

THE THEORY OF YIN-YANG AND CHAOS THEORY: A PHILOSOPHY OF INTERDEPENDENCE AND BALANCE

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Abstract

Interrelatedness, with precise balance, is observed in each and every particle of natural creation and in all aspects of human life as well. Theories like yin-yang and chaos are two closely shaped ways of explaining those life oriented and interlinked philosophy, which provide a precise meaning of existence in this material world. The finely tuned universe has been sorted in physical creation and likewise, there is philosophical understanding regarding the just living aspect of human being. Therefore, it is crucial to know the insight of human existence in connection to other earthly occurrences and this is how the perfection of life is formulated. The theory of yin-yang and chaos theory argue about different philosophical reasonings on this balance and dependency of natural life. As a matter of fact, this is an effective and true observation of life, creation, nature and terrestrial activities that explains and conveys the inner philosophy of harmonious coexistence.

Keywords: Theory, Philosophy, Life, Balance, Dependence, Nature.

Introduction

Virtually, every academic field of philosophy and science are connected in a great way with the theory of yin-yang and chaos theory. Theory of yin-yang finds its way with pure philosophical reasoning, whereas chaos theory is especially designed in mathematical perspective. Philosophy is the root of all knowledge and nothing can be thought outside of it. Present paper deals primarily with the philosophical understanding of interdependence and balance regarding those theories. Natural world is based on harmony and thus harmony always finds its logical understanding in natural science and philosophy at large, especially when observing the finely tuned existence of this universe. Everything in nature is in order and the necessary balance among things comes, only, through their

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interdependence. These theories can be a unique way of observing the balance of natural life and the associated activities with it from intellectual point of view. This work mainly intends to provide the dependence mechanism of nature considering the issues of human importance.

Any observation or perception about the existing nature justifies a proof of finely tuned cosmological existence. Anything in this universe cannot necessarily defy a product by chance and that's because of their unusually balanced way of establishment. Scientific records starting from the Bing-bang has been showing a universe full of natural phenomena. Causes or sources behind each happening are not theories but law providing facts. Every scientific invention or discovery necessitates a hypothesis to work on or sometimes several attempts to make the outcomes even more perfect. This beautiful cosmos is the by-product of a chaos (bang) over a very long period of time. Chaos theory or Butterfly Effect shapes or explains our environmental objects or phenomena through cause-effect dependency. Chaos theory (Ghys, 2012) of 20th century and Yin-yang theory of Zhou Dynasty (1122-256 B.C.) get some issues of resemblance regarding every fact in universe. Well, each theory considers some interconnectedness of issues to form the ultimate and somehow both theories might have common philosophy in between. Special Relativity is the theory claiming that space and time exhibit a particular symmetry. (Hooft, 2001) Same aspect in a more advanced way is explained by his theory of general relativity and Albert Einstein said, "the theory of relativity is intimately connected with the theory of space and time". (Einstein, 1922) Space-time combining with matter is all we see and all we are. There was no necessary existence of space, time and matter before the creation until big bang occurred. Scientifically speaking, the entire creation is simply composed of those three components. The questions are: 'what are the roles of the theory of yin-yang and chaos theory to explain natural happenings?' and 'how can they be necessary in human life?'

Background

There is no such theory prevailed to explain all natural phenomena. Law of nature governs it. To give 'the theory of everything' or 'a grand unifying theory' was lifelong desire to great scientists like Albert Einstein and Stephen Hawking. Stephen Hawking wrote a book on this title as 'The Theory of Everything'. In this book, he tried to explain his intention on

this issue. Hawking's 'Theory of Everything' seems like assuming God's mind or like the ultimate theory is impossible through any physical explanation at all. (Coles, 2000) His intention was not to believe in God but to know the plan behind the creation. The universe is so balanced to live on and everything is in a relative pattern. Though, the world has been experiencing natural disasters, calamities, earthquake, drought, etc. This is actually a message of balance or interdependency about our nature and human life. There comes the theory of Yin-yang and Chaos theory, in both cases stand for the philosophy of interdependency and balance.

Theory of Yin-yang

The theory of yin-yang has explanation of many things in nature, though not everything as predicted by Albert Einstein and Stephen William Hawking. Yin and yang combine the popular symbol '*tai-chi*' (Joshi & Narolia, 2015, 444) which shows the philosophy within this. *Tai-chi* in its first look gives the etymology of white (yang) and black (yin) as the very meaning of it. The theory of yin-yang initially has conditions (Fang, 2014) as follows,

1. Yin-yang explains everything.
2. Yin and yang are two dimensions of nature.
3. Each symbolizes opposite to other.
4. One depends on other to exist.
5. Perfection is through the combination of both.

As detail information, yin-yang represents black-white, bad-good, negative-positive, cold-hot, night-day, female-male, moon-sun, dark-bright, soft-hard, weak-strong, 0-1, less-more, down-up, hell-heaven, destruction-creation, sinner-innocent, stupid-intelligent, failure-success, bottom-top, winter-summer, liquid-solid, small-big, etc. (Fang, 2012, 31-32) In this philosophical understanding, everything possesses two opposite features to take an ultimate shape. But the necessary features are directed by the law of nature. Su Wen said: "Yin and Yang serve as *Dao* (law) of the heavens and the earth, the fundamental principle of all things, the parents of change, the beginning of life and death. (Xiru & Zhaoguo, 2005) '*Dao*' or '*Tao*', in Chinese Taoism, represents the law, which causes everything to happen in the certain way. All things are bonded with the law of nature and the law is static to run the entire nature. This law is not

only the source of the creation but also the explanation of universe's governing way. Taoism's sacred text *Tao-Teh-Ching* depicts,

Tao can be talked about, but not the Eternal Tao.

Names can be named, but not the Eternal name.

As the origin of heaven-and-earth, it is nameless:

As "the Mother" of all things, it is nameable.

So, as ever hidden, we should look at its inner essence:

As always manifest, we should look at its outer aspects.

These two flow from the same source, though differently named;

And both are called mysteries.

The Mystery of mysteries is the Door of all essence. (Tzu, 1989)

The holy *Tao-Teh-Ching* provides necessary guidance to move toward the right ways and on the other hand, yin-yang evaluates the inner mechanism of those prescribed guidance. Actually, yin and yang are forces or energies which combine to produce something precisely. There is a fine tuning of those two components and interestingly no so called negativity exists in them. When yin represents the black, female, bad, etc. is not pointing any negativity at all or there is nothing here it underestimates but only calls for the necessary fulfillment. A river cannot be a river without waves or a life without ups and down. Perfectness originates from the balance of negative and positive effects. As the theory of yin-yang is a Chinese theory, the Chinese people and their culture can easily be understood by this. For example, philosophies or religions of Chinese origin like Taoism and Confucianism lack the traditional religious idea of heaven or hell unlike the Western religions. As a simple understanding, heaven composes absolute happiness whereas hell calls for total distress. Both the ideas of heaven and hell defy the theory of yin-yang for sure because there cannot be anything absolute according to it but only with the combination of two opposite things. In traditional thinking, heaven is heaven only and only if it does not possess anything from hell and same goes with the hell in an opposite way.

The yin-yang thinking has had an enormous impact on "Chinese philosophies, martial arts, medicine, science, literature, politics, daily behavior, beliefs, thinking, and other arenas for thousands of years" (Lee,

2000) Nothing escapes the composition of yin-yang like the black hole. The theory is very crucial for this world because of its positive description regarding all aspects. Yin does not mean opposite to yang rather each is complementary force to other. Even yin force itself possesses yang within it and vice versa. The beauty of creation contains only through the balance of both yin and yang energies. That beauty of anything presupposes so called limitation which is not in the spirit of yin-yang theory. If we imagine that all men (yang energy) are dead, suddenly, on earth remaining the women (yin energy) only, there will be probably no trace of human life after hundred or two hundred years. A proper balance is necessary and that can only be obtained when yin depending on yang is possessed in every phenomenon.

How does this law govern the nature? The law has the necessary interchanging mechanism through yin and yang. Yin changes into yang force and yang changes into yin energy. This process of interchange has been going on since the very beginning of nature and running in an endless fashion. No one ever experienced a night after night or a day before a day. Every day starts with the rising Sun, whether visible to our sight or not. In the same way, winter comes after summer and turns into summer again as the time passes. If Sun is there to make the day hot, Moon provides the coolness to rest a bit. There is description to all things under the yin-yang theory and this is how the relative approach is going on. According to the '*Commentary of The Book of Changes*', the law of changes in the world is caused by the interaction between yin and yang. (Yang, 2006) *The Book of Changes* is made of two parts: *I-Ching* and the *Commentary of I-Ching*. In the Warring states period (500-200 B.C.) a book of commentary written by Confucius was published known as "Yizhuan" based on the philosophical analysis of *The Book of Changes*. (Porter, 1996) From the very creation (Big Bang) of the universe, the universe is ever developing and changing. This changing pattern of the universe is necessary for the survival of living beings, where yin-yang balance plays a very significant role. Any of the forces needs the other to present itself out, which somehow corresponds to the relation of yin and yang following the overall law of natural harmony. (Lan, 1999) Interdependence and relativity are necessary to have a balance, and balance prerequisites harmony. Yin and yang show the balance through interdependence and thus they bring the message of harmony in nature at large.

Yin and yang do not exist alone. That's why, it's impossible to think of yin without the presence of yang. The popular symbol of yin-yang clearly shows that even the major part of any one of them is not fully occupied by itself but has the existence of its opposite force also. This is a very rare example of interdependence. Yin-yang idea is the plainest and natural philosophy that has originated from the early endeavors of understanding the universal laws of the cosmos, which is based on the most intuitive perceptions and experience of everyday life. (Ye, 2016, 02) Natural manifestations are the examples to observe the insight of yin-yang theory and the theory is needed to get the touch of structural function as well. Connectivity of the opposite energies associates all feasible existences and this association is very much associated with the theory of yin-yang, as they act as one. (Joshi & Narolia, 2015)

Chaos Theory

Chaos theory became a real turn out to explain certain incidents or phenomena regarding both of this nature and everyday lives of human world since 1970. The theory is difficult to specify by any single point of explanation. To have a better understanding of the issue, definition of it should be combined with various explanations as well. Normally it discusses something chaotic in nature but in reality it is much more of a philosophy. In order to define chaos theory, Barengi stated that "Chaos is the periodic long-term behavior in a deterministic system that exhibits sensitive dependence on the initial condition." (Barengi, 2010, 37) This definition is taken into granted, while talking about the possible connection between the happenings and the responsible prior causes. Here, the inner philosophy deals with how something changes or transforms over time. (Williams, 1997, 01) Relation or interdependence among activities around us gets a strong understanding through this theory. It is also stated that, "Chaos is sustained and disorderly-looking long-term evolution that satisfies certain special mathematical criteria and that occurs in a deterministic nonlinear system." (Williams, 1997, 05) The two terms "deterministic" and "random" aren't mutually exclusive; anything random is also deterministic, and both terms can characterize the same sequence of data. Random means based strictly on a chance mechanism (the luck of the draw), with negligible deterministic effects. (Tashman & Lamborn, 1979) Nonlinear means that output isn't directly proportional to input, or that a change in one variable doesn't produce a proportional change or reaction in

the related variable(s). The result or outcome is not in the same way like the causes. The new theory of 20th century is very significant to have a long term research on the matter of relativity and interdependence. Chaos theory is mainly based on occurrences around us throughout the history with a reason to describe. Law represents static outcome but it's sometime difficult for it to assume or declare certain future facts. Chaos theory deals with the phenomenon of "orderly disorder created by simple processes." (Gleick, 1987, 266) A little approach or cause may turn into a big and earth breaking production. For example, Isaac Newton's third law states, "For each action, there is an equal and opposite reaction." (Fabian) Newton's scientific discoveries took the scientific world much ahead of time and he is being followed by many other scientists to work on farther. His third law of motion discusses three key points:

- a. Equal approach.
- b. Opposite happening.
- c. Combination of Action with Reaction.

Chaos theory represents a system where values at one time aren't proportional to the values at an earlier time. The two variables, here are different to each other. (Williams, 1997, 05) Things are not happening in the way it's expected. This is not a random case but it's our usual life to go through. In most cases, according to the theory, the effect is long term. There has a necessary dependence between two incidents. The initial condition plays a vital role to direct the eventual act to take part.

'Chaos theory' also identifies as 'Butterfly Effect' considering the balance and interdependency of incidents around us. A key premise of chaos theory or the butterfly effect states that "small changes in initial conditions have fundamental effects on outcomes." (Gleick, 1987, 20-23) Butterfly can be a true example to show the philosophy of balance in nature. Two wings of the butterfly keep it stable and thus it can manage to fly on. Most of the birds hold the same equilibrium regarding their wings and the scientists could build many machines using the model of dependency or mutual effect. So it's also a theory about relativity and interdependence. Its interdisciplinary feature is clear in terms of its area of study. Chaos, as a subject of study, is found in any discipline like environmental sciences, biology, physics, mathematics, ecology, communications, chemistry, medicine, economics, physiology, geology, oceanography, astronomy, sociology, literature, history and in other fields.

Any happening happens over time is chaotic depending on the very theory. Examples are natural calamities, epidemics, environmental pollution, droughts, economic changes, weather condition, global warming and so on. According to this theory, things happen from positive to negative, positive from negative, tiny to a big one or some earth shattering incidents from a simple something like Newton's third law from the idea brought from apple falling. Interconnectedness and dependency are two key factors which run the theory most. (Williams, 1997, 08) Human lives, for example, are full of fluctuating phenomena and thus compose the human at last. More or less, every person on earth has been experiencing ups and downs in life and that's the beauty of life. Mortality is the necessary feature of human being. The inevitable death makes human immortal through their contributions to humanity. It's better to live working for the betterment of humanity. Because people are being remembered for the sake of their good works and physical immortality has nothing to do with.

Happenings around us can either be logical, irregular or even random but as per the law of nature is concerned, it must have reasonable ways. The conditions (Williams, 1997, 1-4) behind the Chaos theory are very useful to understand the theory. They are as follows,

1. Chaos relates two main incidents over time.
2. It may start with a confusion or clash and result in a smooth way.
3. Chaos causes a long term effect.
4. First strike has significant cause for a greater something.
5. Initial chaos has direct influence on the next.
6. Happenings through Chaos are interrelated to each other.

Chaotic systems are classified as conservative or dissipative. For instance, astronomical systems are examples of conservative systems and sometimes referred to as 'Physicist's chaos', where the phase space volume remains unchanged but changes its overall shape in time. (Tobin, 2016) Here, chaotic systems can be understood through the ever expanding theory of the universe. Einstein's theory of non static universe was proved by Edwin Hubble in 1929. According to Hubble, stars from distant space are moving farther from each other justifying the fact of universe's expansion. (Hawking, 2006, 25-26) Big bang suggests the creation through an explosion, which causes the creation of all from a single point. (White & Gribbin, 2002, 80) That means, all created things were attached together

as one and big bang caused them to be as separated objects. So the assumption formed here is, all natural existences were mixed in single state about ten or twenty thousand million years ago. (Hawking, 2006) There was no space before the creation but now it's all about space we experience. Edward Lorenz (mathematician) discovered quite by accident, one of the hallmarks of chaos theory whilst modeling weather patterns. For example, a limited variation of a situation may cause a greater change to somewhere else. (Lorenz, 1963) One single step or one single thing is responsible enough to cause the thing entirely changed. Edward Lorenz commented that, "Predictability: Does the fluttering of a butterfly's wings in Brazil set off a Tornado in Texas?" (Ghys, 2012) Lorenz talked especially about the weather changing pattern in a distant matter but this 'chaos theory' is no more limited to weather forecasting aspects. The alternative designation as 'the butterfly effect' by Andy Andrews added our lives and predictability of it. This effect reveals the secret of how one can live a life with permanent purpose and shows how our everyday actions can make a difference for generations to come. (Ghys, 2012) Life does not always go in same pace and if it is then it's not life at all. This philosophy of ups and down can be a better way to live. Accepting the situation should be necessary component of human being on earth. Frustration of man comes with nothing but destruction and the chaos theory describes thing just in the opposite way. If you are now in a bad position, it will not be always like this. People must believe in hard work and dedication instead of frustration or grief. As Jean Paul Sartre once said, "Man is nothing else but what he makes of himself." (Gensler & Swindal, 2004)

So, the theory has explanation of people's life which causes in an effective way and it changes our life dramatically. For example, the apple falling incident of Isaac Newton is the root cause of his 'theory of Gravitation' later on. Idea is important and it's always there before any discovery or happening. The incident definitely helped Newton to come up with the idea of 'Gravitation' theory. A simple occurrence results in an outstanding way. This initial happening had been developed to the ground breaking theory of Newton though it took him to go through a painstaking task. This connection between apple and gravitation theory was believed by Newton and as we do too. Nothing matters at all when the result has that much wonderful effect to humanity. So a simple or little occurrence may cause a great consequence. As chaos theory suggests, an initial

incident to a certain thing or place gradually ends up with bigger outcome. The theory also supports the necessary connection among happenings. The field of astronomy had many developments throughout the history but not like the Newton's gravitational force which explain the orbiting aspects of heavenly bodies so nicely. Many examples can be specified on this regard.

There is chaos in order and there is order in chaos. (Reynolds, 1991) Gordon also points out that the "regime of exceptions contradict[s] ... the regime of rules." (Gordon, 1987) Human life, for example, is a combination of both stress and happiness, where the intensity only varies from person to person considering the different situations. Negativity of life is not a long lasting agenda and only a matter of time it takes to turn it into a positive change as described before. The famous British physicist James Clerk Maxwell also reportedly said in an 1873 address that "... When an infinitely small variation in the present state may bring about a finite difference in the state of the system in a finite time, the condition of the system is said to be unstable ... (and) renders impossible the prediction of future events, if our knowledge of the present state is only approximate, and not accurate." (Hunt & York, 1993)

A future world can be theorized but an absolute certainty is always impossible. Even though, theory remains with its effectiveness in matters of cause and effect balance. So, it's really tough to provide explanation of a theory on what "is" and what "ought to be." (Moore, 1971) Here, 'is' states anything from its descriptive outlook or having a description on something. On the other hand, 'ought to be' is morally associated with nature. The second one is, actually, suggestion about the right activities or action as prescribed from ethical points of view. (O'Neil, 1983) In this real world, it's an easier probability to describe reason of something occurred eventually despite of talking about the future and that's what the theory like "Chaos" stands for. It's better to have faith in sequential changes and choices rather than a random conclusion. Every action requires a choice and declining to choose is also a choice. (Posner, 1986)

Every single step directs us to a certain end and each one is counted. Gilmore suggests, "Man's fate will forever elude the attempts of his intellect to understand it. The accidental variables which hedge us about effectively screen the future from our view. The quest for the laws which will explain the riddle of human behavior leads us not toward truth but toward the illusion of certainty, which is our curse." (Gilmore, 1977)

Evaluation of Chaos Theory and Theory of Yin-Yang

According to yin-yang theory, everything of this universe consists of two basic aspects or two sides. Duality of nature is the basic feature of this universe. (Dou, 1995 & Ye, 2016). It's a human psyche to observe this duality in a precise way and should be the ultimate perception. Justification of precisely order has been rooted in our very nature since the beginning of creation. As Charles Steele reasonably remarked: "There are a number of very unique and precisely set features about our universe that defy random chance beginnings." (Steele, 2009) This reasonable feature is initiated and being carried way with the duality of nature.

There are numerous phenomena in everyday life that could prove the idea of the eternal change, such as the recycle of day and night, the alternation of seasons, the replacement of good fortune, and bad fortune, and so on. According to the *The Book of Changes*, everything in the world is ever changing, transforming and recycling. Yin and yang do not keep stable permanently, but are always tending to transmit to their opposite sides. (Lan, 1999) World renowned physicist like Stephen Hawking can be a suitable example on this regard. He was affected by 'motor neuron disease' (also known as ALS), (Gribbin & White, 2002, 60) when he was only 21 years old. The concerned doctor gave him a chance of possible survival of around 3-4 years more or less but he survived another 55 years and died in 2018, when he was 76 years old. His life of a paralyzed body gave him much time for his study and research. Disease didn't make him dead but more alive with outstanding contribution in physics. Negativity can be a greater opportunity to live on with unexpected success as well. Chaos theory comes up with the explanation of negativity to positivity of a human life and yin-yang describes it as it's the only way to live on.

Jacques Hadamard, a French mathematician, remarked in 1898 that a discrepancy or error in initial conditions can provide an unpredictable long-term behavior in its system. (Ruelle, 1991) Change in subject pattern is inevitable under the natural law and interdependence between or among the causes is also natural. Nature does not mean sticking to one inflexible rigid rule. (Ye, 2016, 03) The relative attitude of opposite energies is not only natural but also necessary. So both theories are talking similar in some conditions. For example, the third law of Sir Isaac Newton has been discussed as a philosophy of two complementary actions and their necessary connectivity. This insight directly relates to both chaos theory

and yin-yang theory. Philosophy of interconnectivity can be found in any object of nature.

Yin-yang theory depicts two interdependent forces which combine to make a relative pattern, as we experience in the symbol of '*tai chi*'. Chaos theory also describes effect and causes of an incident, where causes may be one or many but are relative to the aftermath as well. There is always a root cause behind everything in this nature. Our universe was not like this always. A massive explosion about 15 billion years ago commenced the expansion of the universe. 'Big Bang' is nothing but the explosion. The world was born with the 'Big Bang' in an incredible hot and dense point. The visible universe took a shape with the creation of light within about 10^{-33} second and that is really unthinkable short period of time. (Hawking, 1988) One second is short enough to think of a creation like the universe. Then it's really difficult to think of that creation less than that. As its even short period of time than a blink of an eye, if 1 second is divided by 1 with 33 zeros. At first, the universe was hot but by the time it became cold enough for the survival of living creatures. In the beginning, it was dense and now turned into expanded universe. Just before the big bang, the universe was in a super-dense mode and the big bang caused the stretching incident to take part. (Gribbin & White, 2002, 82-83)

If both theories provide the philosophy of interdependence and relativity, what are their common grounds on this regard? They are as follows,

- a. Both chaos theory and theory of yin-yang provide information about human existence.
- b. The theory of yin-yang and chaos theory talk of two necessary features of nature.
- c. In both theories, the components and occurrences are balanced phenomena.
- d. The theories refer opposite things in all cases around us.
- e. Both theories offer the philosophy of perfectness out of two necessary opposite actions.
- f. The presence of relativity between two different things is always there in both cases.

But the theories are not holding the same philosophy of balance but they also have differences. They differ in the following way:

- a. When theory of yin-yang presents the philosophy of things around us, the chaos theory is always about the happenings only.
- b. Chaos theory is counted through the calculation from past to present but yin-yang only says the opposite aspects of past and present without any calculation of happenings.
- c. Chaos theory deals with cause and effect on nature but the other one only says that there are always cause and effect avoiding the necessary insight of those.
- d. Yin-yang has no relation with earth breaking contributions of human but chaos theory explains this.
- e. In yin and yang, two energies interchange into each other but chaos theory provides only the necessary connection of events.

Conclusion

The important fact is that both of the theories are important, when balance of nature is to be understood. It's normal to find different theories like yin-yang and chaos having differences but the common grounds between them can, really, be crucial fields of inquiry. Natural phenomena are full of precious treasures and that's because of the prevailed harmony followed by balance upon things. The theory of yin-yang and chaos theory appeared in different times from the historical context but possess a very common insight between them. Both theories provide necessary philosophical understanding to see nature and life from a unique angle. Human being is the most crucial part of creation and, space and time have associated the human world to provide the precisely set concept of the universe. Eventually, to have a fine explanation of matter, space and time as the picture of the entire cosmos, chaos theory and theory of yin-yang have much discussion to go with. Human beings can have a peaceful living world only and only through a harmonious co-existence with nature. Stewardship of nature is obviously belonged to the human philosophy of interdependence and balance of opposite energies or happenings.

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