



The Heidelberg Model of Traditional Chinese Medicine-A Systematic View on Emotions

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Introduction

Since antiquity, the scientific community has discussed the role of emotions in life and human health [1]. The development of bio-engineering and neuroscience allowed us to glimpse the monistic mind-body relationship of the human being, which was confirmed with the interaction between the organic (including vegetative changes) and psychological dimensions of the humans [2-4]. Nowadays, models of emotional processing, such as the model proposed by the neuroscientist Antonio Damasio, assume that emotions are reflected in the body, and they have a crucial action in the coordination of behavior and physiological states during the events [5-9]. The current scientific evidence suggests that changes of state of the body are mapped topographically in the central nervous system

(CNS) and are triggers for corrective physiological responses. These answers are interrupted when the homeostatic deviation has been rectified [6]. As stated by António Damásio, the awareness of emotions is based on the neural representation of bodily cognitions, with 'somatic markers' evoking feeling states that influence cognition and behavior [10,11]. Emotions arise, prevail, and mobilize this complex neural mechanism. They directly report the beneficial or disadvantageous nature of a physiological event that facilitates learning of the conditions that led to homeostatic imbalances and their respective corrections, allowing future anticipation of adverse (withdraw) or favorable conditions (approach) [6].

Traditional Chinese Medicine

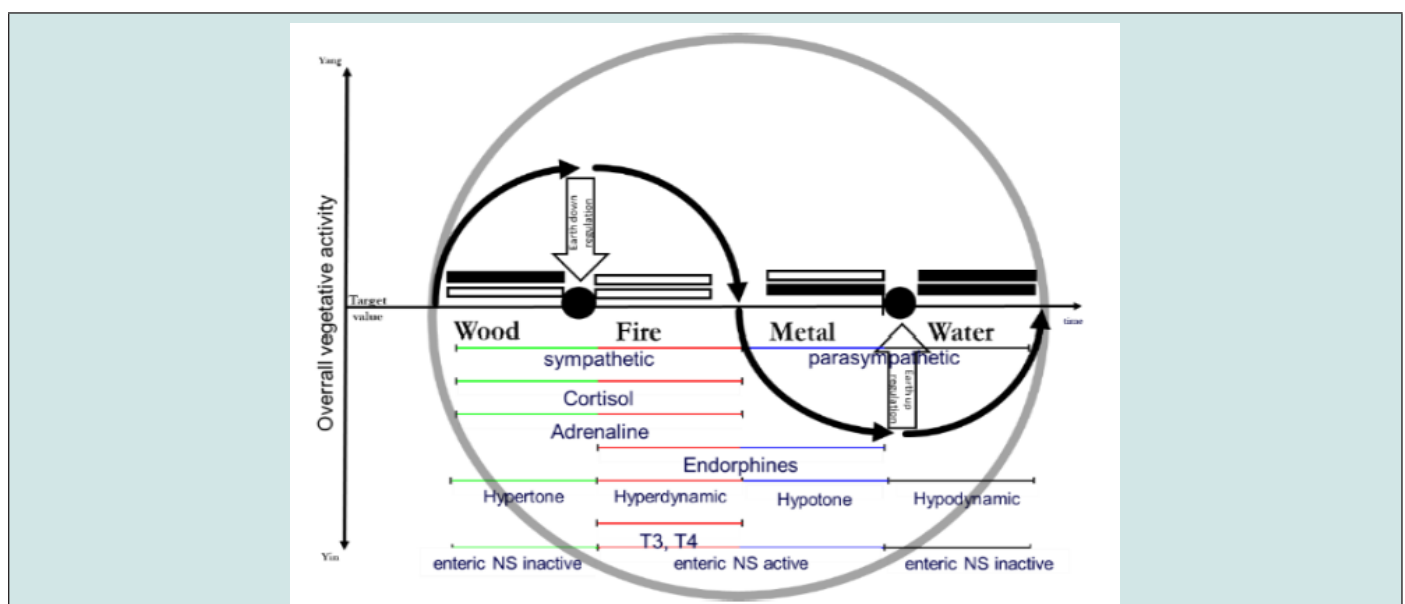


Figure 1: Sinusoidal curve of postulated physiological mechanisms of the phases and vegetative functional mechanisms (adapted from Greten 2017).

For thousands of years, Traditional Chinese Medicine (TCM) recognized emotions as part of patterns, in a continuum among body, biotypology and mind, which lead to systemic functional diagnosis and treatment strategies. The so-called Heidelberg's model (HM) of TCM, defines it as a system of findings and sensations designed to establish the patient's functional vegetative state [12]. In this model, the classic concepts of TCM are integrated into the knowledge of Western medicine [13,14]. The circular description of lifelong regulation processes is described throughout a sinusoidal curve and by analogy with human physiology, the "phases" (or elements) are described as vectors of physiological and functional action, in which the "earth phase" assumes the homeostatic target value (Figure 1).

In terms of vegetative action, in the yang phases, sympathetic functions dominate more than in the yin phases whereas in the yin phases, parasympathetic activity is relatively more present (Figure 1) [13,15]. The application of this cybernetic model to the autonomic nervous system, results in a categorization of "organic patterns" called "orbs" (equivalent to Zang-Fu), a physiological response with neurovegetative origin [15,16]. In TCM, each "orb" is related to regions of the body, a somatotopic representation. Thus, each "phase", "orb" and the corresponding emotion, will manifest itself in accordance with its characteristics in different somatotopic

areas of the body, which reminds us of Carl G. Carus' theory about constitutions. Therefore, TCM is essentially based on a system that describes functional anomalies through the analysis of signs and symptoms that arise from neurovegetative activity, also reporting the bio-psycho-behavioral activity (Table 1). The HM of TCM conceptualizes emotions as neuro-emotional vectors of the "phases", which reflect a vegetative experience of being, exerting a network role in the overall of mental impulses [13,15,17] where emotions consist of vectorial movements arising from the center, ("e-motion") expressing a certain "phase", a vegetative functional tendency (Figure 2) [13]. Moreover, an emotion is the component that comes out of actions, whereas a feeling is the component that comes out of our perspective on those actions [13]. In addition, emotions are an integral part of reasoning and decision-making processes [18,19]. Paraphrasing, Henry Greten (2012), "emotions are vectorial movements that reflect the vegetative experience of being, and in turn interact globally and dynamically with neuro-cortical impulses" [20] (Figures 2 & 3). Within this system of the phases, a coordinate system of emotions can be elaborated (13), a two-part system of behavioral action and inhibition may be discriminated (Figures 2 & 3) as well as the analysis of compensated or decompensated behavioral manifestations of each "phase" (Table 1).

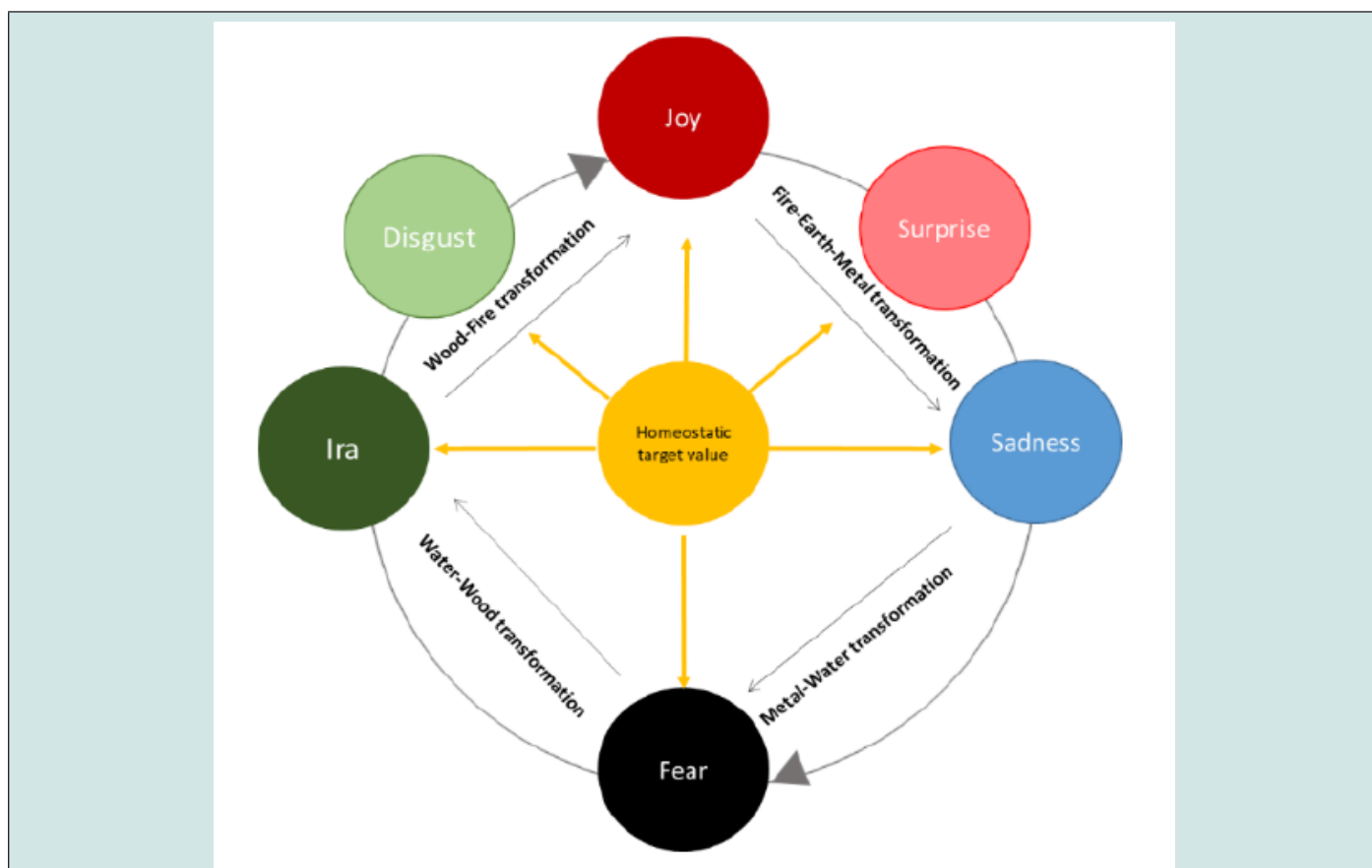


Figure 2: Emotion as a vectorial movement that arises from the center, in a direct relationship with the regulatory system of the phases. The homeostatic target value corresponds to the "earth" phase (Greten 2007).

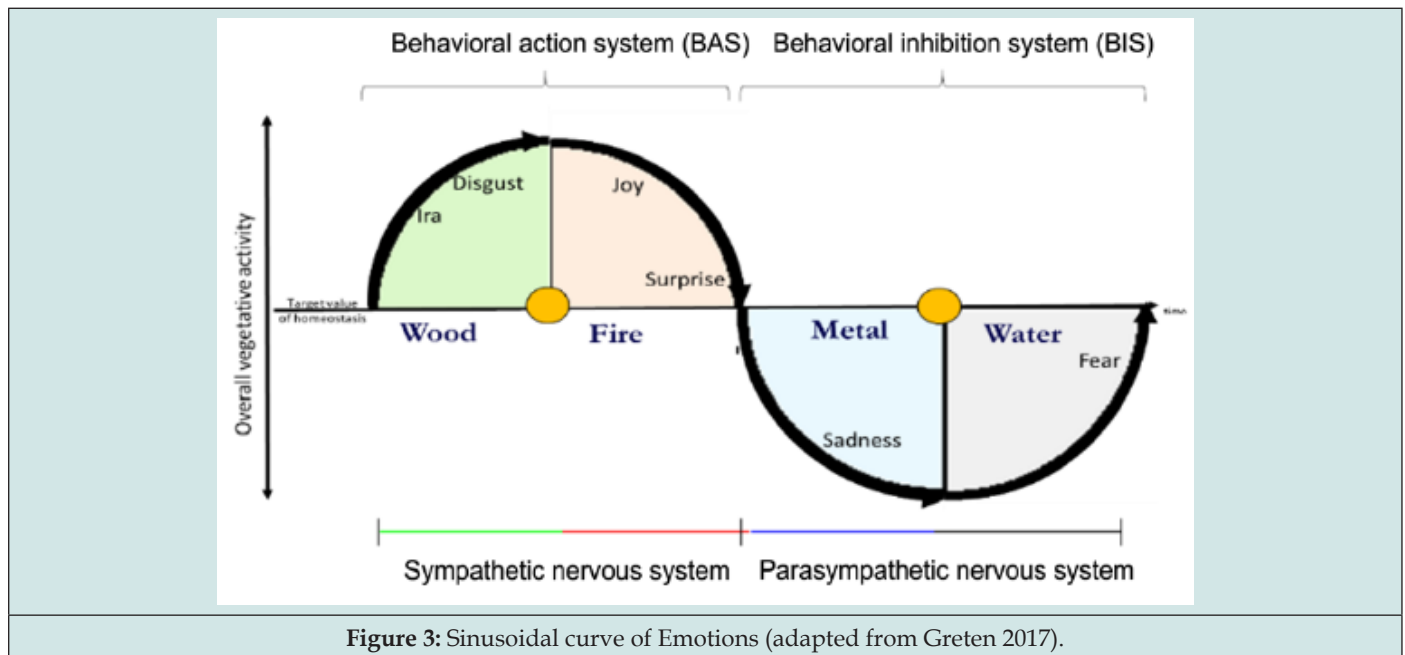


Figure 3: Sinusoidal curve of Emotions (adapted from Greten 2017).

Table 1: Chinese emotional patterns and behavior manifestations.

Emotion	Corresponding phase	Behavior when compensated (around target value)	Behavior when decompensated (away from target value)
Anger (<i>ira</i>)	Wood phase	Initiative, autonomy, authority, and ambition. Good muscle tonus	Choleric and aggressive Hypertonus
Disgust	Late wood	Good avoiding behavior; assertive	Haughtiness, arrogance. Asymmetry
Euphoria (joy)	Fire phase	Creative, enthusiastic, communicative, flexibility	Egocentricity, maniac-depressive and borderline; Hyperdynamic.
Surprise	Late fire	Proactive; can direct attention to different actions.	Impulsive gestures, accelerated speech; unfocused; Blush face
Sadness (<i>maeror</i>)	Metal phase	Symbiotic, receptive; relax	Diminished self-esteem, over, over-sensibility or introversion. Hypotonus
Fear	Water phase	Rational	Rigid and compulsive

Conclusion

In conclusion, there are numerous analogies between the Chinese classic model of emotionality and modern western psychology and neurophysiology. Considering the recent theories about emotions and the theories of TCM, especially the HM, we realize that the common points are more than the differences between the western/allopathic and eastern/holistic models of human health. In fact, in recent years these models tend to converge in their conceptions of emotions. This realization leads us to believe that future comparative studies should be carried out, as they will most probably allow a better understanding of the human mind.

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