From TION-EMO Theory To A New Beginning Of Artificial Emotions

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Abstract

The author has proposed a new theory: the Tion–Emo Theory (TET) [1, 2]. The TET concept makes it possible to build artificial emotions because the TET is a simple system and provides an organised structure with a nucleon that controls the emotional scheme with the self-object. This emotional system seems to depend on three objects that are particular to three regions: the intellectual object (IO) in the intellectual region, the social object (SOO) in the semi-intellectual region and the self-object (SEO) in the non-intellectual region. Connecting these three objects at their different levels of function appears to be a requirement for forming a self-sustainable system and producing emotion. The system needs two forces, the positive IO and the negative SEO; the SOO is necessary to mediate between the two. Self-survival hierarchy censorship systems regulate all survival matters, and the emotional energy that gives rise to the system is underlied by the SEO. Social hierarchy censorship sorts and regulates the social information that is also regulated by the SEO. Physiological neural network research supports the TET.

Keywords: Artificial emotion; emotional energy; objects; TET; function of basic emotions; intellectual region and intellectual object; semi-intellectual region and social object; non-intellectual region and non-intellectual object; self-survival hierarchy censorship and social hierarchy censorship.

1. INTRODUCTION

Scientists from disciplines as varied as psychology, neuroscience and intelligent systems have endeavored to build a biologically-based artificial system [3, 4, and 5]. Animal researchers have gathered information from ethnology, psychology, neurobiology and evolutionary biology, and their studies frequently begin with low-level sensorimotor abilities and then work up to higher cognitive functions [6].

Other researchers are working on an evolutionary robotic basis for artificial evolution [7, 8]. In Nolfi's preliminary work, he stated that his work with evolutionary robots would "…involve a population of autonomous elementary robotic units that are left free to interact and to self-assemble. The possibility of self-assembling and propagating their genotype into the body of assembled units leads to a spontaneous evolutionary process without the need for an explicit selection criterion." [9] (pp.224*).*

Numerous researchers in embodied and cognitive science and in artificial and evolutionary robotics are taking into account the crucial interactions of the brain, the body and the environment for the development of artificial, intelligent and adaptive behavior [10].

Recently, there have been great strides in human computer interaction through advances in our understanding of the relationship between cognition and the affective state. By taking into account many aspects of body measures [11, 12]), the component process model (CPM) has made an impact on artificial emotion with a cognitive mechanism [13]. Asynchronous Learning by Emotion and Cognition (ALEC) with emotion-based architecture (EBII) is an attempt to perform according to a goal system; this helps to make the emotional system more abstract [14]. Database is another system in the endeavor to

produce artificial emotions [15]. It seems reasonable that research in the artificial area should be dedicated to find a new theory of emotion to build a self sustainable system.

The question of the primacy of affect and cognition has been a subject of much debate [16, 17, 18, and 19] on the interrelationship between cognition and emotion. Emotion appears to be dominated by cognition because cognition appears logical to our intellectual side. Despite this assumption, Panksepp [20] is among the researchers who argue that emotion should be studied independently from cognition through neuroscience (in both animals and humans). The studies of artificial emotions and psychology have always been subject to cognitive science (or other related disciplines); this is likely due to the fact that there is no genuine theory of emotion that would allow researchers to study emotion without the direct intervention of cognitive science.

Emotions first evolved in our species to produce a self sustainable system (in other words, to increase survival). Panksepp states that "Emotional systems have an integrity that was created through evolutionary selection rather than simply through the life experiences of organisms." [20], (p.12). We should already have a self sustainable system. This paper proposes to describe the beginning of a self sustainable system. This work is based by examining Freud works in the last one half decade [2], and working two and half decade with Tion-Emo Theory (TET) and two decade of clinical work with TET therapy [1]. For better understanding it is recommended to read [1]; [2]. Since working with this new theory for decades it has accumulated vast amount of information even the author is trying to keep it as minimum as possible.

To study emotion from a non-cognitive point of view we must consider Freud theories. Even though he did not directly study emotion, he still offers some knowledge on how our psyches work. However, everything needs to be translated through the TET to be comprehended in artificial emotion (Table 1.) Freud has explained human psychology in many different fashions, making complicated to understand his theories properly; see [2] for a comparison of the TET with Freud's theories.

The author proposes the creation of a self sustainable system based on the emotional mechanisms of the TET. At first, we need to build a nucleon with a mechanism for non- intellectual information and the self-object (SEO), or the internal object (the author prefers to use the term SEO, because elucidate that SEO is more an executive object). The SEO mechanism enables it to be compared with both the intellectual object (IO) that represents the external object in the brain and the social object (SOO) that is not only semi-intellectual but is also an object of compromise between internal life and the social life [2] (Figure 1). It also seems that SOO may melt with the IO to form the other object of comparison. Another possibility is simply that the SOO is underlie by SEO and compared with IO. Furthermore, the self-survival hierarchy censorship and the social hierarchy censorship are regulated by the SEO and the other TET mechanisms [1]; [2] (Figure 1). For this endeavor, we must integrate computer science, neural architecture, neuroscience and physiology, as well as an understanding of the evolution of emotion from an untainted point of view. We have plenty of technology; we just need to direct it towards emotional mechanisms.

2. SOME BASIC OF TION-EMO-THEORY

2.1. TET regions, therapy and objects regions

TET regions are like a big kingdom in which the king names a governor and an adviser in order to better govern his kingdom. The self-object (SEO) is the king. The intellectual object (IO) is the governor of the external world ruled over by the SEO. The IO is the governor and other officials who provide information to the social SOO to filter the information to the king**.** The social object is the close adviser of the king, located in the semi-intellectual region. In the transition between the intellectual and the non-intellectual regions, the adviser provides information to the king (SEO). The SOO helps the king regulate his instinctive energy, despite the fact that he may not be realistic in his decisions, because the nature of the

SEO is excessive motivation while lacking contact with the outside world. Even though all of these objects are under the king-SEO mechanism, to be a good kingdom it needs a good adviser.

The three regions seem to be at three different levels of function, beginning with the non-intellectual region to the intellectual region (Table 1). In relation to emotion, every region may have its own object, own mechanism, physiological organs [1]; [2], own neural network connection, own neurochemicals and own evolution. The intellectual region may house the intellect and/or cognition along with the IO. Panksepp [20] and [14] Gadanho both propose that cognition may be situated in the cortical region.

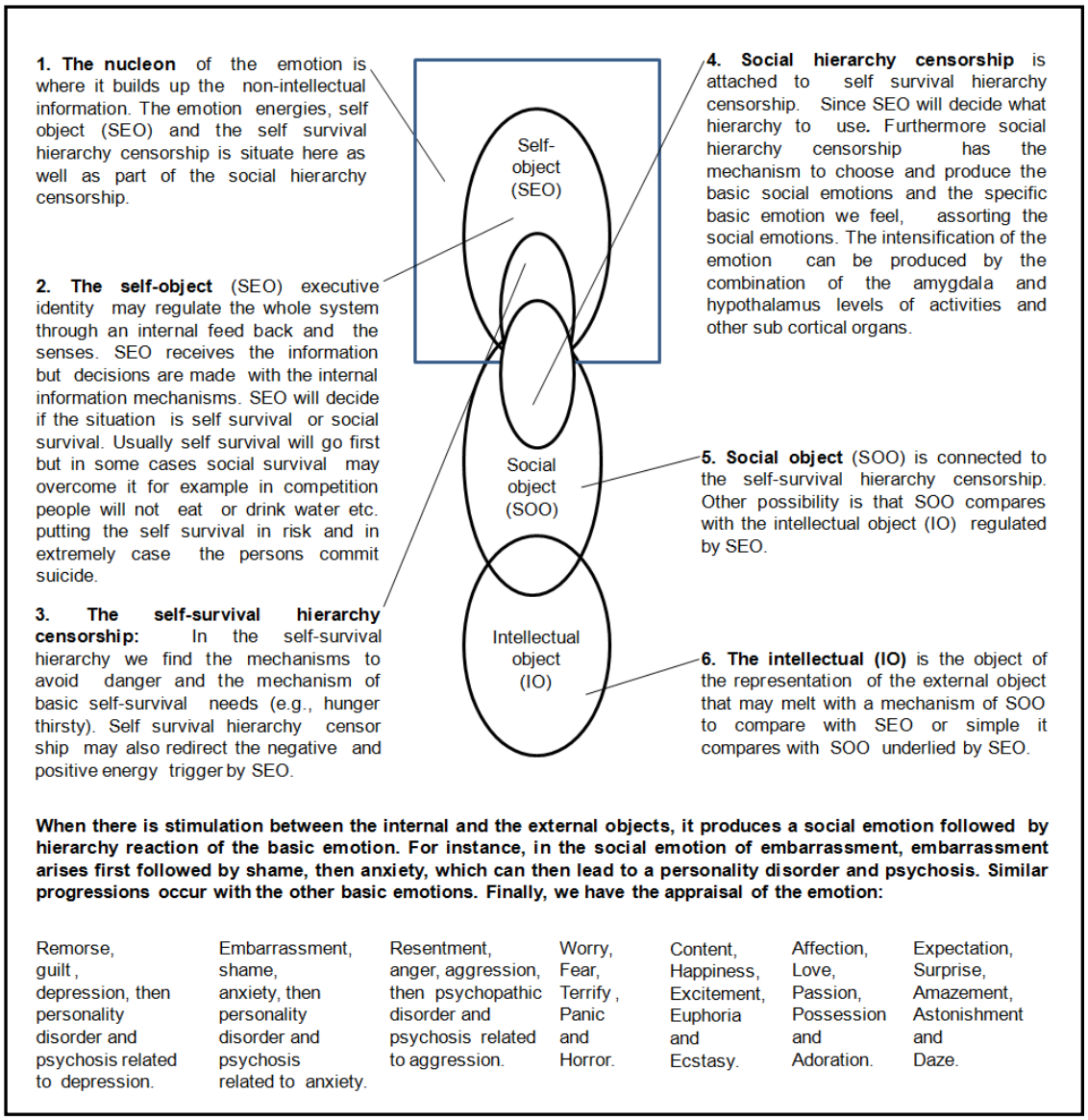

FIGURE 1: Represents the function of the nucleon and self-object in the relation to self-survival hierarchy censorship and social hierarchy censorship in connection to the comparison of the intellectual object, social object and the hierarchies' reaction of basic or social emotions.

The semi-intellectual region can be considered to be the transition between the intellectual and non-intellectual regions; this region seems to be the seat of basic, and social, emotions (Figure 1 and Table 1). Panksepp [20] has proposed that the sub-cortical region seems to be the seat of emotions. The author view, the sub-cortical region is divided into two accentuated regions: the non-intellectual region and the semi-intellectual region. There might be rudimentary cognition in the outer part of the semi-intellectual region as a result of brain evolution that has united the intellectual and non-intellectual regions**.** In this case, the non-intellectual region (which should be located in the sub-cortical area, in a more primitive section) could be situated in the hypothalamus or adjacent organs, where we also find self-survival emotions that all species share to some extent [2] (Figure 1 and Table 1). Damasio et al. consider that [21], "Some of these maps, such as those in brainstem and hypothalamus, are coarse, and their information is perhaps not directly accessible to consciousness." (p.1051).

2.2. TET therapy

The object in TET was born when the author found after using cognitive method for years that cognitive therapy did not have the expected effects on emotion. He discovered that by imaging the SEO, and imaging the IO, he could make a bridge between the internal and external worlds [1]. In TET therapy, we simultaneously image the IO (that may melt with SOO) and the SEO, and then we find "the helping words" from the semi-intellectual regions and iterate them. Furthermore, "the helping words" are very limited, but it is difficult to state how many exist (probably about 20-50**);** they are from the semi-intellectual area and they need to fit in the situation of the conflict (see also, [1]). At the beginning of TET therapy, we seek only to image and feel the IO, (SEO, probably was implied when we image the IO). Then we use some of the "the helping words" (e.g., it does not help to worry, we say bad things when we are mad etc.) [1]. After that, we reiterate the "nucleon sentence" by imaging IO while stating that: "it is not worthwhile to compare or to feel envy"; we repeat this 3 or 4 times, then repeat "the helping words", and so on [1]. Now in the TET therapy it is not necessary to use the "nucleon sentence" anymore because if we image and feel the two objects simultaneously (SEO and IO), we can continuously repeat as many "helping words" as we want. "The helping words" come from the social emotional mechanism, not from the cognition area or mechanism, and they need to fit the situation of the conflict [1]. The TET method and therapy have not spread thus far because the scientific community does not have good access to the TET.

3. SOME RELATION BETWEEN FREUD THEORY AND TION-EMO-THEORY

3.1. Object

The object seems to appear even before a child has born. It is present in their genes, first for self-survival reasons and then for social survival as Freud [22] considers: "In this way the mother, who satisfies the child's hunger, becomes its first love-object and certainly also its first protection against all the undefined dangers which that threaten it in the external world – its first protection against anxiety, we may say." (p. 24). So, when the child begins to interact with his or her caretaker, it marks the beginning of the formation of the IO and SOO that is attached to the mechanism of self-survival and is regulated by the SEO.

SEO is a nucleon image of oneself that can execute the direction of the organism [1]; [2]. It should have its own neural networks, neurochemistry, neurodynamics and physiological organ where the emotions are seated (from Freud's point of view). "The object [Objekt] of an instinct is the thing in regard to which or through which the instinct is able to achieve its aim.... The object is not necessarily something extraneous: it may equally well be a part of the subject's own body." [23] (pp. 122-123).

In the TET, the social object requires being a person and needs to be a whole object in order to produce a basic emotion or social emotions [1]. According to the TET, the appearance of objects results from early period of evolution since the organism's need to adapt, survive, safeguard and manage the internal and external worlds and therefore need the objects [1]; [2]. As Panksepp [20] points out, the emotional

function is from an early stage of evolution, and most creatures are self sustainable despite the lack of a cognitive system.

The external objects in self-survival can be inanimate; these are the objects that the organism can identify as good, bad, dangerous or real as the internal mechanism (and anatomy and physiology) permits. The internal object (or SEO) may be the object that all animals and humans share and its sophistication and function is dictated by either evolution or genetic predisposition.

In the therapy, the Self-object (SEO) appears when we imagine ourselves as whole, and the external object is the person who we compare ourselves to as whole; this leads to the expression of social emotions [1]. The SEO is the only object that can give the specific executive command in this area. Humans have a sophisticated system that presumably does not function without internal directions. Panksepp points out that "…a natural neurobiological function of the brain is to generate a menagerie of positively and negatively valence affective states, of various degrees and type of arousal, that help guide organisms in life-sustaining activities." [20], (p. 12). Batter Slade [24] has proposed the importance of the objects, postulating that infants cannot think without simultaneously acting on objects. Freud considered the object to be transcendental, for instance, by carrying psychic energy within the individual and between individuals [1]. Freud believed that individuals became sick when they lost the love object [25].

The three systems serve different functions (Figure 1 and Table 1). One system processes intellectual information by comparing inanimate objects for possible intellectual growth; emotion has its own neural network connections. The second system processes the semi-intellectual function; it obtains an assortment of information in cooperation with social hierarchy censorship, transforms it to semi-intellectual information, and then gives that information to the SEO in a less intellectual manner [1]. The social and basic emotions seem be produced only by comparison with the human object [1] (Figure 1 and Table 1). SOO is semi-intellectual mechanisms possibly as well convert the non-intellectual information in more intellectual structure for IO and mechanism to comprehend. The third system processes the non-intellectual information and the SEO redirect the non-intellectual information for the purpose of motivation. The SOO or mechanisms mediate social emotion, and ultimately, the emotional system is produced.

These objects imply an easy link among systems (Table 1).This feature gives the impression that these objects of comparison, combined with the TET mechanisms, make a marvelous entity that forms a self-sustainable system. When these objects interact with or stimulate each other within a fountain of energy, emotions are produced (Figure 1).

3.2. Freud psychic energy: instinct libido and cathexis and TET emotional energy

The TET developed independently of Freud's theory, and the author has interpreted Freud through the TET. In Freud's works, there are three forms of energy that this author identifies: the instinct, the libido and the cathexis. Instinct seems to be characterized by dual functions: sexual instinct vs. ego instinct as well life instinct vs. death instinct (see also Author), [2]. Freud [23] also described the relationship between a stimulus and an instinct in the following manner: "There is nothing to prevent our subsuming the concept of 'instinct' under that of 'stimuli' and saying that an instinct is a stimulus applied to the mind." (p. 118). This could mean that the emotional energy stimuli SEO and it redirect the energy after that SEO makes the comparison with IO and produces the emotion (Figure 1). Laplanche defined life and death instincts as follows, "…the death instincts, which are opposed to the life instincts, strive towards the reduction of tensions to zero-point. In other words, their goal is to bring the living being back to the inorganic state." [26], (p. 97).

In TET we produce tension reduction through the object by reducing comparison. All of these instincts are viewed in the TET as emotional energy that relies on neural networks and specific neurochemical and physiological makeups to form this emotional energy. These functions could be regulated by the SEO and assisted by social objects mechanism: social hierarchy censorship and self-survival hierarchy censorship (see also Author, [2] (Figure 1 and Table 1). We need to understand the emotional energy

and its dynamic to further understand the SEO's executive role in the emotion system. In therapy, the SEO has been shown to be responsible for these functions [1]. It is important to mention here that this emotional energy or instincts may not follow the law of the physic energy; this should be taken into account when constructing artificial emotions and observing how this energy interacts with objects. Emotional energy should be neurochemical with emotional logic.

Theories	TET Objects and Freud divisions	TET Regions and Freud divisions	TET Emotions	Brain structures
TET	External object	Intellectual Region	"Cognitive emotions" appraisal and cognition	Hippocampus
FREUD	Ego	Consciousness		
TET	Social object	Semi-intellectual region	Social emotions	Amygdala
FREUD	Super ego	Pre-consciousness		
TET	Self-object	Non-intellectual region	Self-survival emotions	Hypothalamus
FREUD	ID	Unconsciousness		

TABLE 1: This table shows that there are some apparently similarities between Freud's theories and the TET and TET emotions. There are brain structures that have their own place and levels in emotion. Terms begins form external (upper row) to the internal function (lowest row). The external object, may be considered to be a parallel to the ego, the social object (SOO), corresponds to the superego, and self-object (SEO), could correspond to the Id. The intellectual area can coincide with the consciousness, the semi-intellectual area can be compared to the pre-consciousness, the non- intellectual area also corresponds to the unconsciousness. In the hippocampus there might be appraisal and cognition and "cognitive emotions". the social emotions: guilt, shame, anger, happiness, love, etc. might be located in the amygdala. The self-object may be situated in the hypothalamus. Even thought, there are many other subcortical regions, that play a great role in self sustain emotion system. The self-survival emotions: pleasure, panic/anxiety might also be located in the hypothalamus and controlled by the self-object (SEO).

3.3. Libido

Libido could be the unification of all of the instincts. As Freud [27] wrote, "Libido is an expression taken from the theory of emotions. We call by that name the energy, regarded as a quantitative magnitude (though not at present actually measurable)…" (p. 90). Therefore, this energy should be based in a sub-cortical mechanism and involve specific neurochemistry as point out Panksepp [20]. What the author calls emotional energy which reside in the nucleon of emotion. Freud [25] pointed out that: "… we are constantly detaching our libido in this way from people or from other objects without falling ill." (p. 72). This means that SEO is continuously interacting with external objects through the comparison after which SEO makes negative or positive energy producing negative or positive emotions in the system according to the dominant energy. In the TET, we use the two objects to resolve the conflict by reducing the comparison between the objects (see also the author [1]; [2]) with the help of the SOO or better to say with SOO mechanism. The reduction of the comparison probably reduces the activity organs and/or produces more or less a neurochemical which decrease in the negative energy. Zald [28] considers by examinations, that amygdala activity augmented more in response to negative, rather than positive, emotional stimuli. Because negative emotions are instrumental in reducing negative emotion, we are left with more positive energy [1].

3.4. Cathexis

Cathexis is another term that Freud uses to explain psychic energy, pointing out: “The nucleus of the Ucs. consists of instinctual representatives which seek to discharge their cathexis; that is to say, it consists of wishful impulses.” [23], (p. 186). The author speculated that the nucleon of emotion is the main source of the emotional energy that is regulated or redirect by the SEO and by the help other mechanisms (Figure 1 and Table 1). This cathexis could mean that the energy between the objects (that is the comparison energy) which facility is charged into objects by SEO mechanism [1]; [2]. The comparison of objects facilitates the stimulation of internal and external emotional energy help the organism to life sustain that is motivated by the SEO. Panksepp, [20] believes in various quantities and category of arousal that can help the organism in life self sustain.

Laplanche [26] claims that, according to Freud, “…cathexis is not withdrawn from the object – on the contrary, the object is heavily ‘cathected’ as an object-to-be-avoided.” (p. 64). This is quite evident in phobias in which the individual cannot see that the real object of comparison is a person. A car phobia could appear for one of two reasons. In one case, it can be generated by self-survival, and in therapy we need to use only the image of the Self-object, but it is also possible that the phobia of driving a car can be caused by shame [1].This stems from the urge towards social self-survival. If this is the case, we also need the social object that fuse with the IO in addition to the SEO [1].

3.5. The three TET systems with their objects and Freud geographic divisions of psychic

The three systems described in the TET show similarities to Freud’s psychic topographic divisions (Table 1). However, the author does not use Freud's terminology because ultimately the concepts are not the same (see also author [1]; [2]). The intellectual area corresponds to Freud’s consciousness, the intellectual object (IO) to the ego, the semi-intellectual area to the pre-consciousness, and the social object (SOO) to the super ego [1]. The social object mechanism should have the capacity to understand the demands of the SEO. Because humans are motivated to survive socially and have the predisposition to be outstanding, a compromise system is needed to understand the mechanism of the SEO [2]. The non-intellectual area (which is the unconscious) and the non-intellectual object or (SEO) form the Id but among other things the id does not have executive function and TET objects and regions have many different mechanism that Freud objects energy and regions may not contain the same functionality (Figure 1 and Table 1). The SEO may be shared by all species, with specific levels of development according to the species. Panksepp [20] states that a basic neural architecture could generate internal experiences. In order to function artificially, we will need to develop a new configuration or architecture because it seems according to the TET, that emotion has its own mechanism.

4. SOME PHYSIOLOGY IN THE SELF-SURVIVAL AND SOCIAL SURVIVAL HIERACHY AND EMOTIONS

4.1. The relationship of the hypothalamus to emotions, self-survival hierarchy censorship and the self-object

The non-intellectual area seems to be located in the more primitive areas of the sub-cortical region; this could correspond to the hypothalamus and nearby organs (Table 1). Here, we may find the self-survival hierarchy censorship emotions of anxiety (panic) and pleasure (and their mechanisms), the SEO with the mechanisms of safeguarding and decision making, the self-survival hierarchy censorship mechanism of danger and the self-survival censorship mechanism of basic needs (e.g., hunger) that all species share to some extent [2] (Figure 1 and Table 1). Panksepp [20] believes that “In sum, one guiding premise of ‘affective neuroscience’ is that a natural neurobiological function of the brain is to generate a menagerie of positively and negatively valence affective states, of various degrees and types of arousal, that help guide organisms in life-sustaining activities.”(p. 12).

We have for a long time recognized that the hypothalamus controls at least some basic biological functions of self-survival (for example, hunger and thirst) while taking into consideration that these function are underlied by the evolutionary emotional system and safeguarded by the SEO. Numerous studies have shown the significance of the sub-cortical regions in human affective experiences, such as

the craving for money [29]; [30] (a, b), the enjoyment of music [31], orgasm [32], and air starvation [33] (table 1). The author considers these functions to be the product of emotional self-survival mechanism that motivates and safeguards the organism to self-survival that is accomplished by the SEO and that this energy is the result of evolution. Panksepp [20] has stated that "Emotional systems have an integrity that was created through evolutionary selection rather than simply through the life experiences of organisms." (p. 12). Even though social emotions are stimulated by social interactions and modified by life experiences, the author considers them to be the foundation of the neural, evolutionary and authentic emotion mechanisms. Social emotions seem to be produced by the interaction between objects and regulated by social hierarchy censorship that is probably attached to self-survival hierarchy censorship and allowed by the SEO [2] (Figure 1).

In addition, Straub [34] points out that the fetus already experiences emotions and sensations before birth. The author has postulated that pleasure and panic/anxiety are the two basic emotions of self-survival [2]. Panksepp [20] points out that "…the fundamental ability of neural tissue to elaborate primary-process forms of affective experience evolved long before human brain evolution allowed us to think and to talk about such things." (p. 7). Emotions or sensations appear to be regulated directly by the SEO by directing the organisms to react when the SEO seems it necessary and may be assisted by other mechanisms such as the SOO mechanisms and self-survival hierarchy censorships [2] (Figure 1 and Table 1). Additionally, the SEO determines if a situation is not related to self-survival and seems to emerge as the decision-maker for the whole emotional system [2].Thus, the author of this paper hypothesizes that self-survival hierarchy censorship emotions reside in the hypothalamus (possible other sub cortical area) and that the SEO connects to other cortical areas through other neural emotional mechanisms (Figure 1 and Table 1). Panksepp [20] considers emotions to interact in the cortical regions of the brain but thinks they should be viewed as a different class.

The author suggests that the self-survival hierarchy censorship has two functions, one for meeting basic needs such as hunger thirsty etc. and another for avoiding danger [2]**.** Valenstein, Cox, and Kakolewski [35] found that electrical stimulation of the hypothalamus triggered a wired-in hierarchy of conduct that was particular to the species being tested. For example for a child or creature to learn, that snakes are dangerous by forming an image of a dangerous snake, he/she/ it creates the object of the snake in the self-survival hierarchy censorship region and uses it to compare with other snakes or other animals in order to escape or to practice how to respond; (these objects are attach to the existing self-survival mechanism) are used as references that are interrelated to each other to form a system of self-survival hierarchy censorship; the more sophisticated the species, the further this interrelation is refined [2]. In humans, the interrelation goes further to form a social self-survival hierarchy censorship mechanism.

4.2. The relationship of the amygdala to the social object and basic emotions

Figure 1 shows the hierarchy of emotions. We can see in the first parallel line remorse, embarrassment and resentment etc. emotions that could take the place of the basic emotions. Nevertheless we recognize the second parallel line as the basic emotions. All the emotions in TET hierarchy are called social emotions including basic emotion. The author speculates that basic emotions are situated in the amygdala and other sub-cortical regions. In human evolution, as we have advanced socially, we have developed sophisticated basic or social emotions. However, the social emotions continue to be underlied by the basic mechanism of self-survival hierarchy censorship (which was crucial during earlier stages of evolution), while being safeguarded and directed by the SEO and sorted by social hierarchy censorship created because of need to survive socially (Figure 1). First, according to the TET, in order for an emotion to be social emotion of the self-sustain system, it needs to involve a hierarchy; for example, disgust does not seem to form a hierarchy (Figure 1). Sander [13] finds that several studies demonstrate that signals of fear and disgust are processed by distinctive neural substrates. This could mean that disgust is not a basic (social) emotion. Some of these feelings and sensations could be from the cognitive area of later development.

Adolphs [36] has organized emotions quite differently from the TET; he does not use a coordinated mechanism like the TET to regulate emotions. In TET we call social emotion all the emotions that are

produced through the comparison of the objects including basic emotion. Adolphs [36] uses the term social emotion with different meaning. Adolphs [36] "motivational states" might be analogous to the self-survival hierarchy censorship of basic needs in TET; he also considers two of the basic emotions as "social emotions" to be guilt and shame (Figure 1). These are two important basic emotions (or social emotion according to TET) in human pathology and in everyday life (see author [1]) and they seem to form a hierarchy if you see figure 1. Two other "social emotions" that he describes are: pride and jealousy [36]. In TET pride and jealousy are consider the mechanism of comparison that sparked the beginning of emotions, so that at first, they were even considered to be the nucleon of emotion but were later supplanted by the objects. Jealousy seems to originate in humans from a comparison between the internal object and the external object to produce emotion [1], and "pride" may be a more primitive form that sparks the self-survival hierarchy censorship but plays the same role of jealousy or it might also spark a comparison in the TET social emotions or basic emotions.

Most studies show that basic emotions seem to reside in the amygdala and in other sub-cortical regions (Figure 1). LeDoux [37] suggested that the amygdala was a crucial in the organization of the affective network, and Rolls [38] stated that the amygdala seems to be involved in emotional and social responses to faces. Furthermore, Rolls [38] described consistent evidence that the amygdala is involved in emotions. Kalin found that monkeys with specific lesions affecting the cell bodies of the amygdala showed deficits in their expressions of fear [39]. Similarly to the animal studies, patients with amygdala injuries are more likely to have problems in dealing with static, negative, emotional stimuli [40]. These results support the hypothesis that the SOO and hierarchy emotions are either located in the amygdala or spread among different subcortical areas (Figure 1 and Table 1). Panksepp [20] suggested that the origin of emotion is in the sub-neocortical region.

We may consider that the basic emotions, such as guilt, shame, fear, anger, happiness, surprise, love and the other emotions within the same hierarchies (Figure 1 and Table 1), are situated in the amygdala and probably in other sub-cortical regions (naturally, there should be other basic emotions). The author identifies this region as the semi-intellectual region; therefore, it needs a mechanisms and a region to unite the other two regions to produce homeostasis (Figure 1). The generations of these emotions are based on the evolution of the species and they should have their own neural structure, neurochemistry, and neurodynamics and they are grounded in the emotion mechanism of comparison with the objects and all other mechanisms that the author of this paper has proposed [2]. Buck considered that primes: "… are based on innate mechanisms organized in the subcortical and paleocortical regions of the brain…" [41], (p. 391). Panksepp considered, "Thus, even though emotions and cognitions interact massively, especially in the higher regions of the brain, there are many reasons to view them as distinct species." [20], (pp.11).

The basic (social) emotions should be connected to the SEO through cooperation from social hierarchy censorship and other mechanism. After that, they react in a hierarchical manner as the author has proposed (Figure 1) [42]; [2]. Zald [28] found that in fMRI studies, amygdala activity increased more in response to negative, rather than positive, emotional stimuli. This author concludes that because negative emotions are instrumental, their reduction allows more positive emotions to be available [1]. The author of this paper has also proposed that when we reduce comparisons, positive emotions increase [1]. This function is likely specific to the sub-cortical region.

4.3. The function of basic emotions and social hierarchy censorship emotions

The basic emotion mechanisms of emotions should be regulated by social hierarchy censorship attached to the self-survival hierarchy censorship mechanism then to SEO (Figure 1) [2]. The child needs to learn to survive socially. For example, he must learn that he cannot punch other people for no reason and must continue to store the object of the person in the existing mechanism of social survival in the situation for later comparisons through association mechanisms [2]. The reactions and feelings of the person who senses that he cannot survival socially are quite similar to feelings involving physical self-survival, because it is attached to self-survival hierarchy, except that in social situations, we cannot see

the social objects of as dangerous because of our shame of feeling inferior [1], but we can be aware easily of the objects of our physical dangerous.

It is valuable to understand how the basic emotions, such as guilt, shame, anger, happiness, or love, are produced. We need to hypothesize how we feel a specific emotion. There should theoretically be a comparison between objects (Figure 1) [1]; [2], which may mean that we first need to artificially create the conception of the basic emotion or they can be already in the social censorships. For example, guilt is a feeling that we have wronged another person, shame is feeling ridiculed, anger is feeling that somebody has committed a wrong against us. In love, the object belongs to us and we "own" it. We need to explore whether there is a specific organ (e.g., the amygdala or the hypothalamus) that forms each of these concepts and produces the neurochemical, neural network and genetic ability to form different emotions. Another subsystem, the social hierarchy censorship, then sorts and chooses emotions. The social hierarchy censorship was created and directed by the SEO to aid in social survival (Figure 1 and Table 1) (see also [2]).

Additionally, we should determine whether there is a genetic predisposition to express emotions. As previously highlighted by Straub [34], the fetus experiences some primary sensations, such as pleasure, simple tactile enjoyment, fear and panic (self-survival emotions). One possibility is that the self-survival hierarchy censorship gives rise to the social emotions; pleasure being the positive basic emotions and anxiety being the negative social emotions, then the social hierarchy censorships will form the different basic emotion if it has the conception of basic emotion (Figure 1 and Table 1). For example, decreasing anxiety increases pleasure through reducing comparison of the objects. In relation to the negative and positive energy of the self-survival hierarchy censorship, we can only speculate that decreasing the activity of the hypothalamus (or part of it) will lead to more positive energy or pleasure (decrease anxiety) and that increasing its activity would generate more negative energy or anxiety.

The amygdala can be related to the social emotions. Zald [29] already found that the activity of the amygdala generally increases with negative emotions and decreases with positive emotions. Then, the social hierarchy censorship with his conception mechanism chooses the basic emotion that we feel from the positive or negative according to the dominant energy and then SEO executes or permitted it. For example it can choose from happiness, guilt and shame (Figure 1 and Table 1). The magnitude of the increase or decrease of the specific emotion and its hierarchy will function according to the activity of the organ (e.g., the amygdale, brainstem thalamus hypothalamus etc.*)*. An example of the hierarchy function involving shame is that initially you feel ridicule, then shame, followed by anxiety, then anxiety that is related to a personality disorder, and finally psychosis that is related to the anxiety; the last two stages have more organic causes. The same logic applies to the other basic emotions (Figure 1) [42]; [2]. This could be the pattern of an efficient functional form, or there may be other prototypes to discover. The Social hierarchy censorship resides between the IO and the SEO [2].

5. IMAGE

Image is important to the development of artificial emotions because it is a basic part of the non-intellectual function (and possibly also of the intellectual area), the intellectual system also needs to be compared between the inanimate objects to create an intellectual meaning. We have an abundance of information in relation to the camera and other optical discovery so we need to make artificial mechanism that IO can form images of the external objects that can compare with the SEO to further stimulate the emotional system and be able to image the external objects without their presence. When making an image of SEO as defines by the author with the executive mechanism, then we need the image and the mechanism of the SEO to compare to the IO (or SOO and IO) images. Image and mechanism that compromise between the two objects and social hierarchy censorships and self-survival hierarchy censorship mechanism that regulated in formations and energy and other mechanism propose here (Figure 1). Images have been used in the healing process and in therapy, and we have not given it significance from the point of view of a TET object.

Can we make this information work? Yes, even by using the knowledge we already have. However, we need more knowledge about the mechanism of the organ that is responsible for making these images of the SEO, the SOO and the IO. We need to know if the images of all of the objects in the system involve the same mechanisms.

6. SOME PHYSIOLOGICAL MODELIN THE FUNCTION OF EMOTION

6.1. TET and other theories of physiological emotions, neural network and robots

There are several models of how neural networks may work in emotions. Ledoux considers that [43] neuroscience is enchanting again the interest in emotion for example, by using two neural, emotional and cognitive relations and connecting the two networks. Ledoux [37]; Parvizi and Damasio [44] postulated the existent of consciousness in neurobiological conditions. The brain makes patterns of object and sense of self. Fellow has a model [45]; [46] that is oriented to the peripheral model. Damasio et al., [47] regards emotion as a dynamic pattern of neuron modulation**.** Canamero [48] proposes an approach that depends on an internal mechanism and a value system model to regulate external positive and negative actions and stimuli. Most of these approaches are oriented towards cognitive functions, but some of their features can be appropriated to create a more authentic self sustainable emotional system by combining an unadulterated theory of emotion with the internal object, the external objects and the other mechanisms of the TET. Each of these models misses the elements of the TET, which emerge as a unified and organized theory of emotion (Figure 1).

Some authors (Balkenuis and Moren) have created a set of sophisticated connections for the neural model of emotion. These researchers have put together a computational model of emotional learning that employs neural networks in diverse brain regions and unifies them with specific regions, such as the amygdala, the thalamus, the sensory cortex and the orbitofrontal cortex; however, this sophisticated system had not yet been set into operation [49]; [50]. The neural model may be improved by the addition of a simple and more reliable theory of emotion that takes into account the different parts of the brain with an efficient and lucid emotional approach but considers emotion to be independent from cognition; otherwise the system may be too chaotic (Figure 1 and Table 1). Many studies suggest that emotions function in a neural network but they do not have a unified system. Basic neural studies should help to develop a system of emotion according to the TET principle by connecting the TET emotional mechanisms with neurochemical and neural networks and constructing the TET regions, objects, social censorship, self-survival hierarchy censorship, and the basic emotions within the system. In reality, this is a difficult prospect because we need to start with a new mechanism but as soon as we find the logic development can be fast.

The fight-or-flight response is a common model that has been the subject of research for a long time; it is a model of basic homeostatic control. Lately involves some neural connections and neurohormones assembly related to flee and fight [51]; [52]; [53].The culmination of the fight-or-flight response seems to be a dual response mechanism. The author concludes that it is missing a control centre, especially because we are organisms with a self-sustainable emotional system. The fight-or-flight response may resemble the self-survival hierarchy censorship mechanism reaction in the TET that involves the emotions of pleasure and panic (anxiety), but they are different. The TET has a clear self-survival hierarchy censorship system that is theoretically controlled by the SEO. Furthermore, there is a social system or basic emotion attached to the nucleon, controlled by the SEO, mediated by the SOO and sorted by the social hierarchy censorship (Figure 1).

In the development of artificial emotions, in addition to a computer, we need a robot or some sort of machine to embody all of the artifacts and mechanisms that are needed to produce artificial emotions. At this moment, there have been many advances in artificial intelligence, as well as in robotic movements, in the visual area, in consciousness and in other related areas. Nolfi, as well as Cliff et al., has done preliminary work involving spontaneous evolutionary robotic processes [7]; [8]. When emotion is placed as a factor in the current evolution of the robot (allowing changes in neurochemistry, neurodynamics and early evolution), we may be able to begin the evolution of artificial emotion as the SEO will produce the

genuine motivation and arousal for the system in its interactions with the internal and external objects. The other mechanisms of TET will produce self sustain system and as we advance we will see the need of other devices (Figure 1). Buck considers primes to "...generally require internal or external stimuli to become activated…" [41], (p. 391).

Canamero [48] concludes that the robot model does not offer much insight into how the internal or external mechanisms should be stimulated in order to produce emotions. However, it is obvious for the TET that at least two objects are needed to stimulate the internal and external environments: IO, SEO and SOO mechanism for homeostasis. The IO is a representation of the external world within the brain. The SOO is the object or mechanisms of compromise, and the SEO is the object of motivation and execution. Once we have a self-sustainable system, the evolution of an autonomous robot will make more sense because the robots may have decision-making system and self-sustain system. Panksepp has strongly consider that affective and cognitive types of consciousness come from lower regions (subcortical) where executive schemes for emotional responses are ordered and organized in different manner then cortical area [20]; [54]; [55]; [56]; [57].

Therefore, one could propose in hypothetical rough manner to unite the emotion system using the following scheme: the intellectual regions and the external object with the hippocampus, brain hemispheres, the semi-intellectual region and the social object with the amygdale, other subcortical areas, the non- intellectual region, the SEO and nucleon with the hypothalamus and brainstem etc. (Table 1). Naturally there are numerous other regions and organs that are exploring and many other needs to be explored and see how they function interconnect. After that, emotions sometime need to be appraised in the higher regions such as the intellectual region (IO) (which corresponds with the hippocampus and the left and right hemispheres) (Figure 1 and Table 1). Panksepp considered [20], "Thus, even though emotions and cognitions interact massively, especially in the higher regions of the brain, there are many reasons to view them as distinct species." (p. 11).

7. COMPUTER AND EMOTION

7.1. Computer interactions with humans

Recently, there have been great advances in human-computer interactions through an improved understanding of the interactions between cognition and affective states, along with the use of miniature cameras, physiological measures with various types of electrodes and posture detector monitors, as well as the measurement of artifacts such as Galvanic Skin, EEG, ECG, measurement of the recognition of facial expressions and many other body measurements [11]. Furthermore, many researchers are looking for efficient body markers for affective states with the aim to develop a better understanding of the interactions between computers and humans, taking into consideration the influence of cognitive affective states.

The intelligent tutoring system (ITS), developed by the tutoring research group (TRG) at the University of Memphis, features an automatic tutor that can interact with the students in a natural manner, like a real tutor, even though the computer behaves in an automatic fashion [58]; [59]. Another area where an intelligent tutor system is useful is in autism. The Interactive Socio-Emotional Toolkit (iSET) has been developed to help with the various difficulties that are faced by autistic patients; it is based on the recognition of facial expressions and the emotions of oneself and of others [60]. This is a great advance in computer and human interaction but not in self sustain system of emotion.

Woolf et al., [61] has proposed to repair the inequity that exists between the cognitive and affective states. D'Mello et al., [62] has described some emotions or sensations in learning such as boredom, flow/engagement, confusion, frustration, flow and neutral state. Because learning is a cognitive state, these feelings are more cognitive and therefore influence the learner. The basic and social emotions and self-survival emotions are a self sustainable system; they have to do with social self-survival and physical self-survival, so they influence learning in a different manner (Figure 1). Relatively speaking, there have been considerable advances and positive movement in these areas resulting from the cognitive and

affective learner but they have moved from the genuine emotions theories of the self sustainable system. Computer interaction with human knowledge could be useful in the future in order to produce a more complete human-like robot. It would be great if we could integrate a self sustain system as propose here.

7.2. The component process model (CPM), Asynchronous Learning by Emotion and Cognition (ALEC) and Database

There are many exceptional computational systems that are oriented to cognitive theory, like the component process model (CPM) and the stimulus evaluation check (SEC); Sander [13] proposes that "…the CPM assumes that emotion differentiation is produced by the results of the SEC sequence, it follows that the latter should also be the key to predicting modal emotions."(p. 325). Even though this knowledge is oriented more towards the cognitive, it could be integrated to be used in an emotional human self sustainable system. Sander et al., [13] point out that despite the fact that the computational model of CPM does not exists in real life, Sander et al., proposed the prospect "…of constructing computational models of emotion using neural networks…" (p. 325).

Scherer has suggested architecture of emotion with fundamental mechanisms that can be applied to both emergence and the specific role of consciousness in emotional processing [63]; [64]. The component process model (CPM) and the stimulus evaluation check (SEC), in conjunction with the neural network, might help to develop a more untainted artificial emotion if we were able to find a new theory of emotion that encompassed these theories and allowed them to be modified by each other.

The Asynchronous Learning by Emotion and Cognition (ALEC) with the emotion-based architecture (EBII) is an attempt to make a system that performs with a goal system, helping to make the emotion system more abstract; ALEC also endorses developments in the advancement of artificial emotion. Furthermore, Gadanho points out [14] "The reported experiments test ALEC within a simulated autonomous robot which learns to perform a multi-goal and multi-step survival task when faced with real world conditions..." (p.385)

Database is another system in the endeavor to produce artificial emotions. "One of the key developments is a growing recognition that the task of assembling adequate databases is a major challenge, intellectual as well as practical, with links to fundamental issues in the theory of emotion." [15] (p. 37); furthermore, Sander et al., [13] believes that "… such modeling promises to do a better job in explaining a number of intuitively obvious characteristics of emotional responses (such as abrupt changes that are difficult to explain by linear functions or dependency of the response on the origin or departure point)." (p. 344).

The stimulus evaluation check (SEC), the emotion-based architecture (EBII), the emergence and specific roles of consciousness in emotional processing and the rules system (and other similar systems) seem to be an attempt to make a self sustainable mechanism at the cognitive level. However, it may not be possible to have such a system at the cognitive level. As Panksepp [20] points out, the emotional function is from an early stage of evolution, and most creatures are self sustainable despite the lack of a cognitive system.

These systems are sophisticated, but they seem to demote the idea of genuine independent emotion and a self sustainable system that takes into account earlier evolution and sub-cortical area as a main source of emotion, while also taking into consideration comparisons between these objects self-survival hierarchies and emotion mechanism. As mentioned, all species should have some mechanism of comparison in order to understand the difference between good and bad and danger. Furthermore, the ideal system would take into account other mechanisms of the TET and the neurochemical and neural network attributes that allow the self sustainable system to function.

In order to build a goal system, to assembly emotion more abstract, creating intuitive device, generating consciousness, understand stimuli functions, assembly databases etc. we need to have internal and external interaction system and other mechanism to assist these functions and direction in self sustain manner.

8. CONCLUSION

The TET could be the key to artificial emotion, since it provides a systematic and organized system that can be applied to building artificial emotions. It has limitations, but it is a good starting point. At first, we need to make an image of the SEO with executive mechanisms and an internal object (or Self-object) to compare against the external world IO (Figure 1 and Table 1). In the nucleon (or non-intellectual region), we also need a self-survival hierarchy censorship mechanism that motivates us to regulate our basic needs (e.g., hunger) and avoid danger. We also need a mechanism for the interaction between objects.

The semi-intellectual region and SOO have the mechanisms for producing homeostasis because the friction between the internal and external objects. The semi-intellectual region has more to do with human social interaction and is underlied by the internal object (or SEO). Here we can find in addition, the mechanisms of the social hierarchy censorship, the devices or mechanism that choose the dominant emotion, and mechanism to choose the right basic emotion and the emotional hierarchy functions also need to be built up.

Next, we must represent the IO (which is the representation of the external object) and the intellectual region, which may be situated in the nucleon of cognition. In addition, we should look for the most efficient functions and interactions between and within each of the functions. It is expected that we need to integrate knowledge from computer science, neurochemistry and neural networks. The fields of evolution, physiology and other sciences will also help to build a self sustainable system. This means that the TET and other sciences must influence each other without losing the vision of a self sustainable system from an untainted emotional theory point of view.

The TET proposes an embodied system with artificial organs that resemble biological organs as much as possible. The main critiques of the TET focus on its simplicity, but the author believes that this system should be simple since evolution is a process that selects for an efficient system. It is necessary to postulate more daring theories with other mechanisms (e.g., an object's self-survival hierarchy censorship and social hierarchy censorship system) and to move in other directions. Canamero [48] indicates the need for more theories of emotions, and the author has proposed one, [1]; [2]. Meanwhile, clinical work shows the objects' existence. It has taken over two and a half decades to develop this theory and more than two decades of clinical work spent exclusively working with the TET comprising thousands of hours spent working with clients [1].

Logically, building artificial emotions will provide immense information about emotional systems. This is especially true when using the TET model because it offers a new way to perceive emotions and its organization seems logical. Emotion has been relegated to the cortical region in the past, although it belongs in the sub-cortical region. We view intellectualization as a more significant function of human beings. However, the emotional system has great transcendental importance to us. What make possible the self-sustainable system among other mechanisms are three forces, one illogical, the other logical and the third mediating. Through comparison or friction between the objects, emotions arise and stimulate the energy of the system.

Most theories appear to look for sophisticated schemes of the self-sustain system but one of the greatest problems is, that most emotion theories are cognitive oriented but self-sustain system of emotion does not have anything to do with cognition. If you think an animal, you notice that every animal have a self-sustain system, which indicates, that self-sustain system cannot be too complex. If wanted to build an artificial life, that resembles a human, cognition, social and self-survival emotions are needed but after that, we are facing a problem since there has not been theories which could guide us to build unadulterated separated self-sustain system. The emotional theories do not use image neither non-intellectual system and self-survival and social survival hierarchy according to TET theory. Additionally, emotion theories do not show good schema how to stimulated and connect internal and external world neither mechanisms of how choose and to regulated the social and self survival emotions.

Computer has solely cognitive function and now there is development of affective emotion, which seems to have more cognitive emotions than emotions of the self-sustain system since they do not form hierarchy and they have more to do with learning process. The lack of organized system without a nucleon will lead us at end with chaotic and unpractical system. Physiological emotions theories, neural network and robots theories cannot present theory with a nucleon to organized and redirect information. TET presents an ordered system with a nucleon, hierarchies and different stages of organization which can even be used as a starting point of constructing a less sophisticated self-sustain system.

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