

The relationship between sports activity and emotions in the formation of cognitive processes

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Abstract

Emotions, their development and their effects have long been studied in multiple fields of science. Many disciplines like psychology, pedagogy, biology and neuroscience contributed to the realization of the current knowledge about emotions. Today, their evolutionary value is known thanks to the contribution of Darwin and numerous distinguished scholars, and many theories have followed each other over time, analysing the close relationship between emotions and cognitive processes. Furthermore, modern technologies resulted in a deeper understanding of these phenomenon, allowing the development of new theories, and their expansion and application to several field of study. Wherever the individual exists there are emotions, and that is why the sporting environment cannot be exempt of them. People are involved in sport for several reasons, putting into play their emotion and being driven by them. Given the important educational value of sport, and its highly dynamic context, the emotional aspect must be strongly taken into account. The purpose of this work is to analyse the relationships between sports, emotions and cognitive processes and delve into their importance. We took into consideration several studies which highlighted the contribute of sport in promoting social and emotional development, creating a true virtuous circle, able to benefits several aspects of life. Furthermore, we considered the delicate and reciprocal relationship between emotions and performance in sport, and how the former can positively or negatively affect the latter. In conclusion we considered the educator as the main actor in the management social, emotional and cognitive development in the sporting environment.

Keywords: Sport; Emotion; Cognitive process; Physical activity; Education.

Introduction

When ever we speak of functions that relate to our individuality, we believe to have a deep knowledge of them. Every day we use concepts (and related verbal expressions) assume that their meaning is clear to us and to our interlocutors. Even if concepts such as intelligence, intuition, sensitivity, cunning seems to be universally clear to everyone, they are extremely difficult to classify and therefore define rigorously. Emotions, and cognitive processes, make no exception. More recently, the study of brain networks in health and disease by functional magnetic resonance imaging (fMRI) or magneto encephalography (MEG) has allowed a more rigorous understanding of these phenomena. Emotions are involved in any interaction of the individual with the out side world (Lazarus, 2006) and this is the reason why a formative relationship in the sports field must necessarily take into account emotions. Similarly, cognitive processes elaborate the events and situations in which we are involved and transform the min to information, knowledge and experience (Varela, Thompson, & Rosch, 2016). Finally, considering the close relationship between emotions and cognitive processes, it is clear how sports activity, able to stimulate and regulate emotions (Zhang, Fu, Sun, Gong, & Tang, 2019), becomes a key element for an important cognitive development. The aim of this work is to analyse the relationship between sport and emotions, and provide observations about the importance of including emotional management in the sports environment, to achieve a correct cognitive development.

Emotions and evolution

We live and organize existential situations in such a way that they give us pleasure and joy, and avoid those that bring disappointment, sadness or pain. Emotions represent intrinsic responses that evolved through survival and adaptation, and are therefore a fundamental psychophysiological mechanism (LeDoux, 2012). Talking about evolution, it is mandatory to refer to Darwin, who in his work *Expression of emotions in man and animals*, of 1872, stated that the facial expressions of emotions in human are innate, universal in all races and originating from the facial expressions of animals. He collected examples of various physical expressions appearing similar in different species, proposing the concept of fundamental emotions represented by fear, anger and happiness (Darwin & Prodger, 1998).

Recently, the Darwinian idea has been revived by scholars such as Frijda, Plutchik and Ekman. In particular, Ekman et al. conducted several experiments on populations in Borneo and New Guinea, confirming the thesis of the universality of fundamental facial expressions. The authors verified the ability of indigenous peoples and American students to recognize each other's emotions through expressions. These results represented a very strong suggestion of the biological and non-cultural nature of emotions (Ekman, Friesen, & Ancoli, 1980; Ekman & Friesen, 1971).

Emotion theories: a brief anthology

Over time there have been several theories about the development of emotions, taking into account their close relationship with cognitive processes. Below we propose a summary of emotion theories, going through some of the key points of the development of such theories.

In 1884, James and Lange rejected the traditional notion that it is the conscious emotional event that initiates the reflected responses of the nervous system. They proposed a theory, defined as *peripheral*, according to which the cognitive experience of emotions is secondary to their physiological expression (Sullivan, 2009). However, there are numerous evidences to suggest that this theory can only explain some of the aspects of emotional behaviour.

The main objection to James-Lange's theory was raised following the research of Walter Cannon (Cannon, 1927) and Philip Bard (Bard, 1934), who hypothesized that thalamus and hypothalamus play a key role in the mediation of emotions. This theory was therefore defined as *central*, as it provided for an emotional activation into the hypothalamus, which in turn determined somatic and behavioural changes, being this, the nucleus of the emotional mind.

Although both the James-Lange and Cannon-Bard models were criticized, over time it became clear that both theories highlighted fundamental aspects of the complex process that gives life to emotion.

In more recent times, emotional behaviour has been considered as the result of the interaction between psychological and physiological factors. Indeed, according to Stanley Schachter, it is the recognition of our own psychophysiological activation (*arousal*) and the explanation that we give to it, according to the emotional situation, to generate the emotion (Reisenzein, 1983).

Further contributions, concerning the emotions, have been developed through the *appraisal*, intended as the evaluation that we make of a situation. According to Arnold, the unconscious, implicit assessment of a stimulus is followed by different operational acts, then peripheral responses and, finally, a conscious explanation, while the emotions are the outcome of this whole process (Arnold, 1960). Following these theories, Lazarus realized the *cognitive-mediational theory of emotion*, which became over time one of the most accredited theories about the development of emotions. This theory, based on the appraisal, delves into fundamental elements such as unconscious appraisal, stress and motivation, and the related interconnections that lead to the development of emotions (Lazarus & Lazarus, 1991).

The sporting environment

Before describing and addressing the effects of sport on emotions, it is necessary to make a brief description of what is the environment in which sport comes to life. For the child, sport may be a fun game; for teenagers sport can be competition, but also an important social setting; for adults it can be a recreational moment, psychophysical wellness activity or even a job. These are just some of the motivations that lead people of all ages to participate in sport (Allender, Cowburn, & Foster, 2006; Diehl, Fuchs, Rathmann, & Hilger-Kolb, 2018; Kondric, Sindik, Furjan-Mandic, & Schiefler, 2013; Napolitano, Ascione & Di Palma, 2018a; 2018b). It is clear that the different wills which bring people to play sport, carry with them a set of heterogeneous values, to which must be given equal importance and consideration, since they are part of the subjective world of the individual. Similarly, agonists and amateurs can experience the sport in similar or completely distinct ways as well, depending on beliefs, goals, their own system of values and any personal consideration. But we must not be deceived, this does not mean that we will be able to necessarily predict the emotions and feelings of the individual in any situation. We could see an explosion of anger in an amateur sportsman who loses a game among friends, as well as we could observe a moderate resignation in a competitive athlete who loses an important game. In the sea of contexts belonging to the world of sport, another element which deserves to be mentioned, is the difference between team sports and individual sports (Di Palma & Tafuri, 2016; Di Palma, Raiola & Tafuri, 2016; Kajbafnezhad, Ahadi, Heidarie, Askari, & Enayati, 2011; Nia & Besharat, 2010; Raiola, Lipoma & Tafuri, 2015). Although the former inevitably present a greater number of interactions (and often, of different nature), even individual sports do not lack important interactions. Unless the individual trains completely alone, even in individual sport people must inevitably relate to training partners, coaches, trainers, opponents, judges. In both cases, people's subjective worlds meet and eventually collide into unpredictable contexts, which trigger equally unpredictable emotional and cognitive processes.

Monitoring, interpreting and, above all, preparing for such contexts is not always an easy task for the educator, who must take into account a large number of variables that come into contact in a highly dynamic context (Carron & Brawley, 2008; Widmeyer, Brawley, & Carron, 1992).

At this point it is clear how much each element contributes and comes into contact with the emotional and cognitive sphere of individuals who are involved into sport. We will not go further with the description of the contexts and individualities that take part in such processes since it is not the purpose of this work, but rather the analysis of the relationship between sport and emotions and the final consideration about the role of the educator.

Results and Discussion

Beneficial effects of moderate physical activity are well known. Health and disease prevention are among the first elements to benefit from an healthy sports practice (Karacabey, 2005; Kruk, 2007; Pharr & Lough, 2017). Moreover, current technologies allow us to analyse motor characteristics and sport benefits with precise and accurate methodologies (Zheng & Barrentine, 2000). But the positive effects are not limited to these. Social and emotional development, critically important from childhood to adolescence, is also strongly affected by sport (Chen, Snyder, & Magner, 2010; D'Angelo & Rosa, 2020; Eime, Young, Harvey, Charity, & Payne, 2013; Vilhjalmsson & Thorlindsson, 1992). A developed emotional intelligence allows us to build healthy relationships with the other individuals. Recognizing one's own and others' emotions, knowingly interpreting and managing them, allows to relate positively to friends and family. It has been observed that sports activity is able to induce positive changes in emotional intelligence (Ubago-Jiménez, González-Valero, Puertas-Molero, & García-Martínez, 2019). The individual improves the ability to perceive, understand and manage emotions. This modification in turn leads the individual to seek greater favourable interactions with other people, in order to benefit from the positive aspects of such relationships. In this way the individual feels more motivated to practice sports activities, triggering a real virtuous circle, able to offer important benefits both to the physical, social and emotional condition. It has also been observed that a developed emotional intelligence is also able to modulate and therefore reduce the stressful factors that result from sports practice (Laborde, Dosseville, Guillén, & Chávez, 2014; Ruiz, Lorenzo, & García, 2013). Positive management of these characteristics is inevitably able to mitigate the negative effects of stress and reduce the risk of abandonment of the practiced activity (Goodger, Gorely, Lavallee, & Harwood, 2007); abandonment which could, in turn, lead to further negative effects such as the sense of defeat, dissatisfaction, loss of social ties and, of course, the lack of physical activity.

If one considers the virtuous circle mentioned above, the effect of emotions on sports activity must be strongly taken into consideration. It is known that an emotion is able to positively or negatively affect a sporting performance (Lavallee, Thatcher, & Jones, 2004; McCarthy, 2011; Woodman et al., 2009) from which it derives the importance of the need to develop good emotional intelligence. Beyond that, the very regulation of emotions can have an effect on sports performance. It has been observed that such regulation can result in an important cognitive load that can negatively affect performance in one or more of its components (Montesano et al., 2013; Wagstaff, 2014). Hence, the relationship between emotion and sport performance is very delicate and must be deepened and managed with awareness.

Conclusions

In conclusion, we can affirm that every educational experience in the field of sports, inevitably passes through the close relationship between cognitive development and emotions, and relative mutual influence with the sporting environment. The main actor in the management of this context and in the promotion of a positive development is inevitably intended for the educator. The latter, in addition to promoting the participation in sport, must be aware that such activity will inevitably have an effect on the emotional and social components of the individuals, and that it is therefore his responsibility to act with care and awareness. The educator must be able to monitor, read, interpret and manage contexts not only from a sports and performance point of view. He has the responsibility to also consider the social and emotional characteristics which are inherent aspects of the human being. In the sports environment, the educator must necessarily include a path of growth of the emotional component, which if not controlled and not properly developed can manifest itself through deviant behaviours and social and relational problems.

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