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Abstract

Modern sport, as a prominent social event in contemporary society capable of mobilizing millions of people across the planet, appears to the researcher as a relevant object of study. This is because, not only is it a central activity in contemporary societies, but it is one of the most widespread phenomena of the twentieth and twenty-first centuries. This work intends to seek and obtain some answers to the central role that modern sport seems to have, through the ideas of sociocultural homeostasis of neurobiologist António Damásio. We will argue that modern sport is a socio-cultural manifestation of biological homeostasis which, in the form of feelings such as fear and motivation, embodies new ways of strengthening the body and new ways of achieving greater well-being. That is, modern sport is the result of unconscious biological mechanisms that, mediated by consciousness through emotions and feelings (like fear and motivation), act in the sociocultural space in order to create devices of homeostatic balance. As we will demonstrate, during the twentieth and twenty-first century, several studies proved the benefits of modern sport in health, which helped to strengthen the effectiveness of modern sport in combating, preventing and treating physical and mental illnesses. In sum, we will argue that modern sport is a sociocultural way of regulate the body homeostasis.

Keywords: sport, sociocultural homeostasis, António Damásio, motivation, degeneration

1. Introduction

Modern sport (MS) emerged during the nineteenth century in the context of the liberalization of European societies [1], and since then its impact on the human being’s *modus vivendi* has been significant [2, 3]. In contemporary times, the huge number of people it mobilizes, the enormous resources it moves and the countless societies that, throughout the twentieth century, used and institutionalized it for various purposes cannot fail to arouse interest and some astonishment. In addition to religion, present in all known societies, from the most primitive to the most
developed, MS is probably the most mobilizing activity for people on the entire planet [1–3].

Now, given the ubiquity that MS seems to have in contemporary society, it is relevant to find answers to this phenomenon. What does MS have in particular, or what has changed in human understanding, so that certain sporting activities (such as football, athletics, rugby, basketball, among many others) that did not exist before the nineteenth century, were created and started to have the attention of millions of people around the world, which made them one of the main occupations of our life [1–3]? Is it simply a part of leisure-related activities, having a primary role of entertaining, amusing and distracting from “real life” as some authors argue [3], or does it have other functions, eventually outside the sphere of leisure, which must be taken into account for a more accurate understanding of the phenomenon?

In this chapter, we will argue that MS is a sociocultural manifestation of biological homeostasis which, in the form of feelings such as fear and motivation, created new ways of strengthening the body and new ways of achieving greater well-being. In other words, MS is a sociocultural manifestation of biology – it has the same function, namely contribute to the regulation of the body. Through feelings such as fear and motivation, homeostasis operates subliminally in the sociocultural space so that its role is fulfilled, both inside the organism and outside.

2. The problem

MS, born during the nineteenth century, became in the twentieth century one of the most central and mediatic human activities [1–3]. Every week, millions of people mobilize around MS, whether as practitioners (amateurs or professionals) or spectators, filling stadiums, pavilions and venues with tens of thousands of people. To this reality, some authors theorizing about the concept of MS tried to respond with some innovative theories [2–9]. Due to his prominence in academia and the epistemological scope of his thought, it seems to us that the sociologist Norbert Elias is the author who best manages to theorize about the role of MS in contemporary society, trying to explain the phenomenon in the light of the Civilizational Process as the main reason for the decrease in violence in human societies [10]. According to the sociologist, the Civilization Process, initiated during the late Middle Ages in European courts, originally in France, through the institution, first, of an increasingly centralized state – a court society, producer of new customs and new models of behavior – and later, of a set of rules of etiquette that aimed to replace the obsolete medieval traditions; as well as the development of new mechanisms of social control, led to the acquisition of a set of new behavioral patterns that repressed not only violence, but also the disposition to brutality verified in medieval customs ([10]: 336). The construction of a centralized court society that increasingly controlled the behavior of its subjects, applying heavy sanctions to those who deviated from the implemented social norms, meant that, according to Elias, social violence gradually decreased in a process of about 500 years. Over time, state coercion became self-constraint - the self-control that human beings acquired throughout this process ([10]: 620).

According to Elias, when the Industrial Revolution took place and enabled the institutionalization of some sports games within an urban dynamic, societies were already in a civilizing process of some success in controlling emotions, thus opening space for forms of leisure activities that, in line with the guidelines issued by the State, were intended to be effective in catalyzing emotions. According to the sociologist,
leisure activities were implemented as an efficient response to humans’ needs to release the tension inherent in “real life” and the concentration of emotions repressed by the power of the State [3]. Now that violence was prohibited and repressed, the Search for Excitement (in the term used by Elias) would be sought during the twentieth century in leisure, where MS was inserted, along with theater, races, parties and other recreational games. MS would therefore be the quest for excitement forbidden in “real life”.

Although Elias’ thesis has been established as a paradigm, widely accepted by numerous sociologists and historians [11–13], despite some criticisms from some authors who consider his approach somewhat biased [14, 15], Elysian thought offers us a problem that we would like to see discussed. Elias’ thesis provides answers from a perspective that seems to us oblique insofar as it explains it exclusively as a product of the Civilizational Process, with the exclusive functions of providing a space for the representation of repressed emotions in a fictional imagery framework, thus functioning as a catalyst for “real life”.

In this chapter we discuss the hypothesis that sport has much more complex functions, much broader and, above all, more vital than those mentioned by Elias, namely therapeutic and medicinal functions, related to the concept of sociocultural homeostasis, developed by the neuroscientist António Damásio.

3. The rise of modern sport

MS can be defined as: “Physical exercise regulated by specific norms, suitable for the development ... of the human body and practiced individually or in a team” [16]. In its broader conceptualization, related to play and entertainment and not to physical exercise, sport must have existed for thousands of years, since human beings invented ways to recreate and relate in a more complex way, in forms of ritual and others, in a logic that could meet some of the ideas of historian Johan Huizinga [5]. As an activity related to physical exercise, it probably has its origins in the ancient Olympic Games, dating from around 800 BC ([1, 17]: 44–73). However, despite some convergence with hellenic physical practices, the result of an integrated representation of the body–mind problem in which the body should serve as a cult to the gods, contemporary sports activities are a new phenomenon, which have little or nothing to do with those that preceded them [18–21].

Contrary to what happened in classical greek culture, throughout the Middle Ages the body - seen as a mundane and sinful element – was deeply ostracized and humiliated, fundamentally, by the monks (medieval behavior model) ([22], p. 120), which subsequently led to the establishment of harmful bodily practices for the health of the individual and the social body, as well as the creation of ideal conditions for the spread of diseases [19]. Consequently, for many centuries there was the complete abandonment of any bodily practice that did not have military purposes. The soul, in turn, was represented in this period as the noble substance of the human being, the only one that would deserve special care, which led to a general concern to strengthen the intellect at the expense of the body. From the eighteenth century onwards, with the defense of states increasingly entrusted to professional military personnel, without the need for intense military training, the wealthier population began to dedicate themselves many times to idleness or to the cultivation of the mind since, according to Judeo-Christian tradition, there were no great reasons to exercise the body, since only the soul could crave eternal life [19, 20].

3
During the period of the liberal revolutions that began with the French Revolution, in 1789, in which social values and a political organization completely different from Absolutism were disseminated, a collective conscience that was broadly critical of the lifestyle of the Ancient Régime developed. With the perception that they were heirs of a new order, the nineteenth century authorities began efforts to replace social models and rooted obsolete behaviors, subsequently criticizing both the idleness of the elites and the poor hygiene of the most disadvantaged social extracts, both deeply imbued in medieval traditions and beliefs, in which the body was a condemned element ([23]: 35–43). The lack of public sanitation combined with poor food, the lack of decent sanitary facilities and an efficient organization of the territory, as well as the beliefs in secular traditions harmful to health, contribute to create population centers highly prone to diseases that not infrequently spread and caused high mortality ([19, 23]: 29–43).

After centuries in which the body was considered the tomb of the soul, in the nineteenth century new perspectives were opened regarding the human condition, valuing the body and life in a way that raised questions about the habits that for centuries were rooted in medieval societies [19, 20]. It is in a context of modification of the cognitive representations of the body–mind problem, in which an enormous appreciation of the body emerges as a repository of the integral individual, that doctors, philosophers, scientists, politicians and teachers will defend a set of measures that would allow a rupture with the obsolete way in which the body was treated, thus promoting the implementation of public health, in which physical education (and subsequently physical exercise and sport) was a central piece [24]. The very meaning of death and life was revised ([20]: 123–176), which led to a discrediting of all activities that could appeal to the afterlife, the immaterial and the supernatural, such as the veracity of witches, healers and sorcerers, but also the Church, widely criticized by the scientific and political community at that time [25]. The existence of the soul was disregarded in the intellectual environment and a materialist/naturalist current of the human being was implemented, widely in vogue throughout civilized Europe, which has some of its main Portuguese defenders in Miguel Bombarda [25], Teófilo Braga [26], Júlio de Matos [27], Bettencourt Raposo [28], Teixeira Bastos [29], among others. We argue that it was this new cognitive representation of the body–mind problem, in which the conception of human nature acquires an eminently physiological representation (positivist, materialist), either at the level of the mind, seen as a product of the brain, or at the level of the body itself, which has led to the emergence and implementation and promotion of modern sport as a means of strengthening human nature now seen from an integrated perspective [24].

A greater knowledge of the human body and brain, provided by the works of Louis Pasteur, Paul Borca or Ramon y Cajal, among many others, exponentially increased knowledge about human nature, completely modifying cognitive representations in relation to the body–mind problem. At the same time, the transformist theses of Charles Darwin and Jean-Baptiste Lamarck gave rise to the general conviction that, given the contempt that was seen (and still endured) for centuries in relation to the body, the human species had entered a process of degenerative physiological condition that was necessary to stop in order to avoid its self-destruction [30–33]. In other words, several intellectuals considered that the devaluation given to the body ended up implementing sedentary habits that had atrophied the human organism, which, combined with obsolete hygienic practices, could lead to the decline of the species, as well as its extinction [24]. In this way, a new perspective of human nature, in which the body and mind interact through physiological processes, paved the way for a
profound revolution in human thought. Mental problems such as alienation, epilepsy, hysteria and others began to be seen, not only as problems of the mind, but as physiological illnesses that, as a result of obsolete hygienic behaviors, took root in bodies and manifested themselves in minds, and could then jump generations and contaminate the offspring once acquired by the parents [27, 31]. In this period, a deep feeling of decadence of the “race” sets in and numerous authors appear to warn that something should be done to avoid the extinction of the species.

4. The MS in curing the degeneration of the species

This deep sense of the decadence of the “race” that emerged in the nineteenth century throughout Europe could be, at the time, legitimized by the Prussian victory over France in 1870, attributed to the better physical preparation of the Prussians against what was considered the greatest European military power at the time ([33]: 368; [31]: 40, 70, 72). In fact, it is not by chance that the main “decadentist” authors are more successful after 1870, namely the French psychiatrist Bénédict Morel, who launched “the concept of degeneration in its historical trajectory,” ([32]: 102), and the Italian anthropologist Cesare Lombroso, whose ideas on the degeneration of the “race” circulated in Europe even before the eugenic ideas of the Englishman Francis Galton [30, 31].

It is with the intent of combating the degeneration of the species that, mainly, from 1870 onwards, numerous thinkers, doctors, hygienists, philosophers and other authors ostensibly defend the implementation of gymnastic and the practice of MS in the entire population. Otherwise, according to the scientific and philosophical elite, the human species was at risk of extinction, such were the vices to which the human body was subjected by obsolete habits and traditional practices that facilitated the spread of diseases such as syphilis, tuberculosis and alcoholism ([33]: 368; [19]: 23, 55, 130–145; [20, 21]). Scientific and medicinal advances, combined with a greater knowledge of human nature, helped to promote the idea that MS strengthened the body, prolonged life and prevented diseases, which stimulated the creation and implementation of various forms of gymnastic and of various sports all over Europe. In other words, first gymnastic, and then MS, will appear in the eyes of doctors, philosophers, teachers and scientists as the cure for the physiological decay of the species [24].

This therapeutic dimension of MS can, in fact, be verified in a wide range of sources and documents during the transition from the nineteenth to the twentieth century. In 1874, the doctor José Ferreira Castro considered MS as the essential factor “for the maintenance of health” (162) and “beautification of the body” (170), namely the practice of jumping, fighting, swimming, walking, hunting, dancing, riding, among other exercises (170). Along the same lines, the doctor and professor at the University of Coimbra, Augusto Filipe Simões, wrote and published two books [34, 35] with the aim of publicizing the urgent need for the population to practice physical exercises in order to avoid the decline of the portuguese “race”. In 1891, the physician Carlos Alberto Lima published his thesis entitled Improvement of the race through physical exercise, developed with the precise objective of regenerating the Portuguese “race” through sport (62). That same year, Miguel Bombarda defended in Contemporary Medicine [36, 37] that the practice of sport was the most efficient means of regenerating and strengthening the body against diseases and ephemeral events (24-5-1891, 163) [38]. The importance of MS in the regeneration of the “race”
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can also be observed in the nineteenth century press. *The Diário Ilustrado*, most likely the first Portuguese generalist newspaper to have a sports section, said in 1894 [39]: “... given the benefit that can be for our country and spread the sport, thus achieving a good amusement for many, and at the same time its development, or perhaps the refinement of our entire race under all the points of view that everyone claims, which today walks in a sad decadence...” (20 March 1894, 1). In 1897 the newspaper *O Sport*, in its debut issue, said the following [40]: “The sport! What enthusiasm to pronounce it?! Sport is the salvation of human life; it is our future education; it is our own soul [...]. The purpose of sport is physical development; it fortifies us and gives us agility; it gives us...a life as pleasant as possible, completely turning us away from all kinds of vices and thus making us robust and healthy [...] Is sport, then, the salvation of human life? It is for certain, or at least we are sure of that [...] It is clear that sport is all that is most beautiful and sublime” (12 February 1897, 1).

It is in a historical context of deep rupture with the old daily practices, in which the most literate Portuguese society plunges into a collective feeling of decadence of the species, that MS, not only is increased but, fundamentally, acquires its most prominent social function - to contribute to the salvation of the species. It is within the scope of improving public health, in which the individual is valued according to the vitality of his body as a core instrument for the progress of a society that was intended to be turned to the future, that sport acquires its function of contributing to social empowerment. In fact, it does not seem to us that the development of MS is an autonomous process that can be conveniently studied without understanding it within a paradigm of control of the social body, within the scope of an institutionalization of a public health that intended to implement new models of bodily conduct. It seems to us that it is in this continuous process of regeneration of the social body, in which we witness the institution of public health, that MS finds the main strength of its existence – to strengthen, in an integrated way, the subject’s body and mind, in order to avoid the decline of the “race” [19–21].

In short, a seemingly strong awareness of the need to control the social body, combined with the dissemination of the idea of degeneration of the “race”, led not only to the institutionalization of new everyday bodily practices, with greater expression for the implementation of public health, but also to the institutionalization of physical education, where MS was inscribed as one of the most efficient means of ensuring the health of societies.

5. The sociocultural homeostasis

Homeostasis is generally understood as the continuous effort of the organism to maintain the physiological limits necessary for the existence of life within it. In the words of António Damásio: “life requires that a series of limiting parameters be maintained at all costs in literally dozens of components of the dynamic interior of the body”. This limit is “known by the term homeostatic and the process through which this balanced state is reached is called homeostasis” ([41]: 64). In support of homeostasis – the complex, automatic and totally unconscious process of managing and protecting life – is the biological value, the value of life – the natural force or indispensable incentive for this regulation ([41]: 64).

Biological value has an omnipresent presence in Nature through genes resulting from Natural Selection that endowed organisms with homeostatic capacities, in which, first emotions and then feelings flourished ([41]: 65–66). Emotions are
physiological systems created by evolution to serve homeostatic purposes, motivating the organism to find sources of energy, opportunities for developing and partners with whom to ensure genetic continuation, or avoid predators and other situations that could endanger the integrity of the organism. Emotions, such as fear and motivation, among others, guide the behavior of organisms, manifesting themselves: “... as simply as in the release of chemical molecules linked to the reward [in finding a source of energy or a partner] and punishment [in the face of danger], or as elaborate as our social emotions and sophisticated reasoning.” ([41]: 45). Feelings, in turn, correspond to the mental substrate of emotions: “they are images of actions and not actions in themselves” ([41], 143). A certain feeling is, mutatis mutandis, the mental experience of an emotion, which allows the subject to consciously experience a certain emotion and mentally retrieve it whenever necessary [41–44]. If emotions are homeostatic bodily programs of action, feelings, in turn, are the “... mental adjuncts of homeostasis” ([44]: 43) - the mental experiences of the state of life in the body ([44]: 43) or “the mental expressions of homeostasis” ([44], 17). That is, when we are faced with a certain challenge, it is the emotions that make us act to solve it, but it is the feelings that consciously qualify this situation (as positive or negative) so that in the future we can anticipate it, remember it and deal with it more efficiently.

By helping to predict events, emotions and feelings are crucial for organisms to optimize their body’s health. It is feelings that codify experiences and signal situations (as good or bad), providing the necessary motivation to create certain sociocultural devices that ultimately aim at a more efficient homeostatic regulation. Without emotions and feelings, it would be impossible to catalog and identify any stimulus, situation, object or person, as good or bad, beautiful or ugly, rewarding or punitive, pleasant or painful ([44], 147).

According to António Damásio, emotions and feelings are at the origin of the sociocultural devices that have been developed over time as means of sociability. In other words, emotions and feelings were the interlocutors between human beings and their peers, in a relationship that led to the elaboration of codes of conduct, laws and social norms, as well as institutions, which aim to enhance the hypotheses of individual and collective survival. These social and cultural devices are designated by António Damásio as socio-cultural homeostasis [41, 44]. Therefore, emotions, first, and then their mental substrate - feelings - are sophisticated devices, originated by homeostatic mechanisms that essentially aim at the same thing: to guide and encourage organisms to seek better means of survival. It is feelings, such as fear and motivation, that “indicate to the mind, without saying a word, the good and bad course of the processes of life inside the respective body” ([44]: 26). Homeostasis without feelings is clearly possible, as the countless species that are highly effective in adapting to environments that do not have them, such as bacteria, prove, but once present in evolution they fulfill and improve homeostatic mechanisms by consciously qualifying situations, objects and the internal environment of the organism, which makes it possible to anticipate and predict these qualified situations through what human beings call memory.

The emergence of consciousness in evolution has equipped its holders with new devices in the management of life, more optimized and more efficient, through a much more detailed knowledge of their inner environment and the environment in which they are inserted. Consciousness has allowed an organism not only to feel and experience its internal state and the external world, but also to know them and be able to reflect on them, being able to subsequently intervene in them [41, 44]. Human consciousness - the ability it offers to intervene and modify the environment - will have
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allowed an improvement in the social manifestation of feelings in the sense that it has expanded the spectrum of action of the latter. That is, consciousness has allowed feelings to be embodied in what human beings call culture. It is important to note, however, that consciousness has little or no ability to directly intervene in the unfolding of the homeostatic process. In fact, some authors have been demonstrating that consciousness does not have the power of decision or action [45–47] so consciousness may have emerged in evolution to serve as an intermediary between internal homeostatic processes and the environment in which an organism is inserted. Consciousness would have, in this perspective, the function of mediating the basic homeostatic impositions with the environment so that the former are fulfilled and optimized in the socio-cultural environment. In other words, consciousness does not interfere with homeostasis but makes it knowable ([41]: 56), allowing the value of life to intervene beyond the limits of the body and create, in the socio-cultural context, new and efficient forms of life regulation. To a large extent, consciousness made it possible for the subject to know the hidden “wills” and “desires” of the multiple microorganisms that inhabit their body. Feelings are the mental experiences of these hidden desires, which subsequently embody socio-cultural activities [44]. In other words, the vast neural capacities of human beings (emotions, feelings, self-awareness, language, reasoning, etc.) will have allowed for a better management of basic homeostasis which, in turn, enabled socio-cultural homeostasis ([41]: 358).

It is therefore not possible, according to Damásio, “to imagine the origin of the responses that became medicine or art outside an affective context” ([44]: 239). To rephrase it, medicine, art, and culture in general, had at their origin a feeling: a feeling of pain in the face of a sick individual who needed help; a feeling of concern for a loved one who needed help; a feeling of compassion towards the wounded warrior; a feeling of fear in the face of death or illness; a feeling of happiness when these pain situations were overcome, which motivated the subject to continually resolve them [44]. According to the neuroscientist, the primordial needs of Homo sapiens and hominid species before him led to the development of the first forms of culture: tools, weapons, clothing, shelter, rituals. Faced with difficulties in relation to individual and group survival, the first human societies created a set of devices to deal with the enormous challenges they would face, be they the search for food, the defense of a predator, the cold or the preparation of food. The most basic feelings of survival, such as fear, motivation, hunger, thirst and sexual desire, guided human beings in how they could increase their chances of life and, thus, reproduce ([44], 237, 238). Feelings of happiness, contentment and joy classified the stimuli as positive (to be repeated), while feelings of fear, anxiety, disgust, shame or guilt identified the stimuli as negative (to be avoided) ([44], 238).

At times when group coexistence became advantageous, first in small sedentary groups, and later in more complex societies, it became necessary to regulate human behavior in order to facilitate social relations and, in this way, create normative means of interpersonal relationships. In this ancestral context, feelings of motivation, empathy, fear, shame and guilt were necessary and decisive to build codes of conduct and judicial systems that could guarantee individual (basic homeostatic) and collective (socio-cultural homeostatic) balance. The elaboration of codes of conduct, laws and norms, as well as justice and government institutions were, in the words of Damásio, “a response to the detection of imbalances caused by social behaviors that endanger individuals and the group” ([41], 358).

Art and culture, for example, are excellent means of providing states of satisfaction, joy and ecstasy, what in biology is called a reward. Painting, dance, theater,
cinema or music can inject feelings of extreme well-being and enormous motivation, which can immediately explain their homeostatic function [44]. In fact, art forms such as music or painting have been shown to benefit mental health by stimulating neurotransmitters related to pleasure, focus, motivation and reward – such as dopamine – [48].

Religion, in turn, may play a homeostatic role. Born probably from the need for human beings to understand their finitude and support their mortal condition, religion may have the ability to help support feelings of pain, sadness and anguish. By offering answers to the place and purpose of human beings in the world, and by propagating the idea of a life beyond death, religion can help human beings deal with loss, illness and the finitude of life [44]. Medicine is probably the field in which we can most intuitively find homeostasis operating in the socio-cultural context. Pain, suffering, empathy and fear of death will have sharpened the need to create ways to cure diseases and prolong life, and medicines, tools and technology have been developed for this purpose, with obvious effects. As Damásio advocates, “... in illness, injuries, fractures and infections were first detected by homeostatic feelings, and then treated by «new technologies» that became increasingly effective and that we came to know as «medicine»” ([44], 238).

In short, socio-cultural homeostasis is the embodiment of biological homeostasis. The emergence of human consciousness potentiated the expression of feelings and, subsequently, the formation of sociocultural activities that are, in essence, externalizations of basic homeostasis.

6. Sport as a materialization of feelings

António Damásio does not mention MS in his long list of sociocultural devices that were invented to promote life and contribute to the homeostatic balance of the individual and social body. In the context of art and leisure as homeostatic manifestations, we can infer that MS could probably be inserted in leisure, in Damasian thought. We suggest that sport has a central role in the socio-cultural homeostatic balance advocated by Damásio.

The homeostatic role of MS comprises two dimensions that deserve to be analyzed separately, but which are interconnected: 1) a historical dimension and 2) a biological dimension. On the one hand (1), MS was created and promoted by a large group of minds who felt the need to regenerate the species through physical exercise. It was a socio-cultural creation (a historical phenomenon) that aimed to intervene in the future of the human species, strengthening it. On the other hand (2), contemporary sport is an effective and valid means of improving the health of the body and mind (biological dimension). Although the second dimension was only proven in the twentieth century, through numerous studies and tests on the clinical function of physical exercise, the biological component is present in its historical dimension [24].

Interestingly, and in line with what António Damásio suggests in his theory of socio-cultural homeostasis, MS arises due to a feeling of physiological decay of the species. That is to say, it is a feeling (or several, as we will see) that is at the origin of the implementation and development of MS. It is a feeling of motivation that serves as an engine for it to develop and acquire a central role in human society, as well as a feeling of anxiety regarding the future of the “race” that makes sport above all a historical and social phenomenon. It is also a feeling of aversion – the felt identification of a
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biological and social imbalance – which is at the origin of what we have already mentioned as the collective awareness of a need. Later, throughout the twentieth century, science and medicine gathered vast evidence that MS, when practiced regularly and in moderation, has an excellent preventive and therapeutic role, which brings about (or strengthens) a feeling of well-being and confidence about the effects of sport on health. In other words, the fact that sport has been proven to be beneficial for health reinforced the feeling that sport was something positive, pleasant, related to the well-being and survival of human beings. Feelings such as satisfaction, joy and well-being will have positively cataloged the effects of sport on the body–mind, on society and on the species in general. Therefore, at the origin of MS are feelings of motivation, fear and anxiety that led to the need to improve the organism of the human species (historical dimension). In its evolution, feelings of motivation, fear and anxiety are complemented by other feelings arising from the success of sport (joy, satisfaction, well-being, confidence and hope) in the vitality of the body–mind [24].

We suggest that the collective awareness, in the nineteenth century, that society had embarked on sedentary behaviors may have led to the emergence of feelings that qualified the current hygienic situation as highly negative and harmful to the human species. It is, in fact, possible that a sedentary lifestyle caused negative changes in the body that manifested in the mind in the form of negative feelings that identified homeostatic imbalances. It is likely that the marks of a sedentary lifestyle left in the body in the form of obesity, diabetes and other diseases had given rise to negative ideas about these morbid states, which unleashed feelings that, by qualifying these same states as unbalanced from a homeostatic point of view, gave rise to solutions, in the form of ideas. One of those ideas, probably the most important, was MS. This was a natural response, because it perfectly met the physical-cognitive needs that men and women needed to strengthen themselves. In other words, we believe that sedentary behaviors led to chemical imbalances inside the body that manifested in the mind in the form of feelings, which subsequently gave rise to the need to create responses to homeostatic imbalances [24]. The physical education advocated in this period and, subsequently, MS, corresponds to the materialization of feelings that, first, identified homeostatic imbalances and that, second, created solutions to restore the necessary balance [44].

From this perspective – that is, according to the idea that MS emerged to respond to a feeling of existential crisis of the species, MS is, in our view, a homeostatic manifestation [49]. In a context of profound pessimism, MS was implemented and acquired its place as a social practice, because it came to respond to a set of feelings. A feeling of aversion towards the disease, a feeling of fear towards transformist conclusions, a feeling of anxiety towards the future of the human species. But also, a feeling of hope that the human “race” could be saved and a feeling of courage that sport could eradicate the disease through practices that required new bodily behaviors. In fact, MS materializes the human motivation to solve a problem related to its survival. Later, as the benefits of sport were verified ([50], p. 258) either in the first person or through scientific experiments, other feelings emerged, such as confidence, satisfaction and well-being [24].

In summary, it seems to us that MS is the materialization of a group of feelings that, by identifying certain biological and social imbalances, qualified the critical need to intervene in the course of human evolution in order to guarantee the lost rebalance or to provide greater robustness to the needs of man/woman in the context of their survival and their affirmation in the context of life. In other words, the physical marks of the bodies caused by morbid states, not in line with the
homeostatic balance, will have led to the emergence of feelings that triggered the creation of solutions to these problems, with MS being the result of this process.

7. Homeostatic effects of MS

Since the mid-twentieth century, several health organizations have developed goals and collected data on the benefits of sports on the body’s health. The World Health Organization, or other national institutions such as the Portuguese National Health Service (under the Health and Sports program) or the US department of health and human services systematically refer to the benefits of MS in public health, disease prevention and treatment of others [51]. In addition, when reading texts about health, the relationship between sport/physical exercise and medicine is impressive. As highlighted by Markula and Pringle: “The names of scientific organizations, the constant references to scientific literature, the qualifications of the scientific experts on physical fitness, the requirement for medically supervised fitness testing, the demand for reaching an appropriate physical fitness level to prevent illness all speak the language of medicine” ([51], 68).

As we have seen, both MS and public health instituted in the nineteenth century had the same objective. Public health is a phenomenon conceived by the central power that had become aware of the need to control the social body [19, 20, 51]. Established in Portugal in the nineteenth century, its origins can be traced back to the eighteenth century, when the first attempts were made to codify bodily behaviors at the level of new hygienic practices and new codes of conduct [51, 52]. It is, however, with regard to the Portuguese case, only in the nineteenth century that we witnessed the application of ideas that, transformed into institutions, aimed to regulate bodily practices in order to bring about a healthier, stronger and more useful society under the political-social point of view. Sport, in turn, acquires the same meaning as public health, but in different ways. While public health is an institutionalized phenomenon by the central power, sport is, above all, an individualized phenomenon that will be promoted by doctors, hygiениists and teachers, first by private initiative and only later with the support of the central power. Although it will also be used by the central government and, in fact, framed in public health within the scope of school physical education, sport in Portugal is, originally, a medicinal activity - a remedy, a cure - that should be at the service and integrated in public health. In other words, public health is an instrument for applying measures to discipline the body, while sport is one of the many tools that public health should use to enforce its goals. There are hundreds, probably thousands, of studies that have proven the effects of sport on human health. Let us look at just a few examples.

From a motor point of view, it seems relatively simple to explain the effects of sport on the body’s physiological systems in terms of preventing diseases such as type 2 diabetes, obesity, some types of cancer, osteoporosis and various heart diseases [51]. Numerous studies prove that sport promotes: muscle development, flexibility, agility, body strength, increased cardiorespiratory capacity, greater oxygenation and nutrition of tissues and organs, weight loss, etc. [51, 53]. The effects of sport on motor behavior are vast and, in fact, known for many decades. More recent and surprising are the studies on the effects of sport on mental processes, as numerous experiments have shown an increase in the cognitive capacity of people who practice sport or exercise regularly.
The mechanisms by which sport can affect cognitive functions can act directly or indirectly. The direct mechanisms are those that act directly on neuronal transmission, such as effective blood circulation and a good supply of oxygen and glucose, which can be improved by the practice of physical exercise. Indirectly, factors such as a decrease in blood pressure, a decrease in cholesterol and triglyceride levels in blood plasma seem to interact positively with the brain, increasing its cognitive capacity [54]. Physical exercise can, therefore, interfere with cognitive performance in two ways: 1) due to increased levels of neurotransmitters and 2) due to structural brain changes.

According to neuroscientist Hanna Antunes, there seems to be a fundamental role for oxygen as one of the possible fundamental elements in the exercise-cognition relationship, since neurotransmitters need an oxygen supply and good and efficient intercellular functioning [54]. The practice of aerobic exercise seems to release antioxidant enzymes, as happens with muscle tissues, as well as several neurotransmitters, such as an increase in the concentrations of dopamine, norepinephrine, noradrenaline, vasopressin, adrenaline, serotonin and endorphins, which seem to cause better neuronal functions, especially at the level of central systems, namely the hippocampus, amygdala, medial septum and entorhinal cortex [54]. Studies in rodents have shown that “high plasma norepinephrine concentration is related to better memory” [54].

There are also clear signs that demonstrate that sport regulates and increases neuronal plasticity (with effects on learning abilities, intelligence, etc.) preventing the decrease in cerebral circulation due to adverse effects, as well as the increase in “capillarization and the number of dendritic connections” [54]. Hanna Antunes' findings clearly suggest that the practice of sport densifies the brain, not only because it increases synaptic connections, but also because it makes neuronal communication through dendritic connections more efficient. In a 2010 study, Michelle Voss et al. [55] found significant changes in neuronal connectivity after aerobic exercise in the elderly. A 12-month training period was enough for an increase in interconnectivity in neuronal regions related to both the default-mode-network and the frontal executive network, which seems to suggest that physical exercise has a large-scale restorative effect on the brain.

Stanley Colcombe et al. [56], in a study on the effects of regular aerobic training in the elderly, concluded that aerobic exercise participants increased the volume in their gray and white matter in the prefrontal and temporal lobes, precisely the regions that appear to be most rapidly affected with advancing age. This study helped to understand the importance of aerobic exercises, not only as a preventive method for cognitive decline, but as a therapeutic technique for patients with dementia. Colcombe has also shown that the practice of just 6 months of regular aerobic exercise not only preserves brain volume but can increase it in older people. Physical exercise can thus prevent the loss of nerve tissue that characterizes cognitive decline and, ultimately, dementia.

Ramona Hopkins et al. [57] observed that active adults, who regularly participate in aerobic exercises, tend to show a greater brain volume in the frontal, temporal and parietal zones, precisely the areas where a greater morphological decline can be observed over time. Physical exercise appears to increase neurogenesis in brain regions related to memory, so adults who exercise tend to have a larger hippocampus and, subsequently, better memory and fewer cognitive deficits than those who do not exercise [57–60]. This study, carried out in 4615 healthy elderly people over 5 years, showed that physical exercise is associated with a lower rate of cognitive decline [57].
Hopkins’ findings seem to complement the above, suggesting that sport can produce new neurons in the hippocampus, an area related to memory. We know that neurogenesis is a rare phenomenon. Apparently, it only seems to happen in the hippocampus, which can raise some questions such as: why does sport make neurons emerge in an area related to memory? It is possible that this happens due to the relationship that exists between physical exercise and H. sapiens, as if the latter, by practicing physical exercise, were stimulating a critical neuronal zone for the memorization of paths, habitats and crucial environmental contexts for survival away from the environment. In other words, it is possible that sport stimulates the hippocampus because physical exercise, like the one our ancestors practiced for millions of years, depends on a good navigation system. Without a good memory, the exploration of the territory carried out by our ancestors over long distances from the niche would have been impossible, so it is possible that natural selection selected the long-distance race and memory together. The long-distance race without a good memory, that is, without an efficiently functioning hippocampus, would not have been possible [61–63].

Katja Siefken et al. [64], in turn, verified the impact of various sports on the prevention and therapy of depression and anxiety, and found that the moderate but regular practice of some sports, such as football, running, cycling, hockey, basketball, volleyball, dance, tennis, rowing, among others, had a beneficial effect in the prevention and therapy of mental problems. In the same sense, John Guarin found that there is a strong relationship between good mental health and the practice of team sports during adolescence, which can prevent symptoms of depression and anxiety not only during this period but also in adulthood [65]. Among other things, Guarin has shown that the practice of team sports increases self-esteem, implements routines that involve better health habits and decreases the chances of depression and suicide.

Vanessa Shmitz [66], in turn, found that sport prevented diseases adjacent to dementia, developed physical valences, decreased muscle stiffness, recovered joint mobility, stabilized blood pressure, improved VO2, decreased depression, improved cognition and activated blood circulation (2011). Schmitz [66] carried out a survey of 17 of the most significant studies and experiences on the importance of physical exercise in the context of dementia therapy, having verified, in all of them, that simple exercises such as, walking, balance, resistance, extensions, strength, flexibility and aerobics contributed significantly to an improvement in health in general, and cognitive processes in particular.

Louis Bherer et al. [60] reached similar results by demonstrating that the increase in cardiovascular function improvement after physical exercise is associated with a significant improvement in activities that demand attention and higher executive functions. In 2015, Jens Bangsbo et al. [67] demonstrated that playing soccer, three times a week, for about 60 minutes, promotes physical and mental health and individuals over 65 years of age, preventing them from dementia. Similar results were achieved by Dening, who found that playing soccer improved the cognitive performance of adults with dementia (2016) [68].

Kristine Yaffe et al. [69] developed a study with 5925 elderly women over 65 years of age, for 6/8 years, in which they found that the elderly women who had, at the beginning, higher levels of physical activity were those who showed smaller cognitive declines, that is, for 6 or 8 years. At 8 years, more active women demonstrated greater cognitive functionality while less active women were more easily related to mild or severe cognitive declines (2001). Van Boxtel [70], in turn, had already verified that there is a relationship between cognitive improvements and aerobic exercise. In 132 individuals aged between 24 and
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76 years, submitted to an acute session of submaximal exercise on a cycle ergometer, followed by an extensive neuropsychological battery where verbal memory and information processing speed were evaluated, it was concluded that there was a relationship between better physical outcomes and better cognitive outcomes. In 2010 Chiari et al. [71] found strong evidence that physical exercise had beneficial effects on memory. Several studies have also shown that countries that invest more heavily in promoting physical exercise have better rates of physical and mental health, longer life expectancy and higher levels of well-being [65].

Finally, it is easy to imagine the therapeutic effects that sport can have in terms of satisfaction, joy and inter-sociability on the people who practice it. The fact that the subject has to travel to practice a team sport involves the stimulation of social tools, which can help to prevent dementia diseases [72]. The well-being provided by social interaction, on the other hand, is also a characteristic that sport can promote through the affective bonds that are established between players. The *agon* intrinsic to sports games must also cultivate a thirst to win, a desire to overcome obstacles and a desire to transcend internal goals, whether in terms of team results or individual performances. When practicing a sport, the subject is not just competing against the opponent, he or she is also competing against his or her own expectations, demands, and own model of “I”.

8. Discussion

MS has assumed a central role in contemporary times. Although some authors have tried to understand the role of MS throughout the twentieth century, the sociologist Norbert Elias is, in our view, the theorist who developed not only the most accepted thesis in academia, but also the one that seems to have been carried out with a greater epistemological depth, which deserved our attention. Norbert Elias developed the theory of the Search for Excitement in order to find answers to the problem of the centrality of sport in contemporary societies. Although Elysian thought has taken root in academia with substantial success, we believe that his thesis deserves discussion, namely the need to expand the role that sport has in contemporary times, which Elias reduces to a catalytic function and which seems reductive to us.

MS emerged in the nineteenth century in the context of a society that considered that the human species was degenerating due to obsolete hygienic behaviors inherited from the Middle Ages, so it was necessary to intervene in this process of physiological decay. MS emerges in this context as the best therapy for the disease that affected the “race”, being intensely promoted by doctors, hygienists and teachers as the best way for the species to survive and become better able to face the demanding challenges of contemporary societies. MS would be vitally important in strengthening the human body, giving it vitality and, ultimately, transforming the human species to be more robust.

Using concepts from the biological sciences, namely that of sociocultural homeostasis developed by António Damásio, we suggest that MS is the result of unconscious biological mechanisms that, mediated by consciousness through emotions and feelings, act in the sociocultural space in order to create devices of homeostatic balance. During the twentieth and twenty-first centuries, several studies proved the benefits of MS in health, which helped to strengthen the effectiveness of MS in combating, preventing and treat physical and mental illnesses.
9. Conclusion

In conclusion, we argue that MS is a sociocultural embodiment of basic homeostasis. It is homeostasis that crosses the boundaries of the body to act on the outside, modifying the environment in line with its basic needs for survival and well-being. It would have been, above all, the feeling of fear before the fate of the human species, and the feeling of motivation to solve this problem, that would have driven the practice of MS in the nineteenth century.
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