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Research Article

The “Human Emotions” and the “Perrotta Human Emotions Model” (PHEM): The new theoretical model. Historical, neurobiological and clinical profiles

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Abstract

Starting from the models of James-Lange, Cannon-Bard, Watson, Darwin, Ekman, Cowen-Keltner, Schachter-Singer and Mandler, a new model on the subject of human emotions, the "Perrotta Human Emotions Model" (PHEM), was prepared, which would take into account the need to order and distinguish, in a clearer and more functional way, the following concepts: (a) the "sensation" is the result of the interaction between the sense organ and the restitution of the content; (b) the "perception" is the reprocessing of the sensation, and can be of the first level (when the sensation is processed in the neurobiological phase) or of the second level (when the sensation processed neurobiologically passes a second evaluation screen by the person's normative content, and then is returned through behaviors); (c) the "anxiety" is the feeder of the circuit, the energetic activator; (d) the "emotion" is a basic modality that allows us to adapt to internal and external circumstances; (e) the "sentiments (or feelings)" is an emotional-behavioral reaction or the subjective emotional experience lived by the person thanks to the interaction of basic emotions with anxiety, and/or with the combination of sentiments, always with the aim of perfecting one's adaptation; (f) the "discomfort" is a state of mind, such as tension or hyperactivity or hypoactivity, which occurs when the person experiences different feelings, depending on the factual situations; (g) the "affection" is a feeling of attachment to someone or something, even material, exclusively related to the basic emotion of pleasure and in particular (but not exclusively) to the friendly and loving feelings (h) the "need" is the instinctive impulse that arises to satisfy a desire and presupposes a state of necessity that if not satisfied brings suffering and frustration; (i) the "desire" is the object of the need; (j) the "need" is the degree of importance and urgency that need goes to satisfy; (k) the "instinctual drive (or impulse)", unlike the Freudian concept, is any conscious or unconscious manifestation of a need. According to this new perspective, therefore, this construct is based on the hypothesis that every action/behavior arises from a need (or instinctual drive) that seeks satisfaction, and therefore the "emotional states" (or emotions) are the basic modes that our mind knows (and "installed" by default) thanks to which we can adapt to internal and external circumstances, while the "emotional-behavioral reactions" (or sentiments) are subjective emotional experiences experienced by the person thanks to the interaction of basic emotions with anxiety. In total, there are 2 emotional states (or basic emotions: anguish, and pleasure) that give rise to 152 first (14/152), second (42/152), and third-level (96/152) emotional-behavioral reactions (or sentiments). Referring to the PICI-2 model and the role of anxiety as a natural "neutral" activator and/or enhancer (and not as a basic emotion as mistakenly believed by some), the origin of all psychopathologies is to be found, according to this model, in the dysfunctional management of emotions and sentiments, and not in anxiety: in fact, working in psychotherapy on one's own emotional alphabet allows to unlock anxiety (and not vice versa) and consequently the vicious circle that feeds the psychopathological condition, unmasking cognitive distortions and self-deception. The paradigm at the base of PHEM is therefore to work directly on the emotional alphabet of the person and on the analysis of their emotions, to intervene indirectly on the anxiety that feeds and strengthens the maladaptive, dysfunctional, toxic, or pathological pattern..

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Definition and historical profiles

The "emotion", as per general definition, is an intense state of mind, with acute onset and short duration,

multicomponential, determined by an internal or external stimulus and its appearance causes a change in psychic, vegetative and somatic level, functional adaptation and survival; different is the concept of "sentimental" that instead is more structured, resistant over time and certainly not short duration, although with the same function [1-4].

The main theoretical models that have followed over time to explain emotion summarized below: [1].

1) *The physiological theories, by James (1884) and Lange (1885) -peripheral theory: Cannon (1927) and Bard (1928) -central theory-*. Particularly focused on neurophysiological issues, they supported the fundamental role of the central nervous system and its structures. In essence, changes that occur in the body cause and define emotions, activated by the central nervous system or by the reception from outside of sensory stimuli. In the years 1884-1885, the American psychologist James and the Danish psychologist Lange published, independently of each other, a similar theory of emotion. According to the authors it was necessary to fight the "common sense theory", since we do not cry because we are sad, but we feel sad because we cry. Although they agreed that emotion was the sensation of physiological changes, James and Lange highlighted different physiological mechanisms. For James, the physiological bases of sensation were the viscera (the stomach and heart, for example), facial expressions, motor activity, and muscle tension, whereas for Lange it was changes in heart rate and blood pressure. A few years later, Cannon observed that animals exhibited some emotional behaviors even after lesions had been made in the afferent nerve connections that supplied the brain with feedback from the viscera; he therefore challenged James' hypothesis that visceral sensations are the central ingredient of emotional feelings. As much as James-Lange's theory makes specific predictions about sensations, it is difficult to study them in dogs, which cannot tell anything about their internal emotional experiences. To try to find out whether physiological sensations are necessary to produce emotions, Hohmann, in 1966, interviewed army veterans whose spinal cords had been severed. Some of these men had lesions in the upper part of the spinal cord, so they had lost sensitivity to most of the somatic functions that were produced below the shoulders (sensations from the heart remained, however). These individuals, who were left without visceral and skeletal muscle-related feedback, described having less intense emotional experiences, although they often behaved in an entirely emotional manner. Feelings of genuine fear and anger had decreased. Cannon also stated that visceral changes are very general and too indistinct to get at communicating different emotions. Schwartz and his colleagues, in 1981, studied thirty-two college students who had been trained to fake certain situations. These researchers recorded the subjects' blood pressure and heart rate as they imagined going up and down stairs while feeling happy, sad, angry, scared or relaxed. The results indicated that after imagining a state of anger, diastolic blood pressure was higher than when they had imagined all other emotions. It appeared, therefore, that diastolic blood pressure increased significantly when subjects were actually angry, as was the case in Ax's (1953) research, or even if they imagined being angry. Furthermore, when in the research of Schwartz and his colleagues, college students had practiced mimicking a state of anger, their heart rate accelerated more than usual. On top of that, their systolic blood pressure also increased, and it remained abnormally elevated even after they were done staying in that state. In the late 1950s, cognitive psychologists expanded on this view, suggesting that the most important factor in the emotion we

feel is the way we evaluate and interpret situations; in essence, it is not the environment itself that affects us, but the way we represent the environment to ourselves.

2) *Watson's behaviorist theory (1913)*: Emotion is a peripheral response of the organism to peripheral stimuli. He thus identifies three basic emotions, such as fear, anger and love. The basis of his theory was therefore that all other emotions are established in the organism through a process of conditioning from these three primitive emotions.

3) *The evolutionary theories of Darwin (1872), Ekman (1972) and Cowen-Keltner (2017)*: For Darwin, emotion was an adaptive factor for the survival of the species, as it predisposes the organism to react effectively to the situations that elicited the emotion. Ekman, echoing these studies, compiled the list of primary and secondary emotions, devoting his studies primarily to facial expressions. In particular:

- a) The 6 "basic emotions" are: anger, fear, sadness, joy, surprise and disgust. They result from an automatic cognitive evaluation, without introspection or self-awareness, arise quickly and are of short duration, are essential for evolutionary processes and have universal expressive signals, appearing early in the individual development of the person;
- b) The "emotions" are triggered by external situations that solicit an inner perception and can be "functional" or "dysfunctional", depending on whether they allow to react immediately or create a wrong manifestation (for example, paralysis, inability to cope with the circumstance, helplessness).
- c) Each emotion has its own way of expressing itself and a different intensity;
- d) One can dissimulate or falsify an emotion, using lying as a means to achieve the result; however, facial microexpressions betray this behavior.

Cowen and Keltner have also intervened on this topic, theorizing on the same model recognizing the presence of 27 distinct emotional categories, with a specific gradient [5].

4) *The bifactorial theory of Schachter and Singer (1964)*: Emotion is the summation of two components: a) Physiological (state of activation - arousal); b) Cognitive (perception + attribution of meaning). Schachter formulated a theory that for more than two decades has remained the dominant interpretative model of emotion. Included in his theory are both Arnold's emphasis on cognitive evaluation and James' emphasis on physiological sensations. For this reason, Schachter's model is referred to as the "two-factor theory." According to Schachter, we experience an emotion when we choose a cognitive label to designate a diffuse state of physiological activation to which we name a particular sensation. Unlike James, Schachter does not advance the hypothesis that physiological sensations are emotions and that each emotion is accompanied by differentiated physiological changes. Instead, Schachter suggests that the state of activation is merely a generalized activation of the



autonomic nervous system until we cognitively link it to an interpretation related to an emotion. In essence, sensations are like a jukebox, an analogy also suggested almost in the same years by George Mandler (1962). If the coins do not set the machine in motion, no record will be played; but once the jukebox is set in motion, we can choose which song to listen to. Setting the machine in motion with coins is a process analogous to physiological activation. Activation determines the intensity of an emotional experience. The process of selecting a record is analogous to cognitive evaluation and produces the quality of the emotional experience. In a classic experiment, Schachter and Singer subjected the two-factor theory to verification. Their work had been anticipated in part by an observation made almost forty years earlier by Maranon in 1924, who had observed that an injection of adrenaline does not cause genuine reactions, even though it produces a state of physiological activation. But Maranon also reported an interesting anecdote. Before giving the injection, he would sometimes talk to subjects about the loss of their parents or a sick child. When they were in a physiological state of nonactivation, the participants in the experiment would calmly address these topics. When, however, Maranon proposed the same topics after the injection, the subjects expressed much more intense feelings. According to Maranon, thoughts that were harmless in a tranquil state provoke emotions during the physiological activation produced by adrenaline. Schachter and Singer deduced that Maranon's subjects understood that their sensations were caused by a drug and therefore did not tend to interpret their state of activation as the sign of an emotion. In their predictions, subjects who had not been given an adequate explanation for their activation state would have looked for the cause in the immediate situation, i.e., they would have thought they were actually feeling emotions instead of the "as if" emotional states reported by Maranon's subjects. Schachter and Singer told their subjects that they had been recruited for an experiment to evaluate the effects of a vitamin product, Suproxin, on vision. The control group was injected with a placebo, i.e., an inactive substance. The remaining subjects were then divided into three groups (those informed, those uninformed, and those inadequately informed) all of whom received a small dose of adrenaline. The informed group was told to expect certain effects from Suproxin, including altered heart rate and tremors (the effects actually produced by adrenaline). The uninformed group was told by the investigators that Suproxin was a very mild drug that produced no effect. Finally, to the inadequately informed group they told them to expect some unlikely effects, such as numbness in the feet, itching, and mild headache. Schachter and Singer expected that the subjects in the last two groups, who had not received satisfactory explanations for the state of activation they would enter, would search the environment for clues as to why they felt so activated. The researchers provided some clues by using an accomplice who pretended to be a student waiting to take the vision test and behaved in a way that elicited euphoria or anger. In the euphoric condition, he laughed and joked, played hula hoops, and invited subjects to participate in the game. In the anger condition, the accomplice and subjects were seated next

to each other and had to complete a five-page, very personal questionnaire. As they completed the questionnaire, the accomplice became increasingly irritated, eventually tearing up the questionnaire and rushing out of the room. The results of the experiment confirmed the researchers' expectations in many ways. Those who had not received information or had received inadequate information tended to assume the mood of the accomplice: they complained in the situation that produced a state of anger and behaved frivolously in the euphoric one. Informed subjects, who knew how to explain their state of physiological activation, tended to a lesser extent to imitate the accomplice. Some of the findings made by Schachter and Singer, however, do not coincide with the two-factor theory. For example, the control group (subjects who had been given a placebo and experienced no activation) appeared angrier than the informed ones. In an attempt to resolve this discrepancy Schachter and Singer advanced the hypothesis that a placebo does not prevent the occurrence of an activation state.

Neurobiological profiles

Emotions are therefore complex responses of the organism to appropriate stimuli, which are manifested with specific repertoires of actions and changes in the internal state that can be observed and measured, as they generate a series of complex responses by the organism and are expressed through the activation of different brain structures, cortical and subcortical. In particular [4-12].

- a) **Medial prefrontal cortex:** It is the area of social information processing (empathy). The dorsal (posterior) part is involved in the representation of the thoughts and feelings of others, while the ventral (frontal or anterior) part is involved in self-awareness and the formation of optimistic and positive thoughts. One of the famous cases is Phineas Gage, foreman during the works of a station, and accidentally injured by a metal plate that pierced his brain just in that area, transforming him from a polite and diligent person to childish and lacking in empathy and social inhibition.
- b) **Orbitofrontal cortex:** It is part of the empathy circuitry, where if damaged it prevents the victim from judging the pragmatic aspects and understanding the painful signal, effectively losing social judgment as well (and becoming a social disinhibitory).
- c) **Cingulate cortex/anterior insula:** Activated when experiencing pain or observing it in others, playing an important role in awareness of self and others and in recognizing feelings such as happiness, disgust, and pain.
- d) **Temporo-parietal junction:** It is activated when judging someone's intention and beliefs, including monitoring of self and others. Stimulation of this area can cause a feeling of someone's presence even if they are not physically there (e.g., ghosts, out-of-body experience).
- e) **Superior temporal sulcus:** It is activated when one has to

monitor the direction of a gaze, being involved in the observation of biological movement.

- f) *Somato-sensory cortex*: It is activated when one has to encode a tactile experience, painful or not.
- g) *Frontal operculum*: This is the area of processing empathy, encoding others' intentions and goals, and producing fluent language (where if damaged it produces Broca's aphasia).
- h) *Inferior frontal gyrus*: Under the operculum is this large area that is intended for the recognition of facial emotions; in fact, the anterior insula processes disgust, the ventral striatum processes happiness, the supplementary motor cortex processes anger while in other areas including the hypothalamus sadness is processed.
- i) *Inferior parietal lobule*: Connected with the structures in points g) and h), the lobule is the third part of the system of "mirror neurons", which are activated when we follow an action or watch an action performed by others in the same direction. It is involved in mirroring the actions and emotions of others;
- j) *Amygdala*: It is located in the limbic system, below the cortex. It is involved in emotional learning and regulation of emotions, including fear.
- k) *Subcallosal cingulate cortex*: Site of the reworking of sadness.

Perrotta Human Emotions Model (PHEM): The theoretical model and clinical applications

The model under consideration, *Perrotta Human Emotions Model (PHEM)*, assumes that the models proposed so far have the following criticalities: a) They are reductive in listing emotions and emotional states. b) They do not take into account, in a structured and orderly way, the difference between sensations, perceptions, emotions, sentiments, affections, needs and instinctual drives. c) They do not emphasize the role of anxiety in the functional and dysfunctional mechanisms of emotion. d) They do not examine the psychopathological implications of dysfunctional emotions. e) They do not analyze the distinction between emotional state and emotional-behavioral reaction.

To address these needs, the PHEM was structured according to the following assumptions:

1) The Perceptual System (or Functioning): The Perceptual System (or Functioning) of a person is composed of two areas: a) "the sensory area", i.e. the human senses that capture the elements of external space in the form of sensations; b) "the perceptual area", i.e. the processing of sensations according to a process that consists of three phases: the elaborative moment, the normative moment and the restitutive moment. In the first moment, the elaborative one, the sensory signal captured by one of the human senses is transmitted following the neuroanatomical pathways according to the sense involved in the specific process; in the second moment, the normative

one, the first elaborated perception is confronted with a whole series of psychic elements of the mind, which shape it according to them, i.e. the emotions managed by the "Self" (first function of the ego), the defense mechanisms managed by the "Superego" (second function of the ego), on which then the internal system of needs is based, the personal constructs (of experiential derivation), the beliefs and the conditioning social influences [13]; in the third moment, the restitutive one, a new perceptual elaboration is thus returned with respect to the one obtained from the sensations, which may suffer not only from registration errors arising from sensory distortions but also from systematic errors and dysfunctional psychic processes arising from psychopathological conditions. For these reasons, this process is always considered subjective and unique, because it cannot be duplicated or repeated by another person in its final result [14].

2) The role of anxiety in the perceptual process: Generally, the role of dysfunctional anxiety in different psychopathological conditions and how it fuels them is discussed. Rarely, in the clinical setting, is the role of functional anxiety exalted, namely that mechanism of psychophysical activation that allows us to interact with external and internal space through cognitive and adaptive activation: in fact, anxiety allows us to activate different cognitive processes [15], such as attention and perception; it allows us to react to external events according to adaptive mechanisms of attack-escape and emergence (in the presence of a threat or danger); it allows us to put in place emotional-behavioral reactions necessary for adaptation with the external environment; it allows us to trigger adaptive cardiovascular and neurovegetative body mechanisms [16]. It becomes dysfunctional [17] only when the Self (first ego function) fails to manage primary emotions and these dysfunctionally hyperactivate defense mechanisms managed by the Superego (second ego function), favoring exaggerated reactions up to real chronic psychopathologies such as anxiety disorder and panic attacks [18]. Therefore, in the proposed model, anxiety is not considered an emotion but returns to be that functional and adaptive mechanism, in itself neutral, in line with neurobiological dictates, which allows adaptation to the environment; in essence, the feeding of the whole circuit that becomes an enhancer of dysfunctionality and maladjustment only if the management of the specific basic emotion is such.

3) The distinction between "emotional states" and "emotional-behavioral reactions": The proposed model is structured on the basis of a continuous process that originates from sensations (captured by the sense organs) and evolves into perception, thanks to anxiety (functional) that intervenes as a fluidifying and activating mechanism of human cognitive processes. At this point, perception (as a reprocessing of sensation) is confronted in its final and restitutive version with the "normative content" of the person (Super-Ego, according to the new PICI-2 theorization) [19-25], which is formed from birth and over the years starting from attachment content [26] to continue with family and relational models [27], ego defense mechanisms (which are activated on the basis of primary emotions) [28], the internal system of needs, personal



constructs (experientially derived), beliefs, and conditioning social influences [13], up to psychological traumas and their dysfunctional adaptations [29]. In this process, the role of

emotional states (or emotions) is central, since it is thanks to them if we have the emotional-behavioral reactions, with respect to internal and external stimuli: in essence, the

Table 1: Emotional states and emotional-behavioral reactions.

EMOTIONAL STATE (EMOTIONS)	EMOTIONAL-BEHAVIORAL REACTIONS		
	Sentiment FIRST-LEVEL (+ Anxiety)	Sentiment SECOND-LEVEL (Recombined)	Sentiment THIRD-LEVEL (Empowered)
Anguish	Fear	Insecurity	Impotence
Anguish	Fear	Concern	Terror
Anguish	Fear	Incredulity	Shock
Anguish	Fear	Awe	Avoidance
Anguish	Fear	Awe	Subjugation
Anguish	Anger	Aggressiveness	Resentment
Anguish	Anger	Nuisance	Irritation
Anguish	Anger	Wrath	Fury
Anguish	Anger	Wrath	Revenge
Anguish	Anger	Refusal	Embarrassment
Anguish	Sadness	Sorrow	Melancholy
Anguish	Sadness	Regret	Nostalgia
Anguish	Sadness	Regret	Regret
Anguish	Guilt	Shame	Repentance
Anguish	Guilt	Shame	Forgiveness
Anguish	Guilt	Remorse	Displeasure
Anguish	Frustration	Aversion	Intolerance
Anguish	Frustration	Stagnation	Confusion
Anguish	Frustration	Stagnation	Languish/Complaint
Anguish	Loneliness	Boredom	Exasperation
Anguish	Loneliness	Boredom	Emptiness
Anguish	Disgust	Indignation	Disdain
Anguish	Disgust	Indignation	Take pity on
Anguish	Disappointment	Refusal	Hostility
Anguish	Disappointment	Refusal	Abandonment
Anguish	Disappointment	Disillusionment	Selfishness
Anguish	Disappointment	Disillusionment	Disloyalty
Anguish	Disappointment	Disillusionment	Cynicism
Anguish	Disappointment	Antipathy / Dislike	Animosity
Anguish	Disappointment	Contempt	Hate
Anguish	Disappointment	Contempt	Humiliation
Anguish	Disappointment	Self-Destruct	Self-injury
Anguish	Disappointment	Self-Destruct	Submission
Anguish	Disappointment	Self-Destruct	Domination
Anguish	Disappointment	Self-Destruct	Abasement
Anguish	Disappointment	Resentment	Enmity
Anguish	Disappointment	Resentment	Degradation
Anguish	Disappointment	Resentment	Envy
Anguish	Disappointment	Resentment	Ingratitude
Anguish	Disappointment	Resentment	Malevolence
Anguish	Disappointment	Resentment	Wickdness
Anguish	Disappointment	Resentment	Irriverence
Anguish	Disappointment	Resentment	Disrespect
Anguish	Disappointment	Resentment	Haughtiness
Anguish	Disappointment	Apathy	Resignation
Anguish	Disappointment	Apathy	Indifference
Anguish	Disappointment	Distruct	Dishonesty
Anguish	Apprehension	Torment	Despair
Anguish	Suspiciousness	Mistruct / Skepticism	Discomfort / Discouragement



Pleasure	Surprise	Curiosity	Wonder
Pleasure	Surprise	Amazement	Disconcert / Bewilderment
Pleasure	Surprise	Amazement	Incredulity
Pleasure	Surprise	Amazement	Astonishment
Pleasure	Interest	Desire	Fascination
Pleasure	Interest	Attraction	Infatuation
Pleasure	Interest	Affinity	Sympathy
Pleasure	Interest	Affinity	Confidence
Pleasure	Interest	Pathòs	Friendship
Pleasure	Interest	Pathòs	Emulation
Pleasure	Interest	Pathòs	Imitation
Pleasure	Interest	Pathòs	Adoration
Pleasure	Interest	Pathòs	Admiration
Pleasure	Interest	Pathòs	Devotion
Pleasure	Interest	Pathòs	Dedication
Pleasure	Interest	Pathòs	Sharing
Pleasure	Interest	Pathòs	Goodness
Pleasure	Interest	Pathòs	Trust
Pleasure	Interest	Pathòs	Honesty
Pleasure	Interest	Pathòs	Sincerity
Pleasure	Interest	Pathòs	Loyalty
Pleasure	Interest	Pathòs	Respect
Pleasure	Interest	Pathòs	Altruism
Pleasure	Interest	Pathòs	Faith
Pleasure	Interest	Pathòs	Comprehension
Pleasure	Interest	Pathòs	Gratitude
Pleasure	Interest	Pathòs	Gratefulness
Pleasure	Interest	Pathòs	Empathy
Pleasure	Interest	Animic passion	Love
Pleasure	Interest	Commotion	Pietàs
Pleasure	Interest	Commotion	Compassion
Pleasure	Interest	Commotion	Clemency
Pleasure	Interest	Commotion	Mercy
Pleasure	Interest	Commotion	Benevolence
Pleasure	Joy	Pride	Honor
Pleasure	Joy	Pride	Fierceness
Pleasure	Joy	Self-love	Dignity
Pleasure	Joy	Cheerfulness	Hilarity
Pleasure	Joy	Cheerfulness	Euphoria
Pleasure	Joy	Cheerfulness	Enthusiasm
Pleasure	Joy	Cheerfulness	Entertainment
Pleasure	Joy	Serenity	Fulfillment
Pleasure	Joy	Serenity	Relief
Pleasure	Joy	Happiness	Satisfaction
Pleasure	Joy	Restlessness	Agitation
Pleasure	Joy	Exagitation	Frenzy
Pleasure	Modesty	Decency	Discretion / Confidentiality
Pleasure	Modesty	Decency	Humility

"emotional states" (or emotions) are basic modalities that our mind knows (and "installed" by default) thanks to which we manage to adapt to internal and external circumstances, while the "emotional-behavioral reactions" (or sentiments) are subjective emotional experiences experienced by the person thanks to the interaction of basic emotions with anxiety, and/or with the combination of two or more basic emotions. In particular, these are conceived as follows (as reported in the attached Table No. 1): a) the "first-level sentiments" originate from the recombination between a basic emotion, dysfunctionally managed and maladaptive, and anxiety; b) the "second level sentiments" originate from the recombination of the first level feelings with the second basic emotion or with a first level sentiments; c) "third level sentiments" originate from the recombination of second level sentiments

with a third sentiments or simply from the dysfunctional and maladaptive enhancement of first and second level sentiments. It is a model that guarantees both the structural and functional continuity between emotions/emotional states and sentiments/emotional-behavioral reactions, but above all it explains the complexity of emotional thinking with the possibility of experiencing -starting from one of the two basic emotions- one or more sentiments, even simultaneously, and then always coming to prefer a single way of expression.

4) *The distinction between "sensation", "perception", "anxiety", "emotion", "sentiments", "affect", "need", "desire", "necessity", and "instinctual drive":* In summary: the "sensation" is the result of the interaction between the sense organ and the restitution of the content; the "perception" is the

reprocessing of the sensation, and it can be of first level (when the sensation is processed in the neurobiological phase) or of second level (when the sensation processed neurobiologically passes a second evaluation screen by the normative content of the person, and then be returned through the behaviors); the "anxiety" is the circuit feeder; the "emotion" is a basic modality that allows us to adapt to internal and external circumstances; the "sentiments" is an emotional-behavioral reaction or subjective emotional experience lived by the person thanks to the interaction of basic emotions with anxiety, and/or with the combination of the sentiments, always with the aim of perfecting one's adaptation; the "discomfort" is a state of soul, such as tension or hypoactivity/hypoactivity, that occurs when a person experiences different feelings, based on factual situations; the "affection" is a feeling of attachment to someone or something, even material, exclusively related to the basic emotion of pleasure and in particular (but not exclusively) to friendship and love feelings; the "need" is the instinctive impulse that arises to satisfy a desire and presupposes a state of need that if not satisfied brings suffering and frustration the "desire" is the object of the need; the "necessity" is the degree of importance and urgency that need goes to satisfy; the "instinctual drive (or impulse)", differently in part from the Freudian concept, is any conscious or unconscious manifestation of a need. This construct is therefore based on the idea that every action/behavior arises from a need (or instinctual drive) that seeks satisfaction [30].

5) Theoretical model: The proposed model suggests the list of 2 basic emotional states (or emotions), 14 first-level emotional-behavioral reactions (or feelings), 42 second-level and 96 third-level, for a total of 2 basic emotions and 152 feelings [Table 1]. The reason that justifies the presence of only two basic emotions ("anguish", understood as the absence of pleasure, and "pleasure" understood as the absence of anguish) is given by the fact that all of them can be linked to these identified: from distress derive fear, anger, sadness, guilt, disgust and many others, unlike their location in other theoretical models where they responded to an autonomous need for emotional representation; in fact, on closer inspection, all of them originate precisely from distress that, dysfunctionally managed, gives rise to being, in cascade. Just like the Freudian duality of the reality principle (conscious) and the pleasure principle (unconscious), here the same pattern insists: anguish for reality and pleasure for pleasure, where anguish is the consequence of not being able to satisfy regardless of one's desires as imagined, and pleasure is the origin of the human unconscious structure, understood as the realization of whatever one wants without limits, boundaries and consequences. So there are 2 basic emotions, which cascade into 152 sentiments, which we are often accustomed to call improperly as emotions. The proposed model therefore takes into account, complementing each other, both the dysfunctional sentimental components and the functional sentimental components; the distinction lies therefore in the case-by-case evaluation of the adaptive effects of these emotional states and these emotional-behavioral reactions.

6) Clinical applications of the PHEM model: Referring therefore to the PICI-2 model [19-25] and to the role of anxiety

as a natural activator and/or enhancer (and not as a basic emotion, as erroneously believed until now), the origin of all psychopathologies [3,5,31-61], according to the model under examination, is to be found in the dysfunctional management of one or both basic emotions (anguish and pleasure) and not in anxiety: in fact, working in psychotherapy on basic emotions allows to unlock anxiety (and not inverse) and consequently the vicious circle that feeds the psychopathological condition [62-64]. Obviously, the more deeply rooted the problem is and the more one is not master of one's "emotional alphabet", the more complicated it will be to unravel the knot at the origin of the dysfunctional condition [14]. The paradigm at the base of PHEM is therefore to work directly on the emotional alphabet of the person and on the analysis of their emotions, to intervene indirectly on the anxiety that feeds and enhances the toxic, inattentive, dysfunctional and pathological pattern.

Conclusions

The *Perrotta Human Emotions Model (PHEM)* responds to the need for a better structuring, in a functional framework, of emotions and feelings, giving the right role to anxiety, according to a neurobiological perspective, in a strategic scheme that originates from sensations (captured by the sense organs) and evolves into perception, thanks to anxiety (functional) that intervenes as a fluidifying and activating mechanism of human cognitive processes.

At this point, the perception (as a reprocessing of the sensation) is confronted in its final and restitutive version with the "normative content" of the person (superego, according to the new PICI-2 theorization), which is formed since birth and over the years starting from the contents of attachment to continue with family and relational models, the defense mechanisms of the ego (which are activated on the basis of primary emotions), the internal system of needs, personal constructs (experientially derived), beliefs and social influences conditioning, until psychological trauma and their dysfunctional adaptations.

In this process, the role of emotional states (or emotions) is central, as it is thanks to them that we have the emotional-behavioral reactions, with respect to internal and external stimuli: in essence, the "emotional states" (or emotions) are basic modalities that our mind knows (and "installed" by default) thanks to which we manage to adapt to internal and external circumstances, while the "emotional-behavioral reactions" (or sentiments) are subjective emotional experiences experienced by the person thanks to the interaction of basic emotions with anxiety, and/or with the combination of the sentiments. In particular, these are conceived as follows (as reported in the attached Table 1).

- a) The "first-level sentiments" originate from the recombination between a basic emotion, dysfunctionally managed and maladaptive, and anxiety;
- b) The "second level sentiments" originate from the recombination of the first level feelings with the second basic emotion or with a first level sentiments;



- c) "Third level sentiments" originate from the recombination of second level sentiments with a third sentiments or simply from the dysfunctional and maladaptive enhancement of first and second level sentiments.

Referring therefore to the PICI-2 model and to the role of anxiety as an activator and/or natural enhancer (and not as a basic emotion, as erroneously believed until now), the origin of all psychopathologies, according to the model under examination, is to be found in the dysfunctional management of one or both basic emotions (anguish and pleasure) and not in anxiety: in fact, working in psychotherapy on emotions (first) and feelings (later) allows to unlock anxiety (and not inverse) more easily and consequently the vicious circle that feeds the psychopathological condition. So, if the management of anxiety will be unbalanced, it will be enough to work on pleasure and on the instinctive and irrational part; if instead it will be the pleasure to be unbalanced, it will be enough to work on anxiety and on the empowerment of the Self.

Obviously, the more the problem is rooted and you are not masters of your "emotional alphabet", the more it will be complicated to unravel the knot at the origin of the dysfunction.

The paradigm at the base of PHEM is therefore to work directly on the emotional alphabet of the person and on the analysis of their emotions, to intervene indirectly on the anxiety that feeds and enhances the toxic, inattentive, dysfunctional and pathological pattern.

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