

THEORETICAL STUDY

Features analysis of five-element theory and its basal effects on construction of visceral manifestation theory

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Abstract

OBJECTIVE: To study the Chinese ancient five-element theory, one of the philosophical foundations of Traditional Chinese Medicine (TCM) theory construction, from the perspective of contemporary cognitive science, and to reveal the important functions of five-element theory in the construction of TCM theory.

METHODS: The basic effects of five-element theory in the construction of TCM theory are intensively expounded and proved from the following aspects: embodiment of five-element theory in cognizing the world, quasi axiom of five-element theory in essence, classification theory of family resemblance and deductive inference pattern of five-element theory, and the openness and expansibility of five-element theory.

RESULTS: If five-element theory is considered a

cognitive pattern or cognitive system related to culture, then there should be features of cognitive embodiment in the cognitive system. If five-element theory is regarded as a symbolic system, however, then there should be a quasi-axiom for the system, and inferential deduction. If, however, five-element theory is taken as a theoretical constructive metaphor, then there should be features of opening and expansibility for the metaphor.

CONCLUSION: Based on five-element theory, this study provides a cognitive frame for the construction of TCM (a medicine that originated in China, and is characterized by holism and treatment based on pattern identification differentiation) theory with the function of constructing a concept base, thereby implying further research strategies. Useful information may be produced from the creative inferences obtained from the incorporation of five-element theory.

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Key words: Five phases theory; Cognition; Metaphor; Visceral manifestations

INTRODUCTION

Over thousands of years of the historical accumulation of traditional Chinese culture, a unique philosophical ideological system of cognizing the world was formed. Five-element theory, which arose during the Chinese Warring States period (475-221 BC), is one of the outstanding representatives of this unique system. Through long-term development and living practices, the Chinese ancients recognized that wood, fire, earth,

metal, and water are five indispensable, basic material elements of nature. The ancients summarized them as the "five materials," and it was deduced that everything in the real world is produced by the motions among and variations of these five basic material elements. Among these elements, there are relationships of mutual generation and mutual restriction. The basic view of five-element theory is that the material world can be kept in a dynamically balanced state through these relationships. Just as the foundation of modern medical theory relies on the Western philosophical ideological system, the foundation of Traditional Chinese Medicine (TCM, a medicine that originated in China, and is characterized by holism and treatment based on pattern identification differentiation) theory also depends on the Chinese traditional philosophical system. Therefore, in the process of establishing the TCM theoretical system, five-element theory was introduced and applied naturally. In developing and improving the processes of TCM, the significance of the material elements gradually weakened and faded, while the significance of methodology was strengthened and became more prominent, such that it evolved as a basic thinking model and theoretical framework for Chinese medicine with respect to cognizing human physiology and pathology. Therefore, five-element theory is both a cognitive pattern and cognitive system related to traditional Chinese culture. Regarding its influence on TCM theory, five-element theory is a theoretical constructive metaphor with full clairvoyance; that is, it does not simply serve a simple explanatory function, but it directly participates in scientific theoretical construction, such that it can introduce terminologies for future theoretical construction while also serving the function of providing a cognitive framework and constructing a concept base for theoretical construction. For example, to illustrate the physiological functions and interactions among the *Zang-Fu* organs, practitioners of TCM use five-element theory, in which earth, one of the five elements, is matched with the spleen system.¹

EMBODIMENT OF FIVE-ELEMENT THEORY IN COGNIZING THE UNIVERSE

The chief representative of five-element theory in ancient China was Zou Yan during the Warring States period (475-221 BC). However, his original works on five-element theory have been lost, and thus the earliest traceable academic relics are those recorded in volumes of the *Historical Records*, one of the historical classics of ancient China; specifically, in Volume Seventy-four *Biography of Mencius* and Xun Qing, it is recorded that "Zou Yan observed the *Yin-Yang* waxing and waning situation of everything carefully, and recorded the strange and lofty changes, of which there were more than 100 000 words in total, such as Begin-

ning and Ending, mahatma. His words were absurd and unreasonable. You should check tiny things first, and then extend your investigation to larger things, until you reach the boundless."² Here, we should pay special attention to the last part of the statement: "You should check tiny things first, and then extend your investigation to larger things, until you reach the boundless." Without a doubt, the meaning of "checking tiny things first" refers to the act of paying attention to the things which we can accept or perceive at any time from our experience, and then analogizing those experiences to other experiences, including abstract things far away from us. Five-element theory, originating from the five basic material elements of wood, fire, earth, metal, and water, can perfectly embody the viewpoint of the modern cognitive theory of "the mind is involved in the body," that is, the experience of the human body, cognizance, and society form the basis for the creation of a conceptual and linguistic system.³ This viewpoint was also recorded in the famous historical records of ancient China. For example, in *Wengong Seventh Year of Zuozhuan*, it is recorded that the elements of wood, fire, earth, metal, water, and grain are known as the six mansions, and as such they are classified as serving the role of meeting the requirements and enriching the lives of the people, thereby demonstrating their importance to human survival.⁴ In *Xianggong Twenty-seventh Year of Zuozhuan*, it is recorded that "The five materials in nature are all used by people. None of them can be dispensed with."⁵ In *The Book of History*, it is stated that "Water and fire are what people need for their diet; metal and wood are essential for people's cultivation; earth is what the lives of everything relies on."⁶ In *Zheng Stories of The National Affairs*, it is stated that "The earlier emperor thought that everything in the world was the mixture of earth, metal, wood, water, and fire."⁷ From these quotations, we can see that wood, fire, earth, metal, and water were considered the five basic materials of daily use, and that the people could use the five materials to produce all things, thus extending the meaning of the five materials as representing the basic substances that form everything in the world. Material origin theory is based on certain life experiences and practical evidence, and the five basic materials are indispensable in the daily lives of the people.⁸ The process of the development from the five basic materials to the five basic elements can be briefly summarized as follows. In the beginning, wood, fire, earth, metal, and water are referred to as the five natural materials of wood, fire, earth, metal, and water (i.e., as themselves); then, people gradually discover the properties of the five materials and start to consider them at more abstract levels. Then, at the point when people start to use the five materials to explain other things, the materials have evolved into metaphorical concepts, that is, they form a system for extending the imagining of concrete, familiar concepts to the imagining of more abstract, unclear concepts. It is

at this point that the definition of the five elements is obtained — they refer to the movements of the five basic materials of wood, fire, earth, metal, and wood, and as such they become abstract concepts used for explaining the mutual relationships of things. Instead of simply referring to the five basic concrete materials, they now take on wider connotations. Five-element theory is thus used to understand the properties of things or phenomena according to the functions and properties of the five basic materials, and to state and deduce the mutual relationships and rules for interaction among things or phenomena based on the mutual generation and restriction of the five materials.

QUASI AXIOM OF FIVE-ELEMENT THEORY IN ESSENCE

An axiomatic system mainly includes basic concepts, basic hypotheses (axioms), and derived conclusions. For the abovementioned five-element system, wood, fire, earth, metal, and water are the five symbols representing the basic concepts, and the basic hypotheses or axioms are successively generated between every two elements, restricted between every second element, and rebelled every third element. The relationships of five-element mutual generation, restriction, and rebellion form a series of inclusions deduced by the basic concept and axiom of the theory, and through these relationships the axiomatic system is constructed. According to the correctness and conciseness of the theory, the axiom is necessary and reasonable with respect to the rule of internal relationships of basic concepts. D · Hilbert, a German mathematician, has raised three types of evidence of judgment regarding the reasonability of axiomatic systems: independence, completeness, and compatibility. If a proposition can meet the above three conditions, it is an axiomatic system.⁹ The five-element system meets these three conditions.

Basic objects

(a) The five elements comprise a dynamic, self-adjusting system. (b) The five-element system consists of the five subsystems of wood, fire, earth, metal, and water. (c) Each of the five subsystems of can present the three basic states of "moderate Q_i ," "too little Q_i ," and "too much Q_i ." "Moderate Q_i " refers to the object property in which the subsystem represents a "moderate" state, that is, neither "too little" nor "too much." "Too little Q_i " refers to the object property in which the subsystem represents an "inadequate" or "withered" state. "Too much Q_i " refers to the object property in which the subsystem represents a "hyperactive" or "expansive" state.

The basic relationships of the five subsystems

There are basic relationships of generation and restriction among the five subsystems of wood, fire, earth,

metal, and water. The definitions of generation and restriction are as follows.

(a) Generation refers to mutual engendering, promoting, and encouraging. In this generation relationship of the five elements, any element has the capacity to assume one of two sides of a relationship — "generating me" and "I generate." The element that "generates me" is the "mother," while the element that "I generate" is the "child." Therefore, the generation relationship is also called the "mother-child relationship." If there is any abnormality among the generation relationships of the five elements, two situations will appear — "disorder of the mother-organ affecting the child-organ" and "disorder of the child-organ affecting the mother-organ." (b) Restriction refers to mutually restricting, overcoming, and controlling. In this restricting relationship of the five elements, any element has the capacity to assume one of two sides of a relationship — "restricting me" and "I restrict." The element of "I restrict" is "being restricted," while the element that "restricts me" is "restricting." Therefore, the restriction relationship is also called the "defeating relationship." If there is any abnormality among the restriction relationships of the five elements, two situations will appear — "overwhelming" and "rebellion." Overwhelming refers to too much restriction, while rebellion refers to being too restricted. The orders of overwhelming and rebellion are the opposite of the normal restricting orders.

Axiom of combination

(a) In the five subsystems of wood, fire, earth, metal, and water, there is a relationship between any two subsystems. (b) The respective basic states of the five subsystems of wood, fire, earth, metal, and water are as follows: the three states of "moderate Q_i ," "too little Q_i ," and "too much Q_i ," which decide the occurrence of certain relationships.

Axiom of sequence

(a) The generation relationship of the five elements must match the sequences of wood generating fire, fire generating earth, earth generating metal, metal generating water, and water generating wood. (b) The restriction relationship of the five elements must match the sequences of wood restricting earth, earth restricting water, water restricting fire, fire restricting metal and metal restricting wood. (c) The rebelling sequences can be induced from the restriction relationships, that is, wood rebelling metal, metal rebelling fire, fire rebelling water, water rebelling earth, and earth rebelling wood.

Axiom of condition

(a) If the five subsystems of wood, fire, earth, metal, and water all manifest as the state of "moderate Q_i ," then the relationships of generation and restriction will appear among the five subsystems. In such a state of affairs, the five-element system is stable and harmonious. (b) If any one of the five subsystems of wood, fire,

earth, metal, and water manifests as the state of "too little *Qi*" or "too much *Qi*," a series of abnormal relationships of generation and restriction among the five subsystems will appear. In such a state of affairs, the five-element system is disordered and unharmonious.

BASIS OF FIVE-ELEMENT THEORY IN THE CLASSIFICATION OF EVERYTHING — FAMILY RESEMBLANCE

Ludwig Wittgenstein, a 20th Century Western philosopher, discusses family resemblance in Philosophical Investigations: "for the various resemblances between members of a family: build, features, color of eyes, gait, temperament, etc. overlap and criss-cross in the same way."¹⁰ In other words, for the various phenomena of A, B, C, D falling under one concept, there is no unique kind or group of common property, but instead there are the relationships of A resembling B, B resembling C, C resembling D, and so on. In the case of five-element theory's classification of everything, this can be seen not only based on the features of wood, fire, earth, metal, and water, but also based on connecting the two systems of the five orientations and four seasons. In *Four Seasons of Guanzi* (ca. 348 BC), which is honored as the encyclopedia of the Pre-Qin period of China, the following is stated: "The east orientation refers to the stars, and its season is spring. Its *Qi* is called wind, and wind can generate wood and bone. The south orientation refers to the sun, and its season is summer. Its *Qi* is called *Yang*, and *Yang* can generate fire and *Qi*. The center refers to the earth, and it can assist the coming and going of the four seasons. The west orientation refers to the celestial bodies, and its season is autumn. Its *Qi* is called *Yin*, and *Yin* can generate metal and water. The north orientation refers to the moon, and its season is winter. Its *Qi* is called cold, and cold can generate water and blood."¹¹ *Yin* and *Yang* are combined with the five elements, five orientations, and four seasons. In *Book of Rites* (ca. 51-21 BC), a ritual Pre-Qin monograph compiled during the Western Han period, the thoughts appearing in *Four Season of Guanzi* were developed. The changes of the four seasons are explained according to the waxing and waning of the five elements.¹² On this point, Joseph Needham, an English expert of science and technology history, pointed out, "For the concept of the five elements, they are five basic programs instead of five basic materials."¹³ A conclusion can be drawn from the above that everything can be understood according to the five systems of wood, fire, earth, metal, and water, and that, psychologically speaking, the conclusion of such understanding is a kind of "assimilation," which refers to the absorbing of related information from the external environment, and integrating it into cognitive structures (or "schema"), that is, it is a process of integrating the

information from outside stimulation into an original cognitive structure. Thus, the assimilated wood, fire, earth, metal, and water become the properties of the five big families of wood, fire, earth, metal, and water instead of simply the five respective materials. As such, any one of the five big families maintains its family resemblance.

INFERENCE TYPE OF FIVE-ELEMENT THEORY ON THE CLASSIFICATION OF EVERYTHING — DEDUCTIVE INFERENCE

Deductive inference refers to the process of starting with a general premise and obtaining a concrete statement or an individual conclusion by deduction. Syllogism is the general model of deductive inference, including the following three parts: the major premise — the known general principle; the minor premise — the special situation of the particular inquiry; and conclusion — making a judgment about the special situation based on the general principle.¹⁴

The major premise of the five systems of (wood, fire, earth, metal, and water) of five-element theory is the following, in succession:

All things with the functions or properties of growing, ascending and dispersion, and developing freely belong to wood. All things with the functions or properties of warming and rising belong to fire. All things with the functions of bearing, generation and transformation, and reception belong to earth. All things with the functions of cleaning, purification and descent, and astringing belong to metal. All things with the properties of cold, moistening, and moving downward belong to water.

Under the background of this major premise of five-element theory, any thing with any feature of the above "five elements" can be classified into its corresponding element. Taking "the liver belonging to wood" as an example, the deduction is as follows:

All things with the functions or properties of growing, ascending and dispersion, and developing freely belong to wood (major premise). The liver, one of the five viscera in the TCM theoretical system, has the function of free coursing (minor premise). Therefore, the liver belongs to wood (conclusion).

Thus, we can see that the formal structure of a five-element classification inference is:

All things with the property of x or y or z belong to A; a has the property of x; therefore, a belongs to A.

OPENNESS AND EXPANSIBILITY OF FIVE-ELEMENT THEORY

Five-element theory has the feature and form of openness. Compared with the theory of closure, the theory of openness can involve the reader and researcher, that

is, there is ample space in the theory for the reader's thinking and expansion, such that the theory can be further understood and explained. Under a given condition, therefore, the way will become a kind of information source. With the continued intervention of such actors, the purpose of externally radiating information can be realized. Some scholars have probed the abovementioned generating and restricting relations of ecosystems with five-element theory. They have recognized the features of ordering and self-organization of ecosystems, a finding which has resulted in the promotion of the sustainable development of ecosystems.¹⁵ Scholars have also studied the operating mechanisms of information ecosystems in relation to five-element theory. First, they state the operating rules of the elements comprising the information ecosystem, and then they analyze the ways that information and energy move within the ecological chain. Based on inherited concepts related to five-element theory, they structure an operating mechanism model for the information ecosystem. Eventually the following conclusion is drawn: the balance and imbalance within the information ecosystem are the results of the effects of mutual generation and restriction, and mutual overwhelming and rebelling among the elements of the information ecosystem.¹⁶ Thus, the five-element system is open, and its synthetic content can be continuously updated along with changes in time. Therefore, five-element theory can be said to still be full of vitality.

ANALYSIS OF THE BASIC EFFECTS OF FIVE-ELEMENT THEORY IN THE CONSTRUCTION OF VISCERAL MANIFESTATION THEORY

In general, the following three factors are the basic requirements of the Chinese medicine theoretical system. The first is repeated verification in clinical medical practice. The second is close observation of the body's physiological and pathological phenomena. The third is the exploration of the human body's morphological structures. We cannot deny that observations of the body's surface and viscera allowed our ancestors to learn about the structures, parts, and functions of the viscera. As noted in *The Spiritual Pivot* (99-26 BC), one of the classics of TCM theory, "The five viscera may be small, high or low, strong or fragile, upright, or deflected; while the six bowels may be small or big, long or short, thick or thin, bent or straight, or slow or urgent."¹⁷ Such an understanding of the body's anatomical structure is the basis for further recognizing human physiology and pathology. However, such anatomical knowledge resulting from naked eye observations alone in ancient China cannot be used to explain the more complicated phenomena of human physiology and pathology. While physiological functions and pathological mechanisms could be learned by simple observation

and inference, the keys to a true theoretical system lie in knowing what to observe, how to observe, and how to infer. Regarding the question of what should be observed, Chinese ancients made their position clear. As noted in *The Zhou Compilation of Changes* (ca. 1034-479 BC), one of the foundational works of ancient Chinese philosophy, "Observe astronomical phenomena by looking up, geography by looking down, and observe the close-up images of birds and beasts, and the texture of the earth; observe the objects both beside one and far from him."¹⁸ We can thus investigate the properties of the five basic elements by obtaining the spatial and temporal changes of objects; these changes can be obtained through observation, analogy, and image creation using one's imagination.

The basic effects of five-element theory in the construction of visceral manifestation theory can be expressed as follows. First, wood, fire, earth, metal, and water are matched with the five viscera of TCM, that is, the liver, heart, spleen, lungs, and kidneys, respectively. Thus, the five viscera of TCM have respectively achieved the properties of the five elements, as noted in the following texts: "Water is the moistening and descending"¹⁹ in reference to the governing power of water and its storing of the essence of the kidneys; "Fire is the flaming upward"¹⁹ which refers to the warming and exuberance qualities of the heart (*Yang*); "Wood is characterized by bending and straightening",¹⁹ which refers to the free coursing of the liver; "Metal is the clearing and changing",¹⁹ which refers to the purification and descent of the lungs; "The earth is the sowing and reaping",¹⁹ which refers to the transportation and transformation of the spleen. It can also be derived from the properties of wood, fire, earth, metal, and water that "the moistening purgation corresponds to saltiness, the flaming upward to bitterness, the bending and straightening to sourness, the clearing and changing to pungency, and the sowing and reaping to sweetness".¹⁹ The five viscera (liver, heart, spleen, lungs, and kidneys) are thus matched with the five tastes of sourness, bitterness, sweetness, pungency, and saltiness. Second, the same five viscera become functional constructions based on water and fire. In this case, the titles have merely been changed; for example, the moistening and descending function and property of water are substituted by the moistening physiological function of *Yin* blood and body fluids; the flaming upward function and property of fire are substituted by the warming physiological function of *Qi* and *Yang*; as for the "too much *Qi*" of water and fire, they are changed to water dampness flooding and fire heart exuberance in TCM. For the "too little *Qi*" of water and fire, they are changed to deficiency of *Yin* blood and deficiency of *Yang-Qi* in TCM. "The earlier Emperor thought that everything in the world was a mixture of earth, metal, wood, water, and fire".²⁰ In addition, the "assisting four seasons" of the earth¹¹ notes that the liver, heart, lungs,

and kidneys all require the nourishment of the spleen *Qi*. Third, the relationships of mutual generation, restriction, overwhelming, and rebellion among the five elements are mapped to the physiological and pathological relationships among the five viscera (liver, heart, spleen, lungs, and kidneys), as described in *Essentials from the Golden Cabinet*: "If one suffers from liver disease and knows that it will transmit from the liver to the spleen, then the spleen must first be strengthened. Only when the spleen is effulgent throughout the four seasons is it not necessary to tonify. The mediocre practitioner does not know about disease transmission, and thus the spleen is not strengthened, and only the liver is treated."²¹ The above phenomena represent the embodiment of the generating and restricting relationships of the five elements. There are generation relationships among the viscera and bowels. For example, the kidney can store essence, while the liver can store blood, and the essence of the kidneys can be transformed into the blood of the liver, which means that the kidney "water" nourishes the liver "wood," that is, water generates wood. The liver can store blood, while the heart governs the blood vessels, and therefore if the liver's function of storing blood and regulating blood volume is normal, then the normal function of the heart, which governs the blood vessels, will benefit; this means that the liver "wood" coordinates upward toward the heart "fire," that is, wood generates fire. Similarly, the heart governs the blood vessels and rules the mind, while the spleen is the source of *Qi* and blood production, with functions of governing transportation and transformation, while also controlling the blood; moreover, the heart's *Yang* can warm and activate the spleen's *Yang*, but the spleen can be nourished by blood only if the function of the heart, which governs the blood vessels, is normal; further, it can normally govern transportation and transformation, i.e., produce and control blood, which means that the heart's "fire" can warm and activate the spleen, that is, fire generates earth. The spleen governs the ascent of the clear, while the lungs govern *Qi*, and therefore purification and descent; the spleen can transport the essence of food and tonify the *Qi* to enrich the lungs, so that the functions of the lungs in governing the *Qi* with respect to purification and descent can be normal; this means that the spleen's *Qi* can produce and nourish the lungs' *Qi*, that is, earth generates metal. The lungs govern *Qi* and purification, while the kidneys store essences and govern *Qi* reception. The purification and descent of the lungs' *Qi* is helpful to the hiding and storing of the essence of the kidneys and the controlling and receiving of the kidneys' *Qi*, while normal functions of the lungs with respect to purification and descent and the regulation of water ways can promote the normal function of the kidneys' governing of water; this means that the lungs' "metal" can nourish the kidneys' "water," that is, the metal generates water. It is therefore not hard to see that the mutual genera-

tion relationships among the five viscera are clarified though the generation theory of the five elements, that is, we can say that the relationships are deduced from the generation theory of the five elements. There are also the restriction relationships among the viscera and bowels. For example, if the lungs' *Qi* is normally purifying and descending, and the *Qi* movement is smooth, then the ascending counterflow of the liver's *Qi* and ascendant hyperactivity of liver's *Yang* can be restricted, i.e., metal restricts wood. The free action of the liver's *Qi* can freely remove the retention of spleen dampness, i.e., wood restricts earth. The normal transportation and transformation of the spleen's *Qi* can regulate the kidney's function of governing water to prevent water dampness flooding, i.e., earth restricts water. The moistening of the kidney's water can coordinate upward toward the heart to restrict the flaming upward of the heart fire, i.e., water restricts fire. The *Yang* heat of the heart can restrict the excessive purification of the lung's *Qi*, i.e., fire restricts metal. Thus, the physiological mutual restriction relationships among the five viscera are also clarified through the restriction theory of the five elements.

In sum, the processes of five-element theory in the construction of visceral manifestation theory indicate that the five-element theory system as it relates to the world can be applied to the human body, and then visceral manifestation theory, with its core of five viscera, can be further constructed. During the process, human anatomy as studied by the Chinese ancients does not play an important role, as cognition of the human body's visceral functions is based on the five elements. That is, in visceral manifestation theory the body's visceral functions are classified according to the features of the five elements. Moreover, the classification is quite different from the cognition and classification of the body's functional systems offered by modern medicine.

Five-element theory continues to be debated with a focus on whether it is superstition or science. The objective of this paper is not to explore whether five-element theory is scientific, but rather to discuss what the ancients did with five-element theory and how they went about applying it given the knowledge they had at the time, and what effects five-element theory had on how Chinese ancients cognized the world and the human body using five-element theory as their chief cognizing tool. If we investigate the significance and value of five-element theory from the cognitive perspective of metaphor cognition, we must further ask what difficulties exist for five-element theory as a theoretical construction metaphor, as well as what the possible research applications might be. As one of the important footstones of TCM theory construction, five-element theory has always been, and will continue to be, an important constituent of TCM theory. As a methodology and theoretical construction metaphor, five-element theory will continue to introduce irreplaceable effects and influences to the future development of TCM.

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