A Short Induction to Chinese Medical Theories

Ping Zha (M.D., CHI. Med), Jianqing Wu, Ph.D.

May 10, 2018

Chinese Medicine is an experience-based medicine, which has been used for more than four thousand years. Even though the theory was established very early, it is very similar to Optimization Methodology used in science. The soul of its teachings is relative, holistic, and dialectic approaches while it treats human body as an open system with its focus on emotion and mind. The model is the best we can imagine and that is why it can cure chronic diseases.

(1) Some basic concepts

In seeking the powerful healing model, we naturally focus on the master piece (Huang Di Nei Jing). Its theoretic concepts include extended holistic treatment view, Yinyang five form theory, Jingluo (Channel Theory), disease causes and mechanisms, dialectical diagnostic methods, and treatment of future diseases.

Ancient people correctly understood that human body is an organic unit. The human body composes several organs, tissues and organs. Each viscera, tissues and organs have their own unique physiological functions, and their functions are part of the overall human body function, which determine the internal unity of the human body. The various components of the human body are inseparable in structure, mutually support and restrain in physiological functions. They can influence each others pathologically. This unity of the human body is based on the five internal organs as the center, with six accessory internal organs, connected by the meridian system, which is extended into organs and terminated in the limbs. The five internal organs represent the five systems of the entire human body, and all accessory organs of the human body can be included in the five systems according to associated functions. The human body takes the five internal organs as the center, links the whole body tissues and organs of the six accessory organs (colon, intestines, gallbladder, stomach, bladder, and heart wrapping), the five bodies (muscle/ligament, blood vessels, muscles, skin, and bone), the five orifices (mouth, eyes, tongue, ears, and nose), the nine orifices, the four limbs, and the hundred bones to form an organic whole through the meridian, and can realize the body functions through required spirits, Qi, blood, and saliva/sperm etc.

Chinese Medicine also believes that the human body on one hand relies on the organs to perform their own functions, and, on the other hand, also relies on the synergies of mutually reinforcing organs and the restraining effects of other organs to maintain its physiological balance. Each organ has its own functions, consistent with overall activities, but also provides necessary cooperation. This is known as harmony between a local organ and the whole body. This fact demonstrates that health problem cannot be studied by double-blind trial with variables controlled.

In understanding and analyzing pathological condition of a disease, Chinese Medicine starts from the whole, focuses on the overall pathological changes caused by local lesions, and connects local pathological changes with overall pathological changes. In general, a local pathological change is related to Qi and blood, yin and yang, and ups and downs in all organs. Because main organs, tissues and accessory organs are physiologically and pathologically interrelated, diagnosis can be made by seeing external changes in facial colors, body shape, tongue features, and pulse characteristic to judge their intrinsic changes in lesions so as to conduct appropriate treatment.

Human body is an organic unit. In treating a local disease, one must proceed from the whole. For example, the heart is viewed as terminal part in the tongue (note, many heart problems can be directly seen from observing the tongue tip), and the heart and small intestine are related to each other as an inner part and an surface part (there is obvious justification from glucose supply and it impact to the heart output) so one can use Qingxin (a well known herb) to treat tongue erosion. Several well known principles such as "using yang from the Yin," "using yin to treat yang," "treating right to cure the left," "treating left to cure right" (many concepts are routinely used in acupuncture, this left and right swap is reflected stroke damages), and "treating a low position for a disease in a high position etc. are holistic treatment principles. Yin and Yang have their correspondent points in the body. Use a point in a yin part to treat a condition in a yang organ. If we conduct a detail analysis, we could show that yin-and-yang principle is a relativity approach for treating a problem influenced by two sides.

Ancient people correctly understood the crucial relationship between the human and external environment.

The holistic concept of traditional Chinese Medicine emphasizes the overall harmony, coordination, and unification of the internal and external environment. It considers the human body as an organic whole that emphasizes the unity of human internal environment and the unity of human and external environment. The so-called external environment refers to natural and social environment on which mankind depends. The modern system theory holds that the life system consists of, in eight levels, cells, organs, organisms, groups, organizations, communities, societies and supranational systems. In the environment, the system adjusts an infinite number of variables to survive in response to changes in material flow, energy flow, and information flow. The relationship between man and nature is the basic problem of ancient Chinese philosophy. This concept is used in stroke management. We will show in the book that expanded holistic approach and the open-system nature require us to use a completely new approach to cure diseases.

In ancient Chinese philosophy, the relationship between man and nature includes the relationship between the man and nature and that between the man and society. It holds the view that man and nature are united. Nature and people

have material unity, and have some common rule. By using "harmony between man and nature", traditional Chinese Medicine stresses the unity of man and nature. Understanding the nature must be beneficial to the man, and place human needs and human health studies on the nature and men relationship context.

Human beings and nature share the same origin and properties. Human beings are born in nature, and thus the life activities of human beings are inevitably regulated and influenced by nature. The material unity of man and nature determines the unity between human life and natural laws.

Human beings live in nature and nature provides necessary conditions for human existence. Changes in nature can directly or indirectly affect the human body so that the body will have corresponding physiological and pathological changes. This "nature and man unity view" hold that the sky has three yins, three yangs, six Qis, and five elements, and so the human body also has three yins, three yangs, six Qis, and five forms of internal organ movements. The changing rules of the five elements in the nature are consistent with changing rules of the human internal organs. Therefore, the human body and nature are closely interlinked and closely related. Human beings cannot only take the initiative to adapt to nature, but also actively transform nature so as to maintain their health and survive.

This unity is shown in concrete manifestation in the following several aspects:

Human being requires the atmosphere to survive. Chinese Medicine holds that the world is originally from gas and is the result of the changes of yin and yang of gases. The sky and earth is the base of life origin. The yin and yang airs in the sky and earth provides the most suitable environment for the life. Therefore, it is said that life is born on the nature, life is maintained in the nature, sky and earth becomes a unity. This view was developed more than four thousand years ago, and yin and yang difference is the driving force for changes.

Life is an inevitable product of the natural development in a certain stage. Men, like heaven and earth and everything between, are the products of the yin and yang of the sky and earth, and are the result of the regular changes of the material and natural world. Human beings were originated in nature, and nature provides necessary conditions for their survival. Therefore, it is said that "the heaven gives human five kinds of Qi (wind, hotness, humidity, dryness, and coldness) and the earth provides five different basic flavors (acid, hot, bitter, salt, and sweet). Metabolism is the basic characteristic of life.

Life is both an automatic system and also an open system. It must continuously exchange material, energy and information with the external environment. Man is a complex giant system. Qi (life energy) is the basic material that forms the human body and also the material basis for the maintenance of life activity. Qi is often in continuous self-renewal and self-replication of the metabolic process. Qi can be changed into other form such as

force and other form can be changed into Qi. There is no life activity without Qi for vertical movements, intake, discharging, and up and down movements.

Ancient medicine correctly understood the influences of nature on the human body:

Man and nature is a unity, they follow the common rules and are constrained by the laws of the changes of the five elements of yin and yang, and there are also interrelated relationships in many specific laws of movements. Human physiological activities change according to natural changes and natural conditions. The "changing rules for the man is consistent with the changing rules of the nature." If one violates the laws of nature, he will suffer adverse consequences.

The most common treatment methods in Chinese Medicine include herb formulation, acupuncture, massage, pushing and pulling, cupping, Qigong, and diet and other treatments to reconcile yin and yang for all five main organs to regain balance.

The Yin-Yang theory is a philosophical concept for understanding things and natural phenomena and driving forces in nature. It is actually based upon relativity. Based on those noted properties, ancient people correctly recognized that nearly all things could have yin and yang properties. This concept can describe relative aspects of each of known phenomena. This concept can explain nearly all driving forces in living beings and the body.

One representative doctor is Eastern Han Dynasty famous medical scientist, Zhang Zhongjing (ca. 150 -154 years -- about 215 to 219 AD, born in Han Nie Nanyang County, now Henan). Zhang extensively collected medical records and wrote a medical masterpiece "Treatise on Typhoid fever and Misclanious Diseases." It establishes the principle of the dialectical diagnostic method which is the soul of Chinese Medicine. Those formulations as used by Dr. Ke Li in modern times show incredible curing power.

(2) Yin-and-Yang theory interpreted in science

The Yin-yang theory is an ancient version of the Relativity which can be used to characterize complex matter like personal health. Usually, yang is a property that has more energetic qualities such as hot, moving, expanding, and lighting. Yin, on the other hand, is a property that carries less energetic qualities. Examples include cold, stillness, contracting, descending, and dark. There are several critically important things about this theory. First, Yin and Yang are always relative concepts that can be defined by degrees. If three objects have three different temperatures T1, T2, T3, T2 is considered as yin as compared to T1, but as yang as compared with T3. This concept is the most powerful method for studying ALL balances in the human body.

Second, this theory explains the forces for all changes in the nature. At a first blush, the theory sounds strange. However, those concepts were developed before the science age. The language that ancient people used was not what we

can understand now. However, this theory correctly predict most natural forces: yin and yang always generate force in the nature: air moves from a high pressure point to a low pressure point, so that difference in pressure generate wind with kinetic energy; particles located in a media with two different concentrations will move from the higher concentration to the low concentration; and water at a high position will drop like rain falls from the sky, they gain kinetic energy; sunlight make all plants to grow by photosynthesis; higher temperature means more thermal energy than the same thing at a lower temperature. In addition, this theory could explain things like thermal expansion, batteries power reserve etc. Yin-yang theory can explain nearly all physical driving forces in the nature and in the human body even though society then did not know even water molecules and energy. We believe that it can cover all phenomena with the scope of the classic physics.

This philosophical theory is most useful in healing art. Ancient people divided human body types according to certain properties such as temperature, active level etc. They also divide different organs (different from medical classification), and rate their states by relative degrees. By whatever strange language they use, they tried to rate individual organs by different degrees. This theory allowed them to appraise health problems that were caused by imbalance. This relative approach was the only way to appraise internal imbalance. Like an automobile, the combustion system, the exhaustion system, and the cooling system must work in harmony, all organs in the human body must work in harmony. As we show in various simulations, even one percent differences in an organ could result in catastrophic healthy result. This can be seen even form simplest car: if one 1% of heat cannot removed in each work cycle, the car WILL explode. This theory was the best tool to evaluate health condition when objective chemical data and instrument data were unavailable. To maintain health, a person must achieve energy supply balance, oxygen supply balance, signal exchanging balance, hormone exchange balance, and nutrient supply and use balance etc. Ancient people did not use a binary system such as good or bad. They did not use normal or abnormal blood pressure, and normal or abnormal glucose levels.

This theory is applied in Chinese Medicine, and it implies that every two organs must be balanced in a quantitative manner on an absolute scale. By applying the theory to each pair of organs or things by permutation, one has to find that the whole body must be in balance in a quantitative manner. Lungs must be in harmony with the heart; the heart must be in harmony with the kidneys; and the kidneys must be in harmony with both the lungs and the heart.... Each organ may take one of an infinitely large number of states. Health cannot be achieved by using two binary states which are grossly inadequate.

By using this yin-yang relativity in health, it would generate nearly an infinitely large number of combinations. For five properties with each being resolved by 10 states (we use it for convenience), it would have 100,000 states. Full realization of this theory is severely limited by the practical ability to define states. Thus, what can be delivered would depend upon correct characterization

of yin-yang states for each property. In a tuberculosis study, a researcher may normally present more than 20 different kinds (derived just from three organ interactions) compared with just one in modern medicine. The difference is that modern medicine focuses on killing the bacteria, while Chinese Medicine attempts to restore the function of the lungs.

(3) The Five Form Theory

It is strange that most moving mechanic devices such as cars, ships and planes have similar components like the human body. For example, each of them has a combustion chamber (like the heart), air injection (like the lungs), fuel injection (like the liver), and exhaustion system (like the kidneys). Ancient people used the interactions of five universal elements for cooperative and regulatory relationship among five major organs.

They used the five elements to represent five major organs and developed their relationships. Four kinds of cooperative actions are well recognized. Functional dependence: One organ function depends on the product of another organ. Functional restraint: function of one organ is restrained by the function of another organ. Functional inhibition: function of one organ is strongly inhibited by another organ. Functional reverse restraint: when an organ is normally restrained by a second organ in a normal way but a change in the body causes the second organ to be restrained by the organ.

At a first blush, all possible relationships among five organs can only yield a limited number of interaction models. However, each of all those interactive four modes can have different degrees per the yin-yang theory. Now, we have five organs, four possible interactive modes, and each interaction also has different quantitative degrees, there would be an extremely large number of final states (even by incomplete permutations). For example, in treating tuberculosis, the medicine treats it as one disease using same or similar antibiotic drug. It can kill the pathogen, but will make no effort to improve diminished or damaged lung function. In Chinese Medicine, it can easily come up with more then twenty sub types because it must be treated according to differences in other organs. Moreover, health states cannot be evaluated without considering environmental factors. If all possible health states are further combined with all environmental factors per the expanded holistic principle, the possible number of health patterns (e.g. health states plus attended environment factors) is as large as infinite. We must say that Chinese Medicine presents extreme difficulty that could not be properly addressed in reality. It is an art that would require a person life time to learn and a doctor can only master skills for treating some diseases.

In our stroke approach, we use the same approach we would easily find hundreds of factors, even without including all factors. Those theories require us to consider activity degrees, body orientation, exercise timing, seasonal factors, ambient factors, personal daily cycles, social factors and even incoming information flow. The five form theory requires us to consider all major organs. This easily results in hundreds of additional factors that are considered in both

treating and preventing stroke. Each of those factors can have a decisive impact in certain situations, or a combination of two or several of the main factors can make magnitude differences. In contrast, modern medicine attempts to treat health problems in a gross-oversimplification way. That is why it cannot effectively find disease causes and is unable to enable patients to prevent diseases.

The five form theory implies that most effective methods for managing stroke risk must consider each of the five organs. Even though, the old theory was developed by experience, their veracity has been proved again and again. Lungs affect stroke condition by changing oxygen availability and carbon dioxide removal; the liver and stomach affect the stroke condition by affecting glucose concentration and its stability; and kidneys can directly control the heart beats (we believe they affect the heart by mechanisms more than what are known in modern medicine).

The spleen plays multiple supporting roles in the body. It acts as a filter for blood as part of the immune system. Old red blood cells are recycled in the spleen, and platelets and white blood cells are stored there. When it has the function of removing red blood cells, it must have a mechanism to control the amount of red blood cells or their recycling speed, and types of red blood cells to be removed. This is a simple inference one must make: if there is no such a mechanism, it may remove too much or too few of red blood cells. While possible regulatory functions may be located in other places, it is the most convenient way to view the regulatory function as part of the spleen. Chinese Medicine has strange convention to bundle all accessory organs or parts for performing an essential function as a single organ even if they are located in different places. Thus, the spleen condition can affect the blood ability to carry oxygen. Dysfunction of the spleen typically presents as diarrhea, malnutrition, edema, weak muscles, greasy taste in the mouth, or excessive bleeding. If one tracks down the central role of oxygen in glucose metabolism, most of those problems could be explained except bleeding (excessive bleeding may be caused by insufficient production of platelets).

The kidney role in stroke is very obvious. One well known fact is that many high blood pressure cases are caused by compromised kidney functions. A classical health problem is heart-and-kidney out of harmony. While modern medicine discovers limited regulatory mechanisms of the heart by the kidneys, we cannot exclude other possible mechanisms which have not been found. The kidneys directly affect inorganic composition of the body fluid, and thus affect the blood volume and blood pressures. If the kidneys are unable to remove metabolic by-products, and other harmful compounds, accumulated metabolic products will slow down metabolic process. This kind of interactions can be predicted reliably. When the normal metabolic process is impaired, all tissues will suffer from energy insufficiency, which then forces the heart to increase output. Because the body is a complex system, the heart may behave differently in response to extreme problems. When the heart is unable to improve the body performance by racing heart beat, the heart fails.

Chinese Medicine views the kidneys as an organ that can directly affect heart load. Raising heart output and reducing heart output must be two sides of a coin. The kidneys are considered as water while the heart is as fire in Chinese Medicine. This relationship implies that the kidneys have a capacity control fire. Cases reporting successful treatments of heart problems by treating the kidneys can be found in abundance in Chinese Medicine. We note that kidneys can affect heart beats in a matter of minutes. We suspect that this quenching effect may not be through the wear-out of adrenal hormones as in a typical stress reaction. We believe that the true mechanism is not known yet. Regulation by changing chemicals and hormones in the blood stream is only one possible mechanism, nerve signal exchanges through interconnected nerves and neural signal exchanges inside the brain are obvious possibilities. It is impossible to decode nerve signals, neural signals in the brain, and the roles of all possible chemical compounds in the blood. There is no basis to assume that hormone regulations are the only mechanisms for kidney-and-heart interactions. It is improper to deny the existence of anything that cannot be proved.

(4) The holistic approach

Another concept used for thousands of years is the holistic approach to treat health problems. While "holistic" is narrowly construed in the Western to mean the whole body, it is intended to cover everything in the universe. The holistic approach originally used in Chinese Medicine is not limited by "whole body" scope. The approach requires us to consider all interactions between any two organs or parts, and all interactions between men and nature. For treating health problems, one must consider all factors that affect or could affect health, without any limitations. This approach thus points to the importance of environmental factors and information flow. Human beings are highly active, and they can move to all over the places in a matter of days. They are exposed to anything such as pollutants, toxins and infections that could exist in nature. It is then improper to limit disease agents to only certain imaginary factors. Harmful radioactive air and bad information originated anywhere can affect anyone in any place. Contamination from any place can affect anyone by food importation. Thus, we must consider and identify factors by considering personal daily activity. This is why we must address factors by using the largest life-dynamic model, which emphasizes interactions between man and the nature.

(5) Dialectical diagnostic method

Another crucial concept is dialectical diagnostic and treatment method which is considered as the soul of Chinese Medicine for thousands of years. Due to its extreme complexity, we can only mention a few key points here.

Dialectical process for recognizing a disease syndrome is different from finding a symptom. Syndrome in this book means a generalized pathological reflection of the body at a certain stage of the disease, including the location, cause, nature and injurious agent of the lesion, reflecting the nature of the pathological changes. Thus, syndromes are more comprehensive, more profound and more accurately reveal the nature of the disease than one or more

symptoms. Dialectics means that, based on the information collected by four common diagnostic routes, a doctor conducts an analysis and identifies the etiology, nature, and location of the disease, and the relationship between the pathogen and fighting ability, and summarizes the syndrome.

Dialectical treatment means that based on the results of dialectical analysis determine an appropriate treatment. Dialectics and finding treatment for the disease are two tasks that cannot be separated from each other. Dialectical diagnosis is the premise and basis for decision-making, while treatment is the means and method that can test the correctness of dialectics.

Syndrome differentiation is the process of understanding the disease and curing the disease, which is a combination of theory and practice. It is the concrete application of herbal prescription of traditional Chinese Medicine in clinics and is the basic principle guiding the clinical work of Chinese Medicine.

Syndrome differentiation refers to the collection of information, symptoms, and signs by using four clinical methods (look, smell, ask, and consultation) and analyze, and identify the relationship between cause, nature, location, and pathogen of the disease. All information is summed up to determine the nature of the disease. On treatment, also known as providing a cure, that is, according to the results of dialectics, determine appropriate treatment. The process of syndrome differentiation is also part of the recognizing and curing disease process.

Chinese Medicine stresses dialectical analysis, which is not focused on disease similarities and differences but the syndrome of the disease. For example, a cold is a disease that can have clinical symptoms such as aversion to chills, fever and headache. However, due to different causes of the disease and differences in body reactions, cold may manifest as a cold-induced flu, a hot-induced flu, and a summer-steam-induced flu. Only if a right type of flu is identified as syndrome, can a correct treatment be applied. This is very different from applying painkillers because painkillers work on all patients.

Chinese Medicine believes that the same disease in different stages of development may show different syndromes; and different diseases in the course of their development may show the same syndrome. Therefore, in the treatment of diseases, doctors may "treat the same disease with different treatments" or "treat different diseases with a same method." For example, in different stages of measles, one uses different treatment methods. Different diseases using the same treatment means that different diseases in their development processes may have same type of syndrome, which require the same treatment. For example, arrhythmia and amenorrhea are two completely different diseases, but may appear as "blood stasis" syndrome, and they may be treated using same herb formulation or herb prescription for improving blood circulation. Thus, it is not strange that a large number of diseases can be treated by similar formulations for improving blood circulation.

When the yin-yang theory is combined with the holistic approach and the

dialectical diagnostic approach, they have the potential to cure any disease.

The most powerful stroke controlling method and risk reduction method can be found by combining all of the three principles. For obvious reasons, stroke risk must be appraised by using a quantitative way, the scope of analysis must be holistic, and all criteria must be used for individual persons without regarding averaged data, population data, normal range data, or government recommended references. When those three concepts are used correctly, success for stroke prevention and risk elimination are a matter of time and persistence.

(6) Nature of Qi in our view

Qi is one of the three core life elements used in Chinese Medicine, and is the most illusive and confusing concept. Chinese Medicine is revolved around Qi blood, and retained matters (note the term is referenced in many different contexts). We provide a broadest and the most inclusive definition of Qi.

Qi is a quantitative property for measuring physiological state or life vitality of any referenced tissues or organ or the whole body, and can be felted subjectively to various extents. It may be referred to any subject including the whole body, an organ, part of the body, part of an organ, or any particular point. While Qi reflects the life vitality of a referenced subject, the most dominant component of Qi is an energy metabolism condition or availability of free usable energy such as ATPs in the referenced subject. It is often referenced as life energy by Western people, and may be vaguely described as physical force, the ability to performing things and the ability to performing mental tasks etc. Thus, anything which can degrade physiological properties can impair Qi. Naturally, it is the most useful property for characterizing diseases.

Qi can be subjectively felt by human beings in different degrees. We make this generality based upon how Chinese Medicine was developed. In ancient times, chemistry was unknown; water and oxygen molecules were unknown; and there was no way to characterize any physical and chemical properties. One thing that ancient people could do far better than modern people is detecting problems inside the body. During the long evolution, to survive from diseases, a person had to tell what was wrong in his body. The ability to survive depended on two skills: fighting against enemies and ability to heal. The people at that time had to develop a high sensitivity to sense the inner body. It was inevitable for them to accumulate rich knowledge of subjective feeling inside. Qi is the only thing that ancient people would measure and tell.

Several groups of people are known for making great contributions to Chinese Medicine. The major groups were Daoists, monks, and Ru practitioners, who often practiced meditation and engaged in quiet-sitting. Many of them might enter deep meditation for hours each day, as part of their normal life. When they were in deep meditation state, they could sense the inner self with much higher sensitivity. In a meditation state, the central nerve system is attending only the inner body. A person in a meditated state had a high relative sensitivity to sense life vitality, physical activities, and physical force in various parts. They tried to

focus any part and could scan the inner body. In thousands of years, it was natural for some of them to figure out that they could improve Qi by using mind effort, deep breathing exercise, sound-induction, and body-form induction. This was how Qigong became a branch of Chinese Medicine. Qigong is also an essential component of martial art because it can strengthen the body and help martial artists to heal wounds. Many Qigong masters and healing artists are also martial artists.

Since Qi reflects life-vitality level that can be subjectively felt, it must include nerve activities and brain activities. It is dependent upon a large number of interference factors. While human history advanced from ancient times to modern times, little has changed as to the structure and functions. However, one thing has changed is that modern people abilities to detect inner self have dramatically reduced. For any disease, ancient people could sense a large number of changes in various parts, but modern people, without special skills, may feel only a few major symptoms.

In the world without scientific methods for treating diseases, it is also natural for ancient people to classify diseases by felt Qi and its changing patterns because it would be much easy for them to tell about diseases. This is why different diseases are classified as a group of diseases. For example, a large number of diseases is known for Qi collapsing. They include rectal prolapse, uterine prolapse, pelvic floor prolapse, nephroptosis (kidneys droop) and gastroptosis (stomach droop), abdominal dropping feeling, and certain long diarrhea (regardless of cause). In this context, ascending and descending Qi means the body ability or force for maintaining organ vertical movements (all organs are maintained in the vertical direction). The main clinical manifestations for those diseases include both Qi deficiency and a sunken organ or part. This class of diseases tends to have general subjective signs such as dizziness, short-breath, pale tongue with white tongue moss, weak pulse, reluctance to speak, and fatigue.

Those diseases are treated as completely different diseases in modern medicine, but they are actually caused by same cause in Chinese Medicine: the body is unable to generate Qi for maintaining organ virtual position. Each of the organs depends upon Qi for vertical moment against gravity, external force, and disease agent attacks. A disease happens when the organ ability to maintain its normal vertical position is insufficient to overcome a sinking force caused by gravity, external force, or a disease attack. Those diseases are classified as a group because the root cause is glucose metabolism and structural weakness and also because they share similar subjective signs. They can be treated using similar herbs. This is very similar to the stroke condition, which we have to bring all seemingly unrelated factors into the same equation.