

Relationship between chaos theory and history of philosophy

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Abstract

Each history of physics, evolutionary theory, and philosophy can be determined as myth, assertive thinking, non-assertive thinking, and chaos theoretical thinking. There is a direction with decreasing entropy in only chaos theoretical thinking. The theories of Copernicus, Newton, Einstein, Darwin, and Greek philosophers are equivalent to assertive thinking. The theories of quantum mechanics, Imanishi, Russell, and Brouwer are equivalent to non-assertive thinking. And new gravitation equation and gene learning evolution theory are equivalent to chaos theoretical thinking.

This author explains cosmology, evolution, dialectics, theology, psychology (counseling, development theory, and autism), literature, and so on with reference to chaos theory. Is such a style of thinking equivalent to a new philosophy? Thinking with decreasing entropy as being a common purpose of living creatures will be considered as a new philosophical modality within most academic fields.

Keywords: decreasing entropy; physics; evolution, philosophy; chaos theory

Introduction

Each history of physics, evolutionary theory, and philosophy can be determined as myth, assertive thinking, non-assertive thinking, and chaos theoretical thinking (Yanagisawa, 1992, 2000, 2019). There is a direction with decreasing entropy in only chaos theoretical thinking. A process wherein a decrease in entropy within human's thinking is made clear in each history.

This author explains cosmology, evolution, dialectics, theology, psychology (counseling, developmental theory, and autism), literature, and so on with specific reference to chaos theory (Yanagisawa, 1992, 2000, 2017a, 2015a, 2011a, 2004a, 2004b, 2014a, 2015b, 2015c, 2015d, 2011b, 2012, 2014b, 2015e, 2015f, 2016b, 2016c, 2017b, 2018a, 2018b, 2018c, 2019). With reference to these, thinking modalities with decreasing entropy being a common purpose of living creatures will be considered as a new style of philosophy with them most academic fields.

Method

Explanation of chaos theory

Here, we explain chaos theory, the relationship between thinking, and chaos theory, and some important preliminary results concerning this.

The contents of "Explanation of chaos theory" is similar to the sub-section "Relation between entropy decrease and human life" in another of the author's articles (Yanagisawa, 2015e, 2015f; 2016b; 2016c; 2017b; 2018a; 2018b; 2018c; 2019). However, it is repeated in this report because of its importance.

Definition of Chaos Theory

The definition of chaos theory was reported as below (Yanagisawa, 2016b).

Chaos theory can be defined as "the qualitative study of unstable a periodic behavior in deterministic non-linear dynamical systems" (Kellert, 1993). Chaos theory is a part of complexity theory that concerns itself with nonlinear dynamic systems whose behavior does not follow clearly predictable and repeatable pathways. In linear systems, the relationship between an environmental factor and system behavior is predictable and easily modeled.

As the presence of an environmental factor increases, system behavior changes

linearly in response to it. In contrast, behavior in chaotic systems might be perceived as unpredictable³. In this regard, it is important that such a chaotic state is not confused with the term "random." In mathematical terms, "random" means the "statistics governed by or involving equal chances for each item" (New Oxford American Dictionary).

Relationship between continuous covariation and chaos theory

Three or more variables and continuous covariation are required to have a chaotic equation (Yanagisawa, 1996, pp. 115-123, 2017a, 2015a, 2011b, 2012, 2014b, 2015e, 2015f, 2016b, 2016c, 2017b, 2018a, 2018b, 2018c, 2019). In any chaos equation, fixed and chaotic solutions can be obtained. These solutions are continuous and have a bifurcation point between them, known as the Feigenbaum point (Feigenbaum, 1978).

For example, a chaos equation that is representative of chaos is expressed as follows:

$$Y(n + 1) = p[1 - Y(n)]Y(n) \quad (1)$$

In Figure 1, a schema near the Feigenbaum point is shown in parts C, D, and E, where the converging fixed (parts C, D, and E), localized (part G), and proliferating chaotic (part H) states are illustrated. The dotted line F is the Feigenbaum point. Reality obeys chaos theory because of the existence of three or more variables and their continuous covariation between several phenomena, including matters and mind.

Relationship between entropy, change, and chaos theory

Entropy is a statistical word and was originally unrelated to any physical phenomena (Stanford Encyclopedia of Philosophy, 2009). Entropy decreases when there is a change of direction from a chaotic state to a fixed state (Yanagisawa, 1996, pp. 115-123, 1992, 2000, 2004a, 2004b, 2011a, 2011b, 2012, 2014a, 2014b, 2015a, 2015b, 2015c, 2015d, 2015e, 2015f, 2016b, 2016c, 2017a, 2017b, 2018a, 2018b, 2018c, 2019).

This is shown as the arrow L in Figure 2. A schema of near Feigenbaum point is shown as the parts E, G, and H in Figure 2.

On the other hand, entropy increases whenever there is a change of direction from a fixed state to a chaotic state. This is shown as the arrow M in Figure 2.

Mathematical classification: inside chaos theory and outside chaos theory

For a chaos equation, there are either possible or impossible solutions. While impossible

solutions refer to those where there is either no solution or solutions which are infinite, possible solutions comprise complete fixed, incomplete fixed, chaotic, and random states (Yanagisawa, 1992, 2000, 2017b, 2018a, 2018b, 2018c, 2019). In chaos theory, a fixed state can change to a chaotic state depending on the variables in the equation. This means that the state of a solution can also change as the environment changes. Therefore, in chaos theory, a fixed state is incomplete. However, mathematical principles and historical facts do not change as the environment changes; they remain in a complete fixed state.

In Figure 2, the extreme left side of part E, i.e., part B is a complete fixed state and lies outside chaos theory. However, both the incomplete fixed (part E) and the chaotic (part G and H) states are amenable to chaos theory. The extreme right side of part H, i.e., part K is a random state and it is not amenable to chaos theory. Since a chaos equation is based on mathematical principles, it is a complete fixed state, and it can be used to resolve incomplete fixed and chaotic states as well.

Relationship between thinking and chaos theory

Relation between counseling and chaos theory

It has been reported that the process of counseling is same as the process of solving scientific problems with respect to chaos theory (Yanagisawa, 2015a, 2015e, 2018c). Both can be explained as processes which involves the rearrangement of thinking so as to decrease entropy (Yanagisawa, 2012, 2014b, 2015a, 2015e, 2015f, 2016b, 2016c, 2017a, 2017b, 2018a, 2018b, 2018c, 2019) During counseling, a counselor pays close attention to the client's thinking without reference to any objective standards. Because the focus of the counselor is on the client's thinking pattern, the counselor's thinking must be of the chaotic type. The counselor may not correct the client's ignorance of a particular objective standard; however, if the client's expressions are merely returned by the counselor, then the counselor's thinking differs from the fixed type of thinking. This amounts to merely parroting the client's expressions. Consequently, the counseling will fail because the client's thinking is unclear or because the client is confused. During counseling, the counselor's primary skills involve: listening closely, using reception, and synesthesia.

The second skill is the counselor confirming incomprehensible points by putting himself in the client's shoes. This confirmation process, which is same as the process of discovering a new theory or equation in science, is crucial in counseling. This can be

achieved professionally by using a fixed type of thinking. Conversely, in a chaotic type of thinking, there is no need to clarify incomprehensible points (Yanagisawa, 2015e, 2015f, 2016b, 2016c, 2017b, 2018a, 2018b, 2018c, 2019).

People who demonstrate a chaotic type of thinking cannot act autonomously due to dependence or lack of reference to objective standards. Therefore, by merely listening closely, using reception, and synesthesia are (in and of themselves) insufficient to conduct counseling because under such situations there would be no decrease in entropy. This is discussed in the next section. Moreover, if entropy does not decrease, both the client and the counselor would never manage to achieve any form of lasting mental stability and therefore never be joyous.

Relation between entropy decrease and human life

Through evolution and thinking, living creatures experience a decrease in entropy (Yanagisawa, 1992, 2000, 2012, 2014b, 2015a, 2015e, 2015f, 2016b, 2016c, 2017a, 2017b, 2018a, 2018b, 2018c, 2019) from a proliferating chaotic state to a localized chaotic or an incomplete fixed state as shown by the arrow E in Figure 2.

Rearranging human thinking in such a way that entropy decrease will lead to human satisfaction. Moreover, humans may feel like God on passing through the Feigenbaum point (1978) (arrow F in Figure 2). However, entropy does not decrease naturally in humans unless their thinking patterns are rearranged.

Relationship between Chaos Theory and History of Physics

Until the emergence of Copernican theory (ENCYCLOPEDIA BRITANNICA Copernican system) was reported, the Ptolemaic geocentric system theory (Evening Star: The Ptolemaic Method) had been de facto believed in medieval Europe as a given. The Ptolemaic theory was equivalent to a mythical theory based on poor observations. Because myth is ill-founded, it is equivalent to the arrow B of Figure 3. In Figures 3, 4, 5, and 6 of physics, the horizontal axis represents time, and the vertical axis represents the theory. The theory used to explain the real phenomena is shown as the arrow A₂; however, human can never know it. The process that the theory B being different from the theory explaining the real phenomena was considered is not clear in the Ptolemaic theory.

Next, both Copernicus and Newton (1686) presented the Copernican theory and Newtonian gravitational equations based on many observations. Each of these are

equivalent to the arrow B. Each theory and equation were reported at the time t_1 . Of course, each time that they were reported the results were different. However, all phenomena could not be explained with them because Newton's personal opinion and subconscious psychodynamics (Yanagisawa, under submission) were mixed in with his equations. Newton's equations were approximate equations explaining a part of all phenomena within the totality of the cosmos. Therefore, it is shown as a dotted line M.

Next, Einstein (1916) never considered Newton's equations and many observations in the movement of heavenly bodies. As the result, he considered a gravitational equation based on the constant speed of light. His opinion was not mixed in it. Therefore, it is presented as solid line M in Figure 5. However, there was a defective part in Einstein's equation (Yanagisawa, 2011a, 2015b, 2015d).

Following this, it became clear that all phenomena with more detailed observations could not be explained with conclusive theories such as represented by Newton's and Einstein's equations. Therefore, quantum mechanics (Solov'ev, 2011) was born as a non-conclusive theory. It is shown as the arrow B considered on the time t_2 in Figure 6.

Non-assertive phenomena (Yanagisawa, 1992, 1996, pp. 115-123, 2000, 2019) are shown as the hatching box part on the left side of the time t_2 . It is equivalent to the proliferating chaotic state in chaos theory such as the Part H in Figure 2. However, quantum mechanics is the approximate theory which exists with the mixing of scientists' opinions as well as more detailed observations, too. The process whereby the scientist decreased entropy for considering it is not reported by any equations. Therefore, the part with decreasing entropy to the arrow B is not shown in Figure 6.

Lastly, a gravitation equation calculated by thinking with entropy decreasing is shown in Figure 7 (Yanagisawa, 2011a, 2015b, 2015d). By it, dark matter and dark energy (Peebles & Ratra, 2003) were explained as energy yet ignored by Newton and Einstein. Big Bang theory (Narlikar, 1991) is not required, either. Here the horizontal axis represents time, and the vertical axis represents the fields of academy in Figure 7. The arrow from A_1 to A_2 represents the development of present cosmology including Big Bang, dark matter, and dark energy theories. Each time t_1 , t_2 , and t_3 represents the ancient times, 1994 and 2011. The academic fields expanded till time t_2 from time t_1 . Psychology and medicine are also contained in them. They are shown as the point P_1 in Figure 7.

In 1994, the Stress Equation was considered for explaining human's mental stress (Yanagisawa, 1994). It is expressed as follows:

$$\frac{dE}{dt} = kE \quad (2)$$

Here, each k , t , and E is a constant number, time, and the quantity of energy. Music and pictures are shown as the point P_2 . The relationship between them and fluctuation ($1/f$) was reported (Anderson et al., 1993). In 2004, the article 'Three Equations of Fluctuation ($1/f$) to Feeling, Weber-Fechner's Law, and Hubble's Law deduced from Stress Equation ($dE/dt = kE$)' was published (Yanagisawa, 2004b). The new cosmology with no Big Bang is shown as the point P_3 . Furthermore, in 2011, the article 'Energy Ignored by Einstein: Dark Matter is not Required' was reported (Yanagisawa, 2011a). A new gravitation equation is shown as the arrow B. Human's mental stress, feeling and Weber-Fechner's law (Anderson et al., 1993; Yanagisawa, 1994, 2004b) are included in This new gravitation equation. It means to suggest that entropy in academic fields was decreased as a triangle (points P_1 , P_3 , and B) heading for the arrow B in Figure 7.

Relationship between chaos theory and the history of evolution theory

Before Darwin's theory of evolution was published and widely disseminated (Darwin, 1859), it was believed that God had made all species. A new species is shown as the arrow B against the previous species (arrow A_2) in Figure 3 because of myth. In evolutionary theory, the horizontal axis represents time, and the vertical axis represents the species. The process that a new species B was born is not clear in myth.

Darwin's theory is shown in Figure 4. A new species separated from the old species (arrow A_1 - A_2) is at the time t_1 . However, the process that a new species B (with mutation) was born is not clear. Therefore, it is shown as a dotted line M.

Next, Imanishi's theory (Imanishi, 1938) is shown in Figure 6. He said: 'The species changes on the time that it must change.' The central ability of evolution in living creatures is not mutation. Its non-assertive phenomena are shown as the hatching box part on the left side of the time t_2 . The hatching box part on the left side of the time t_2 is equivalent to the proliferating chaotic state in chaos theory such as Part H in Figure 2. The process with decreasing entropy that a new species B was born is not clear.

Lastly, a new evolution theory is shown in Figure 7. In gene learning evolution theory, living creatures adapt to changed environments. And it changes to a new species with gene's learning function (Yanagisawa, 1992, 2000, 2011b, 2019). In Figure 7, it is shown as an expanding triangle with the time that the old species adapts with its adaptive abilities to a changed environment till the time t_2 from the time t_1 . It is shown as a diminishing triangle with the time that the new species B was born with decreasing entropy (Styer, 2008; Yanagisawa, 1992, 2000, 2019) till the time t_3 from the time t_2 . The change representing decreasing entropy over time course can be explained with the

arrow L of Figure 2.

Relationship between chaos theory and history of philosophy

Before Greek philosophy (GREEK PHILOSOPHY), it was considered that the theories and opinions with no argument and rationale were full as philosophy in society. Because they are equal to myth with no basis, they are shown as the arrow B in Figure 3. In the history of philosophy, the horizontal axis represents time, and the vertical axis represents the theories and opinions related to this. Here, the correct theories and opinions are shown as the arrow A₂; however, humans can never know it.

In Greek philosophy, the words were defined and theories were made clear with argument and rationale. It is shown in Figure 5 that the theory or opinion B is different from A₂. Assertive thinking was important in Greek philosophy. Therefore, argument and rationale are shown as a solid line M on the time t₁. It is equivalent to the incomplete fixed state in chaos theory such as part E in Figure 2. Hilbert's formalism (Stanford Encyclopedia of Philosophy, 2003a) is an assertive type, too. Thinking and opinion are applied to fixed expressions in formalism.

In Greek philosophy, dialectics obeying chaos theory were considered. Entropy decreases in dialectics, surely (Gilgen, 2000; Yanagisawa, under submission-a). However, not correct solutions but moderation 'Synthesis' was demanded in dialectics (Stanford Encyclopedia of Philosophy, 2016). Therefore, most philosophers now think 'dialectics is wrong' (Adorno, 1996; Marx & Engels, 1844; Mocombe, 2016; Yanagisawa, under submission-a).

Next, non-assertive theories were considered by Russell (Stanford Encyclopedia of Philosophy, 1995), Brouwer (Stanford Encyclopedia of Philosophy, 2003b), and so on. Their thinking is equivalent to quantum mechanics such as seen in Figure 6. The hatching box part on the left side of the time t₂ is equivalent to the proliferating chaotic state in chaos theory such as Part H in Figure 2. The process decreasing entropy in Russell's phenomenology and Brouwer's intuitionism is not clear.

Firstly, phenomenology is explained with only a proliferating chaotic state. All phenomena except mathematics and past fact have always some continuous covariant relation to other. Therefore, all phenomena obey chaos theory. And most phenomena changing over time course are equivalent to the proliferating chaotic state. A few of phenomena are equivalent to the localized chaotic state. The contents, such as law, are equivalent to an incomplete fixed state (part E) because of possible changes such as the parts E, G, and H in Figure 2 demonstrate. However, the product description is

equivalent to a complete fixed state (part B) because of the impossibility of change. Therefore, most phenomena in reality can be explained with/by the proliferating chaotic state.

Secondly, intuitionism is explained with only a proliferating chaotic state. Intuition is not fixed and greatly changes with the course of time. Therefore, it is equivalent to the proliferating chaotic state because its basis is not clear.

Next, Russell's five postulates (Herger, 2003) are explained via chaos theory. I shall summarize the key elements of this presently.

- (1) 'The postulate of quasi-permanence' can be explained with the localized chaotic state such as the part G in Figure 2. All solutions are similar in the localized chaotic state.
- (2) 'The postulate of separable causal lines' can be explained with the incomplete fixed state (part E) to the chaotic state (parts G and H) in Figure 2. Each different solution can be unified to a fixed solution according to condition change.
- (3) 'The postulate of spatial-temporal continuity in causal lines' can be explained with the relationship between incomplete fixed state and chaotic state. There are four solutions in the part E (points E₁, E₂, E₃, and E₄) of Figure 1. According to change of the variable 'p,' they can change to chaotic state. And the solutions in chaotic state cannot be distinguished from each fixed solution.
- (4) 'The postulate of the common causal origin of similar structures ranged about a center, or, more simply, the structural postulate' can be explained with a relationship between incomplete fixed state (part E) and chaotic state (parts G and H) in Figure 2. The method shifting a chaotic state to a fixed state in rearranging thinking is used as Kawakida Jiro method, Schedule for the Evaluation of Individual Quality of Life-Direct Weighting (SEIQoL-DW) method and so on (Yanagisawa, 2011b, 2012, 2014b, 2015d, 2015e, 2015f, 2016b, 2016c, 2017b, 2018a, 2018b, 2018c, 2019).
- (5) 'The postulate of analogy' can be explained with the relationship between the incomplete fixed state (part D) and the chaotic state (arrows G and H) in Figure 1. In 'equation (1),' two solutions of the part D (points D1 and D2) cannot exist with only one side. In most chaos equations, pair solutions such as this can exist. The numbers of the pair solutions in the arrow E or 'equation (3)' are not two but four.

$$\frac{Y(n+1)}{Z(m+1)} = \frac{p[1-Y(n)]Y(n)}{p[1-Z(m)]Z(m)} \quad (3)$$

There is no part of two solutions in 'equation (3).'

Thus, Russell's postulates are similar to characteristics of chaos theory. However, he could not know chaos theory because it was not recognized as a common theory in the

1960s (Valle, 2000). And only Russell's postulates are insufficient to explain chaos theory. Therefore, his thinking cannot be positioned as chaos theory-based theoretical philosophy.

Lastly, this author does not know of a concrete example of philosophy with decreasing entropy according to chaos theory. A logical ground with decreasing entropy is required in a new philosophy which obeys chaos theory. Thinking in most fields will be included in this new philosophy. A necessary condition of chaos theory is a continuous covariant relation. Therefore, some common variables and (one or most likely several) time course(s) are required in a reality-based philosophy tackling this.

As stated previously, the pattern decreasing entropy with the process of dialectics is similar to chaos theory. However, the purpose of dialectics is moderate and it is different from a common purpose of thinking in many fields. Moderation is not always right.

On the other hand, Leibniz reported the definitions of space and time (Stanford Encyclopedia of Philosophy, 2007; Yanagisawa, 1996, pp. 115-123, 2019). His definition 'time course is born with change' suggested that continuous covariant relations exist. Because time can become a common variable in reality, all phenomena with a time course obey chaos theory. However, a common purpose for decreasing entropy was not present in Leibniz's philosophy, either.

This author thinks that the common purpose of philosophy must be equal to that of a living creature. The new philosophy is shown as B in Figure 7. Times t_1 and t_2 are the ancient Greek era and now. Philosophy was characterized by having many fields till now. The new philosophy will be considered similarly to the new gravitation equations in physics. It must include the thinking of most fields (point P_1 , P_2 , and P_3). The theory including thinking in many fields will become a chaos theory-based theoretical philosophy. The thinking with decreasing entropy (being a common purpose of living creatures) will be considered as a key aspect of the chaos theory-based theoretical philosophy in most academic fields (Yanagisawa 2019). Of course, chaos theory is not always absolute.

Results

The history of physics represented within gravitational equations and theory can be explained via chaos theory. The history of evolutionary theory can be explained via chaos theory. This author does not know any new philosophy which obeys chaos theory. However, it is thought that the history of philosophy can be explained with chaos theory.

Discussion

There are two modalities of thought in the sciences and thinking. One is based on observational evidence. The other is based on theory. In the former, individual opinion with subconscious bias can become mixed in scientific discourse. Therefore, the sciences are not always right. In the later, mixing is impossible. Therefore, the rate of error is low.

In particular, individual interpretation of them can never be changed in the sciences which are deduced from equations being in a complete fixed state (part B) in Figure 2. Because reality is always with continuous covariation, and since time obeys chaos theory, it can accurately be explained with chaos theory. Chaos theory was proved with equations being outside chaos theory. Furthermore, incomplete fixed and chaotic states being inside chaos theory were proved with it.

So far, environmental change and individual opinion have been incorporated into physics, evolutionary theory, and so on. It appears prominently in psychology, theology, philosophy, education, and so on. However, academic discourse of this type are not always correct because of the bias of individual opinions. It is best that they be explained with recourse to logically deducible equations.

This author explained cosmology, evolution, dialectics, theology, psychology (counseling, development theory, and autism), literature, and so on with reference to equations of chaos theory (Yanagisawa, 1992, 2000, 2017a, 2015a, 2011a, 2004a, 2004b, 2014a, 2015b, 2015c, 2015d, 2011b, 2012, 2014b, 2015e, 2015f, 2016b, 2016c, 2017b, 2018a, 2018b, 2018c, 2019). Is such thinking equivalent to a new philosophy? In most academic fields, the new philosophy will become the thinking with decreasing entropy being a common purpose of living creatures. The new philosophy can be assumed from the histories of other fields, theoretically. Of course, chaos theory is not always absolute. However, it surely obeys real phenomena.

Conclusion

Each history of physics, evolution, and philosophy can be explained with the process of decreasing entropy as understood by chaos theory. The thinking with decreasing entropy being a common purpose of living creatures will be considered as chaos theory-based theoretical philosophy in most academic fields. It may prove to be similar to this author's works.

References

- Adorno, W. T. (1966). *Negative Dialectics*. Bloomsbury, American Heritage Dictionary of the English Language, 4th Ed., updated 2009: Houghton Mifflin Company.
- Anderson, C. M., Holroyd T., Bressler S. L., Nakamura, R., Selz K. A., & Mandell A. J. (1993). 1/f-like spectra in cortical and subcortical brain structures: a possible marker of behavioral state-dependent self-organization. *ATP Conference Proceedings*, 285, 737–740.
- Darwin, C. (1859). *On the Origin of Species by means of natural selection, or the preservation of favoured races in the struggle for life*. London: John Murray.
- Einstein, A. (1916). Die Grundlage der allgemeinen Relativitätstheorie, *Annalen der Physik*, 49, 762-822.
- Encyclopedia Britannica. Copernican system. Retrieved from <http://www.britannica.com/Copernican-system>
- Evening Star: The Ptolemaic Model. Retrieved from http://www.polaris.iastate.edu/EveningStar/Unit2/unit2_sub1.htm
- Feigenbaum, M. J. (1978). Quantitative universality for a class of nonlinear transformations. *Journal of Statistical Physics*, 19(1), 25–52.
- Gilgen, A. R. (2000). Common prescriptions for psychology derived from dialectical materialism and chaos theory. *Psychology Reports*, 86(2), 482–492.
- Greek Philosophy. Retrieved from <http://www3.northern.edu/marmorsa/grphilosnotes440.htm>
- Heger, P. (2003). In Nicholas Griffin (ed.), *The Cambridge Companion to Bertrand Russell*. (pp. 310). Cambridge University Press.
- Imanishi, K. (1938). Annot. *Zool. Japon* 17, 23–36; Mem. Coll. Kyoto Imp. Uni. Ser. B. 16, (pp. 1–35). (1941). (in English).
- Lewin, J. D. & Smith P. F. (1984). Can cosmic neutrinos be detected with superconductors? *Astrophysical Letters*, 67, 59–67.
- Marx, K. & Engels, F. (1845). *The Holy Family or Critique of Critical Criticism. Against Bruno Bauer and Company*. Frankfurt am Main.
- Mocombe, P. C. (2016). The ant-dialectical signification of Erzulie Danthor and Bois Caiman of the Haitian revolution. *African Identities*, 14(4), 332–347.
- Narlikar, J. (1991). What if the Big Bang didn't happen? *New Scientist*, 48–51.
- Newton, I. (1687). *Philosophiæ Naturalis Principia Mathematica*. Jussu Societatis Regiæ ac Typis Joseph Streater, London.

- Peebles, P. J. E. & Ratra P. (2003). The cosmological constant and dark energy, *Review Modern Physics*, 75, 559–606.
- Solov'ev, E. A. (2011) Classical approach in atomic physics, *European Physical Journal D*, 65(3), 331–351.
- Styer, D. F. (2008). Entropy and evolution. *American Journal of Physics*, 76, 1031–1033.
- Stanford Encyclopedia of Philosophy. (1995). Bertrand Russell. Retrieved from <http://plato.stanford.edu/entries/russell/>
- Stanford Encyclopedia of Philosophy. (2003a). Hilbert's Program. Retrieved from <http://plato.stanford.edu/entries/hilbert-program/>
- Stanford Encyclopedia of Philosophy. (2003b). Luitzen Egbertus Jan Brouwer. Retrieved from <http://plato.stanford.edu/entries/brouwer/>
- Stanford Encyclopedia of Philosophy. (2007). Leibnitz's Philosophy of Physics. Retrieved from <http://plato.stanford.edu/entries/leibnitz-physics/>
- Stanford Encyclopedia of Philosophy. (2009). Information Processing and Thermodynamic Entropy. Retrieved from <http://plato.stanford.edu/entries/information-entropy/>
- Stanford Encyclopedia of Philosophy. (2016). Hegel's Dialectics. Retrieved from <http://plato.stanford.edu/entries/hegel-dialectics/>
- Valle, V. (2000). Chaos, Complexity and Deterrence, Retrieved from: <http://www.au.af.mil/au/awc/awcgate/ndu/valle.pdf>
- Yanagisawa, H. (1992). *Relation of Heart (Mind) to Gene; The evolutionary theory with gene's learning function*. Kiri-shobou, Tokyo. (in Japanese)
- Yanagisawa, H. (1994). *Relation of DNA to Mental Stress - Unification of material and mental stresses, Double helix of DNA to solve by equation -*. Kiri-shobou, Tokyo, (in Japanese)
- Yanagisawa, H. (1996). *Contradiction and development of modern science - Beyond chaos theory*. (pp. 115–123). Kirishobo Co., Tokyo, (in Japanese)
- Yanagisawa, H. (2000). *Rediscovery of Heart (Mind) and Time; Serious contradiction between atomic clock and atomic range finder*. Maruzen-Planet, Kiri-shobou, Tokyo. (in Japanese)
- Yanagisawa, H. (2004a). Space Time defined by stress equation. *Electric Journal of Theoretical Physics*, 2, 11–15.
- Yanagisawa, H. (2004b). Three equations of fluctuation (1/f) to feeling, Weber-Fechner's Law and Hubble's Law deduced from stress equation ($dE/dt=kE$). *Electric Journal of Theoretical Physics*, 3, 32–36,

- Yanagisawa, H. (2011a). Energy ignored by Einstein: Dark matter is not required. *General Science Journal*. Retrieved from http://www.gsjournal.net/files/4277_yanagisawa.pdf
- Yanagisawa, H. (2011b). Relation of evolutionary theory to second law of thermodynamics (part 1): Relation of chaos theory to gene's learning function. *Electric Journal of Science Research*, 53(1), 80–83,
- Yanagisawa, H. (2012). Relation of the chaos equation to God perceived by Pascal, Nietzsche and Nightingale. *Scientific God Journal*, 3(2), 207–212,
- Yanagisawa, H. (2014a). A Theory on the Attractive Force between Like Positive Masses. *General Science Journal*. Retrieved from <http://gsjournal.net/Science-Journals/Research%20Papers-Relativity%20Theory/Download/5732>
- Yanagisawa, H. (2014b). Relation of the Chaos Equation to the SEIQoL-DW (Schedule for the Evaluation of Individual Quality of Life-Direct Weighting) method. *Mediterranean Journal of Clinical Psychology*, 2(2). Retrieved from http://cab.unime.it/journals/index.php/MJCP/article/view/974/pdf_40
- Yanagisawa, H. (2015a). Association of Evolutionary Topics related to God and Chaos Theory. *General Science Journal*. Retrieved from <http://www.gsjournal.net/Science-Journals/Research%20Papers-Unification%20Theories/Download/5889>
- Yanagisawa, H. (2015b). Distance to Turning Point Between Dark Matter's Attractive Force and Dark Energy's Repulsive Force. *General Science Journal*. Retrieved from <http://www.gsjournal.net/Science-Journals/Research%20Papers-Cosmology/Download/5884>
- Yanagisawa, H. (2015c). A Precondition for using general relativity in quantum gravity theory: It may not always be appropriate to expand new theories from old theories that are used in cosmology without meeting this precondition. *General Science Journal*. Retrieved from <http://www.gsjournal.net/Science-Journals/Research%20Papers-Unification%20Theories/Download/5965>
- Yanagisawa, H. (2015d). Relation between ‘Constant Dark Energy Pattern’ and ‘Ignored Energy by Einstein’: Big bang and dark energy are not required. *General Science Journal*. Retrieved from <http://www.gsjournal.net/Science-Journals/Research%20Papers-Cosmology/Download/6020>

- Yanagisawa, H. (2015e). Discovering equations in relation to the counseling process. *Mediterranean Journal of Clinical Psychology*, 3(1). Retrieved from http://cab.unime.it/journals/index.php/MJCP/article/download/1044/pdf_49
- Yanagisawa, H. (2015f). Relation between chaos theory and peer support in mental illnesses: Wisdom in the “Serenity Prayer” embodies the peer support effect and ability to sense behavioral changes through continuous covariation. *Mediterranean Journal of Clinical Psychology*, 3(3). Retrieved from <http://cab.unime.it/journals/index.php/MJCP/article/download/1099/pdf>
- Yanagisawa, H. (2016a). Relationship between Chaos Theory and God's Laws in Florence Nightingale's philosophy. *Asian Journal of Nursing Education and Research*, 6(1), 81–84.
- Yanagisawa, H. (2016b). Relationship of a chaos equation to Piaget's developmental theory and selective attention deficits. *Romanian Journal of Applied Psychology*, 18(1), 18–23.
- Yanagisawa, H. (2016c). Relation between Chaos Theory and Lewis's Development theory: Common understanding is never achieved by covariation alone. *Mediterranean Journal of Clinical Psychology*, 4(3). Retrieved from http://cab.unime.it/journals/index.php/MJCP/article/download/1193/pdf_1
- Yanagisawa, H. (2017a). Decreasing entropy in thoughts and evolution: Main ability related to inside nature. *Mediterranean Journal of Clinical Psychology*, 5(2), Retrieved from <http://cab.unime.it/journals/index.php/MJCP/article/view/1498/pdf>
- Yanagisawa, H. (2017b). Relation between the chaos equation and gender differences of the human brain - nightingale's brain was the fixed type. *Asian Journal of Nursing Education and Research*, 7(3), 273–277.
- Yanagisawa, H. (2018a). Chaos theory and nurses' perspectives on child abuse within the family. *Asian Journal of Nursing Education and Research*, 8(1), 137–141.
- Yanagisawa, H. (2018b). Chaos Theory Applied to Irresponsible Use of ‘Reception and Syn-esthesia’ by Japanese Public Health Nurses. *Indian Journal of Nursing Education. & Administration*, 4 (2, 26-32.
- Yanagisawa, H. (2018c). Chaos Theory and the Cohen Hypothesis: Difference between the Chaotic Female Type and Fixed Male Type in Attention Deficit Hyperactivity Disorder. *Indian Journal of Nursing Education & Administration*4, (2), 21-25.
- Yanagisawa, H. (2019). *Relations between Human Thinking and Chaos Theory*. Scientific & Academic Publishing, USA.

Figure Legends

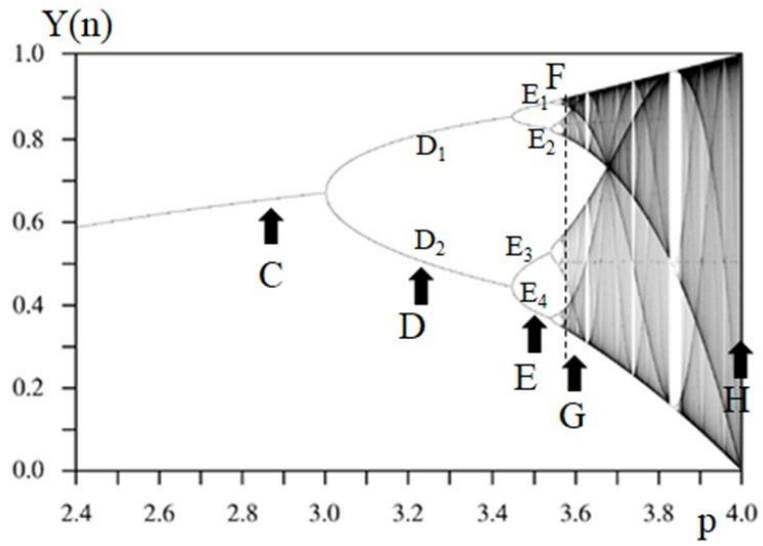


Figure 1. Logistic map of Equation (1)

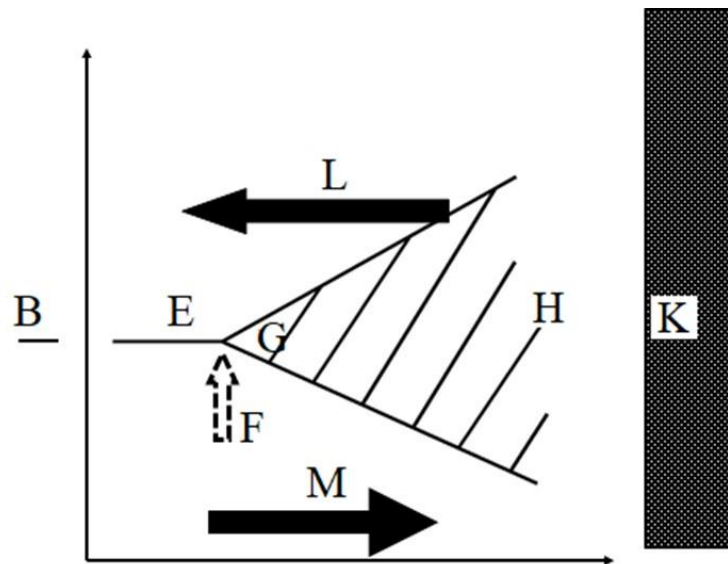


Figure 2. Schema of complete fixed, incomplete fixed, chaotic, and random states

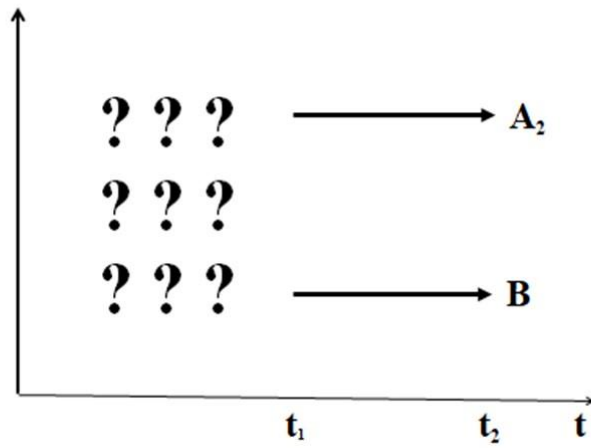


Figure 3. Relationship between myth and each theory in physics, evolution, and philosophy

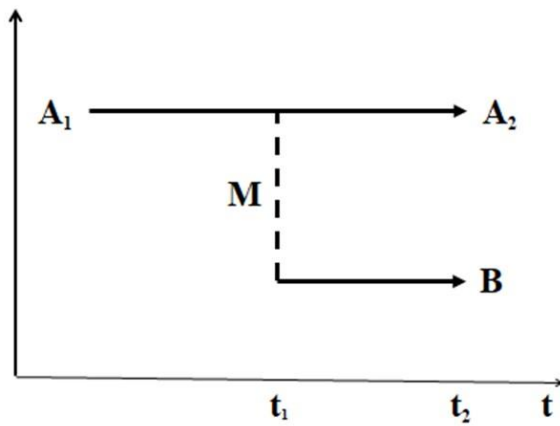


Figure 4. Inarticulate relationship between assertive thinking and each theory in physics, evolution, and philosophy

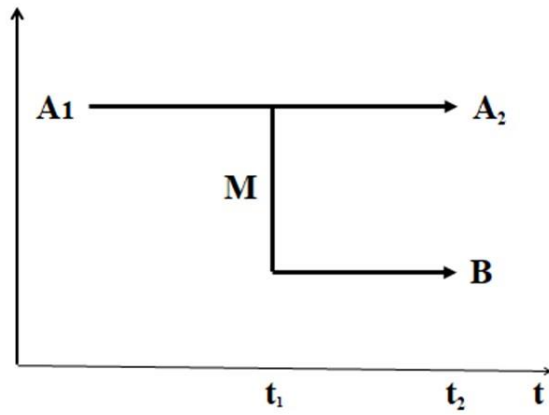


Figure 5. Clear relationship between assertive thinking and each theory in physics, evolution, and philosophy

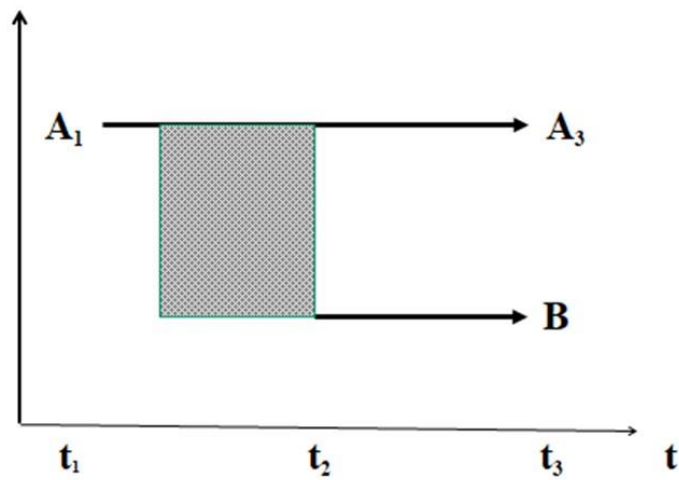


Figure 6. Relationship between non-assertive thinking and each theory in physics, evolution, and philosophy

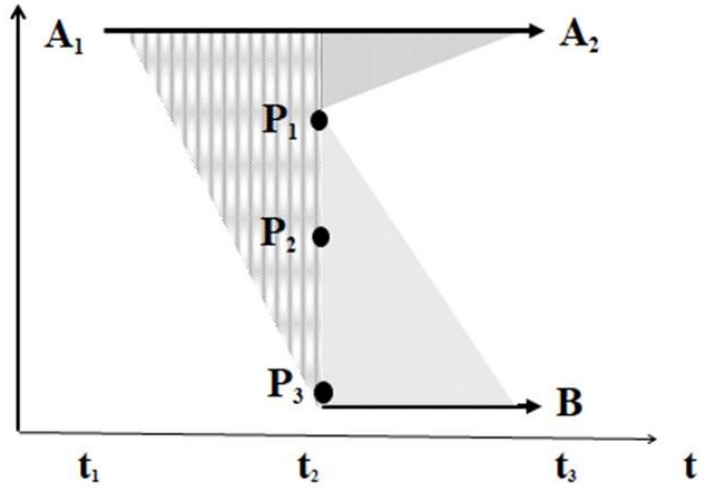


Figure 7. Relationship between chaos theory thinking and each theory in physics, evolution and philosophy