et al., 2013).

Another aspect where coach-athlete relationship could influence is motivational orientation: athletes who perceive higher levels of closeness, co-operation and commitment perceived their coaches as more task-orientated (Olympiou, Jowett, & Duda, 2008), and this could be of huge benefit for the athletes that are supported in develop a task-motivational orientation, which could be more effective for his sporting career, allowing sport engagement and continuation within time, better and more effective goal setting and higher levels of satisfaction from sport participation. Overall, such aspects recall the meaning in life, autonomy and self-acceptance dimensions of psychological wellbeing. It would be interesting to examine if this aspect vary over different age and competitive level groups.

Outside sport, the motivational climate focused on learning is promoted by parents, especially mothers, and is considered as the most supportive aspect in the relational sphere of the players, while worry conductive climates are little considered for mothers and no impact for fathers. Players perceive that their parents support mainly their progresses and effort in training, consider results a consequence of determination and that they are less inclined to worry for failures and provide positive feedback in case of mistakes. Thus, both parents emphasise a task- involving climate which supported the results of previous studies (White 1998, White, et al., 1998; Salselas & Marquez, 2009; Kolayış, Sarı, & Çelik, 2017), that consider the motivational climate promoted by parents as a precursor of self-determined motivation toward sport, sport engagement and higher levels of satisfaction with sport. Moreover, parent-initiated motivational climate was found a significant predictor of late-season self-esteem, trait anxiety, and autonomous regulation even higher than the coach-

initiated motivational climate (O'Rourke, Smith, Smoll, & Cumming, 2014). In their study authors speculate to find an explanation to this result, concluding that parents are the major social agent, especially for younger athletes: therefore, their impact in motivational orientation act not only in sport but in all the activities and other life contexts (like school or friendship) of the athlete. Their role in enhancing an effective motivational orientation is clear and fundamental for a balanced and harmonious development of the athlete, and this is particularly important for sport Clubs and organizations when managing parents in their youth sectors.

Motivational climate promoted by parents have been found influencing self-esteem by the mediation of autonomy (O'Rourke et al. 2011), which could be considered very near to self-acceptance dimension of PWB. Recently, findings were found for the role of motivational climates induced by parents in contribution to overtraining syndrome (Frydrychová, Bartošová, & Hutečková, 2018), as they suggest that also non-sport (or non-training) activities and stress situations could lead to negative consequences to athlete's health, especially if supported by an ego-oriented motivational climate from parents (Machado de Matos, 2010). Such correlation could not be so simple, as Gustafsson and coll., (Gustafsson, Hill, Stenling, & Wagnsson, 2015) show that also personality traits could impact on perceived stress from athletes, but such indication seems to be useful for more progress of research. The different weight and roles of father and mother impact appear as an interesting emerging issue, which concerns the different roles and approaches toward sport of each parent (Kolayış, et al., 2017; Wuerth, et al., 2004).

Reflecting on the different weight that athletes give to their coach and their parents it seems interesting to do another reflection: adolescence is the period within life when new models are looked for, in order to exit from the parental idealization and find new adult to trust and aspire. Coaches are the main landmark for their sporting career: they are responsible for selecting players, organize training to develop at best, deciding players for matches, and many other aspects that can help players to progress in their career, even more than parents. Our results show that coaches, next to teammates, assume a key role within the developmental path of young athletes, as the relationship with them has been considered necessary for the psychological wellbeing. Therefore, they need to be aware of their importance and be educated in managing a set of relational skills to deal with athletes, not only as "technician", but also as a source of emotional support.

Following a psychosocial approach, and according to our definition of relationship, coaching not only means to give instructions and feedback on technical - tactical aspect of the game, but to create a relational space where emotional knowledge and personal growth are shared and co-built. It would be interesting to deepen the meanings, values and expectations young athletes built within their relationship with their teammates and their coach, as it could help us in explaining better the present results.



## *Study III - The mediating role of individual variables between the characteristics of relationship and psychological wellbeing: an interaction model*

### *Aim*

In the framework of psychosocial approach, that claims for the importance of the interaction between individual and his relationships in his developmental and life experiences, we suppose that the impact of the characteristics of relationships on his psychological wellbeing could be mediated by some psychological characteristics of the athletes. Therefore, we want to analyse the possible mediation effect by the psychological characteristics on the impact of the characteristics of relationships on psychological wellbeing of athletes.

### *Sample*

The sample of this analysis were 417 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16, 2 years.

### *Measurement*

After analysing the reliability of each scale, we used in our data collection, we'll insert in the model the resulting structures. To facilitate the reader, we'll reassume the factorial structure we obtained for each scale from the CFA analysis presented in Study I, with the related abbreviations.

- **Ryff's Psychological Well-Being Scale** (Ryff, 1989; Ryff & Keyes, 1995; Italian version by Sirigatti et al., 2009): from our CFA analysis only 4 factors emerged as reliable in our sample, that are:
  - Self-acceptance (PWB\_AC), a positive attitude toward the oneself and one's past life and experiences;
  - Positive relationship with others (PWB\_RE), that is the ability to establish satisfying relationship;
  - Autonomy (PWB\_AU), a sense of independence and self-determination in own's life;
  - Meaning in Life (PWB\_ME), or the belief of a unique meaning to one's life.
  
- **Task and Ego Orientation in Sport Questionnaire** (Duda et al., 1995; Italian version by Bortoli & Robazza, 2005): from our CFA analysis both motivational orientation (Task- and Ego- motivational orientation) emerged as reliable in our sample, named in the analysis as "Mot\_Ego" and "Mot-Task".

- **Self-Regulation of Learning Self Report Scale for Sport-practice** (Bartulovic, Young & Baker, 2017): from our CFA analysis the factor of Self-efficacy should be removed from the scale, but considering Self-efficacy as an important part of the Self-regulation, as well as of the psychological variables of talented athletes, we decided to remove it from the SR scale, but to maintain it into the Structural Equation Model as a single factor, created by the union of its constituent items. Therefore, we obtained 5 constituent factors for Self-Regulation and 1 independent factor of Self efficacy. For Self-Regulation we considered:
  - Planning (SR\_PLAN), which implies identifying and planning strategies to face and solve training tasks;
  - Self-Monitoring (SR\_MON), that means monitoring strategy implementation to assure that they are correct;
  - Evaluation (SR\_VAL) of training outcomes with the aim to adjust behaviours considering their outcomes;
  - Reflection (SR\_REF), which implies identify performance aspects and skills that need to be improved;
  - Effort (SR\_EFF), that describe the type and intensity of engagement into a specific task execution.
  - Self-Efficacy (SELF\_EFF), which is an evaluation about personal abilities and effectiveness on specific tasks.
  
- **Coach – Athlete Relationship Questionnaire** (Jowett, 2004): from our CFA analysis all three constituent factors (Closeness, Complementarity and Commitment) resulted important and reliable in our sample, therefore we maintain all of them (COA\_COMM, COA\_CLO and COA\_COMP).
  
- **Peer Motivational Climate in Youth Sport Questionnaire** (Ntoumanis & Vazou, 2005), from our CFA analysis only 4 factors of 5 resulted reliable for our sample, therefore we only considered the following constituent factors:
  - Focus on improvement (TEAM\_IMP), that means supporting each other to improve in abilities and skill acquisition;
  - Effort (TEAM\_EFF), that is the degree to which team members push their teammates to give their best and try harder when failing;
  - Intra-team competitiveness (TEAM\_COMP), the promotion of inter-individual competition by the members of the group;
  - Intra-team conflict (TEAM\_CNF), that implies negative and unsupportive behaviours toward teammates.

- **Parent – Initiated Motivational Climate Questionnaire** (White, Duda & Hart 1992): from our CFA analysis only two motivational climates emerged as reliable in our sample, therefore we only consider a double factorial solution, composed by:
  - Learning/Enjoyment climate (by father and by mother), that means supporting a climate of learning, where errors are considered as part of the learning process and enjoyment is the main outcome of the sporting experience (LEARN\_F/M);
  - Worry Conductive climate (by father and by mother), that means instead to create a climate of concerns about making mistakes or when it's necessary to show underdeveloped abilities (WORRY\_F/M).

### *Data analysis*

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### *Mediation analysis with SEM*

In mediation analysis we consider an intermediate or process variable, called the mediator (M), that helps explain how or why an independent/exogenous variable (X) influences an outcome/endogenous one (Y), how shown in Figure 3. The main advantages of using structural equation modelling instead of standard regression methods for mediation analysis is that mediation assumes both causality and a temporal ordering among the variables under study. As variables in a mediation analysis can be both causes and effects, the standard regression paradigm is not suited for modelling such a relationship because it assigns a specific role of cause or effect to each variable (Baron & Kenny, 1986; MacKinnon & Fairchild, 2009).

The main strengths of SEM framework in mediation analysis over simple regression are: a) SEM allows an easier interpretation of results, as it's designed to simplify results in a single analysis, b) SEM doesn't need missing data deletion, as it uses specific estimators, c) SEM provides model fit information about the consistency of the hypothesized model, and d) SEM implies a functional relationship between variables, made by a conceptual model, path diagram, and mathematical equations (for a brief but detailed analysis about mediation with SEM, see Gunzler, et al., 2013).

To express a mediation analysis, we must consider all the effects between variables (see Figure 14 below), that are:

- $\gamma_{xy}$  is the *direct effect*, shown by the dotted path from the independent variable X (called "exogenous") to the outcome variable Y (called "endogenous"), is the part of the effect of X on Y that is independent of the pathway through Z;
- the *indirect effect* is the product  $\beta_{xz} \gamma_{zy}$ , described by the pathway from the exogenous variable X to the outcome variable Y through the mediator variable Z (that is both endogenous, as it's influenced by X, and exogenous, as it influences Y); in other words, it is interpreted as the amount by which two cases who differ by one unit on X are expected to differ on Y through X's effect on Z, which in turn affects Y. In contemporary mediational analyses, the indirect effect is the measure of the amount of mediation;
- the total effect is the sum of the direct and indirect effects of the exogenous variables on the outcome:  $\gamma_{xy} + \beta_{xz} \gamma_{zy}$ .

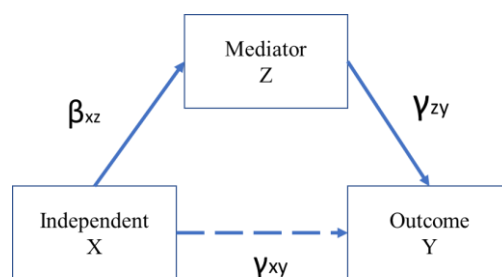


Figure 14 - Representation of a mediation analysis

There are two kinds of mediation that are: *complete* mediation and *partial* mediation. In the first case, variable X no longer affects Y after M has been controlled, making path  $\gamma_{xy}$  equal to zero. This doesn't mean that X and Y have no link between them, but that their connection is strictly linked to the effect of the mediator variable M. In the second case, that is partial mediation, the path from X to Y is reduced in absolute size but is still different from zero when the mediator is introduced; this means that both the exogenous and mediator have both an influence on the outcome variable. In general, the way to measure mediation is the indirect effect. The most effective methods to test the indirect effect of a mediation is by *bootstrapping-based methods*, as suggested by Hayes, (Hayes, 2009). Preacher and Hayes Bootstrapping method is a non-parametric test that creates  $k$  (at least 1000, but better 5000) simulations of the original sample (by a "with replacement"

technique), obtaining an empirical representation of the sampling distribution of the indirect effect. Therefore, there will be  $K$  estimates of the indirect effect, whose distribution is an empirical approximation of the sampling distribution of the indirect effect, when taking a sample of size  $n$  from the original population. An inference is made about the size of the indirect effect in the population sampled by using the  $k$  estimates to generate a  $ci\%$  confidence interval. If zero is not between the lower and upper bound, then it's possible to affirm that the indirect effect is not zero with  $ci\%$  confidence. Simulation research shows that bootstrapping is one of the best and powerful methods for testing intervening variable effects (Williams & MacKinnon, 2008).

## *Results*

*Preliminary analysis.* As Psychological Wellbeing factors had means values which differ from other factors (see the section dedicated to the Psychological Wellbeing Scale, p. 93 where the mean values for the scale was ranged from 3 to 12), we first transform the factors' mean values into a value similar to the ones of other scales. Therefore, we calculate the mean value for each factor by dividing each factor value for 3 (e.g.:  $PWB\_self\ acceptance\_original/3 = PWB\_self\ acceptance\_mean$ ). Also, factors were standardized to have a mean of 0 and a standard error of 1.

We run a simple measurement-of-mediation model, with using Mplus 7.11 (Muthèn & Muthèn, 1998-2017), using Maximum Estimation Robust as estimator, where Psychological characteristics (Psy\_Ind) are the mediator variable between the Characteristics of relationship (C\_Rel) and Psychological wellbeing (PWB).

Results of the different model tested are reported in Table 29, while the diagrams of hypothesized models and the results of the analysis are reported in the following pages (Figures 15-17).

In the first model (represented in Figures 15-16), we estimate the direct effect of C\_Rel on PWB ( $\gamma_{xy}$ ) and on Psy\_Ind ( $\beta_{xz}$ ) and the indirect effect of Psy\_Ind on PWB ( $\gamma_{zy}$ ).

As shown in Table 29, the indirect effect resulted non-significant (.488, *ci*: -.238 and 1.214), as zero value is included in its confidence intervals. Moreover, we noticed that in this model the direct effect of C\_Rel on PWB resulted significantly small and non-significant (.231, *ci*: -.595 and 1.057), while the direct effect of C\_Rel on Psy\_Ind is the only significant one (.868, *ci*:.755 and .981).

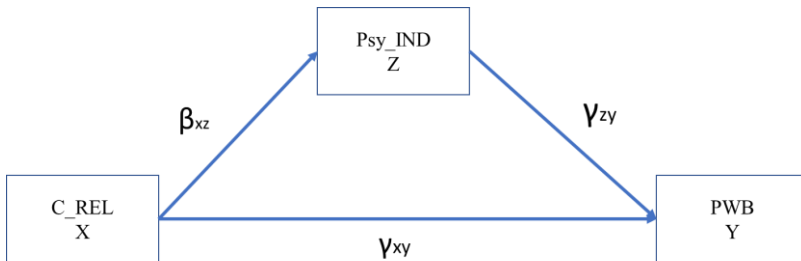


Figure 15 - Model 1: standard mediation model between C\_Rel, Psy\_Ind and PWB

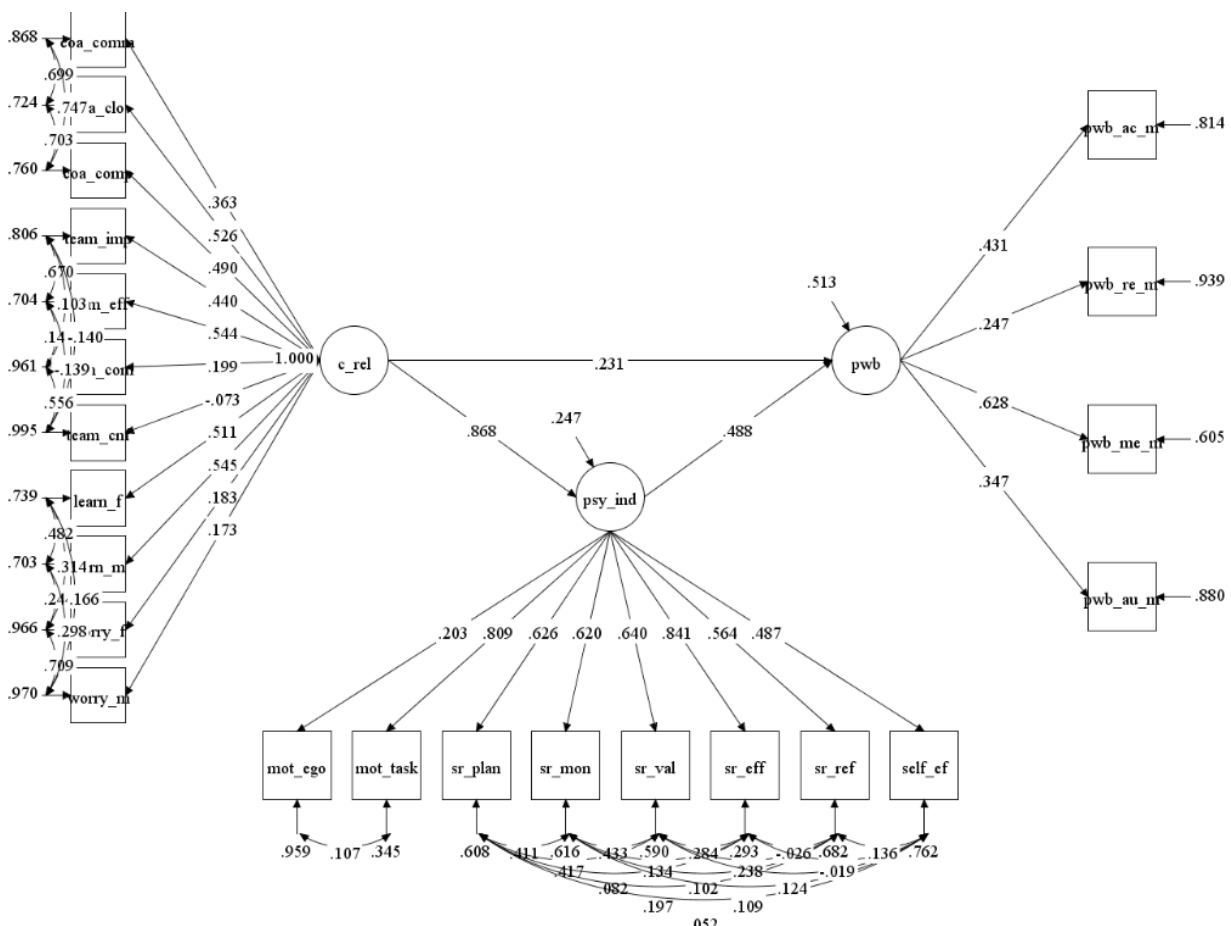


Figure 16 - Model 1 diagram results from MPLus output

Considering the results of our previous study (see Study II, pp. 100-106) we cannot refuse the hypothesis of an influence of C\_Rel on PWB, therefore it's possible to presumed that when Psychological characteristics are introduced in the model they strongly interact with the characteristics of the relationships, influencing their impact on other variables, as it's shown by the strong correlation between them. Therefore, we ran two alternative models, where we test two more hypothesis.

In Model 2 (reported in Figures 17-18) we delete the direct effect of C\_Rel on PWB ( $\gamma_{xy}$ ) and consider only the indirect effect of C\_Rel on Psy\_Ind ( $\beta_{xz}$ ) and the direct effect of Psy\_Ind on PWB ( $\gamma_{zy}$ ), which is very close to a complete mediation.

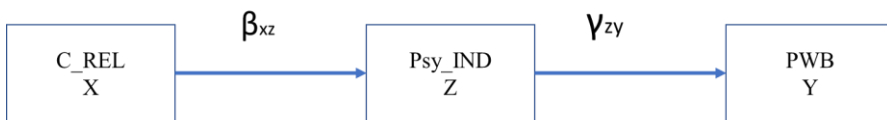


Figure 17 - Model 2: complete mediation of Psy\_Ind between C\_Rel and PWB

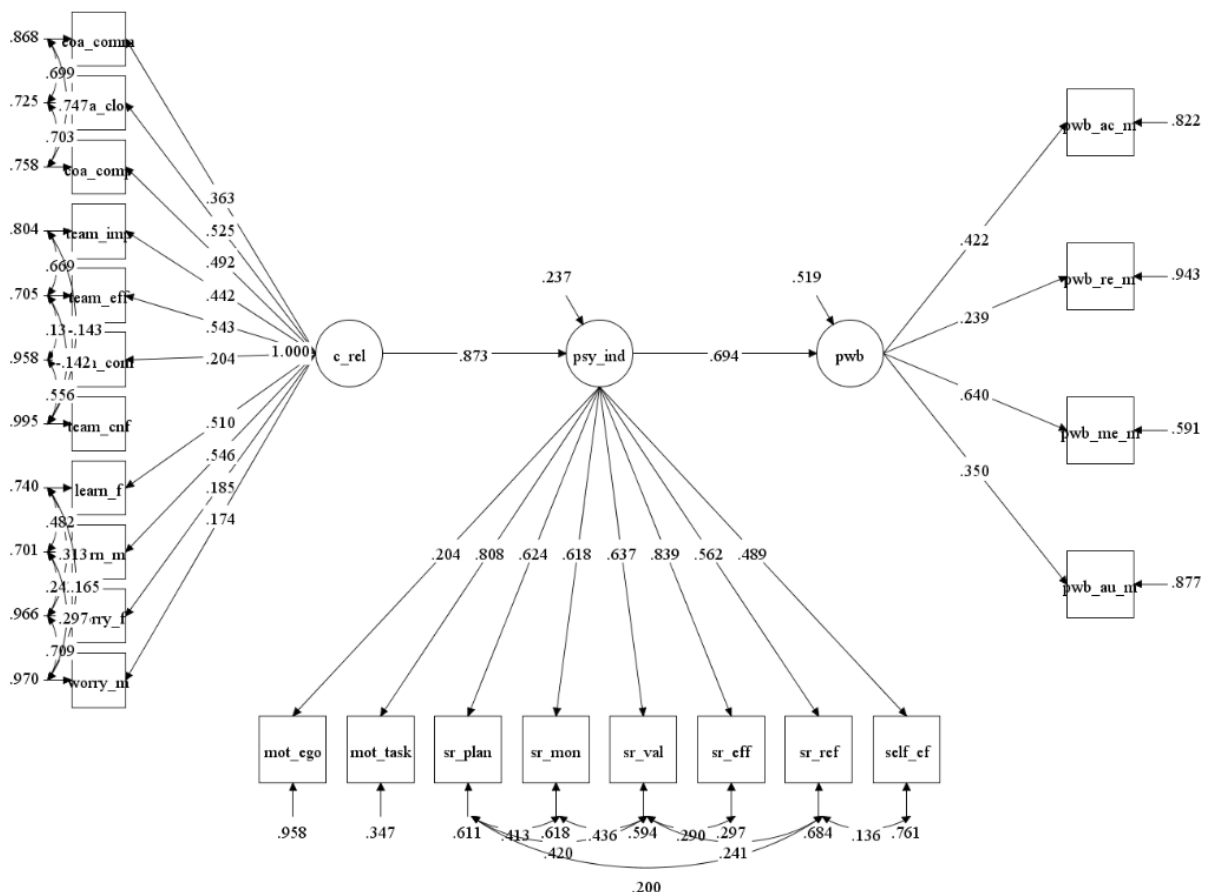


Figure 18 - Model 2 diagram results from MPlus output

In Model 3 (represented in Figures 19 and 20) we hypothesized only a direct effect for each exogenous latent factor on PWB ( $\gamma_{xy}$  and  $\gamma_{zy}$ ), considering only their correlation (the dotted line in Figure 17), in order to study their effect on PWB.

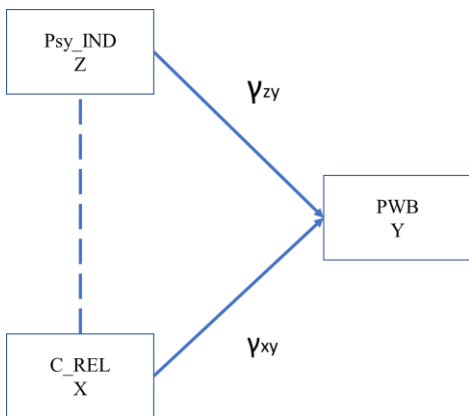


Figure 19 - Model 3: no mediation, single effect model

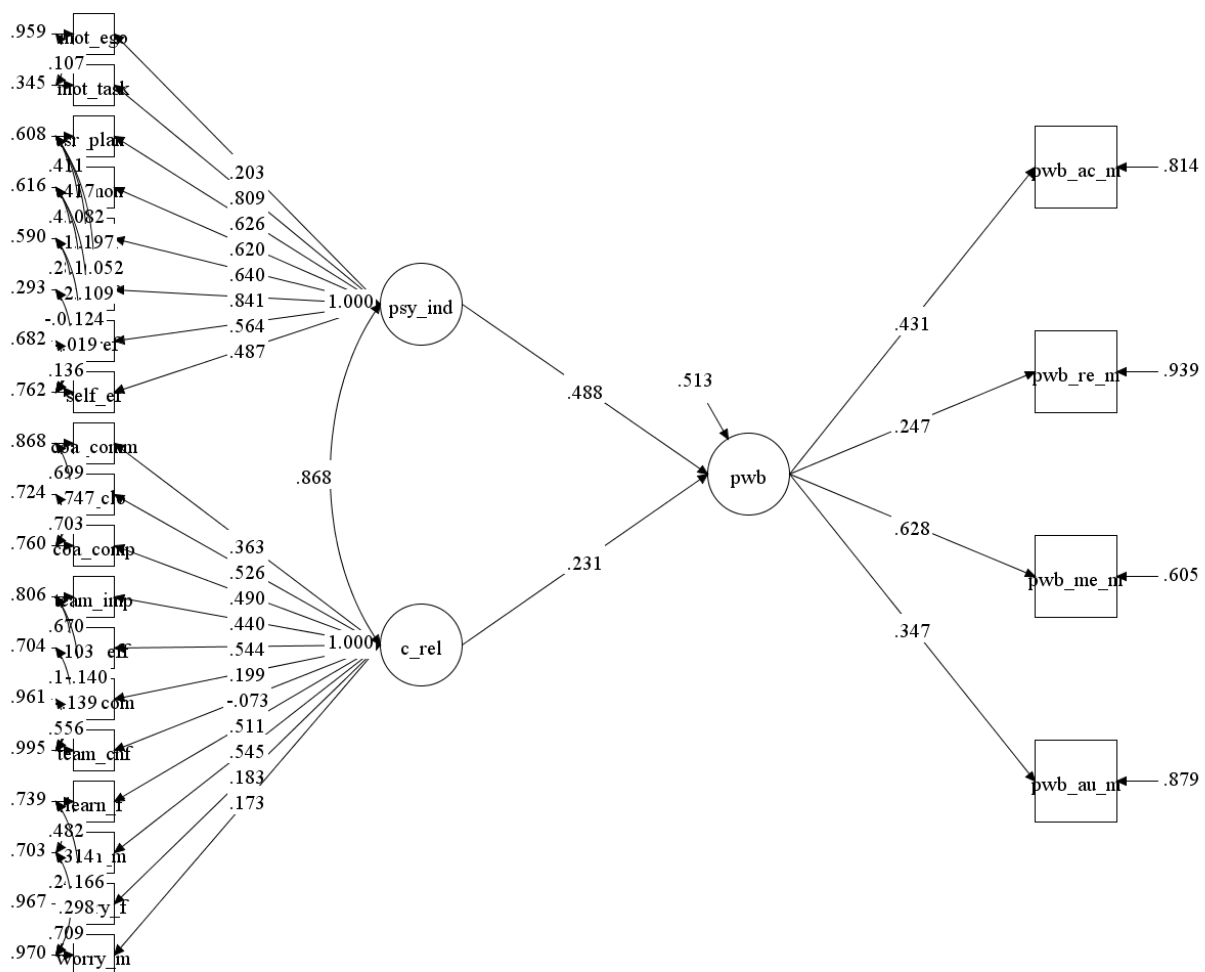


Figure 20 - Model 3 diagram results from MPLus output



Results reported in Table 29 show that Model 2 is the best fitting model for our sample, that is a model of complete mediation. Such result shows that when the individual variables are introduced in the model, they strongly interact with the characteristics of the relationships in influencing the psychological wellbeing and that such interaction is much stronger than the single impact of the characteristics of relationships on psychological wellbeing (see Study II).

Moreover, Model 1 and Model 2 show that the direct effect of Psy\_Ind on C\_Rel are the only significant effects when introduced in the model and their strong link could be the main cause for the non-significance of the other indirect effects.

<b>Fit indices of the models<sup>7</sup></b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Chi-Square Test of Model Fit (Degrees of Freedom)	453.312 (196)	451.491 (197)	453.314 (196)
CFI	.925	.926	.925
RMSEA	.056	.056	.056
SRMR	.060	.060	.060
AIC	15196.506	15195.147	15196.506
BIC	15611.914	15606.521	15611.914
Between factors effect: (CI% indirect effect: lower and upper)	Indirect: Psy_Ind on PWB: .488 (-.238 and 1.214);  Direct: C_Rel on PWB: .231 (-.595 and 1.057);  Direct: Psy_Ind on C_Rel: .868** (.755 and .981).	Direct: C_Rel on Psy_Ind: .873** (.761 and .986);  Direct: Psy_Ind on PWB: .694** (.542 and .845).	Direct: Psy_Ind on PWB: .488 (-.238 and 1.214);  Direct: C_Rel on PWB: .231 (-.595 and 1.057).

\*\* . Correlation is significative at 0,01 (2-tails).

Table 29 - Models and related fit indices of mediation analysis

In the following Tables are reported the means and standard deviations of variables in the Model 2 (Table 30) and the estimated factor loadings (Tables 31-33). As we can see from Table 32 Team Conflict doesn't load on its factor, while other variables have little load but are anyway significant in the model (i.e.: Motivational Orientation on Ego, Positive Relationships with others, Intra-Team Competitiveness and the Worry Conductive Climates of both parents).

<sup>7</sup> Number of missing data patterns are 85.

<b>Factor</b>	<b>Mean</b>	<b>sd</b>
Motivational orientation Ego	3.22	.84
Motivational orientation Task	4.29	.54
SR_Planning	3.62	.63
SR_Monitoring	3.59	.67
SR_Evaluation	3.84	.76
SR_Effort	4.06	.67
SR_Reflection	3.77	.77
Self_Efficacy	3.50	.60
Coach Commitment	3.45	.86
Coach Closeness	4.03	.78
Coach Complementarity	3.75	.76
Team Improvement	3.49	.74
Team Effort	3.79	.66
Intra-Team Competitiveness	3.32	.68
Intra-Team Conflict	2.82	.86
Learning/enjoyment climate (father)	3.80	.56
Worry Conductive climate (father)	3.37	.67
Learning/enjoyment climate (mother)	3.82	.60
Worry Conductive climate (mother)	3.45	.71
PWB Self-acceptance	3.16	.43
PWB Positive relationship	3.30	.51
PWB Meaning in life	3.15	.56
PWB Autonomy	3.10	.50

Table 30 - Means and standard deviations of variables in the model tested in the mediation analysis

<b>Psychological Wellbeing Latent factor</b>	<b>Estimated factor loading</b>	<b><i>p</i></b>
Self-acceptance	.422	.0001
Positive relationship	.239	.0001
Meaning in life	.640	.0001
Autonomy	.350	.0001

Table 31 - Estimated factor loadings in Psychological Wellbeing latent factor

<b>Characteristics of relationships Latent Factor</b>	<b>Estimated factor loading</b>	<b><i>p</i></b>
Coach Commitment	.363	.0001
Coach Closeness	.525	.0001
Coach Complementarity	.492	.0001
Team Improvement	.442	.0001
Team Effort	.543	.0001
Intra-Team Competitiveness	.204	.0001
Intra-Team Conflict	-.068	.498
Learning/enjoyment climate (father)	.510	.0001
Learning/enjoyment climate (mother)	.546	.0001
Worry Conductive climate (father)	.185	.0001
Worry Conductive climate (mother)	.174	.001

Table 32 - Estimated factor loadings in Characteristics of relationships latent factor

<b>Psychological characteristics</b>	<b>Estimated factor loading</b>	<b><i>p</i></b>
<b>Latent Factor</b>		
Motivational orientation Ego	.204	.002
Motivational orientation Task	.808	.0001
SR_Planning	.624	.0001
SR_Monitoring	.618	.0001
SR_Evaluation	.637	.0001
SR_Effort	.839	.0001
SR_Reflection	.562	.0001
Self_Efficacy	.489	.0001

Table 33 - Estimated factor loadings in Psychological characteristics latent factor

Having established that Model 2 is the best fitting mediation model between our hypothesized, we will now analyse some results about factor loadings. Regarding the C\_Rel latent factor, we observe as Learning/Enjoyment climate induced by parents (Mother: .546; Father: .510), Team Effort (.543), Coach Closeness (.525), and are the most important variables in the latent factor.

Considering the Psy\_Ind latent factor instead, Self-regulated Effort (.839) and Task-Motivational orientation (.808) are the most important individual characteristics responsible for the mediation effect. Moreover, concerning the Self-Regulation dimensions, besides Effort, it seems that all dimensions can be considered important individual characteristics as their factor loading is between .618 to .839.

Finally, in PWB latent factor it seems that having a meaning in life could be considered as the most important dimension, therefore all the variables in the previous factors have an impact mostly on this psychological outcome (.640).

Contrary, Team Conflict seems to be the only variable that have no connection with the latent C\_Rel, while surprisingly the factor of Team Competitiveness does, even if restricted (.204). Also Worry Conductive climate by parents have a little impact in the hypothesized model, but it's still more restricted than Team Competitiveness.

### *Discussion*

According to psychosocial approach, with this study we want to add complexity to the model tested in Study II, investigating the mediation effect by psychological characteristics between relational variables and PWB. Doing this we probably remove some variability to the model, but we could identify the most important variables in the model.

Overall these results recall the results of Study II of the present work, that is learning motivational climate promoted by parents, effort within team, coach closeness as the most important variables regarding relationship that impact on psychological wellbeing. Furthermore, the model also allows to identify that self-regulation effort and task motivational climate are the most important psychological characteristics that mediate the effect of relational variables on psychological wellbeing (described as “having a meaning in life”). Therefore, starting

from comparing results of Study II and Study III of the present work, we'll then deepen the role of psychological characteristics on the psychological wellbeing.

Effort, as self-efficacy, represent the motivational aspect of self-regulation (Toering et al., 2009), that help the athlete in setting effective goals and find the right level of dedication in realizing them. Effort, as part of self-regulatory skills, is generated also by feedback of others. Toering et al. (2009) examine elite/non-elite athlete differences in SRL finding that players were 7.0 times more likely to belong in the elite group if they scored high in effort. Results suggest elite players are more engaged in what they have learned and are more willing to invest effort and persistence with task execution (Toering et al., 2009). Like Toering et al. (2009), Bartulovic, Young & Baker (2017) found elite athletes benefit from processes associated with effort, as they have greater ability to structure and manage daily-practice routines, practice with effort and are more resilient in facing difficulties than non-elite or novices (Kitsantas & Zimmerman, 2002).

Our results seem to confirm the literature findings about effort as one of the most important behavioural demonstration of dedication and care about one's responsibility in sport, as it allows athletes to set goals and find the right resources to manage and reach them. Moreover, our results show that effort is strongly linked to the characteristics of relationship of athletes and their PWB. Our result show that it supports them in perceiving a meaning in their life and in finding the right resources to reach it.

Motivational orientation on task is one of the most investigated aspect in the athletic development, since it was one of the first psychological characteristics to be identified as effective for development and maintenance of elite performance (MacNamara & Collins, 2011; Zuber, Ziburg & Conzelmann, 2015). For example, high motivation on task or intrinsic motivation have been shown to facilitate skill acquisition, enabling athletes to invest the right amount of time for practice and commitment to development, facilitate the progression to junior national team, but also protecting athletes from burn-out when entering elite training centers (Isoard-Gauthier et al., 2013). In their recent longitudinal work, Forsman, Blomqvist, Davids, Liukkonen & Konttinen (2016) find that young players scoring moderately in motivation have 7.45 times greater chance of becoming an elite player at the age of 19 years than low-scoring players, whereas for high-scoring players this chance was 9.63 times greater. In addition, youth soccer players who scored in the moderate or highest category in motivation, at 15 years, were about seven to 10 times more likely to reach the elite performance level at the age of 19, than low-scoring players. Findings suggested that in coaching young talented soccer players, the focus should be made in promoting the development of players' motivation towards soccer. Results of our study underline that not only motivational orientation is influenced by other's, but that it becomes a characteristics athlete use to mediate the effect of their relationships on their goals of development.

Results of the study reveals that learning/enjoyment motivational climate induced by mother is the most important variables among the characteristics of relationship in generating motivation and self-reguation. That's surprising, because mothers are usually less involved in sport experience than father, especially in the

context of football, that is mainly a male sport where the father often create a special bond with the son. It seems that our results go over such kind of “gender stereotype” and show a new (and effective) role for the player’s mothers, made by support and facilitation of a learning and enjoyment approach to sport, more than father. Coakley (2006) strongly underlines the change of the family role within the last century: it started with the changes in mothers role (which began to work), which caused a change in father’s role too within family-life management. Fathers took more and more the responsibility of parenting and childcaring, and this lead to many changes also in their role within children sport participation.

Our results seems to confirm a certain literature on differences in parenting in sport. Holt and colleagues (2009), show how parental styles are very different, with mother showing more autonomy-supportive and father more controlling behaviours, showing the necessity to investigate the role and behaviours of each single parent into the development of athletes. Also Wuerth and coll. (2004) found differences in parenting involvement between fathers and mothers, with mothers that promote more praise and understanding and fathers give express more directive behaviours toward sport practice. Moreover, they also show how such parental involvement change within athletic career, but remain always different between the two parents. Not only mothers and fathers differ a lot on parenting styles and involvement: our results seem to show that athletes’ perceive mothers as more promoting a learning motivational climate than fathers, even if the difference is small. Our results confirm that parental motivational climate impact on generating a motivation on task and a self-regulated effort that mediate its positive impact on PWB, confirming that these psychological characteristics are not only influenced by others (Zimmerman, 2002; Schunk & Zimmerman, 1997; Cox, 2002) and they are used in mediating the relationship with others.

Team effort is the degree to which team members push their teammates to give their best and try harder when failing (Ntoumanis & Vazou, 2005), and results of our study show that this specific dimension results one of the most important in their relational context. This is a surprising result, as research in this sense is very scarce: most of the research focused on cohesion within team (Bruner et al., 2014; García-Calvo, et al., 2014; Bray & Whaley, 2016), mastery/task motivational climate in general (Ntoumanis, et al., 2012), focus on improvement and enjoyment (Macdonald, Côté, Eys, & Deakin, 2011) or the effect of coaching behaviours and leadership styles (Cheval, et al., 2017) on performance and positive development of team.

In previous studies effort has been investigated as personal outcome of the team motivational climate or cohesion, but not as a specific predictor of motivation, self-regulation or wellbeing, unlinked to the other dimensions of the team variables. Effort within the team has been considered as part of the motivational climate, and it’s hard to find it considered as unique precondition. Therefore, our results show that it could be interesting to deepen the knowledge of this specific dimension and its effects on psychological characteristics and wellbeing.

As expected, intra-team conflict inversely impacts on psychological characteristics and indirectly on wellbeing, that means when athletes perceive high levels of conflicts within their team, this could lead not only to perceive high levels of stress or discomfort within the team, but also a difficulty in development

psychological characteristics. Intra-team competitiveness impact partially on psychological characteristics, that could indicate that a positive competitiveness within the team can support players in such development (Passos et al., 2016). The more a player plays in matches, the higher his possibilities to be selected by observatory and scouts from other major Clubs are, thus the higher his possibilities to continue in his career (Gledhill, et al., 2017). According to Passos et coll. competitiveness helps players to develop also a set of skills that help them both individually and as a team to adapt continuously to environmental constraints (both in matches and in training), and to effectively reach their goals (improvement or victory). Our results seem to confirm such idea, and to add that competitiveness if mediated by well developed task orientation and effort can positively impact on PWB, so in the development of potentiality of each players in a situational game like soccer.

Coach closeness represents the emotional dimension in the coach-athlete relationship, and it appears as the third dimension in the characteristics of relationship factor, followed by the complementarity, confirming the results of Study II. Results of the present Study reveals an important aspect: intimacy and behavioural sense of complementarity between athlete and coach are important in generating a task motivational orientation of players and the self-regulated sense of effort that impact on the personal PWB. As for the motivational climate induced by parents, also coach-athlete relationship seems to be strongly mediated by some psychological characteristics of the athletes in its influence on PWB, this means that not only a better coach-athlete relationship promote a task/mastery approach to sport (Olympiou, Jowett, & Duda, 2008), and on effort, but that its impact on the PWB is also mediated by these variables.

The most important dimension in psychological wellbeing latent factor in the model is the sensation of having meaning in life. If we recall the eudaimonic definition of PWB by Ryff (1989), it correspond to the possibility to reach human potential and to the personal resources necessary to reach an optimal level of functioning in the long term. According to Lundqvist (2011) having a meaning in life has been described by athletes as the awareness that own's effort are devoted to a specific and higher life-goal that could be reached specifically through sport. Such definitions support our tentative to describe talent development following the psychosocial approach as the attempt to reach athlete's potential through the interaction of many elements at different levels, both on the relational and the individual point of view.

Specifically, the model seems to show that some characteristics of relationship - specifically coach closeness, team effort and parental learning motivational climate - positively influence the perception of having a meaning in life, by the development of task motivational orientation and effort of each athletes.

It is a quite interesting result, as it allows to underline the fundamental role of the characteristics of relationship in supporting or promoting the development of certain psychological characteristics, underlining that relationship are the necessary base for effective talent development to reach one's potential, thanks to the support of the development of these psychological characteristics.

This result underline how athletes with apparently the same athletic potential reach different levels of performance even within the same (sporting) contexts because of the interaction among relationships and their psychological characteristics. Therefore, not only psychological characteristics can help athletes in setting and reaching goals, but we show how such characteristics can be created by their relationship and have a strong influence their personal path of development.









## *Study IV - Analysis of the model variation within competitive level and age groups*

### *Aim*

This study aims at analyzing how the model changes within the competitive level and age groups in our sample. Considering the results of the previous studies, we want to test if the model varies for higher and lower competitive level players and between older and younger athletes. We expect to find differences between such groups to initially prove the validity of our hypothesis about the importance of psychological wellbeing as an effective talent development condition generated by better relationship and psychological characteristics.

### *Sample*

The sample of this analysis were 417 male young soccer players from 2 professional (Serie A and B, N=127), 2 semi-professional (Serie C, N=162) and 4 amateur (N=128) Youth Academies of Italian soccer Clubs. Their age varied between 14 and 20 years, with a mean of 16.2 years. We divided the total sample into 3 competitive levels groups and 3 age groups obtaining the following groups (Tables 34 - 35). We deleted from the analysis the 5 players of 20 years of age and the players that didn't indicate their birth (N=25 total deleted), obtaining a total of 392 players in the analysis.

<b>Competitive level groups</b>			
	<b>League</b>	<b>N</b>	<b>%</b>
Valid	G.1 Elite (Serie A + B)	127	30.5
	G.2 Sub-elite (Serie C)	162	38.8
	G.3 Amateurs	128	30.7
Missing	999	0	
Total		417	

*Table 34 - Competitive groups*

<b>Age groups</b>			
	<b>Age</b>	<b>N</b>	<b>%</b>
Valid	G.1 14-15	139	33.3
	G.2 16-17	181	43.4
	G.3 18-19	72	17.3
	Total	392	
	20 or missing	25	6.0
Total		417	

*Table 35 - Age groups*

## *Measurement*

After analysing the reliability of each scale, we used in our data collection, we'll insert in the model the resulting structures. To facilitate the reader, we'll reassume the factorial structure we obtained for each scale from the CFA analysis presented in Study I, with the related abbreviations.

- **Ryff's Psychological Well-Being Scale** (Ryff, 1989; Ryff & Keyes, 1995; Italian version by Sirigatti et al., 2009): from our CFA analysis only 4 factors emerged as reliable in our sample, that are:
  - Self-acceptance (PWB\_AC), a positive attitude toward the oneself and one's past life and experiences;
  - Positive relationship with others (PWB\_RE), that is the ability to establish satisfying relationship;
  - Autonomy (PWB\_AU), a sense of independence and self-determination in own's life;
  - Meaning in Life (PWB\_ME), or the belief of a unique meaning to one's life.
  
- **Task and Ego Orientation in Sport Questionnaire** (Duda et al., 1995; Italian version by Bortoli & Robazza, 2005): from our CFA analysis both motivational orientation (Task- and Ego- motivational orientation) emerged as reliable in our sample, named in the analysis as "Mot\_Ego" and "Mot-Task".
  
- **Self-Regulation of Learning Self Report Scale for Sport-practice** (Bartulovic, Young & Baker, 2017): from our CFA analysis the factor of Self-efficacy should be removed from the scale, but considering Self-efficacy as an important part of the Self-regulation, as well as of the psychological variables of talented athletes, we decided to remove it from the SR scale, but to maintain it into the Structural Equation Model as a single factor, created by the union of its constituent items. Therefore, we obtained 5 constituent factors for Self-Regulation and 1 independent factor of Self efficacy. For Self-Regulation we considered:
  - Planning (SR\_PLAN), which implies identifying and planning strategies to face and solve training tasks;
  - Self-Monitoring (SR\_MON), that means monitoring strategy implementation to assure that they are correct;
  - Evaluation (SR\_VAL) of training outcomes with the aim to adjust behaviours considering their outcomes;
  - Reflection (SR\_REF), which implies identify performance aspects and skills that need to be improved;
  - Effort (SR\_EFF), that describe the type and intensity of engagement into a specific task execution.
  - Self-Efficacy (SELF\_EFF), which is an evaluation about personal abilities and effectiveness on specific tasks.

- **Coach – Athlete Relationship Questionnaire** (Jowett, 2004): from our CFA analysis all three constituent factors (Closeness, Complementarity and Commitment) resulted important and reliable in our sample, therefore we maintain all of them (COA\_COMM, COA\_CLO and COA\_COMP).
- **Peer Motivational Climate in Youth Sport Questionnaire** (Ntoumanis & Vazou, 2005), from our CFA analysis only 4 factors of 5 resulted reliable for our sample, therefore we only considered the following constituent factors:
  - Focus on improvement (TEAM\_IMP), that means supporting each other to improve in abilities and skill acquisition;
  - Effort (TEAM\_EFF), that is the degree to which team members push their teammates to give their best and try harder when failing;
  - Intra-team competitiveness (TEAM\_COMP), the promotion of inter-individual competition by the members of the group;
  - Intra-team conflict (TEAM\_CNF), that implies negative and unsupportive behaviours toward teammates.
- **Parent – Initiated Motivational Climate Questionnaire** (White, Duda & Hart 1992): from our CFA analysis only two motivational climates emerged as reliable in our sample, therefore we only consider a double factorial solution, composed by:
  - Learning/Enjoyment climate (by father and by mother), that means supporting a climate of learning, where errors are considered as part of the learning process and enjoyment is the main outcome of the sporting experience (LEARN\_F/M);
  - Worry Conductive climate (by father and by mother), that means instead to create a climate of concerns about making mistakes or when it's necessary to show underdeveloped abilities (WORRY\_F/M).

### *Data analysis*

We first use Structural Equation Model to test the variation of the model between groups of players, but as we run the analysis the results show that the model fit indices were not acceptable. We hypothesize that such result is caused by the limited number of participants per groups and the high number of variables in the model. Therefore, we change our analysis and used the Analysis of Variance to compare group means.

Analysis of Variance (ANOVA) is a collection of statistical models and their associated estimation procedures used to analyze the differences among group means in a sample. ANOVA divides the observed variance into many components attributable to different sources of variation to provide a statistical test of whether the population means of tested groups are equal. ANOVA is useful for comparing three or more group means for

statistical significance. It is like multiple two-sample t-tests, but is more conservative, resulting in fewer type I errors (Tabachnick & Fidell, 2007; Barbaranelli, 2007). Moreover we performed a Welch ANOVA, that can be used even if data violates the assumption of homogeneity of variances (Moder, 2010).

Using ANOVA, we compare the 3 groups based on competitive level and age on all the variables collected: Psychological Wellbeing, Motivational Orientation, Self-regulation of Learning in Sport, Parent Initiated Motivational Climate, Relationship with the Coach and Peer Initiated Motivational Climate (see the Measurement section for more details on the scales).

### *Results for competitive levels group differences*

Variables	G1 Elite		G2 Sub-elite		G3 Amateurs		F/Welch	p
	M	DS	M	DS	M	DS		
PWB_composite*	9.85	.85	9.56	.94	9.31	.94	10.06	.0001
PWB_autonomy*	9.72	1.49	9.37	1.46	8.87	1.51	9.94	.0001
PWB_meaning*	9.95	1.36	9.50	1.85	8.95	1.65	13.32 w	.0001
PWB_self-acceptance**	9.75	1.25	9.41	1.32	9.35	1.31	3.39	.035
PWB_positive relation	9.93	1.47	9.93	1.51	9.91	1.68	.005	.995
MOT_task*	4.48	.44	4.31	.51	4.10	.62	14.73 w	.0001
MOT_ego	3.32	.76	3,27	.89	3.09	.87	2.59 w	.079
SRL_composite*	3.86	.41	3.78	.52	3.52	.56	14.08 w	.0001
SRL_planning**	3.71	.54	3.67	.62	3.45	.73	5 w	.007
SRL_monitoring*	3.70	.57	3.67	.65	3.36	.74	9.20 w	.0001
SRL_evaluating*	3.99	.61	3.96	.76	3.55	.83	12.48 w	.0001
SRL_effort*	4.26	.52	4.18	.65	3.72	.72	23.79 w	.0001
SRL_reflection**	3.88	.73	3.82	.79	3.63	.79	3.52	.030
SRL_self efficacy**	3.56	.56	3.56	.62	3.39	.60	3.61	.028
PAR_worry**	3.55	.58	3.46	.62	3.25	.70	6.46	.0002
PAR_learn**	3.91	.48	3.87	.49	3.68	.60	6.17	.0002
COA_composite**	3.72	.67	3.85	.64	3.63	.89	3.03 w	.050
COA_closeness**	4.10	.64	4.14	.70	3.84	.95	4.68 w	.010
COA_complementarity**	3.67	.69	3.88	.68	3.67	.90	3.89 w	.022
COA_committment	3.40	.85	3.54	.79	3.43	.94	1.02	.359
TEAM_learning	3.51	.68	3.49	.78	3.47	.76	.084	.920
TEAM_effort	3.87	.60	3.79	.68	3.72	.71	1.63	.197
TEAM_intra-compet**	3.15	.62	3.33	.67	3.41	.75	4.34	.014
TEAM_intra-conflict*	2.63	.70	2.79	.96	3.05	.85	8.89 w	.0001

w: ANOVA Welch values have been used as Levene test shows unequal variances

\*p<.0001

\*\*p<.05

Concerning PWB, we obtain an overall statistically significant difference between all three groups. Conducting post hoc analysis we find differences in G1 Elite that has highest score and is statistically significant different from G2 Sub-elite ( $p=.028$ ) and G3 Amateurs ( $p=.0001$ ), while G3 Amateurs and G2 Sub-elite didn't show a statistical difference between them. Analysis also reveal a statistically significant difference between all three groups in Meaning in life and Autonomy dimensions, specifically G3 Amateurs are significantly lower than the other two groups in both dimensions (Meaning G1-G3,  $p<.0001$ ; G2-G3,  $p=.018$ ; Autonomy G1-G3,  $p<.0001$ ; G2-G3,  $p=.017$ ). Self-acceptance is different only between G3 Amateurs and G1 Elite ( $p=.046$ ), with G3 lower than G1.

Analysis show a statistically significant difference between all groups in the dimension of Motivational Task orientation, where G1 Elite show the higher score ( $M=4.48$ ) compared to G2 Sub elite ( $M=4.31$ ;  $p=.033$ ) and G3 Amateurs ( $M=4.10$ ;  $p<.0001$ ).

We calculated a synthetic score for SRL (mean of all constituent dimensions) and then compare the 3 groups on both composite and single dimension scores, obtaining a statistically significant difference between all three groups. In particular post hoc tests show that G3 Amateurs were significantly lower in SRL composite than the other two groups ( $M=3.52$ ;  $p<.0001$ ), while G1 Elite ( $M=3.86$ ) and G2 Sub elite ( $M=3.78$ ) didn't differ between them. Regarding each constituent dimensions results show that the three competitive groups are different on Planning, Monitoring, Evaluation, and Effort. Post hoc analysis reveal that G3 Amateurs were significantly lower than the other two groups on Planning (G1-G3,  $p=.006$ ; G2-G3,  $p=.014$ ), Monitoring (G1-G3,  $p<.0001$ ; G2-G3,  $p<.0001$ ), Evaluation (G1-G3,  $p<.0001$ ; G2-G3,  $p<.0001$ ) and Effort (G1-G3,  $p<.0001$ ; G2-G3,  $p<.0001$ ) dimensions. Post hoc analysis show also that Reflection only differ between G3 Amateurs and G1 Elite ( $p<.001$ ) and Self efficacy is only different between G3 Amateurs and G2 Sub elite, with G3 lower than G2 ( $p=.040$ ).

We calculated a composite score for both Worry and Learning conducive climates by meaning Father and Mother scores and compared groups on them, obtaining that all three groups are statistically significant different. Post hoc analysis reveals that G3 Amateurs are significantly lower than the other two groups on both variables (Worry climate: G1-G3  $p=.002$ ; G2-G3  $p=.028$ ; Learning climate: G1-G3  $p=.006$ ; G2-G3  $P=.020$ ).

We calculated also a composite score for Coach-Athlete relationship variable and compare the three groups on both the composite score and each one of the three constituent dimensions (Closeness, Complementarity and Commitment). We obtained a statistically significant difference in the composite score and post hoc analysis reveal a statistically significant difference between G3 ( $M=3.63$ ) and G2 ( $M=3.85$ ;  $p=.039$ ). Regarding the constituent dimensions, we obtained a statistically significant difference among three groups in Closeness and Complementarity. Post hoc analysis reveal that on Closeness G3 Amateurs ( $M=3.84$ ) are lower than the other groups (G1-G3  $p=.003$ ; G1-G3,  $p=.023$ ), and Complementarity where G2 Sub Elite are higher than G1 Elite ( $p=.044$ ).

Finally, we compared the three groups on each constituent dimension of the motivational climate induced by peers and teammates, obtaining statistically significant results in Intra-team Competitiveness and Intra-team

Conflict. In particular, G3 Amateur (M=3.41) were significantly higher than G1 Elite (M=3.15;  $p=.013$ ) in Intra-team Competitiveness and Intra Team Conflict ( $p<.0001$ ).

*Results for age groups differences*

Variables	G1 14-15		G2 16-17		G3 18-19		F/Welch	p
	M	DS	M	DS	M	DS		
PWB_composite	9.52	.95	9.54	.93	9.66	.88	1,27	.281
PWB_autonomy**	9.11	1.55	9.26	1.56	9.69	1.22	3.43	.033
PWB_meaning	9.29	1.70	9.52	.69	9.77	1.62	1.89	.151
PWB_self-acceptance	9.62	1.32	9.46	1.32	9.32	1.20	1.27	.281
PWB_positive relation	9.99	1.53	9.91	1.49	9.79	1.69	.370	.691
MOT_task	4.38	.50	4.28	.55	4.21	.59	2,70	.068
MOT_ego	3.14	.87	3.25	.81	3.27	.86	.85	.426
SRL_composite	3.80	.49	3.71	.53	3.67	.54	1.68	.198
SRL_planning	3.67	.62	3.60	.62	3.57	.74	.62	.535
SRL_monitoring	3.61	.65	3.61	.67	3.54	.70	.34	.710
SRL_evaluating	3.89	.71	3.86	.75	3.82	.86	.21	.80
SRL_effort	4.18	.61	4.03	.65	4.03	.74	2,43	.089
SRL_reflection	3.87	.72	3.76	.79	3.71	.77	1.31	.271
SRL_self efficacy	3.55	.61	3.48	.59	3.52	.54	.587	.557
PAR_worry*	3.36	.65	3.36	.64	3.61	.56	3.97	.020
PAR_learn	3.90	.47	3.76	.59	3.84	.47	2.33 w	.10
COA_composite*	3.87	.71	3.64	.81	3.73	.52	3.60	.029
COA_closeness*	4.17	.76	3.91	.83	4.06	.56	4.37	.014
COA_complementarity*	3.89	.75	3.65	.82	3.73	.55	3.61	.029
COA_committment	3.58	.80	3.37	.94	3.41	.65	2.51	.084
TEAM_learning	3.55	.72	3.45	.77	3.56	.64	.90	.407
TEAM_effort	3.82	.66	3.73	.68	3.94	.62	2.43	.089
TEAM_intra-compet	3.39	.72	3.24	.68	3.21	.64	2.13	.120
TEAM_intra-conflict*	2.84	.83	2.89	.84	2.58	.91	3.50	.031

w: ANOVA Welch values have been used as Levene test shows unequal variances

\* $p<.0001$

\*\* $p<.05$

We firstly calculated a composite score for PWB (mean of all the dimensions) and compare groups on both the synthetic score and each constituent dimension of PWB (Meaning in life, Autonomy, Self-acceptance and Positive relationship). We obtain that the only statistically significant difference between the groups is on the dimension of Autonomy between G1 14-15 (M=9.11) and G3 18-19 (M=9.7;  $p=.026$ ).

We find no statistically significant differences in age groups on Motivational orientation and Self-regulation of learning in sport.

We calculated a composite score for both Worry and Learning conducive climates by meaning Father and Mother scores and compared groups on these resulting scores, obtaining a difference in Worry conducive



climate ( $p=.20$ ). Post hoc analysis show a statistically significant difference between G3 18-19 and the other two groups, where G3 18-19 ( $M=3.61$ ) is significantly higher than the other ( $M_{g2}=3.36$ ,  $p=.026$ ;  $M_{g1}=3.37$ ,  $p=.028$ ).

We calculated a composite score for Coach-Athlete relationship variable and compare the three groups on both the synthetic score and each of the three constituent dimensions (Closeness, Complementarity and Commitment). Results show a statistically significant difference in the composite score and in the dimensions of Closeness and Complementarity. Post hoc analysis reveal that G1 14-15 has a higher composite score compared to G2 16-17 ( $p=.016$ ). Concerning Closeness and Complementarity G1 14-15 is always higher than G2 16-17 in both dimensions (Closeness G1-G2  $p=.007$ ; Complementarity G1-G2  $p=.017$ ).

Finally, we compared the three groups on each constituent dimension of the motivational climate induced by peers and teammates, obtaining that the only difference between groups lies in Intra team Conflict between G2 16-17 and G3 18-19, with G2 higher than G3 ( $p=.025$ ).

### *Discussion*

Overall, we found most differences in competitive level groups analysis, even if some reflections can be made also on age group. We'll first analyze results of the comparison between competitive level groups and then the age group results.

Firstly, and most important, we found a statistically significant difference in PWB between elite and sub-elite players and amateurs, as the first ones have higher levels of PWB. In particular, G1 Elite is statistically higher than G3 Amateurs but not than G2 Sub-elite. Additionally, G3 Amateurs perceive lower levels of Autonomy and Meaning in life that is statistically different from G1 Elite and G2 Sub-elite. Moreover, the difference between the mentioned groups are always higher among G1 and G3. Considering that Meaning in life has been found as the most relevant dimension within the model tested in Study III, these results seem to support the hypothesis of PWB as functional variable that vary among elite and less elite players and amateurs.

Concerning psychological characteristics, the three competitive groups differ in the levels of Task Motivational orientation, where G1 Elite have statistically higher scores compared to the other two, especially respect to G3 Amateurs. Regarding Self-regulation skills, G3 Amateurs players differ significantly from the other two groups particularly in the cognitive skills (Planning, Monitoring, Evaluating and Effort). Effort emerged as the most important dimension within the model of Study III, thus a significant difference in such dimension is particularly indicative for our hypothesis. Differences have been found also among G3 Amateurs and G1 regarding Reflection, where G3 is lower than G1 and among G3 and G2 Sub-elite, where G3 is lower on Self-efficacy. Considering that Effort and Task Motivational orientation have been identified as the most important variables that mediate the effect of characteristics of relationships on PWB (see Study III), our analysis reveals that Elite players possess higher level of such skills, confirming the results from literature (Toering et al., 2009; Bartulovic, Young & Baker, 2017; Blomqvist, et al., 2016).

Regarding the characteristics of relationships variables (parent and peers' motivational climate and relationship with the coach), we found the main differences between amateurs and elite players groups. Specifically, regarding the parent initiated motivational climate, we found a significant difference in both worry and learning oriented climates between elite and amateurs, where the former were significantly lower than the first, that means not only that amateur players perceive less worry from their parents, but also less support toward learning and enjoyment in sport participation.

Relating to the relationship between players and their coach, results show that overall amateurs perceive less closeness with their coach compared to other players, but sub-elite players perceive more complementarity than elite players. It is also interesting that the sub-elite players perceive an overall better relationship with their coaches if compared to the other groups. Considering that closeness and complementarity with the coach are the most important variables in the model of Studies II and III, results of these analysis allow some interesting reflections.

Literature shows us that a good relationship with the coach lead to better outcomes, both under performance and under wellbeing. The results of our study allow us to confirm that the coach-athlete relationship is a bond that is created bi-directionally among the coach and the athlete, by specific demonstration of effort and emotional intimacy, both from the coach and the athlete (Davis, et al., 2013; Felton & Jowett, 2013; Jowett & Nezlek, 2012). Specifically, our results seem to show that the athlete use specifically effort (a behavioral demonstration of his motivation) and task motivational orientation to create a positive relationship with the coach. Such result confirms the proposal of Gledhill and coll. (2017) concerning the importance of behavioral demonstration of effort both within and outside sport as the main elements that allow chances of career progression. Nevertheless, our results don't allow us to understand all the set of meanings, values and expectations co-built be people within the relationship, and therefore this could be necessary to investigate.

Finally, concerning team motivational climate, it is interesting to note that both competitiveness and conflict are higher in G3 Amateurs players than G1 Elite ones; such results add information to the model of Study III, that reveal the huge benefits of a positive team climate among high level football players. Motivational climate among team has been found as one of the most important variables in models tested in Study II and III and its importance has been confirmed in the current analysis, with higher level players that underline how conflicts and competitiveness within the team are disruptive for their positive development.

Overall, results of the current study suggest that there are many differences between elite/sub-elite and amateurs players, most of which concern the variables previously identified as effective for their development in the model tested in Study II and III. Even without using SEM models as we previously expected, we've reached our aim to compare the overall changes of the variables among the competitive level groups in our sample and results support our comprehension of the models tested in Study II and III.

Concerning the comparison between age groups, it emerges that the only difference between groups concerning PWB is among younger and older athletes, specifically in the autonomy. This could be caused by an higher level of self-confidence: younger players are still more depending from others and cannot perceive

much independence in their developmental path. Analysis reveals no differences in the psychological characteristics between age groups, suggesting that motivation and self-regulation skills may not vary over time.

Concerning relationship, it seems interesting that older players perceive more worry conducive climates from their parents than the other. This could be due to the proximity with the professional world and the possibility to become a pro-player, and parents could be worry about their possible future as football player and stress the importance of play hard and show abilities to be noted. Regarding the relationship with the coach, it's interesting to note that the younger players perceive a closer relationship with their coaches. This could be due to the greater need from younger athletes of perceiving the coach as a role model, as they are still in the first adolescence phase and they are still exploring relationship with significant other that are different from parents, trying to find new landmarks.

Finally, concerning team motivational climate we only find differences between intermediate age group and older athletes in the dimension of Conflict; this could be due to the fact that players know each other since more time and have learned to manage conflicts within their team, and maybe they've learned better strategies to manage.

In Study II we've deepen the impact of the characteristics of relationships (coach, team and parents) on PWB, and we've found that closeness and complementarity with the coach, improvement and effort focused climate in the team and learning conducive climate from parents have a strong and positive impact on psychological wellbeing, specifically on the self-acceptance and meaning in life dimensions of PWB. Current analysis reveals that both composite PWB and perception of having a meaning in life are higher for elite athletes and that they also perceive more positive and supportive relationship. Such results support current literature that stress the importance of social environment and the interaction with it in developing talent (Henriksen, 2010; Henriksen et al, 2010; Davids, Güllich, Shuttleworth & Araújo 2017).

In Study III it emerged that psychological characteristics mediate – that means they cause - the effects of closeness with the coach, team effort and learning climate promoted by parents on the meaning in life (PWB), showing the importance of the relationship on supporting personal characteristics in managing a personal development path. The current analysis show that elite players perceive higher levels of PWB compared to other groups of players, especially amateurs. Moreover, elite players show higher levels of task motivational orientation and better self-regulatory skills. According to Study III task motivational orientation and effort are the most important variables that mediate the impact of relationships on PWB. Therefore, the present analysis show that elite and sub-elite players possess better psychological skills that allow them a better impact on PWB. Following literature, psychological characteristics are necessary to reach performance outcomes, setting goals and managing competitions and hard training (Gould, Dieffenbach, & Moffett, 2002; MacNamara, Button, & Collins, 2010b; Elbe & Wikman, 2017). Our analysis seems to underline that psychological

characteristics are elicited by relationship with the most important people in athlete's surroundings to impact in psychological wellbeing.

According to Abbott and coll., that define talent development as: "*a complex dynamical system in which future behaviours emerge from an interaction of key performance determinants such as psychological behaviours, motor abilities, and physical characteristics*" (Abbott, et al., 2005, p.61), our results suggests that psychological wellbeing, in the form of having a meaning in life, could be considered a ground basic condition for effective talent development, a sort of intermediate step between current and future dynamical system cited by Abbott and coll. We suggest that such ground basic condition for effective talent development is created by the complex interaction among psychological characteristics of athletes and the characteristics of their relationship with fundamental people, both within and outside sport, confirming the importance of adopting an psychosocial framework when dealing with talent development.





## Conclusions

*Where this work has led me...*

This work started with two main aims: the first was to analyse literature on talent development and identify some features from the current theories and models that can justify our psychosocial approach to this theme; the second was to analyse psychological wellbeing and its links with a set of individual and social variables, assuming that it could be considered as a particularly effective situation for athlete's development.

According to psychosocial approach sport is a complex relational space (Gozzoli, 2005; Sanchez-Martin, 2003; Manzi & Gozoli, 2009) where relationships play a fundamental role in athletes' development and throughout all their athletic career. We assumed a specific definition of relationship, inspired by the systemic-relational model (Cigoli & Scabini, 2012), that defines relationship as both a mutual bond among people that can be a constraint and a resource for them (called re-ligo dimension), and the specific meanings, values and expectations people bring and assign to the relationship (called re-fero dimension). Despite we've use such definition, we also believe that in this work we've dealt more the re-ligo dimension of relationship more than the re-fero ones, that represents a future direction of research.

Following a psychosocial approach, this work has deal with the interaction between the characteristics of relationships and individual psychological characteristics, to analyse the impact of such interaction on young athletes' psychological wellbeing, assuming that it could be considered a particularly favourable condition for the development of individual's potential.

We believe that such approach give an added value to the current literature on talent, helping to deepen the understanding of positive or negative developmental path of young athletes, described as psychological wellbeing, as generated within a relational space. One of the goals of the work was to understand if and how the literature would support our psychosocial approach, while on the other hand a second aim was to study it empirically. We believe that we've reach both goals, opening the way for future directions and issues in talent development research.

We analysed the origin of the word "talent", its definitions and development over time, identifying some important elements: the first is the difficulty in reaching a conclusive theory about talent identification and development given the absence of a unique definition. This could be a weakness, but also a strength: over time models and theories about talent and its development have evolved and from an initial mono-dimensional and mono-disciplinary vision of talent to a multi-dimensional and multidisciplinary one, that undoubtedly helps scholars to see talent for what it is: a complex multi-dimensional construct (Baker, Copley, Schorer & Wattie, 2017; Baker, et al., 2018).

Analysing theories and their development within time it's also possible to note two important features: the first is the awareness of the need of a new way to define talent as *potentiality*, as young performance could no longer be considered as a valid indicator of future high-level performance. Therefore, with our psychosocial approach, we suggest using psychological wellbeing as a specific indicator of a particularly effective situation where the athlete can effectively develop his potentiality, and we've find initial support to this proposal in the work of Lundqvist (2011), that follows a eudaimonic perspective of wellbeing (Ryff, 1998). Eudaimonic perspective considers wellbeing as an holistic realization of personal talent and potentialities and we believe that it could effectively used to describe the specific situation of young athletes development.

The second feature is that holistic-ecological approaches (Henriksen, 2010) and ecological-dynamic theory (Araújo & Davids, 2011), underline the importance of the interaction between the individual and the environment, to develop some psychosocial competencies to support career development and to interact with different kinds of constraints to learn and develop effectively. According to a specific definition of psychosocial (Gledhill, et al., 2017), it considers the complex and continuous interactions among individual and social elements to generate individual experiences and growth. Therefore, we've studied recent theories and models of talent development in order to analyse the complex interaction among the individual and its social environment to identify its specific features.

Psychosocial approach to talent development gets the following aspects from the most recent theories:

1. From the model of Abbott and Collins (2004) about psycho-behaviours we assume the importance of mental attitudes and behaviours in the developmental phase of talent development, according to the following definition of talent as: "*a complex dynamical system in which future behaviours emerge from an interaction of key performance determinants such as psychological behaviours, motor abilities, and physical characteristics*" (Abbott, Button, Pepping, & Collins, 2005, p. 61). Our studies is based on the following definition about talent development process as the need "*to consider the interplay between determinants of performance (physical, anthropometric and psychological), the environment (opportunities, parental support) and determinants that underpin the capacity to exploit the opportunities available and to develop within a sport (self-regulatory learning strategies/psycho-behaviours)*" (Abbott & Collins, 2004, p. 399). The definition of Abbott and Collins is a fundamental base for psychosocial approach to talent development.
2. From the holistic-ecological approach (Henriksen, 2010), that defines talent as "*a set of competences and skills developed on the basis of innate potential and of multi-year interactions with the environment, as well as the ability to exploit the strengths and compensate for the weaknesses of the environment and to contribute to its development*" (Henriksen, 2010, p. 161), the psychosocial approach assumes the role of a number of actors in the talent development process, both at micro and



macro level, and the necessity to consider relationships at many levels and their impact in developmental experiences of young athletes.

3. Following the ecological-dynamic approach, talent is: “*a dynamically varying relationship captured by the constraints imposed by the tasks experienced, the physical and social environment, and the personal resources of a performer*” (Araújo & Davids, 2011, p. 24) psychosocial approach assumes the growth mentality that defines the importance of teaching and training the skill to continuously adapt to reality and its constraints as a fundamental skill in talent development and the creation of intrinsic dynamics as the most important aspects for young athletes to learn.
4. Finally, introducing the importance of social environment in supporting the young athlete and the importance of the holistic balance between all aspects of development, we refer to the following definition of *psychosocial* as: “*pertaining to the interrelation of individual psychological characteristics with social influences and to the ways in which these may shape or guide behaviours*” (Gledhill, et al., 2017, p. 93; Martikainen, Bartley, & Lahelma, 2002). This definition highlights how elements from social environment, both from sport and personal context, interact with individual psychological characteristics (e.g.: motivation), influencing athlete’s behaviours and experiences (e.g.: practicing deliberate practice), and impact on the development of psychosocial skills, which are useful to progress in athletic career and to develop talent.

The abovementioned theories underline the importance of adopting a *growth mindset* (Dweck, Chiu & Hong, 1995; Dweck, 2009), that emphasises the importance to focus on the *potentiality to develop abilities* more than current *performance* in such abilities, and that such potentiality development can be supported both by personal resources and by others. Psychosocial approach to talent development is strongly based on a growth mindset (Wattie and Baker, 2017; Dweck, 2009), as it assumes that the individual path of development and personal growth are created by the interaction of the person itself - that is made of personal characteristics, story, motivation, interests, emotions, values and so on - with the people he is surrounded by, thus the relationships he is involved in (Gozzoli, 2009; Gozzoli, 2005; Sanchez-Martin, 2003).

According to the eudaimonic perspective psychological wellbeing could be useful to describe the personal growth and continuous development process that led the individual to discover his personal “*daimon*” (or gift, disposition, specific skill) and develop it throughout his life (Ryff & Keyes, 1995; Ryff, 1989; Ryff, 2013). Psychological wellbeing, as formulated by Ryff and studied in sport by Lundqvist (Lundqvist, 2011; Lundqvist, & Sandin, 2014), seems to be a ground-breaking condition for a positive and effective development of young athletes, especially in the dimension of meaning in (athletic) life, that implies the effort to be devoted to a specific and higher life-goal through sport. Lundqvist and Sandin (2014) reveal that athlete’s personal history – made of behaviors, cognitions, emotions, cognitive self-schemas, life rules and social skills built throughout life – had an impact both in sporting and non-sporting individual wellbeing. Moreover, they show

how personal wellbeing in non-sporting contexts is viewed as a basis for sport-related wellbeing and as a protective factor when facing obstacles in sport.

In studies on wellbeing in competitive athletes based on the achievement goal theory (Nicholls, 1992; Harwood, 2008; O'Rourke, Smith, Smoll, & Cumming, 2011; Ntoumanis, et al., 2012), researchers found that mastery-oriented climate by significant others is characterized by an emphasis on personal improvement, like:

- decrease in performance anxiety levels (similar to the environmental mastery in Ryff PWB model)
- reduced distress toward the coach (similar to positive relationship with others in Ryff PWB model)
- increase in perceived competence and moral attitude (similar to the personal growth in Ryff PWB model)
- higher levels of sport satisfaction (similar to self acceptance in Ryff PWB model)
- more intrinsic motivation (similar to purpose in life in Ryff PWB model)
- better affect and basic needs satisfaction (similar to positive relationship with other in Ryff PWB model).

Therefore, a positive social environment appears to be crucial for young elite athletes' wellbeing and effective development (Fraser-Thomas et al., 2008; Ivarsson, et al., 2015). We follow this idea and hypothesized a possible role of psychological characteristics among the relationships and wellbeing. In discussing each study we've deepened the implications of the respective results (see in particular Chapter III), therefore we'll briefly sum up the main results of the overall work.

After getting theoretical support for our psychosocial approach to talent development, we wanted to test if there could be an empirical demonstration of it. Therefore, we hypothesized that: first, the characteristics of relationship would impact positively on psychological wellbeing by specific individual characteristics; second, that this interaction would be stronger for elite players. Our results support both hypothesis: not only characteristics of relationships positively impact on PWB, but they also influence some psychological characteristics that have been identified as particularly linked to young elite performance, that leads young athletes to have more positive outcomes on their PWB. Moreover, we found also important and significant differences on all the characteristics – relational, individual characteristics and PWB – among elite and non-elite players. This result support our hypothesis of using PWB as a potential indicator of a better developmental path for young athletes.

Considering the key points of HEA and ecological-dynamic theories and according to a psychosocial approach to talent development, three important elements were considered in the study: psychological characteristics linked to learning and engagement in sport, fundamental relationship within and outside sport development and psychological wellbeing.

Overall, our results confirm that elite players perceive higher levels of psychological wellbeing, psychological and relational characteristics and support the hypothesis of an impact of relationships in promoting a higher levels of PWB. Moreover, results show how psychological characteristics are strongly influenced by characteristics of relationships in generating psychological wellbeing of athletes. Therefore, we get some important bases for psychosocial approach in talent development, opening new lines and hypothesis for future researches, even with some limitations, that we're explaining below.

Regarding the characteristics of social environment, our focus was on the relational variables that are particularly important in the path of development and growth of young athletes: parents- and peers-induced motivational climate and coach relationship - (Atkins, et al., 2014; Gould, et al., 2006; Adie & Jowett, 2010; Alvarez, et al., 2012; Smith, 2003). We recognize in Gledhill and colleagues' study (2017) one of the most informative study about the variables that support career progression in soccer and indirectly talent. If by one side this study shows the complex connection between individual and relational factors on the increase of the possibilities to progress throughout athletic career, it has the main weakness of using a performance/career-based element to indicate talent development. In our study we partially confirm the hypothesis of Gledhill and coll. (2017), deducing that it could be important to describe talent development not only by the career progression possibilities but also by focusing on the personal development outcome.

The analysis of Study II show that the characteristics of athletes' relationship have a strong impact on their psychological wellbeing. A team task-oriented motivational climate, specifically focused on effort and improvement, leads athletes to accept and recognize strenghts and weaknesses (self-acceptance) and perceive a greater sense of meaning in life. Confirming literature, such climate could be promoted by appreciating improvements, increasing effort and considering errors as a part of the learning process and growth, of both the team and the single athlete, leading to many important outcomes. The main results of a task oriented motivational climate could be: facing effectively career transitions from junior to senior (Čačija, 2007), moral development (Miller, Roberts & Ommundsen, 2005), and athlete's satisfaction with the participation in the team (García-Calvo et al., 2014), more positive youth development, specifically in greater personal and social skills, initiative, goal setting, personal and social skills, cognitive skills, and lower levels of negative experiences (Bruner et al., 2014). Participation in a more task-oriented team could impact on the holistic development of the athlete: moreover, the abovementioned features are very close to some aspects of psychological wellbeing, like the ability to create positive relationship with others, autonomy and self-acceptance (Lundqvist, 2011; Lundqvist, & Sandin, 2014). Our results show how task motivational climate within the team could help athletes to develop a greater sense of psychological wellbeing, specifically described as self-acceptance and meaning in life.

A particularly interesting result of this study concerns intra-team competitiveness, since ecological-dynamic theory defined it as a particularly effective aspect specific for team sports that support the development the ability to solve different tasks during training or competitions, as team members continuously shape and re-

shape their behaviours and environmental resources in order to continuously co-adapt their behaviours to reach their goals (Passos, et al., 2016). This way each athlete push himself beyond the limit of his performance, in order to gain improvement under the athletic point of view, but also a social status within the team or selection from the coach. They also underline that competitiveness should be trained during team training, as it is not something inherited, but strongly educated by environments. Our results reveal that also competitiveness produce positive impact psychological wellbeing, and therefore it should be used by coaches to support effective development, even if consciously and carefully.

Following literature having a positive relationship with the coach influence both the performance (Jowett, Shanmugam, & Caccoulis, 2012) and the psychological wellbeing of athletes (Jowett & Poczwardowski, 2007; Jowett, & Shanmugam, 2016; Davis, Jowett, & Lafrenière, 2013), but it should also be balanced between the three constituent variables - closeness (emotional), commitment (cognitive) and complementarity (behavioural). In the Clubs where data were collected – and in general in Italian football Clubs -, coaches change the team quite every year, thus both players and coaches need to develop the ability to create positive relationship within a very little frame of time. If such ability could be easier for adults, this could not be the same for adolescents, that need to be supported in such aspect of development, especially in early adolescence (Wyllemann et al., 2013). Our analysis reveals also that younger players perceive more emotional closeness with their coaches, revealing a change within time in with younger athletes perceiving more. Thies aspect reveal the necessity for coaches to adopt a different approach with players at different ages, that imply different relational skills from them.

Coaches are the main landmark in an athletic career: they select players, organize training, decide players for matches, and many other aspects that can help players to progress in their career, even more than parents. Our results confirm that coaches have a key role within the developmental path of young athletes, as the emotional closeness and complementarity have been identified as key features for psychological wellbeing. Following our hypothesis of PWB as a particularly effective condition for talent development it seems important to affirm also that coaches need to be aware that their work means not only “to train athletes”, but also to create a relational space where personal and athletic growth are shared and co-built. It would be interesting to deepen the meanings, values and expectations young athletes built within their relationship with their teammates and their coach, as it could help us in explaining better the present results (the cited re-fero dimension).

The different weight and roles of father and mother appear as an interesting emerging issue, which concerns the different roles toward sport of each parent (Kolayış, et al., 2017; Wuerth, et al., 2004). Overall, both parents emphasise a task- involving climate supporting literature that consider the motivational climate promoted by parents as a precursor of self-determined motivation toward sport, sport engagement and higher levels of satisfaction with sport (White 1998, White, et al., 1998; Salselas & Marquez, 2009; Kolayış, Sarı, & Çelik, 2017). Moreover, parent-initiated motivational climate was found influencing variation into self-esteem, trait anxiety, and autonomous regulation even more than the coach-initiated motivational climate (O'Rourke et al.

2011; O'Rourke, Smith, Smoll, & Cumming, 2014), till arriving to more serious problems like overtraining syndrome (Frydrychová, Bartošová, & Hutečková, 2018). Parents are the major social agent especially for younger athletes and their influence on motivational orientation spread in all aspects of their life. Anyway, Gustafsson and coll. (2015), show that personality traits could impact on perceived stress from athletes, but such indication seems to be deepened.

Study III show that motivational climate induced by significant others, like parents and peers, and the quality of coach-athlete relationship strongly impact on the possibility to develop effectively specific psychological characteristics. Our analysis shows that they all influence, in different ways, the motivational orientation of the athlete (e.g.: a motivational climate focused on task led more easily the athlete's motivational orientation on task), and his effort, which in turn positively influence the psychological wellbeing (e.g.: winning or improving and learning) and the kind of experience he lives in sport. The kind of goals and motivational orientation are shown to be predictive of a long-term involvement in sport or burn-out and premature drop out. Having better and supportive relationships with team, coach and parents led the athletes to develop more effective psychological characteristics and generate an higher level of psychological wellbeing.

The psychological characteristics that have been identified in our analysis as particularly supportive for the development of PWB are task motivational orientation and self-regulatory skills. Motivational orientation on task let the person be focused on the improvement and on enjoyment implicated in the activity itself, more than aspiring to win or to be the best in such activity. This characteristic is particularly useful to let athletes stay focused on their improvement and in building a future performance, more than to aspire to win at present. Task motivational orientation is influenced also by others' feedback, like coaches and peers, that's why the role of others is so fundamental in such individual characteristic (Cox, 2002; White, et al., 1998; Elbe & Beckmann, 2006; Elbe & Wikman, 2017; Keegan, et al., 2009; Keegan, et al., 2010; Allen & Hodge, 2006; Vazou, Ntoumanis, & Duda, 2006).

Self-regulatory skills are a set of metacognitive, motivational and behavioural processes, that let the athlete be an active performer in his learning (Zimmerman, 2008; Zimmerman, 1986) and transform their mental abilities into psychological skills, helping them to learn more effectively (Zimmerman, 2006) and regulating their own motivation and long-term goal striving efforts (Young & Medic, 2008). It's possible to consider self-regulation as a characteristic particularly useful to develop mental skills that allow athlete to develop more effectively.

Our findings underline the importance for sport actors (coach, parents) to support young players in developing such characteristics by showing specific behaviours that support learning/enjoyment climates, emotional closeness and effort, as they could have a strong impact on the possibility to effectively develop athlete's potential. Of course, many other psychological characteristics could be considered as mediator or moderator among relationships and PWB and future investigations should identify and study them (i.e.: grit, volition, self-determination, athletic identity).

Our study reveal that elite players possess higher levels of both psychological and relational characteristics compared to non-elite ones (Study IV), supporting some previous findings from literature but also showing new interesting results. Elite players perceive a more positive relationship with their coach and more effective task oriented motivational climate within the team and promoted by their parents; they also indicate higher levels of task motivational orientation and self-regulatory skills. It seems that such variables could be used to differentiate among them and less-elite players. The fact that they also perceive higher levels of psychological wellbeing allow us in showing how this variable could be also used in differentiating elite and non-elite players.

Overall, showing that relationships impact on PWB by the mediation of psychological characteristics (Study II and III) and that elite players possess higher levels of all these variables (Study IV), we can support our hypothesis: PWB, can be considered as a particularly ground-basic condition for talent development in young players and it is generated by the effect of better relationships with significant others, that impact on specific psychological characteristics specifically linked to better learning skills and motivational behaviours.

### *Limitations and future directions*

The main limits of the study concern the sample and the RPWB Scale. The sample involved in data collection is composed by players from Clubs situated in the north of Italy: this could influence the representativeness of the sample with respect of the population. Moreover, literature suggest some difference in males and female's perception of the motivational climate induced by parents (Vesković, Valdevit & Đorđević-Nikić, 2013; Gledhill & Harwood, 2014): it could be interesting to expand the sample and involve also female soccer players, in order to compare with males' results.

Second, the Ryff Psychological Wellbeing Scale (RPWB Scale) is the only scale we used in the research that doesn't come from the sport literature - even if it has been little used in the world of sport (see Lundqvist, 2011) -, and it's quite short as it has only 18 items for describing 6 different dimensions. This could cause the little internal consistency in factorial structure and the problems we experience with some factors in the model. Some way to solve these problems could be: i) to increase the sample size with players from all Italian territory, ii) to analyse the internal consistency of the factors, iii) to adapt the scale to the sport context, following also the suggestions from the studies of Lundqvist (Lundqvist, 2011; Lundqvist & Sandin, 2014).

Some ideas to improve the research could be to use a longitudinal methods of data collection to verify the time-oriented impact of the personal and relational variables on psychological wellbeing, which would be a more suitable methodology of research to deal with a developmental issue. Longitudinal multilevel studies would also offer the possibility to study the changes over time in each variable considered in the model, or in correspondence of some events (like injuries or career transitions). Moreover, it would be of great interest to consider other sports, in particular individual sports, to check if the same variables impact the same ways or differently for team and individual sports.

The multi-scale questionnaire created for this data collection considered the individual motivational orientation and self-regulation as personal psychological features that characterize talented players and the relationships with coach, peers and parents, to describe the relational network where young players are involved. Such variables and the respective scales have been chosen comparing literature analysis with a specific idea of talent from a psychosocial perspective, but literature also shows the importance of other kinds of psychological (like volition and grit) and relational characteristics (like the relationship with the siblings or with role model) (Gledhill, et al., 2017). Concerning personal characteristics, it would be interesting to add more variables (e.g.: volition, grit, emotional intelligence), while regarding relationships it would be interesting to add scales about sibling's relationship.

Moreover, following our idea about psychological wellbeing as ground-basic condition for an effective athletic development, it could be interesting to consider the impact of performance (e.g.: quantity of play or matches) in our hypothesized model, as also the quantity of time spent in play and competition could be important in defining the sense of effectiveness of development.

Finally, the psychosocial approach that guided the research can be traced back to Holistic-Ecological Approach on one side and to the Ecological-dynamic approach on the other. Both approaches state the importance of both micro- and macro-social environment, while data collection presented in this work only takes in consideration the micro-social one, as it only considers the individual level and its interactions with the nearest environment. To improve the complexity of the model and make it more similar to the complexity in reality assumed from the most recent theories it would be interesting to collect data about the players' perception of their Club's culture and methodology (regarding sport context) or School and intimate relationships (regarding the non-sport context), to understand if and how they impact on their wellbeing.

Considering that sport psychology is a strongly applicative discipline, research in this field could support the applied work of its practitioners. Therefore, this work could help sport psychologists in working with coaches, parents and Clubs to raise awareness toward the importance of all the actors involved in talent development which should promote altogether a motivational climate focused on task and learning instead of stressing performance or results at young age, to influence positively personal growth and wellbeing of young players. Such reflection considers also to the importance for Clubs, both Professional and amateur ones, to create an organizational culture and philosophy of youth development based on the importance of a real global growth of the player and that considers all the aspects of the players over the sport specific skills.

The work also supports the importance for the sport psychologist to work on the self-regulatory skills of young talented players, that could lead to the development of more sophisticated psychological skills particularly useful for the athlete in the management of his/her relationship.

In the Introduction I cited Bauman and his theory about liquidity of modernity that prevents people to create strong bonds, asking: “*What happens to relationships in sport, if we consider the post-modern liquid reality described by Bauman?*”.

At the end of this work I believe it’s possible to affirm that in such chaotic, liquid and challenging modernity relationships assume even a greater importance in people’s life, as they have the power to increase or decrease the possibility to develop one’s potential. On the other side, people need to be aware of and use effectively their psychological characteristics – or need to be supported in develop specific mental skills - to mediate the effect of relationship on their developmental path.







## **ATTACHMENTS**

# Appendix A

Università Cattolica del Sacro Cuore

Sede di Milano



UNIVERSITÀ  
CATTOLICA  
del Sacro Cuore

## ME & SOCCER

**NOTE: IN ORDER TO LET THE READER UNDERSTAND BETTER QUESTIONS AND SCALES OF THE QUESTIONNAIRE, IN THE THESIS IS REPORTED THE ENGLISH VERSION OF THE QUESTIONNAIRE, BUT DATA COLLECTION HAS BEEN MADE WITH THE ITALIAN VERSION OF SCALES, AFTER BACK-TO-BACK TRANSLATION.**

COD \_\_\_\_\_

2017

Hi,

we are researchers from the Catholic University of Milan and we're studying the sporting experience of young soccer players. We would like to know your experience about and use it to improve the work of people in Youth Soccer Academies.

In the following pages, you will read some questions about you, your family and your relationship with sport, and other about your relationships within and outside sport. You will be asked to answer as much sincerely as possible, as we want to know your opinion about different aspects of your experience. Please, remember that there are no right or wrong answers. We're gonna explain you how to mark your answer and then you will be able to start.

### **How to mark answers in the questionnaire:**

In the following pages you will find some phrases and questions about you, your life and your experience as soccer player.

1. Read and answer each question carefully
2. To mark your answer you will color the spot that correspond to your answer (as shown below). Do not mark your answer with crosses or other signs.
3. If you want to delete and correct the answer, please cross the wrong answer and color the right one.
- 
4. Give the answer that you think best represent your opinion, without think too much.
5. If you have any doubts or questions, please ask for the researcher.
6. Please check if you answer all the questions when you finish the questionnaire.
7. Following the Ministerial Law n°196 30 June 2003 your data will remain strictly confidential (only people from the research team will see the answer), and your identity will be protected (any reference to your identity will be protected). Data collected will be used for only research aims.

*3... 2... 1... GOOO!*

Let's start with some questions to know you better...

1. **Month of birth:** \_\_\_\_\_

2. **Where are you born?**

1 Italy (where: \_\_\_\_\_)

2 Other Country (where: \_\_\_\_\_)

3. **You are:**

1 Male

2 Female

4. **What's your nationality?** \_\_\_\_\_

5. **What's your parents' nationality?** \_\_\_\_\_

6. **What School title have your parents?**

**Mother**

1 Elementary School License

2 Middle School License

3 High School Diploma

4 Degree

5 Other, specify: \_\_\_\_\_

**Father**

1 Elementary School License

2 Middle School License

3 High School Diploma

4 Degree

5 Other, specify: \_\_\_\_\_

7. **Where do you live currently?**

1 At home with my family

2 In a residential structure of the Club

3 In a flat rent by my Club

4 In a flat rent by me or my family

5 With one of my parents

6 With some member of my family (relatives)

7 Other, specify: \_\_\_\_\_

**8. Think about you and you life in general, tick how much you agree with the following statements.**

1 Completely disagree	2 Disagree	3 Agree	4 Totally agree
--------------------------	---------------	------------	--------------------

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
1 When I look at the story of my life, I am pleased with how things have turned out	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 The demands of everyday life often get me down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 In general, I feel that I continue to learn more about myself as time goes by	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 I often feel lonely because I have few close friends with whom to share my concerns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 I think it is important to have new experiences that challenge how you think about yourself and the world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 I like most aspects of my personality	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 I tend to be influenced by people with strong opinions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 I don't have a good sense of what I am trying to accomplish in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 I feel like I get a lot out of my friendship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 For the most part, I am proud of who I am and the life I lead	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 I am good at juggling my time so that I can fit everything in that needs to get done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 I am an active person in carrying out the plans I set for myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14 It's difficult for me to voice my opinions on controversial matters	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15 Some people wander aimless through life but I am not one of them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16 For me, life has been a continuous process of learning, changing, and growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17 I know I can trust my friends, and they know they can trust me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18 I have difficulty arranging my life in a way that is satisfying to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## YOU AND YOUR FAMILY

### 9. Next to you, in your family does anyone practice sport?

- 1 Yes
- 2 No

### 10. If Yes, what sport (more answer are allowed):

- 1 Soccer
- 2 Basket
- 3 Volleyball
- 4 Cycling
- 5 Track and field/running
- 6 Other: \_\_\_\_\_

### 11. In your family there have been high level athletes?

- 1 Yes
- 2 No

### 12. If yes, who? (more answer are allowed):

- 1 Father
- 2 Mother
- 3 Grand-parents
- 4 Brother/sister
- 5 Other relatives (aunts or cousins)

### 13. Do you have siblings?

- 1 Yes
- 2 No

### 14. If yes, do your siblings practice sport at elite level?

- 1 Yes (specify \_\_\_\_\_)
- 2 No



**15. Now think about how your father and mother behave towards your sporting experience and indicate how much you agree or disagree with the following statements. If you want, you can answer only in reference to only one of your parents**

1 Not at all	2 Little	3 Enough	4 Much	5 Totally
-----------------	-------------	-------------	-----------	--------------

**1 2 3 4 5**

**I feel that my father...**

- 1 is satisfied when I improve after hard effort  1  2  3  4  5
- 2 is satisfied when I learn something new  1  2  3  4  5
- 3 pays attention to whether I am improving my skills  1  2  3  4  5
- 4 views making mistakes as part of learning  1  2  3  4  5
- 5 values my learning one thing before teaching another  1  2  3  4  5
- 6 worries about my failing  1  2  3  4  5
- 7 worries about my failing because it's negative  1  2  3  4  5
- 8 makes me afraid to make mistakes  1  2  3  4  5
- 9 feels badly when I can't do as well as others  1  2  3  4  5
- 10 worries about me performing skills I'm not good at  1  2  3  4  5
- 11 is satisfied when I achieve a lot without trying hard  1  2  3  4  5
- 12 is satisfied when I win without effort  1  2  3  4  5
- 13 believes I should achieve a lot without trying hard  1  2  3  4  5
- 14 thinks it important for me to win without trying hard  1  2  3  4  5

**I feel that my mother...**

- 15 is satisfied when I improve after hard effort  1  2  3  4  5
- 16 is satisfied when I learn something new  1  2  3  4  5
- 17 pays attention to whether I am improving my skills  1  2  3  4  5
- 18 views making mistakes as part of learning  1  2  3  4  5
- 19 values my learning one thing before teaching another  1  2  3  4  5
- 20 worries about my failing  1  2  3  4  5
- 21 worries about my failing because it's negative  1  2  3  4  5
- 22 makes me afraid to make mistakes  1  2  3  4  5
- 23 feels badly when I can't do as well as others  1  2  3  4  5
- 24 worries about me performing skills I'm not good at  1  2  3  4  5
- 25 is satisfied when I achieve a lot without trying hard  1  2  3  4  5
- 26 is satisfied when I win without effort  1  2  3  4  5
- 27 believes I should achieve a lot without trying hard  1  2  3  4  5
- 28 thinks it important for me to win without trying hard  1  2  3  4  5

**YOU AND SOCCER**

**16. Have you ever practice other sports?**

- 1 Yes
- 2 No

**17. How many years do you play soccer? \_\_\_\_\_**

**18. How many years do you play in this Club? \_\_\_\_\_**

**19. What is the highest level of competition that you've reached with your team ?**

- 1 Regional League
- 2 National League
- 3 Local League

**20. Have you ever played in the Youth National Team?**

- 1 Yes
- 2 No

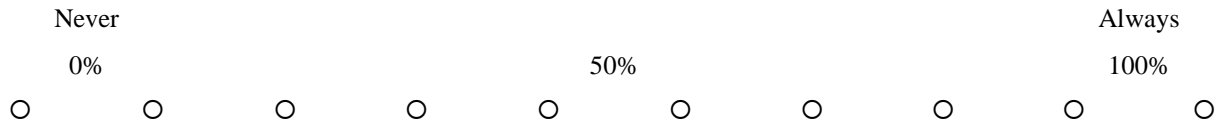
**21. How many times do you train in a week?**

- 1 1-2 days
- 2 2-3 days
- 3 4-6 days
- 4 7 days

**22. In the last period (6 months) have you been injured or are you actually injured?**

- 1 Yes in last 6 months I have been injured
- 2 Yes I am actually injured
- 3 No

**23. In the last 2-3 months, how much did you play?**



**24. Now let's move to some questions about your experience as a player. Indicate how much you agree with the following statements:**

1 Not at all	2 Little	3 Enough	4 Much	5 Totally
-----------------	-------------	-------------	-----------	--------------

*In my sport, I feel completely satisfied when ...*

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1 I'm the only one who can do something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I learn something new and this stimulates me to train more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I can do better than others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 Others can not do things as well as I do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 I learn something that I enjoy doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Others are in trouble and I do not	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 I learn a new skill by committing myself a lot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 I work hard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 I get the best result	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 Something I learn stimulates me to go on and train more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 I'm the best	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 I feel good that I can learn something	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 I do my best	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**25. Read the following sentences and indicate which value best describes the way you behave when you meet a challenge, a difficulty, face a task or an exercise in training.**

Think of a challenge or difficulty that you might encounter during training, or when you have to face a particularly difficult task in training. What do you do before facing it, while you do it and after doing it? And how often do you do these things when you compare yourself with a difficulty in training?

Remember, there are no right or wrong answers, simply describe yourself as you are, not how you would be or how you would act!

1 Never	2 Seldom	3 Sometimes	4 Often	5 Always
------------	-------------	----------------	------------	-------------

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1 I determine how to approach a practice task before I begin.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 I put forth my best effort when performing tasks at practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 I check aspects of my workout while doing it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 I double-check to make sure I did practice tasks right.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 I develop a plan for resolving difficulties at practice.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Even when I don't like a task during practice, I work hard to do well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 7 I don't give up at practice even if a task is hard.
- 8 Before I do a practice task, I think through the steps in my mind
- 9 I keep working hard even when sport training tasks become difficult.
- 10 While I am engaged in a practice task, I know how much of it I still have to complete.
- 11 I am willing to do extra practice on tasks in order to acquire more skill.
- 12 I try to understand the goal of a practice task before I do it.
- 13 If I'm not really good at a task I can compensate for this by practicing hard.
- 14 I ask myself questions about what a practice task requires me to do before I do it
- 15 I work as hard as possible on all tasks at practice.
- 16 I check my work all the way through a practice session
- 17 I check how well I am doing during practice tasks.
- 18 I clearly plan my course of action before starting practice tasks
- 19 After finishing, I look back on the practice task to evaluate my performance.
- 20 Before practice tasks, I figure out my goals and what I need to do to accomplish them.
- 21 I work hard at practice on a task even if it is not important.
- 22 Mi assicuro di aver svolto gli esercizi dell'allenamento correttamente
- 23 Before practice tasks, I carefully plan my course of action
- 24 I look back and check if what I did in practice was right.

**Now indicate how much you agree with each of these phrases:**

	1 Not at all	2 Little	3 Enough	4 Much	5 Totally	
					<b>1 2 3 4 5</b>	
25	I know how to handle unforeseen situations during practice, because I am resourceful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26	I am confident that I can deal efficiently with unexpected events at practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27	When facing difficulties at practice I can remain calm because I can rely on my coping abilities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28	When I am confronted with a difficulty during practice, I can usually find several solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29	No matter what comes my way at practice, I am usually able to handle it.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30	I know how to handle unforeseen situations during practice, because I am resourceful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31	I am confident that I can deal efficiently with unexpected events at practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## YOU, YOUR COACH AND YOUR TEAM

**26. Think about your coach indicate how much you agree or disagree with the following statements**

	1 Not at all	2 Little	3 Enough	4 Much	5 Totally				
				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
1	I like my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	I feel close to my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	When I am coached by my coach, I am ready to do my best				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	I trust my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	I feel committed to my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	When I am coached by my coach, I feel at ease				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	I respect my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	I feel that my sport career is promising with my coach				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	When I am coached by my coach, I feel responsive to his/her efforts				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	I feel appreciation for the sacrifices my coach has experienced in order to improve his/her performance				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	When I am coached by my coach, I adopt a friendly stance				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**27. Now think about your team and express how much you agree or disagree with the following statements**

	1 Not at all	2 Little	3 Enough	4 Much	5 Totally				
				<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	
<b><i>On this team, most athletes...</i></b>									
1	Help each other improve				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	Offer to help their teammates develop new skills				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	Work together to improve the skills they don't do well				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4	Teach their teammates new things				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5	Make their teammates feel valued				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6	Make their teammates feel accepted				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7	Care about everyone's opinion				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8	Encourage their teammates to try their hardest				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9	Praise their teammates who try hard				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10	Are pleased when their teammates try hard				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11	Set an example on giving forth maximum effort				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12	Encourage their teammates to keep trying after they make a mistake				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 13 Encourage each other to outplay their teammates
- 14 Care more about the opinion of the most able teammates
- 15 Try to do better than their teammates
- 16 Look pleased when they do better than their teammates
- 17 Want to be with the most able teammates
- 18 Make negative comments that put their teammates down
- 19 Criticize their teammates when they make mistakes
- 20 Complain when the team doesn't win
- 21 Laugh at their teammates when they make mistakes

**YOU AND YOUR SPORT CONTEXT**

28. **Now think about the people around you in your life. Please indicate how the people listed below support you in your experience as a player; you can add someone if we have forgotten and indicate "not evaluable" if you can not evaluate the relationship with this figure**

1 Not at all	2 Little	3 Enough	4 Much	5 Totally
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<i>How much I feel supported as a soccer player by ...</i>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	Not evaluable
1 My parents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2 My siblings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3 My School mates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4 My grandparents	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5 My teammates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6 Some athletes of my Club	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7 My coach	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8 An older player in my Soccer CLus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9 Staff members	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10 My School teacher	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11 My School	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12 My girlfriend/boyfriend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13 Some manager of my Club	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14 National Federation of Soccer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15 The coach of Youth National Federation/team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16 A player that is my model	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17 My friends outside sport	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18 My sport attorney/lawyer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19 Psychologist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20 Other: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. Thinking about the sports context in which you train and that you live every day, indicate which image you would choose to describe it ...

A	<input type="radio"/>	B	<input type="radio"/>	C	<input type="radio"/>	D	<input type="radio"/>	E	<input type="radio"/>	F	<input type="radio"/>
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Use 3 adjectives or words to justify your answer:

# Appendix B

## TRIMESTER OF BIRTH

	Frequency	%	% valid	% cumulative
Valid	FIRST TRIMESTER	148	35,4	37,4
	SECOND TRIMESTER	108	25,8	64,6
	THIRD TRIMESTER	77	18,4	84,1
	FOURTH TRIMESTER	63	15,1	100,0
	Total	396	94,7	100,0
Missing	999	21	5,0	
	Missing by system	1	,2	
	Total	22	5,3	
Total		418	100,0	

## CLUB'S COMPETITIVE LEAGUE

	Frequency	%	% valid	% cumulative
Valid	LEAGUE A	60	14,4	14,4
	LEAGUE B	67	16,0	30,5
	LEAGUE C	162	38,8	69,3
	AMATEURS	128	30,6	100,0
	Total	417	99,8	100,0
Missing	Missing by system	1	,2	
Total		418	100,0	

## SAMPLE AGE

	Frequency	%	% valid	% cumulative
Valid	14	60	14,4	14,7
	15	92	22,0	37,2
	16	91	21,8	59,4
	17	89	21,3	81,2
	18	41	9,8	91,2
	19	31	7,4	98,8
	20	5	1,2	100,0
	Total	409	97,8	100,0
Missing	999	9	2,2	
Total		418	100,0	



**BIRTH IN ITALY**

		Frequency	%	% valid	% cumulative
Valid	YES	381	91,1	91,6	91,6
	NO	35	8,4	8,4	100,0
	Total	416	99,5	100,0	
Missing	Missing	2	,5		
Total		418	100,0		

**BIRTHPLACE\_FOREIGN COUNTRIES**

		Frequency	%	% valid	% cumulative
Valid		383	91,6	91,6	91,6
	ADDISABEBA ETIOPIA	1	,2	,2	91,9
	ALBANIA	4	1,0	1,0	92,8
	ARAD ROMANIA	1	,2	,2	93,1
	SWITZERLAND (BELLINZONA)	1	,2	,2	93,3
	BRASILE	1	,2	,2	93,5
	BUENOS AIRES	1	,2	,2	93,8
	CIPRO	1	,2	,2	94,0
	CONGO	1	,2	,2	94,3
	COREA DEL SUD	1	,2	,2	94,5
	COSTA D'AVORIO	1	,2	,2	94,7
	CROAZIA	1	,2	,2	95,0
	ETIOPIA	1	,2	,2	95,2
	GHANA	3	,7	,7	95,9
	GUINEA	2	,5	,5	96,4
	INDIA PUNJAB	1	,2	,2	96,7
	MALI	1	,2	,2	96,9
	MOLDAVIA	2	,5	,5	97,4
	NEW YORK	1	,2	,2	97,6
	PAKISTAN	1	,2	,2	97,8
RIO DE JANEIRO	1	,2	,2	98,1	
ROMANIA	3	,9	,9	98,9	
SANPIETROBURGO	1	,2	,2	99,0	

SENEGAL	1	,2	,2	99,3
SERBIA	1	,2	,2	99,5
SWITZERLAND (VIGANELLO)	1	,2	,2	99,8
TUNISIA	1	,2	,2	100,0
Total	418	100,0	100,0	

**NATIONALITY\_PLAYER**

	Frequency	%	% valid	% cumulative
ALBANESE	8	1,9	1,9	1,9
ALBANESE & ITALIANA	1	,2	,2	2,2
ARGENTINA	1	,2	,2	2,4
BRASILIANA	1	,2	,2	2,7
BRASILIANO	1	,2	,2	2,9
CIPRIOTA	1	,2	,2	3,1
CONGO BELGA	1	,2	,2	3,4
CROATA	1	,2	,2	3,6
ETIOPE & ITALIANA	1	,2	,2	3,9
FILIPPINO	1	,2	,2	4,1
GHANESE	4	1,0	1,0	5,1
GUINEA	1	,2	,2	5,3
GUINEANA	1	,2	,2	5,5
Valid INDIANA	1	,2	,2	5,8
ITALO-COREANA- CANADESE	1	,2	,2	6,0
ITALIANA	371	88,8	89,4	95,4
ITALIANA & ALBANESE	1	,2	,2	95,7
ITALIANA & AUSTRALIANA	1	,2	,2	95,9
ITALIANA & SPAGNOLA	1	,2	,2	96,1
ITALO-GHANESE	1	,2	,2	96,4
ITALO-TUNISINA	1	,2	,2	96,6
IVORIANO	1	,2	,2	96,9
MALESIANO	1	,2	,2	97,1
MAROCCHINA & ITALIANA	1	,2	,2	97,3
MOLDAVA	1	,2	,2	97,6

	POLACCA	1	,2	,2	97,8
	ROMENA	1	,2	,2	98,1
	RUMENA	3	,7	,7	98,8
	RUMENA/MOLDAVA	1	,2	,2	99,0
	SENEGALESE	1	,2	,2	99,3
	SERBA	1	,2	,2	99,5
	SVIZZERA	1	,2	,2	99,8
	TUNISINA	1	,2	,2	100,0
Valid	Total	415	99,3	100,0	
Missing	999	3	,7		
Total		418	100,0		

#### NATIONALITY\_PARENTS

	Frequency	%	% valid	% cumulative
	1	,2	,2	,2
ALBANESE	15	3,6	3,6	3,9
ALBANIA	1	,2	,2	4,1
ARGENTINI	1	,2	,2	4,3
BRASILIANA	1	,2	,2	4,6
CIPRIOTA E SERBA	1	,2	,2	4,8
CONGOLESE	1	,2	,2	5,1
CROATA	1	,2	,2	5,3
FILIPPINI	1	,2	,2	5,5
GHANA & SIERRA LEONE	1	,2	,2	5,8
Valid	GHANESE	2	,5	6,3
	GHANESI	3	,7	7,0
	GUINEA	1	,2	7,2
	GUINEANA	2	,5	7,7
	INDIANA	2	,5	8,2
	ITALIA & RUSSIA	1	,2	8,4
	ITALIANA	344	82,3	82,9
	ITALIANA & ALBANESE	2	,5	91,8
	ITALIANA & AUSTRALIANA	1	,2	92,0
	ITALIANA & BURKINA FASO	1	,2	92,3
	ITALIANA & INGLESE	1	,2	92,5

ITALIANA & PAKISTANA	1	,2	,2	92,8
ITALIANA & POLACCA	2	,5	,5	93,3
ITALIANA & SPAGNOLA	1	,2	,2	93,5
ITALIANA & SVIZZERA	1	,2	,2	93,7
ITALIANA & URUGUAIANA	1	,2	,2	94,0
ITALIANA & VENEZUELANA	1	,2	,2	94,2
ITALIANA/IVORIANA	1	,2	,2	94,5
ITALO-CANADESE & COREANA	1	,2	,2	94,7
ITALO-TUNISINA	1	,2	,2	94,9
IVORIANA	2	,5	,5	95,4
MALESIANI	1	,2	,2	95,7
MAMMA ITALIANA PAPA MAROCHINO	1	,2	,2	95,9
MAROCCHINA	2	,5	,5	96,4
MOLDAVA	2	,5	,5	96,9
MOLDAVI	1	,2	,2	97,1
NIGERIA & ITALIANA	1	,2	,2	97,3
POLACCA	1	,2	,2	97,6
ROMENA	1	,2	,2	97,8
RUMENA	3	,7	,7	98,6
RUMENI	1	,2	,2	98,8
SENEGALESE	1	,2	,2	99,0
SERBA	1	,2	,2	99,3
SVIZZERA	1	,2	,2	99,5
TAGIKISTAN E PAKISTANA	1	,2	,2	99,8
TUNISINA	1	,2	,2	100,0
Total	415	99,3	100,0	
Missing	999	,7		
Total	418	100,0		

#### EDUCATION\_MUM

	Frequency	%	% valid	% cumulative
Valid	ELEMENTARY DIPLOMA	5	1,2	1,3
	MIDDLE SCHOOL DIPLOMA	92	22,0	24,3
	HIGH SCHOOL DIPLOMA	198	47,4	73,8

	DEGREE	101	24,2	25,3	99,0
	OTHER	4	1,0	1,0	100,0
	Total	400	95,7	100,0	
Missing	999	18	4,3		
Total		418	100,0		

#### EDUCATION\_DAD

		Frequency	%	% valid	% cumulative
Valid	ELEMENTARY DILPLOMA	12	2,9	3,0	3,0
	MIDDLE SCHOOL DIPLOMA	124	29,7	31,2	34,3
	HIGH SCHOOL DIPLOMA	188	45,0	47,4	81,6
	DEGREE	69	16,5	17,4	99,0
	OTHER	4	1,0	1,0	100,0
	Total	397	95,0	100,0	
Missing	999	21	5,0		
Total		418	100,0		

#### WHERE DO YOU LIVE CURRENTLY?

		Frequency	%	% valid	% cumulative
Valid	FAMILY RESIDENCE	366	87,6	88,0	88,0
	FLAT RENT BY CLUB	5	1,2	1,2	94,7
	ONE PARENT	18	4,3	4,3	99,0
	RELATIVES	2	,5	,5	99,5
	OTHER	2	,5	,5	100,0
	Total	416	99,5	100,0	
	Missing	999	2	,5	
Total		418	100,0		

#### NEXT TO YOU, IN YOUR FAMILY DOES ANYONE PRACTICE SPORT?

		Frequency	%	% valid	% cumulative
Valid	YES	315	75,4	76,1	76,1
	NO	99	23,7	23,9	100,0
	Total	414	99,0	100,0	
Missing	999	4	1,0		

Total	418	100,0		
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**IF YES, WHAT SPORT \_SOCCER?**

	Frequency	%	% valid	% cumulative
Valid NO	191	45,7	45,7	45,7
Valid YES	227	54,3	54,3	100,0
Total	418	100,0	100,0	

**IN YOUR FAMILY THERE HAVE BEEN HIGH LEVEL ATHLETES?**

	Frequency	%	% valid	% cumulative
Valid YES	112	26,8	26,9	26,9
Valid NO	305	73,0	73,1	100,0
Total	417	99,8	100,0	
Missing Missing by system	1	,2		
Total	418	100,0		

**FAMILY\_ATHLETES DAD?**

	Frequency	%	% valid	% cumulative
Valid NO	366	87,6	87,6	87,6
Valid YES	52	12,4	12,4	100,0
Total	418	100,0	100,0	

**FAMILY\_ATHLETES MUM?**

	Frequency	%	% valid	% cumulative
Valid NO	412	98,6	98,6	98,6
Valid YES	6	1,4	1,4	100,0
Total	418	100,0	100,0	

**FAMILY\_ATHLETES GRANDAD?**

	Frequency	%	% valid	% cumulative
Valid NO	400	95,7	95,7	95,7
Valid YES	18	4,3	4,3	100,0
Total	418	100,0	100,0	

**FAMILY\_ATHLETES SIBLINGS?**

	Frequency	%	% valid	% cumulative
NO	392	93,8	93,8	93,8
Valid YES	26	6,2	6,2	100,0
Total	418	100,0	100,0	

**FAMILY\_ATHLETES OTHER?**

	Frequency	%	% valid	% cumulative
NO	375	89,7	89,7	89,7
Valid YES	43	10,3	10,3	100,0
Total	418	100,0	100,0	

**DO YOU HAVE SIBLINGS?**

	Frequency	%	% valid	% cumulative
YES	360	86,1	86,5	86,5
Valid NO	56	13,4	13,5	100,0
Total	416	99,5	100,0	
Missing 999	2	,5		
Total	418	100,0		

**SIBLINGS\_NUMBER**

	Frequency	%	% valid	% cumulative
0	4	1,0	1,1	1,1
1	236	56,5	64,7	65,8
2	98	23,4	26,8	92,6
3	16	3,8	4,4	97,0
Valid 4	8	1,9	2,2	99,2
5	1	,2	,3	99,5
6	1	,2	,3	99,7
9	1	,2	,3	100,0
Total	365	87,3	100,0	
Missing Missing by system	53	12,7		
Total	418	100,0		

**DO YOUR SIBLINGS PRACTICE SPORT AT ÈLITE LEVEL?**

	Frequency	%	% valid	% cumulative
Valid YES	61	14,6	15,0	15,0
Valid NO	347	83,0	85,0	100,0
Valid Total	408	97,6	100,0	
Missing 999	9	2,2		
Missing Missing by system	1	,2		
Missing Total	10	2,4		
Total	418	100,0		

**SIBLINGS\_WHAT\_SPORT**

	Frequency	%	% valid	% cumulative
Valid	370	88,5	88,5	88,5
Valid SOCCER	35	8,4	8,4	97,9
Valid DANCE	2	,5	,5	97,4
Valid HORSE RIDING	2	,5	,5	97,8
Valid GYMNASTIC	1	,2	,2	98,1
Valid KUNG FU	1	,2	,2	98,3
Valid SWIMMING	2	,5	,5	98,8
Valid VOLLEYBALL	4	,8	,8	99,8
Valid TENNIS	1	,2	,2	100,0
Valid Total	418	100,0	100,0	

**HOW MANY YEARS DO YOU PLAY SOCCER?**

	Frequency	%	% valid	% cumulative
Valid 1,0	1	,2	,2	,2
Valid 2,0	1	,2	,2	,5
Valid 3,0	5	1,2	1,2	1,7
Valid 3,5	1	,2	,2	2,0
Valid 4,0	7	1,7	1,7	3,7
Valid 5,0	7	1,7	1,7	5,4
Valid 6,0	14	3,3	3,4	8,8
Valid 7,0	21	5,0	5,1	13,9
Valid 8,0	57	13,6	13,9	27,8
Valid 9,0	52	12,4	12,7	40,5



	10,0	95	22,7	23,2	63,7
	11,0	65	15,6	15,9	79,5
	12,0	51	12,2	12,4	92,0
	13,0	23	5,5	5,6	97,6
	14,0	9	2,2	2,2	99,8
	15,0	1	,2	,2	100,0
	Total	410	98,1	100,0	
Missing	999,0	8	1,9		
Total		418	100,0		

**HOW MANY YEARS DO YOU PLAY IN THIS CLUB?**

	Frequency	%	% valid	% cumulative
	,0	1	,2	,2
	,5	38	9,1	9,4
	1,0	66	15,8	25,4
	1,5	1	,2	25,6
	2,0	72	17,2	43,0
	2,5	1	,2	43,2
	3,0	67	16,0	59,4
	4,0	42	10,0	69,6
Valid	5,0	33	7,9	77,5
	6,0	22	5,3	82,9
	7,0	20	4,8	87,7
	8,0	19	4,5	92,3
	9,0	11	2,6	94,9
	10,0	9	2,2	97,1
	11,0	10	2,4	99,5
	12,0	2	,5	100,0
	Total	414	99,0	100,0
Missing	999,0	4	1,0	
Total		418	100,0	

**WHAT IS THE HIGHEST LEVEL OF COMPETITION THAT YOU'VE REACHED WITH YOUR TEAM?**

	Frequency	%	% valid	% cumulative
Valid REGIONAL LEAGUE	86	20,6	20,6	20,6
NATIONAL LEAGUE	260	62,2	62,2	82,8
LOCAL LEAGUE	72	17,2	17,2	100,0
Total	418	100,0	100,0	

**HAVE YOU EVER PLAYED IN THE NATIONAL YOUTH TEAM?**

	Frequency	%	% valid	% cumulative
Valid YES	59	14,1	14,3	14,3
NO	353	84,4	85,7	100,0
Total	412	98,6	100,0	
Missing 999	6	1,4		
Total	418	100,0		

**ARE YOU/HAVE YOU BEEN INJURED IN THE LAST 6 MONTHS?**

	Frequency	%	% valid	% cumulative
Valid YES	158	37,8	38,0	38,0
YES ACTUALLY	22	5,3	5,3	43,3
NO	236	56,5	56,7	100,0
Total	416	99,5	100,0	
Missing 999	2	,5		
Total	418	100,0		

# Appendix D.1



## CONSENSO INFORMATO SCRITTO

Io sottoscritto/a.....

dichiaro di accettare la proposta di partecipazione allo studio di ricerca descritto nel presente documento.

Il mio consenso è espressione di una libera decisione, non influenzata da promesse di benefici economici o di altra natura, nè da obblighi nei confronti del Ricercatore responsabile dello studio.

Sono consapevole di essere libero/a di ritirare l'autorizzazione alla partecipazione allo studio in qualsiasi momento io lo desidero. Sono consapevole, inoltre, di non avere l'obbligo di motivare la mia decisione di ritirarmi dallo studio.

Mi è stata data l'opportunità di leggere le informazioni contenute nella parte informativa di questo documento e di porre domande circa gli scopi e le metodiche dello studio, i benefici ed i possibili rischi ed i miei diritti come partecipante alla ricerca.

Ho compreso tutte le informazioni ed i chiarimenti che mi sono stati dati e ho avuto il tempo sufficiente per prendere in considerazione la mia partecipazione a questo studio.

Acconsento in particolare che il trattamento dei dati personali (Decreto Legislativo 30 Giugno 2003 n. 196), ivi compresi quelli inerenti allo stato di salute, venga effettuato per gli scopi specifici della ricerca nei limiti e con le modalità indicatemi nel presente documento di informazione e consenso.

Confermo che mi è stata consegnata copia del presente documento informativo e di consenso.

FIRMA del RAPPRESENTANTE Data  
LEGALMENTE RICONOSCIUTO del  
PARTECIPANTE \_\_\_\_\_

### DICHIARAZIONE DELLO SPERIMENTATORE

Dichiaro di aver fornito al partecipante informazioni complete e spiegazioni dettagliate circa la natura, le finalità, le procedure e la durata di questo studio clinico di ricerca.

Dichiaro inoltre di aver fornito al partecipante il foglio informativo ed una copia datata e firmata del modulo di Consenso Informato.

FIRMA DEL RICERCATORE \_\_\_\_\_ Data \_\_\_\_\_  
Responsabile scientifico della ricerca

Nome del ricercatore (*in stampatello*) \_\_\_\_\_  
Caterina Gozzoli

FIRMA DEL RICERCATORE \_\_\_\_\_ Data \_\_\_\_\_  
Eleonora Reverberi

Nome del ricercatore (*in stampatello*) \_\_\_\_\_  
Eleonora Reverberi

## Appendix D.2



### CONSENSO INFORMATO SCRITTO

Io sottoscritto/a.....  
genitore (tutore) del minore.....

dichiaro di accettare la proposta di partecipazione del minore su cui esercito la potestà genitoriale allo studio di ricerca descritto nel presente documento.

Il mio consenso è espressione di una libera decisione, non influenzata da promesse di benefici economici o di altra natura, nè da obblighi nei confronti del Ricercatore responsabile dello studio.

Sono consapevole di essere libero/a di ritirare l'autorizzazione alla partecipazione allo studio in qualsiasi momento io lo desideri. Sono consapevole, inoltre, di non avere l'obbligo di motivare la mia decisione di ritirarmi dallo studio.

Mi è stata data l'opportunità di leggere le informazioni contenute nella parte informativa di questo documento e di porre domande circa gli scopi e le metodiche dello studio, i benefici ed i possibili rischi ed i miei diritti come partecipante alla ricerca.

Ho compreso tutte le informazioni ed i chiarimenti che mi sono stati dati e ho avuto il tempo sufficiente per prendere in considerazione la mia partecipazione a questo studio.

Acconsento in particolare che il trattamento dei dati personali (Decreto Legislativo 30 Giugno 2003 n. 196), ivi compresi quelli inerenti allo stato di salute, venga effettuato per gli scopi specifici della ricerca nei limiti e con le modalità indicatemi nel presente documento di informazione e consenso.

Confermo che mi è stata consegnata copia del presente documento informativo e di consenso.

FIRMA del RAPPRESENTANTE Data  
LEGALMENTE RICONOSCIUTO del  
PARTECIPANTE \_\_\_\_\_

### DICHIARAZIONE DELLO SPERIMENTATORE

Dichiaro di aver fornito al partecipante informazioni complete e spiegazioni dettagliate circa la natura, le finalità, le procedure e la durata di questo studio clinico di ricerca.

Dichiaro inoltre di aver fornito al partecipante il foglio informativo ed una copia datata e firmata del modulo di Consenso Informato.

FIRMA DEL RICERCATORE \_\_\_\_\_ Data \_\_\_\_\_  
Responsabile scientifico della ricerca

Nome del ricercatore (*in stampatello*) \_\_\_\_\_  
Caterina Gozzoli

FIRMA DEL RICERCATORE \_\_\_\_\_ Data \_\_\_\_\_  
Eleonora Reverberi

Nome del ricercatore (*in stampatello*) \_\_\_\_\_  
Eleonora Reverberi

## COPIA INFORMATIVA PER IL PARTECIPANTE

**Si prega di staccare questa pagina e conservarla, riconsegnando solo la prima pagina firmata**

### SCOPO E FINALITÀ DELLA RICERCA

La presente ricerca si propone di indagare l'esperienza sportiva di giovani atleti e le relazioni, sportive e non, che la supportano. A ciascun partecipante verrà richiesto di compilare un questionario a risposte multiple, composto da 164 domande, della durata complessiva stimata di 30 minuti.

I dati verranno raccolti in forma anonima e inseriti in un database, il cui accesso sarà consentito solo all'equipe di ricerca, che si occuperà di analizzarli in forma aggregata, al fine di raggiungere gli obiettivi della ricerca.

Ai questionari verrà applicato un codice che permetterà di identificare il singolo questionario - in caso di inserimento scorretto dei dati nel database - ma non di ricondurlo al soggetto rispondente.

I dati raccolti potranno essere presentati in conferenze, seminari scientifici e pubblicazioni scritte, ma non verrà riportato alcun tipo di dato sensibile e privato. I dati raccolti saranno parte di un lavoro di tesi di dottorato.

Ciascun soggetto coinvolto nella ricerca è libero di abbandonare la stessa in qualsiasi momento senza addurre spiegazioni a riguardo.

Il presente progetto di ricerca è stato sottoposto ed approvato dal Comitato Etico per la Ricerca in Psicologia dell'Università Cattolica del Sacro Cuore di Milano.

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# Appendix E – Item distribution

## Ryff's Psychological Well-Being Scale (Ryff, 1989; Ryff & Keyes, 1995) - RPWB

### Descriptive statistics

	N	Minimum	Maximum	Mean	Sd	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
PSYWB1	415	1	4	3,10	,629	-,314	,120	,407	,239
PSYWB2	412	1	4	3,16	,669	-,239	,120	-,593	,240
PSYWB3	411	1	4	1,79	,706	,534	,120	-,117	,240
PSYWB4	411	1	4	3,27	,688	-,580	,120	-,053	,240
PSYWB5	412	1	4	1,43	,733	1,650	,120	1,960	,240
PSYWB6	410	1	4	3,40	,622	-,640	,121	,086	,240
PSYWB7	414	1	4	3,16	,568	-,073	,120	,245	,239
PSYWB8	410	1	4	1,93	,817	,780	,121	,341	,240
PSYWB9	412	1	4	1,75	,817	,936	,120	,346	,240
PSYWB10	415	1	4	3,04	,696	-,481	,120	,418	,239
PSYWB11	414	1	4	3,23	,647	-,472	,120	,283	,239
PSYWB12	412	1	4	2,82	,810	-,320	,120	-,341	,240
PSYWB13	413	1	4	3,08	,694	-,538	,120	,542	,240
PSYWB14	407	1	4	1,91	,743	,647	,121	,442	,241
PSYWB15	411	1	4	3,14	,910	-,867	,120	-,075	,240
PSYWB16	412	1	4	3,33	,672	-,800	,120	,699	,240
PSYWB17	416	1	4	3,31	,700	-,645	,120	-,262	,239
PSYWB18	415	1	4	1,85	,792	,688	,120	,013	,239
PSYWB5R	412	1	4	3,57	,733	-1,650	,120	1,960	,240
PSYWB8R	410	1	4	3,07	,817	-,780	,121	,341	,240
PSYWB9R	412	1	4	3,25	,817	-,936	,120	,346	,240
PSYWB14R	407	1	4	3,09	,743	-,647	,121	,442	,241
PSYWB18R	415	1	4	3,15	,792	-,688	,120	,013	,239
PSYWB3R	411	1	4	3,21	,706	-,534	,120	-,117	,240
Valid (listwise)	368								

**Task and Ego Orientation in Sport Questionnaire (TEOS-Q) (Duda et al., 1995)**

**Descriptive statistics**

	N	Minimum	Maximum	Mean	Sd	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
MOT1	417	1	5	3,05	1,266	-,026	,120	-,970	,238
MOT2	417	1	5	4,22	,856	-1,147	,120	1,467	,238
MOT3	413	1	5	3,68	1,063	-,412	,120	-,636	,240
MOT4	413	1	5	2,76	1,151	,263	,120	-,670	,240
MOT5	413	1	5	4,26	,818	-,996	,120	,754	,240
MOT6	412	1	5	2,48	1,153	,506	,120	-,569	,240
MOT7	415	1	5	4,25	,870	-1,079	,120	,810	,239
MOT8	416	1	5	4,34	,826	-1,216	,120	1,063	,239
MOT9	416	1	5	4,16	,926	-,946	,120	,428	,239
MOT10	413	1	5	4,32	,775	-1,025	,120	,826	,240
MOT11	412	1	5	3,20	1,409	-,215	,120	-1,225	,240
MOT12	416	2	5	4,14	,776	-,527	,120	-,370	,239
MOT13	415	1	5	4,52	,735	-1,686	,120	3,331	,239
Valid (listwise)	395								

**Self-Regulation of Learning Self Report Scale for Sport-practice (Bartulovic, Young & Baker, 2017)**

**Descriptive statistics**

	N	Minimum	Maximum	Mean	Sd	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
SRLS1	414	1	5	3,80	1,007	-,728	,120	,272	,239
SRLS2	414	1	5	4,20	,836	-1,067	,120	1,312	,239
SRLS3	413	1	5	3,89	,829	-,613	,120	,547	,240
SRLS4	414	1	5	3,94	,929	-,694	,120	,120	,239
SRLS5	415	1	5	3,49	1,033	-,407	,120	-,231	,239
SRLS6	415	1	5	4,00	,964	-,865	,120	,492	,239
SRLS7	413	1	5	4,14	,947	-1,107	,120	1,013	,240
SRLS8	413	1	5	3,43	1,001	-,292	,120	-,226	,240
SRLS9	411	1	5	4,06	,956	-1,043	,120	,996	,240

SRLS10	412	1	5	3,14	1,199	-,145	,120	-,797	,240
SRLS11	412	1	5	4,14	,875	-,838	,120	,335	,240
SRLS12	412	1	5	3,74	,923	-,458	,120	-,077	,240
SRLS13	410	1	5	4,07	,957	-,931	,121	,426	,240
SRLS14	413	1	5	3,69	,969	-,563	,120	,082	,240
SRLS15	410	1	5	4,01	,878	-,656	,121	-,011	,240
SRLS16	409	1	5	3,57	1,027	-,523	,121	-,199	,241
SRLS17	413	1	5	3,76	,945	-,533	,120	-,191	,240
SRLS18	408	1	5	3,44	1,002	-,317	,121	-,322	,241
SRLS19	410	1	5	3,74	1,069	-,660	,121	-,108	,240
SRLS20	404	1	5	3,69	,930	-,465	,121	-,117	,242
SRLS21	409	1	5	3,86	1,015	-,597	,121	-,376	,241
SRLS22	412	1	5	3,85	,935	-,660	,120	,205	,240
SRLS23	411	1	5	3,60	,988	-,458	,120	-,126	,240
SRLS24	412	1	5	3,86	1,071	-,834	,120	,160	,240
SRLS25	412	1	5	3,49	,905	-,381	,120	,166	,240
SRLS26	412	1	5	3,61	,896	-,428	,120	,161	,240
SRLS27	412	1	5	3,70	,951	-,417	,120	-,347	,240
SRLS28	410	1	5	3,25	,967	,038	,121	-,407	,240
SRLS29	409	1	5	3,55	,776	-,088	,121	,123	,241
SRLS30	411	1	5	3,85	,964	-,598	,120	-,260	,240
SRLS31	410	1	5	3,63	,895	-,339	,121	,136	,240
Valid (listwise)	377								



**Coach – Athlete Relationship Questionnaire (Jowett, 2004)**

**Descriptive statistics**

	N	Minimum	Maximum	Mean	Sd	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
ALL1	412	1	5	3,77	1,061	-,878	,120	,408	,240
ALL2	411	1	5	3,35	1,029	-,370	,120	-,205	,240
ALL3	412	1	5	3,99	,923	-1,064	,120	1,311	,240
ALL4	413	1	5	3,95	,969	-,858	,120	,535	,240
ALL5	410	1	5	3,62	1,028	-,467	,121	-,324	,240
ALL6	412	1	5	3,68	,991	-,544	,120	,048	,240
ALL7	413	1	5	4,45	,868	-1,766	,120	2,969	,240
ALL8	409	1	5	3,42	1,009	-,272	,121	-,162	,241
ALL9	413	1	5	3,79	,941	-,658	,120	,297	,240
ALL10	412	1	5	3,97	,974	-,895	,120	,441	,240
ALL11	410	1	5	3,56	1,103	-,605	,121	-,121	,240
Valid (listwise)	401								

**Peer Motivational Climate in Youth Sport Questionnaire (PMCYs-Q) (Ntoumanis & Vazou, 2005)**

**Descriptive statistics**

	N	Minimum	Maximum	Mean	Sd	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
PeMC1	410	1	5	3,57	1,005	-,429	,121	-,212	,240
PeMC2	408	1	5	3,55	,910	-,338	,121	,065	,241
PeMC3	409	1	5	3,75	,916	-,550	,121	-,011	,241
PeMC4	408	1	5	3,62	1,009	-,476	,121	-,445	,241
PeMC5	410	1	5	2,72	1,130	,440	,121	-,544	,240
PeMC6	408	1	5	3,45	,965	-,241	,121	-,397	,241
PeMC7	411	1	5	3,72	,967	-,483	,120	-,153	,240
PeMC8	410	1	5	4,06	,837	-,664	,121	,167	,240
PeMC9	410	1	5	3,46	,994	-,253	,121	-,416	,240
PeMC10	410	1	5	2,95	1,192	,129	,121	-,909	,240

PeMC11	410	1	5	3,66	1,009	-,432	,121	-,497	,240
PeMC12	410	1	5	3,48	,984	-,262	,121	-,402	,240
PeMC13	412	1	5	4,09	,862	-,756	,120	,179	,240
PeMC14	408	1	5	3,37	1,118	-,243	,121	-,690	,241
PeMC15	407	1	5	3,09	1,091	-,021	,121	-,593	,241
PeMC16	406	1	5	3,32	,964	-,136	,121	-,338	,242
PeMC17	403	1	5	3,62	,973	-,415	,122	-,287	,243
PeMC18	404	1	5	3,45	,953	-,323	,121	-,189	,242
PeMC19	406	1	5	2,53	1,228	,466	,121	-,742	,242
PeMC20	405	1	5	2,60	1,168	,387	,121	-,703	,242
PeMC21	405	1	5	3,46	1,070	-,344	,121	-,385	,242
Valid (listwise)	371								

**Parent-Initiated Motivational Climate (PIMC-Q) (White, Duda & Hart, 1992)**

**Descriptive statistics**

	N	Minimum	Maximum	Mean	Std deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std error	Statistic	Std error
PIMC_P1	409	1	5	4,40	,796	-1,375	,121	1,964	,241
PIMC_P2	409	1	5	4,01	,974	-,857	,121	,281	,241
PIMC_P3	405	1	5	2,99	1,018	,043	,121	-,361	,242
PIMC_P4	405	1	5	4,12	,798	-,886	,121	,998	,242
PIMC_P5	407	1	5	3,71	1,059	-,700	,121	-,082	,241
PIMC_P6	403	1	5	2,79	,946	,101	,122	-,271	,243
PIMC_P7	407	1	5	3,79	,966	-,648	,121	,138	,241
PIMC_P8	405	1	5	3,58	1,201	-,474	,121	-,734	,242
PIMC_P9	403	1	5	1,76	,973	1,366	,122	1,523	,243
PIMC_P10	405	1	5	3,55	1,017	-,450	,121	-,232	,242
PIMC_P11	403	1	5	2,84	1,181	,179	,122	-,909	,243
PIMC_P12	397	1	5	3,16	1,020	-,103	,122	-,354	,244
PIMC_P13	405	1	5	2,72	1,069	,318	,121	-,563	,242
PIMC_P14	401	1	5	1,85	,985	1,225	,122	1,132	,243

PIMC_M1	401	1	5	4,47	,787	-1,797	,122	3,934	,243
PIMC_M2	399	1	5	4,12	1,003	-1,073	,122	,591	,244
PIMC_M3	395	1	5	2,95	1,087	,103	,123	-,580	,245
PIMC_M4	400	1	5	4,15	,849	-1,022	,122	1,187	,243
PIMC_M5	396	1	5	3,81	1,068	-,643	,123	-,390	,245
PIMC_M6	397	1	5	2,74	1,046	,213	,122	-,489	,244
PIMC_M7	397	1	5	3,62	1,077	-,600	,122	-,115	,244
PIMC_M8	398	1	5	3,62	1,239	-,606	,122	-,636	,244
PIMC_M9	395	1	5	1,99	1,111	1,082	,123	,421	,245
PIMC_M10	397	1	5	3,71	,941	-,478	,122	-,070	,244
PIMC_M11	392	1	5	2,92	1,207	,060	,123	-,923	,246
PIMC_M12	390	1	5	3,22	1,016	-,133	,124	-,406	,247
PIMC_M13	394	1	5	2,86	1,126	,057	,123	-,732	,245
PIMC_M14	393	1	5	1,98	1,088	1,128	,123	,649	,246
Valid (listwise)	354								



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