

Regulation of Affective States: benefits of contact with the Nature

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Abstract— *It has long been known of the beneficial effects of nature on human health. However, more and more, the human being is disconnected from nature. Unfortunately, our routine takes us further and further away from nature and this can be harmful to our body and mind. What implications does the lack of such contact with nature have for society as a whole? This manuscript, which is a bibliographic review, based on the psychobiological perspective, covers this subject and proposes some solutions to this issue.*

Keywords— *emotional regulation, Psychobiology, nature.*

I. INTRODUCTION

Increasingly, the human being is disconnected from the nature. According to studies, such as Clements (2004); Frost (2010); Pergams and Zaradic (2008), activities such as visits to parks, hunting, fishing, camping in the nature and outdoor games have decreased substantially in recent decades. An American journalist, named Richard Louv, in his book “Last Child in the Woods: Saving Our Children From Nature-Deficit Disorder” coined the term “Nature's Deficit Disorder” to describe possible negative consequences for individual and psychological health, especially for children, they are increasingly moving away from physical contact with the natural world and contact with nature (Louv, 2005). This author who has already published other works such as: “The Nature Principle: Reconnecting with Life in a Virtual Age”, “The Nature Principle: Human Restoration and the End of Nature-Deficit Disorder”, “Vitamin N: The Essential Guide to a Nature-Rich Life: 500 Ways to Enrich Your Family's Health & Happiness”. In his works, Louv (2005) cites researches that point to attention disorders, obesity, impaired creativity and depression as problems associated with a childhood with a deficiency in contact with nature. In this context, in recent years there has been a flourishing of scientific interest about the benefits of contact with nature for human health and well-being. Several recent reviews (e.g. Frumkin et al., 2017) have summarized and assessed the growing evidence base that supports the contributions of contact with nature to the general, physical and psychological well-being of humans. And, what are the implications that the lack of this contact with nature has for society as a whole?

According to many authors such as Gustavsson et al. (2012), Olesen et al. (2012), the economic costs of anxiety and mood disorders, such as depression, were estimated at 187.4 billion euros per year, just for Europe, just to

mention an example of psychiatric disorders that afflict humans. Health problems like these, at least in part, have been attributed to the growing disconnect between people and the natural world resulting from more urbanized and sedentary lifestyles (Miller, 2005; Soga & Gaston 2015). This is supported by research that shows that interactions with nature promotes psychological restoration (Kaplan, 1995), improved mood (Hartig, Evans, Jamner, Davis, & Gärling, 2003; Barton & Pretty, 2010; Roe & Aspinall, 2011), enhanced attention (Hartig, Evans, Jamner, Davis, & Gärling, 2003; Ottosson, & Grahn, 2005) and reduced stress and anxiety (Ulrich, Simons, Losito, Fiorito, Miles, & Zelson 1991; Grahn & Stigsdotter, 2003; Hartig, Evans, Jamner, Davis, & Gärling 2003; Maas, Verheij, Groenewegen, Vries & Spreeuwenberg, 2006). And, all these factors are related to a construct contemplated by psychology called emotional regulation, or as more recently it is being disclosed, emotional self-regulation.

According to Franco and Santos (2015): self-regulation (emotional) or “The regulation of emotions refers to the ability to modulate the intensity or duration of emotional states” (p. 340), in such a way that they are properly managed our impulses and emotions.

In addition to other authors (e.g. Batista & Noronha 2018), emotional self-regulation can be understood, for many authors, as the dynamic process intrinsically linked to conscious efforts to control behaviors, feelings and emotions so that some goal is achieved. In other words, it is the act of managing your thoughts and feelings to get involved in actions aimed at goals, such as organizing behavior, controlling impulses and solving problems constructively. Being able to self-regulate helps us to succeed in many aspects of life, including creating satisfying relationships, tolerating difficulties, thriving in school and working, managing finances and maintaining

physical and mental health. Therefore, emotional self-regulation is a crucial skill for quality of life. Emotional self-regulation depends not only on the biology and individual actions of the child or adult, but also on the contributions of parents, teachers, other mentors, as well as neighborhood conditions to global environments. Although learning about emotional self-regulation is probably easier as children, humans can achieve it at any age, whether through healthy relationships or psychotherapy. A large part of psychotherapeutic work is helping individuals of all ages to learn to self-regulate emotionally.

All societies have their rules for regulating emotions, for example, which is acceptable in the way feelings are expressed. For example, this adequacy applies to aggressive behaviors, which need to be inhibited and channeled so that there is no damage to social life, however, this also applies to positive emotions, such as joy and pride. In some cultures, manifesting the expression of such feelings is also frowned upon and discouraged. Therefore, children must learn to dissociate internal feelings from their open expression and discover how to do it is an important part of their socialization process (Schaffer, 2004).

We certainly cannot generalize contact with nature as a panacea and manage the lack of contact with nature to justify all the issues that interfere with emotional self-regulation, even because the causal factors behind poor mental health are complex and diverse (Kinderman et al., 2015). What we want to demonstrate in this essay are the positive contributions of contact with nature, above all, for emotional self-regulation. That said, it follows for the discussion why being in contact with nature is so important? And what are the positive repercussions of the connection of contemporary man with nature?

II. THE CONCEPT OF SELF-REGULATION

The pioneering author who focused on the theme of emotional regulation in his research was the psychologist James J. Gross. In a chapter entitled: "Individual differences in emotion regulation", in the book "Handbook of emotion regulation", authors Oliver P. John and James Gross, conceptualize emotional regulation as the set of processes by which individuals influence which types of emotions people will have it, when they have it and how they experience and express it (John & Gross, 2007). The procedural model of emotional regulation, developed by these authors, distinguish different strategies of emotional regulation, the most studied being cognitive reevaluation and emotional suppression.

Cognitive reassessment involves modifying the meaning of the situation in a way that alters its emotional

impact. Empirical evidence (e.g. John & Gross, 2007) reveals that the use of this strategy allows the experience of more positive emotions and less negative emotions, better emotional and interpersonal functioning, less depressive symptoms, greater satisfaction with life, more optimism and greater self-esteem. In turn, according to these same authors, emotional suppression can inhibit expressive emotional behavior, but not the experience of negative emotion (John & Gross, 2007). In this sense, suppressing the expression of emotions seems to lead to less manifestation of positive emotions and greater experience of negative emotions, to psychological alienation, to social withdrawal, to higher levels of depressive symptoms and reduced levels of satisfaction with life, self-esteem and optimism.

In addition, Gratz and Roemer (2004) propose a multidimensional conceptualization of emotional regulation, which involves: (a) the awareness and understanding of emotions; (b) the acceptance of emotions; (c) the ability to, in moments of negative emotion, control impulsive behaviors and act in accordance with the desired goals; and (d) the ability to use emotional regulation appropriately by implementing strategies that flexibly modulate emotional responses, in order to achieve individual goals, at the same time, that the requirements of the situation are met.

Emotional self-regulation, for example, can be the ability to not do what we don't want to do. When we interact with each other, many times, we do not say directly or literally what we think and, for good reason: we are subject to the rules of our culture to interact in a way that can respect the feelings and personal space of those who are interacting with us. Emotions can sometimes start very quickly. In fact, so quickly that we don't even realize that our mind and body triggered a specific emotion at a moment. This speed can save our lives in an emergency, but it can also ruin our lives when we overreact and lose control of our actions. In other words, although there is not much control over emotional responses, in certain life situations, it is still possible, even if it is not easy to make some changes in what causes our emotions and how we behave when we are emotionally altered. Since the beginning of the new Millennium, some studies (e.g. Hoyle, 2010; Gallagher, Fleeson, & Hoyle, 2010) characterize emotional self-regulation, considering it as a personality trait and a skill. Personality traits are defined according to how the individual routinely interprets situations and self-regulates them (Hoyle, 2006).

People with high self-regulation capacity find it easier to control their impulses than people with low self-regulation capacity. However, the ability to self-regulate

can be trained: repeated acts of self-regulation enhance self-discipline and the ability to direct our energy towards what is most important for each person (Muraven & Baumeister, 2000). Twin studies confirm a genetic basis in the control effort (e.g. Willems, Boesen, Li, Finkenauer, & Bartels, 2019). However, parenting practices are also associated with individual differences related to the control effort. In general terms, the self-regulation of young children - including behaviors that reflect the control effort - has been positively associated with maternal support and, negatively, with the directive and controlling style of care. Likewise, a secure attachment, at 13 months of age, and maternal sensitivity, at 22 months of age, are predictive factors of the control effort in a future evaluation (Rothbart, Sheese, Rueda, & Posner, 2011).

Recent researches (e.g. Sosnowska, Kuppens, Fruyt, & Hofmans, 2020) consistently have shown that self-regulation is necessary to reinforce our emotional balance. From a behavioral perspective, self-regulation is the ability to act in your best interest in the long run, consistent with your deepest values. Violating your deepest values can lead to feelings of guilt, shame and anxiety, which undermine personal well-being. From an emotional perspective, self-regulation is the ability to calm down when you are upset, angry, frustrated or out of control and to motivate, energize and elevate yourself when people feel dismayed for these reasons. Self-regulation thus establishes a strong relationship with each person's ability to manage emotions.

III. CONTACT WITH NATURE FROM THE PERSPECTIVE OF PSYCHOBIOLOGY

In general, Psychobiology refers to the mind as a set of mechanisms for processing information, whose substrate is the nervous tissue, therefore susceptible to selective pressure like any other organ. This set of mechanisms is responsible for our conscious or unconscious mental activities, for the regulation of our body and for the expression of our behaviors, functions that reflect its phylogenetic origin and that were installed and developed, in a large part of our existence. Pioneeringly, the psychoanalyst Bowlby (1969/1984) called this ancestral environment, the acquisition of evolutionary strategies, as Evolutionary Adaptation Environment (SEA). The term Evolutionary Adaptation Environment, or, is used to denote the qualities of the ancestral environment in which human beings have become adapted to live. This term, which was adopted by Psychobiology, can be defined as a statistical combination of the relevant adaptive properties of environments found by members of ancestral populations (Crawford & Krebs, 1997; Irons, 1998; Tooby

& Cosmides, 1990). Thus, Psychobiology does not locate the SEA in time and space, for example, in the Pleistocene of the African savannahs, although it does not disregard that certain adaptations that we have today are inherited from the hominid ancestors of that time and region. However, the Evolutionary Adaptation Environment (SEA) is estimated to be more than two million years old (Izar, 2009). It is necessary to show that the current ways of life, entirely dependent on resources such as agriculture, livestock, organized societies and writing were not present in that period, having appeared only 10,000 years ago (Rodrigues, 2009). The structure of the human mind, in this way, was delineated with the survival conditions and ancestral problems faced before the appearance of these resources as a fulcrum, with a mismatch between the fixed mental modules and the current ways of life (Pinker, 2004). Human beings, like any other species, were shaped by the forces of evolution. Obviously, this environment comprised a presence closer to Nature compared to what most people experience today.

Plants were of crucial importance for survival during most of our evolutionary history, as a food resource, for shelter and as a water indicator. In a purely theoretical field, it would be expected that the presence of plants, as an integral part of the human evolutionary adaptation environment, has had an impact on the evolution of the brain. We are presumably adapted to live in a green environment. And, how do these data relate to the central theme of this essay, namely, the regulation of affective states: benefits of contact with nature?

Almost 99.9% of the entire evolutionary process was concentrated and tailored in a natural environment, in which men and women lived in direct contact with nature. Currently, and especially urban man, he is incipiently related to nature in relation to that primeval period. In other words, we are adapted to live in constant contact with nature. The routine of contemporary man, especially the city, does not take this importance into account. Based on these considerations, we will soon infer that contemporary man lives and lives in an environment in which he has not yet fully adapted, despite his great behavioral plasticity. And that is what several surveys reveal as we will see the follow.

Diverse researches strongly support the value of increasing contact with nature (Berman et al., 2012; Cervinka, Roderer, & Hefler, 2012; Hartig, Mang, & Evans, 1991; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009; Leather, Pyrgas, & Beale, 1998; Mayer, Frantz, Bruehlman-Senecal, & Dolliver, 2009; Nisbet, Zelenski, & Murphy, 2011; Ryan et al., 2010; Taylor, Kuo, & Sullivan, 2001; Townsend & Weerasuriya, 2010, Ulrich

1984). These researches originate from several different psychological approaches (evolutionary, cognitive-behavioral, psychodynamic, phenomenological and transpersonal psychology). A wide variety of research methods are used (analysis of narrative content, survey, quasi-experimental, experimental and qualitative methods). Experimental drawings that discuss nature's role in emotional regulation include a wide range of encounters with nature: images and videos of nature scenes, natural aromas, indoor plants, trees and fields seen from a window, practical gardening, interaction with animals, proximity to nature, visits to city parks or green spaces in housing development, forest walks and wild areas. Most of the research findings are based on time in contact with nature and images of nature, mainly because these settings are easier for researchers to work with. These findings are corroborated with highly controlled experimental configurations and more realistic and intensive nature encounters.

More specifically, the contact with Nature has been reported to have psychological benefits in reducing stress (Ulrich et al., 1991; Chang & Chen, 2005), improving attention (Kaplan & Kaplan, 1989), having a positive effect in mental restoration (Hartig, Evans, Jamner, Davis, & Gärling, 2003; Korpela & Ylén, 2007; Van den Berg, Hartig, & Staats, 2007) and to dealing with attention deficits (Taylor, Kuo, & Sullivan, 2001; Taylor & Kuo, 2009). In addition to mental benefits, there appear to be direct benefits to physical health (Pretty, Peacock, & Hine, 2006), such as increased longevity (Takano, Nakamura, & Watanabe, 2002) and self-reported health (Maas, Verheij, Groenewegen, De Vries, & Spreeuwenberg, 2006). As might be expected, the availability of Nature correlates positively with health (Mitchell & Popham, 2002). The benefits were associated with various types of nature experiences, including the real wilderness (Kaplan & Talbot, 1983; Hartig, Mang, & Evans, 1991), neighborhood parks (Grahn & Stigsdotter, 2003; Fuller, Irvine, Devine-Wright, Warren, & Gaston, 2007; Kuo, 2010), gardens (Lewis, 1973; Dunnett & Qasim, 2000; Loram, Tratalos, Warren, & Gaston, 2007) and natural features around the residences (Talbot & Kaplan 1991; Wells & Evans 2003).

It has long been known of the beneficial effects of nature on human health. Europe's first hospitals were wards in monastic communities where a garden was considered an essential part of the medium that supported the healing process (Gerlach-Spriggs, Kaufmann, & Warner, 1998). A tendency to add elements of Nature seems to be a universal human characteristic. From the hanging gardens of Babylon, to the cultivation of plants in

apartments or the creation of domestic pets, contact with nature is actively sought. Studies (e.g., Gomes, 2013) show that being involved in nature contributes to relaxation and increased sense of well-being, restoration of mental clarity, physical health and healing, decreased recovery time from surgery and decreased symptoms of Attention Deficit Hyperactivity Disorders in children. There are studies that also point out that walking with bare feet or sitting on the ground has benefits of very common disorders, including sleep disorders, pain and inflammation, chronic stress and cardiovascular diseases (Chevalier, Mori, & Oschman, 2006). Studies such as that of Chevalier, Mori and Oschman (2006) revealed a surprisingly positive and neglected environmental factor in health: direct physical contact with the vast supply of electrons on the Earth's surface.

Ulrich, Simons, & Miles (2003) also investigated the benefits of virtual nature. This study found that the stress levels of people who waited in a room to donate blood were lower when television showed images of natural environments than when city figures appeared.

IV. BIOPHILIA AND EMOTIONAL SELF-REGULATION FROM A PSYCHOBIOLOGICAL PERSPECTIVE

The hypothesis that human beings have an inherent inclination to affiliate with the Nature has been referred to as Biophilia (Wilson, 1984; Kellert & Wilson, 1993). The concept "Biophilia" literally means "love for life" and was popularized when American biologist Edward Wilson published a book with this title in 1984. Ten years later, Wilson edited, with Stephen Kellert, another book, entitled "The hypothesis of Biophilia", which discusses the possibility of having a genetic basis for our appreciation for nature. There is no widely accepted research to prove this theory, but there is no lack of evidence of the healthy influence of green.

And the size of the effect of nature on emotional self-regulation in humans can be explained for what reason? The main reason is that 99.99% of our five million years of evolution as primates during nature. We would essentially be connected to it. The modern lifestyle separates human beings from such contacts. Therefore, this disconnection with nature can be an important contributor to psychobiological dysfunction.

One of the first to show that nature is good was Roger Ulrich, in 1984, when comparing patients in rooms with windows facing trees with those whose rooms overlooked a brick wall, in a hospital in Pennsylvania, in the United States. Their results showed that patients with access to green left the hospital earlier, took weaker or less

painkillers, had less critical comments about nursing and fewer minor post-surgical complications (Ulrich, 1984). Then, other studies (e.g. Evensen, Raanaas, Hagerhall, Johansson, & Patil, 2015) tested colored, but inanimate objects in place of plants, and found that plants offered slightly greater benefits. Based on Ulrich's research (1984), cited in numerous works, many authors (e.g. Dover, 2016) started to defend the construction of more green areas in hospitals and even contact with nature as a form of preventive medicine.

Over time, analyzes have also emerged in offices, schools and apartments, both on the use of nature indoors and outdoors. In a 2000 study, researcher Tove Fjeld, from the University of Agriculture in Norway, saw that complaints about sore throats, for example, decreased by 23% after an office was decorated with plants (Fjeld, 2000). The study by researchers Virginia Lohr and C. H. Pearson-Mims, from Washington State University, found that the presence of plants makes pain more bearable (Lohr & Pearson-Mims, 2000).

Explanations for the effect of nature on our health range from evolutionary factors to better air quality, or even an aesthetic taste for everything that is green or alive. Grinde and Patil (2009) listed possible causes pointed out by Ulrich in his work: being in nature is usually related to physical activities; activities in nature often encourage socialization; and nature offers an opportunity for temporary escape from routine and its demands.

One of the strategies that are suggested by several authors (e.g. Oschman, Chevalier, & Brown, 2015) to reconnect to nature is what the authors call "Grounding", "Anchoring" or "Earthing". Grounding, as some authors call it, involves placing your feet directly on the floor without shoes or socks as a barrier. The logic behind this practice is related to the intense negative charge carried by the Earth. This charge is rich in electrons, theoretically serving as a good supply of antioxidants, helping in metabolic processes such as participation in enzymatic processes and electrons can still act as free radical destroyers. When we put our feet on the ground, there is a direct relationship between the electrical charge of our bodies and the ground. That's because the heart, brain, nervous system, muscles and immune system are all electrical subsystems. When a person has an excess of negative charge (excess of electrons), he is absorbed by the Earth. The same happens when there is a deficiency of electrons that can be supplied by the soil. In this way it is possible to achieve balance.

Oschman, Chevalier and Brow (2015), observe reports in the literature and practices of different cultures around the world that walking barefoot on Earth increases health

in general and provides feelings of welfare. However, for a variety of reasons, many people are reluctant to walk barefoot unless they are, in some situations, for example: on vacation at the beach.

Placing your feet on the ground allows large amounts of negative electrons to be absorbed through the soles of your feet, which, in turn, can help keep your body with the same electrical potential of the negative charge as the Earth. Reconnection with Earth's electrons is a theory found to promote intriguing physiological changes and subjective reports of well-being (Chevalier, Sinatra, Oschman, & Delany, 2013; Chevalier & Sinatra, 2011; Ghaly & Teplitz, 2004; Sokal & Sokal, 2011; Chamberlin, Smith, Appasani, Chirgwin, & Rioux, 2014). So, Grounding refers to the discovery of benefits - including better sleep and reduced pain - from walking barefoot outside or sitting, working or sleeping indoors connected to conductive systems that transport Earth's electrons from the ground to inside the body.

A study (Chevalier, Sinatra, Oschman, Sokal, & Sokal 2012) published in the Journal of Environmental and Public Health entitled "Grounding: Health Implications of Reconnecting the Human Body to Ground Electrolytes" postulates that the earth may represent a potential treatment/solution for a variety of chronic and degenerative diseases. This study suggests that a simple contact with the Earth, through being barefoot or connected to grounded conductive systems, could serve as a natural and "effectively effective" environmental strategy against chronic stress, inflammation, pain, weak sleep, hyper-coagulable and many common health disorders, including cardiovascular disease. The study also concludes that the grounding of the human body can be an essential element in the health equation, along with sunlight, clean air and water, nutritious food and physical activity. According to the study, when the body is in contact with the earth, its electrical potential becomes equalized with the electrical potential of the Earth through the transfer of electrons from the Earth to the body. This, in turn, prevents the 60 Hz mode (ambient voltage) from producing an AC electric potential (alternating current) on the body surface and from disturbing the electrical charges of the body's molecules. People who receive more direct electron flow have been shown to be less stressed, have better muscle tension, and heart rate variability (Chevalier, 2010; Chevalier & Sinatra, 2006; Chevalier, Mori, & Oschman, 2006). Another study, conducted by the Department of Neurosurgery at the Military Clinical Hospital in Powstancow Warszawy, along with other affiliates such as the Medical University of Poland, found that blood urea concentrations are lower in individuals

connected to the land (Sokal et al., 2013). However, there are only a few epidemiological studies on the relationship between nature and health. Epidemiological studies carried out in the Netherlands have shown that residents of neighborhoods with abundant green space tend, on average, to enjoy better general health (De Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003; Maas, Verheij, Groenewegen, De Vries, & Spreeuwenberg, 2006). This correlation was found to be strongest among the elderly, housewives and people from lower socioeconomic groups (Health Council of the Netherlands, 2004; De Vries, Verheij, Groenewegen, & Spreeuwenberg, 2003). However, the study by Beyer et al. (2014) pointed out that even for poor people who lived close to vegetation it was even more likely that they had a higher level of peace and happiness than a richer person who lives in an area with less vegetation. A longitudinal Japanese study showed that living in a neighborhood with relatively accessible green space for walking correlated with lower mortality risk (Takano, Nakamura, & Watanabe, 2002).

It is an established fact, although not widely appreciated, that the Earth's surface has an unlimited and continuously renewed supply of free or mobile electrons. The planet's surface is electrically conductive (except in limited areas, such as deserts), and its negative potential is maintained (that is, its replenished electron supply) by the global atmospheric electrical circuit (Williams & Heckman, 1993; Anisimov, Mareev, & Bakastov, 1999). Thus, scientific evidence suggests that the Earth's negative potential may create a stable internal bioelectric environment for the normal functioning of all body systems. In addition, fluctuations in the intensity of the Earth's potential may be important to adjust the biological clocks that regulate the rhythms of the daytime body, such as cortisol secretion (Oschman, 2008).

Even better, about several studies you don't have to be climbing a mountain or paddling a kayak. Beneficial contact with nature can range from an extensive wilderness excursion, spending time in a park or even your backyard, gardening and even watching nature scenes on TV! Even looking at images of nature scenes in a book or magazine can have a beneficial effect. All these possibilities and scenarios can positively contribute to the issue of emotional self-regulation.

Another way to enjoy the benefits of contact with nature is beaches and waterfalls, why? The human being needs an air volume of approximately 10,000 liters per day and this air needs to be of good quality. In addition to oxygen and nitrogen levels, our body needs air to have an energy charge. The feeling of well-being by a waterfall or sea can be explained by the release of negative ions. When

water molecules hit rocks or beach sand, their electrons escape and attach themselves to other nearby particles. The atom or molecule resulting from this fusion has more electrons than protons, and the negative ion is created, which has benefits for human health. In addition, negative ions can also be found in large quantities in forests, mountains and seas. In urban environments these ions are rare because the pollution of air, water and electromagnetic waves from electronic devices, generates many positive ions, which can be harmful to health. This energetic charge brings well-being and good mood to our lives, in addition to acting in a bactericidal way, as the bacteria cannot handle the modified electric charge due to its microscopic size. They are made primarily of ions, that is, parts of atoms that come off themselves. The sensation is measured by the number of negative ions per cm³ of air. On the beach, where we have a high energy load, there are approximately 50,000 negative ions per cm³. Inside our homes, the average drops to an impressive 10 negative ions per cm³. To leave our home with that cozy feeling, we can increase the number of negative ions inside it by purchasing air ionizing devices based on this principle. Ionizers work with negative ions. In ambient air, small controlled negative charges lead to considerable relief, through electrostatic charges causing the suspended particles to be attracted to it.

So, to reiterate: psychobiological theory states that human beings have developed restorative responses to nature and emotional self-regulation. Therefore, exposure to nature, according to this theory, will reduce negative emotions and increase positive emotions (affective restoration). And several surveys support this claim. Being exposed to a natural environment after watching a scary movie has been shown to improve mood more than being exposed to an artificially constructed environment (Van den Berg, Koole, & Van der Wulp, 2003).

It was only part of the last 100 years that most of us in industrialized countries began to spend most of their time indoors. However, for most of our history as human beings, we were out: hunting, farming, walking or simply watching nature (Ulrich, 1993). Although several studies have been able to demonstrate the positive effects on mood and attention of exposure to nature (e.g., Berman, Jonides, & Kaplan, 2008; Bowler, Buyung-Ali, Knight, & Pullin, 2010; Hartig, Evans, Jamner, Davis & Gärling, 2003; Van den Berg et al., 2003), such research has focused less on the everyday uses of nature than on emotional regulation. However, some relevant studies have been conducted. The use of favorite places for self-regulation is highly similar to the use of nature for emotional regulation and an experimental study has shown positive effects (in

restorative experiences) of prescribing visits to a favorite place once a day, although only a third of visits in this place study went to natural environments (Korpela & Ylén, 2007).

In the article mentioned "The 'transpersonal' benefits of nature" by author John Davis this is well explained. Examples of transpersonal benefits from contact with nature include:

- Nature is a trigger for the best experiences. Jesus, Moses, Buddha and Mohammed had mystical experiences in wild environments;
- Nature can trigger spiritual awakening;
- Nature is an antidote to a world that is overly rationalized;
- Nature can promote a change from what is invented (the ego, built structures) to what is essential (what existed before or before human action).

Davis, in another article entitled: "Psychological benefits of nature experiences: an outline of research and theory" goes even further and says that there is limited, but suggestive, research, that these discoveries are cross-cultural and universal (Davis, 2004).

A dose-response analysis for depression and high blood pressure suggests that visits to green spaces outdoors for 30 minutes or more over the course of a week can reduce the population prevalence of these diseases by up to 7% and 9%, respectively (Shanahan et al, 2016). Given that the societal costs of depression alone in Australia are estimated at \$ 12.6 billion a year according to European Agency for Safety and Health at Work (2014) e to, LaMontagne, Sanderson, & Cocker, (2014), the savings for public health budgets across all health outcomes can be immense.

Another study brings interesting figures on the influence of walking in natural environments. After the second day of wandering in a local forest, a certain type of white blood cell, the body's defense cells, had a 56% increase in the individuals monitored (Miyazaki, Ikei, & Song, 2014). Still, according to this study, 23% more cells compared to the original state were maintained for a month after walking and returning to urban life. For these researchers, this was a clear sign of how nature can contribute to preventive medicine. Because of this, since 2005, in Japan, there are several places where you can practice "Forest Therapy" (called Shinrin-Yoku), a walk-through green area with the potential to cure stress. The Japanese government has invested, since 2004, US \$ 4 million in research on the subject, also aiming to establish more than 100 places where one can participate in the therapy.

For city dwellers struggling to find green spaces, therefore, there would be an alternative: just populate balconies, tables and walls with beautiful flowers and shrubs to feel the difference. In Brazilian territory, Cariocas have a great advantage in relation to enjoying the benefits of green areas. In 2012, the Municipal Secretary of the Environment showed: Rio boasts an average of 55.83 m² of remaining area of the Atlantic Forest per inhabitant - a number well above the minimum 12 m² recommended by the World Health Organization. Other benefits that we can consider about of contact with nature, according to the research cited:

A. Relaxation, stress reduction and mindfulness. These benefits affect individuals directly and *focus* on levels that differ from people to people, such as those discussed the follow. Most have strong empirical evidences;

B. Relaxation, restoration, peace, tranquility. Reducing the burden of roles, conflict and ambiguity. Reduction of burnout and boredom. Faster recovery from stress in response to nature's *stimuli* than built configurations. More than 100 research studies show that stress reduction is a key perceived benefit of wilderness recreation. More detailed comments on this issue have been made by studies such as those conducted by Hartig, Mang and Evans, 1991; Kaplan, 1995, among others. These discoveries include a variety of nature settings close to the wilderness. This focus is on physical, cognitive and affective relaxation. An example is a survey that presented a stressful video (such as industrial accidents) to survey participants and shows that a video of a subsequent nature leads to a faster recovery than a video with other content (Ulrich, 1984);

C. Faster recovery from stress. "A consistent finding in more than 100 research studies of recreational experiences in wild and urban areas has been that stress mitigation is one of the most expressive benefits expressed verbally" (Ulrich et al., 1991).

V. RESEARCH AGENDA

More and more studies, as pointed out by the study by Goenka and Andersen (2016), focus on how urban design and transport to promote healthy lives, both physically and psychologically. In this sense, the knowledge of Psychobiology, can contribute, in a lot, to base and advise these urban planning. Therefore, urban spaces, from this perspective, can be a fruitful area of research, since, until then, due to the recentness of Psychobiology, they are currently incipient.

VI. CONCLUSION

Emotional self-regulation can largely determine the quality of our lives. It happens and manifests itself in any relationship we have, at work, in friendships, with family members, and in our intimate relationships. They can save our lives, but they can also cause serious damage. They can lead us to actions that we think are realistic and appropriate, but deficits in terms of emotional self-regulation can also lead us to act in ways that we later regret.

As we saw, in this essay, the regulation of affective states can benefit from contact with nature, with its importance characterized by the knowledge of the theory of Biophilia and Psychobiology, in such a way that, in one way or another, this contact with the natural can enable quality of life for humans. Experimental research increasingly confirms the hypothesis that direct contact with nature leads to increased mental health and psychological development. Several studies have found strong evidence regarding exposure to natural environments and the recovery from physiological stress and mental fatigue, supporting the Theory of Recovery from Stress and the Theory of Restoration of Attention. In fact, exposures to natural environments protect people from the impact of environmental stressors and offer more physiological, emotional and attention restoration than urban environments.

Natural places that allow the renewal of personal adaptive resources to meet the demands of everyday life are called restorative environments. Natural environments cause greater reassuring responses than urban environments, and in relation to your vision, there is a general reduction in the physiological symptoms of stress. Exposure to natural scenes mediates the negative effects of stress by reducing negative mood and, above all, increasing positive emotions. In addition, the decrease in cognitive performance associated with stress can be recovered, especially reflected in attention tasks, through the salutary effect of observing nature.

Green space has always been present in urban and suburban areas, but in recent decades it has been taken more seriously because of the decline in its global percentage. Although research shows massively the importance of nature for people's physical and psychological balance, green space is declining due to factors such as parks are not being properly served and the replacement of green spaces for further urbanization, such as parking lots, shopping malls, etc. This decrease in green space alerts us to a concern about a decrease in physical activity, and people's mental health (Pietilä et al., 2015).

Since then, the connection between vegetation and therapeutic or preventive medicine has been gradually broken, partly due to the advancement of medical science and the accompanying technical approaches to healing. In the past few decades, however, considerable research has been carried out with the effects of being in nature and adding plants to otherwise sterile environments. To the extent that the results are positive, the idea that access to nature can help to cure or help prevent disease can eventually be incorporated into evidence-based medicine.

In general, research shows that the percentage of green space in people's living environment has a positive association with the perceived general health of residents. The green space seems to be more than just a luxury and, consequently, the development of the green space must be allocated in a more central position in spatial planning policy.

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