Mathematical Analysis of the Functions of Dao’s Following Nature in the Ideological and Political Education*

WANG Tongjun
Beijing International Studies University (BISU), Beijing, China

This paper attempts to argue about the applications of mathematics in the ideological and political education in China based on the Daoism. The popular analysis, like sets, Cartesian coordinate systems, and mathematical models, will be employed. It mainly dissects the current situations on Chinese higher learning, supported by the Dao De Ching (DDC), the Chinese bible, which will be studied in different sections. There will be in-class discussions on cases about the hot issues relevant and related to the university students. The universal language analysis of math goes along with the Chinese philosophy of DDC, enhancing the cultural education.

Keywords: Dao De Ching, Dao, nature, mathematical analysis, ideological and political education

Dao De Ching (DDC), the Daoist philosophical integration, has been undergoing a variety of dialogues home and abroad. Daoism is regarded as the first and most important religion in China. The ethics, surroundings, medical issues, laws and regulations, etc., are involved in the Daoist notions and concepts. It provides the framework for the political, economic, and cultural lives. Hence, with respect to teaching, Daoism can be talked about in almost all the directions; students’ involvement in the debate and their arguments are playing a substantial role in their ideology and world visions. Case studies will facilitate the classroom teaching; individual views connected with their Daoist daily life experience are highly appreciated.

Religion, Philosophy, Mathematics, Psychology and DDC

Religions have the feature of regions, and it holds true to philosophy. Originally, math bears the individual and local preferences, while psychology entails the distinct cultures. But with their movement or “invasion”, they go beyond the core binding line, landing on the foreign spaces. Thus, the set of religion can incorporate philosophy, mathematics, and psychology, which can be described as Daoism = {x|religion, philosophy, maths, psychology, …}. DDC is the religion of Daoism, or philosophy or a maze of mathematics, which involves psychology. Several authors have pointed out that Chinese correlative thinking displays strong similarities with Western mediaeval and Renaissance cosmologies, particularly in regard to the latter’s key idea of the great chain of being in which microcosmic and macrocosmic levels of reality mirror each other (Clarke, 2000, pp. 69-70). Daoism admits all, all for one, one being the part of the whole. All things are linked through Dao. It recognizes no East or West, only nodding nature. Any Dao flows with its nature, where nature is x, the

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WANG Tongjun, Masters of English Literature and Business Law, associate professor, School of English Language, Literature, and Culture, Beijing International Studies University (BISU), Beijing, China.
independent variable, and Dao is \( y \), the dependent variable, \( y = f(x), x \in \infty \). This can be illustrated as follows:

\[
\begin{align*}
\text{Dao}(y) & \quad \text{nature}(x) \\
\end{align*}
\]

Figure 1. Dao following nature.

**Daoism and Religion**

Religion is the mirror of sightseeing the cosmos, a community interpretation of the natural world, which can be measured under mathematical instrument. Needham (1956) explored the relevance, five sorts of process or energy which are characterized by constant activity and change and which merge and flow into one another, constantly condensing and dissolving in an ever-flowing cyclical current…. Where until recently Western philosophical and scientific thought has tended to see the fundamental constituents of the material world as impenetrable and indivisible particles of stuff which, in classical Newtonian physics, are entirely passive and inert, there is now a palpable move towards a much more dynamic and even organic conception of the natural world within mainstream science which has moved beyond the increasingly disputed mechanistic materialism associated with Descartes and Newton (Clarke, 2000, p. 71). The classic tool married to the more dynamic device of philosophy can be a good try to appreciate religions. The insight of cosmos cannot go without math, and it holds true to religions. Cartesian coordinates systems and calculus will contribute to follow the feature of religions.

\[
\text{Religions} = \{ \text{Christianity, Islamism, Buddhism, Daoism, Hinduism} \ldots \}
\]

**Religion and philosophy.** Some scholars go into Daoism from the relationships between religion and philosophy, involving issues, like moral, environments, and administration. In terms of philosophy and religion, Daoism is playing a fundamental and essential part in the modern Chinese daily life (Mou, 2013, pp. 196-197). Chai (2014) revealed Daoism from ontological and ontic perspectives, with further explanation of all moral and epistemological standards. The definitions of nothingness and non-being demonstrate a clearer interpretation of these two terms. They are the foremost important concepts in the Daoism. These two can be integrated into one. The oneness is nothingness, \( Wu \) the Dao. In terms of cosmos and physics, mathematics can do a better job to interpret them. Nothingness can be reflected with the number of 0, the original point, the base. It is created with a long history, even after the births of other numbers (Chai, 2014, pp. 663-671). Ji Zhang (2012) provided the connections between Plato’s thoughts and Ge Hong’s Daoism, with the core of one or many: one is many; mutual learning, mutual help. Perspectives of kinds create many views, which converge into one, nothingness. This can be well illustrated in figure 2. In the class, how to engage the participants in the Daoist talk is the key issue. Knowingly, the abstract and mystery of the Dao scare most of the listeners. Mathematical analysis, like the Cartesian coordinates, proves to be an effective means. Can the students really enjoy nothingness and non-being? Does it motivate the students to link the term into the everyday experiences? The planning of the classroom group discussion is attempting to invite the students’ interests and their foci.
MATHEMATICAL ANALYSIS OF THE FUNCTIONS OF DAO’S FOLLOWING NATURE

Figure 2. Dao, Wu, one and many.

$DAO(0) = \{1, 2, 3, \ldots n, \ldots\}$. In functions, it is as follows,

$$F(x) = 1, 2, 3, \ldots, F(x) = 2(yin \text{ and } yang)$$

$$3(\text{integration of } yin \text{ and } yang)$$

Try to have students concern with the calculus, the differentiation and integration of $DDC$, the critical terms included. $DDC$ is the definite integration of $Dao$ and $De$; $F(b)$ is for $De$ and $F(a)$ is for $Dao$. Or we can say $F(dao)$ has the definition in the interval of $(a, b)$, $a \in yin$, $b \in yang$. This may be demonstrated with the following model.

**Daoism and other religions.** More articles or books involve Daoism with other religions. D’Ambrosio (2016) revealed the links between Confucian and Daoism. Confucianism and Daoism must share some great thoughts, as they are born in the same land. Plus, these two are shaking hands with Buddhism. The exploration of these big three, Confucianism, Daoism, and Buddhism, reveals unparalleled value (pp. 621-631). Liu (2011) dissected the emotional principles in Confucianism and Daoism. Chinese ideas are generally based on emotions, not reasoning. This contributes relationships study in Chinese market (pp. 118-133). Sung-Hae Kim (2014) revealed the tie between Daoism and Christianity. Daoism and Christianity are playing a leading part in China and the West respectively. The dialogue between these two can create fascinating insights. The core of them must share something. Believers shall possess the capability to recognize the strength and weakness of varying values. Also, all of them highlight the significance of water, for example, water in early Chinese philosophical texts has a number of attributes: It is a source of life, but it should flow in channels…. Water always tends downward and it follows its downward course spontaneously. Water, which is soft, weak, and uncontending, yields to any hard object, but it will eventually wear down the hardest of stones and overcome any obstacle put in its path…. In Chinese cosmology, water may be paired with mountains or with fire (Allan, 1997, p. 65). Dao can be the boat, carrying us to where we would like to go; Dao can be the water, floating the boat to where it is. Boats and water can be one, boating water and watering boats. Traditionally, religion is beyond any science, which suggests one cannot go without concerning about the belief, adhering to some religion shapes our mind and soul.

Figure 3. Emotion and reason. Figure 4. Water’s implications in three religions.
Localization of Daoism. Some articles show us the growing and developing of Daoism dominance. Wilkerson (2007) launched an analysis of how Daoism shared the market with the local religions, stating China’s northern male-privileging Taoist religion merged with the Southwest China’s women-empowering religions and other Southeast Asian religions (pp. 150-163). The localization of the Daoism and its ideas and thoughts requires us to adapt the religion to the local people’s preferences. The study of gender and ethnic identity is also capable of revealing the power of the Daoism. Intercultural researches contribute to the understanding of the way of the nature. Daoist cultures have been discussed in variety of perspectives.

We can say, Daoism\(\text{(local)} = Ax + b, \ x \in \text{the core of Daoism, A, b is the modifier. To put it another way, D(l) = \{x|\text{Daoism, local cultures}\}}

Psychological Analysis

Taoism can be interpreted in psychological terms. This non-action philosophy leaves plenty of space for psychology to probe. Ideas, like peace, self, and meditation, are the same topics for Taoism and Jung’ psychology. Liang (2012) introduced the close relationship between Jung and Chinese religions, compared Jung’s psychological theories to Chinese religious thoughts taking Buddhism and Taoism as examples (pp. 747-758). Kam-Shing Yip (2004) stressed the mental health (pp. 25-42). Health in mentality is arising more concern in the modern society. The anxiety and stress out of the pacing of the life generate more psychological problems. The pursuit of life style pushes us to pursue self-improvement in personality.

Discussions

Religions and philosophy: Daoism
Psychology and Daoism
Can the students reflect themselves with closed eyes in the perspectives of Daoism?
How about certainty and uncertainty in math and philosophy, order from chaos?
What is the role or nature of mathematical proof and philosophical thinking?
Tell the philosophy of mathematics from philosophy to mathematics.
Water’s understanding and its significance
Case studies: Try to get some typical cases about pressures of college and university students in China or other countries and have a good discussion on them.

The Functions of Daoism in the Ideological and Political Education

Some others demonstrate the significance of Daoist ideas in terms of pedagogy. Maki (2016) proposed a good analysis. The key experiences of cultivation in teaching can be identified in Daoism. Cultivating yourself and cultivating others, no external forces, let go, let yourself go. There are a host of opposite agreements, such
as the mix of nonbeing and being, the unity of \textit{yin} and \textit{yang}, the harmony of heaven and earth, the peace of human society and nature, the interlink of stillness and moving (pp. 150-164). Roberts (2016) talked on the opposites, like reason and emotion, faith and doubt, happiness and suffering, and action and passivity under the educational environments. Generally, more Confucian views are concerned about education; Daoist education can also be unveiled. Being logical, faithful, happy and actionable, or emotional, doubtful, painful, passive, that is a question (pp. 249-266). Kirkland (1998) discussed how to teach Daoism for the non-specialists, including passing on the authentic Daoism, the updated qualified textbooks, the whole Daoist tradition, believable translation, and responsible choices (pp. 111-119). Daoist topics cover multidiciplines, containing variety of themes. Each section will be better revealed with the typical cases, the current cases in particular, like the case of Zhang Koukou, a poor man in Shan’an Xi Province, China, murdered his three neighbors whose family member negligently killed his mother 22 years ago.

Just as Figure 7 shows, we can see, Dao = \{contradictions\nonbeing and being, \textit{yin} and \textit{yang}, heaven and earth, human and nature, stillness and moving, reason and emotion, faith and doubt, happiness and suffering, and action and passivity, \ldots\}. \textit{Yin} and \textit{yang} stand for numerous couples.

And mathematical models can be employed to show such expressions, F(dao) = X = Y1 + Y2, \textit{dao} is \textit{X}, the independent variable, \textit{Y1}, \textit{yin}, and \textit{Y2}, \textit{yang}, are dependent variables, those contradictions being the outcomes of the \textit{Dao}.

![Figure 7. yin(y1), yang(y2), and dao(x).](image)

**Political Analysis**

Some scholars focus on the political issue on Daoism. John A. Rapp (2012) argued the links between anarchism and Daoism. He analyzed the Daoist ideas from the 4th century BCE to the 9th century CE and made a comparison and contrast with the Western relevant thinking. The research on Daoism and politics is also one of the hot issues. The distinction between the ancient times and the present invites us to go deeper about the notion of taking no action. Actionlessness and interference can be called a contradiction, which is similar to market economy and planned economy (Rapp, 2012). Barbara Hendrichske (2006) underwent the translation of Taiping jing, which narrates the origins of Daoism. Great peace can be constructed in terms of politics and religion. The research of it reveals the origin of the Daoism. The translation will strengthen its transmission and enrich the world religious culture (Hendrichske, 2006). How to assess the connotation of the politics in the Daoism is playing an essential and indispensable part in the ideology and politics class. What is non-action? Does it really mean doing nothing, or of anarchism? What is the function of the governing?

Daoism and anarchism, \textit{x} and \textit{y}, are misunderstanding links. \textit{Wuwei}, non-action or unforced action, is at odds with the metaphysical assumptions of Newton, Descartes et al. (Needham, 1956, pp. 562-564). Actually, it is an equivalent of Daoist governance; or we can put it with the following coordinate system as Figure 8 shows.
Legal Analysis

Bender (2016) argued about the understanding of justice and its practices like non-coercive action and compassion. There are so many terms about ziran, such as self-so, non-coerciveness, spontaneity, organic, effortlessness, just do it, non-action, and naturalness. Harmony among human world, society, and nature renders us no more external forces (pp. 1-18). Dao follows ziran, everything going with non-coercive action, which is a kind of liberty and freedom. This can be the cornerstone of the Daoism. Each verse is closely connected with it, so that the learners can base their daily study with this doctrine. Different views are hungry for heated discussions in the class. China’s rule of law can be argued in the light of the Daoist background.

Dao is of justice, all-inclusiveness, the weak, the strong, the opportunity, the threat. No external forces will push it. Students can have a debate about it. \( F(\text{dao}) = x_1 + x_2, \ldots + x_n \) (x is of Dao or De, y is of laws or ways).

Discussions:

Comments on the significance of political and legal non-actions in China in terms of SWOT?

Case study: Hong Kong protests in 2019

Talks on no one ignorant of geometry come under my roof, let no man who is not willing to learn geometry enter here. Can the study of math be supported by the laws and regulations?

Philosophy is for the service of politics?

Science and civilization in China: how to be civilized gentlemen

Mathematical logic: contrary thinking, method of elimination, transformation approaches, structured approach, method of solving equation

Law and logic

Historical, Cultural and Literary Analyses in Terms of Daoism and Their Mathematical Interpretations

History makes a wise man; historical analysis of Daoism generates clearer knowledge of it. Cultures involve our engagement with Daoist growth and development and its transmission. English is time-based language, while Chinese is space-based. The Englishman has the aptitude of time reasoning, and Chinese people prefer spatial thinking (Wang & Gao, 2019, p. 3). The time-spatial relationship can be demonstrated with Cartesian coordinate mechanism. As we know, the Chinese character, the ancient in particular, is
hieroglyphic, many of which are inversion-like phrases, of contrary thinking, tainted with mathematical feature.

**Historical Analysis**

Dickerson (2006) edited a dictionary with a host of Daoist items, describing the origin, historical development, and significance of Taoism. Learners can edit their own items about Daoism, in groups, team spirits being appreciated. Debate about the reasoning of such choices and editing will be welcomed. The argument will spur the students’ understanding of the text, which cultivates their academic awareness. Smith (2003) carried on the semantic analysis of Daoism. The argument of Sima Tan’s coin version of “-ism” leads us to the wording of Daoism (pp. 129-156). This will strengthen the viewers’ senses of the charm of the original language, ancient Chinese, whose mastery will be a great help to pursue the essence of *Dao De Ching (DDC)*. To Chinese students, more commitments to the authentic text are highlighting the enjoyment of this myth. More articles and books tend to concern Daoism historically. Gil (2012) explored the early Daoism between the first and the fifth centuries CE, disclosing a host of Daoist events. Stephen Eskildsen (1963) did some research of Daoist notions from the latter Han to the Tang Dynasty. Sørensen (2015) produced a review article about Stephen Eskildsen’s points while undergoing a survey of comparison and contrast with Buddhism. The study of the history of the *Dao* will enhance us understanding of the influence of the way. The different roles of humans demonstrate the dominate role of the *Dao*, demanding the variety of goals of our life. Meditation is an ideal mindset or a dream for the Daoist. This involves the serenity and stillness of the mind. Buddhism also emphasizes meditation. Wang (2016) proposed a detailed statement of the themes of Daoism in the history of a Ming novel. Daoism can be viewed as an imaginary world, an ideal state of mind, for faithfulness, honesty, integrity, and justice. Or we can say that is a dream; anyway, dreams in the real world sometimes are not dreams, and the realities are dreams. Our world is full of dreams; we are living in dreams. *You* and *Wu*, being and non-being, are dreams or truths, which are so complex for us to define (pp. 151-154). Historical analysis is a dynamic study, with which the students can acquire some knowledge about the rising of the Daoism. This will sharpen their sense of history to evaluate events or human beings, a helping hand of the psychological analysis to one’s personality and character. Relevant data can be attained through their involvement in the original text. Students can do some research about the history of the Daoism, clarifying the whole picture of its growth. Daoist text is a math-like, a concise and condensed kaleidoscope.

*Dao* is growing, *De* is rising, and *Ching* is developing, whose changes are the history of the philosophy, with times changing. These changes in time are undergoing through Chinese character, space-centered semantic flowing, which can be illustrated with the following Cartesian coordinate scheme of Figure 10.

![Figure 10. Daoist space and time.](image)

The spatial shift refers to Daoist spreading to other countries, while time-changing means the historical information involved in Daoism.
Cultural Analysis

It is said that Daoism is very popular with the Americans. Different nations can share the similar ideas…. The Chinese mind does not aim at grasping the details for their own sake, but at a view which sees the detail as part of the whole…and thus placing the details against a cosmic background—the interplay of Yin and Yang’ (Jung, 1985, p. 49, as cited in Clarke, 2000, p. 73). This can mean individualism yielding to collectivism, which does not imply Daoism ignoring personal development, Dao’s inclusiveness revealing all things being integrated into one.

There are a host of scholars offering a comparative analysis between Daoist culture and Western cultures. Clarke emphasizes the Tao of the West. The incorporation of Daoist ideas and thoughts with the Western blood can be a profound fascinating topic. Transcultural analysis will show the influence and impact of the Daoism. Just like the Chinese food invades the Western food, Jiaozi challenging the hamburger. The Westerners are appealing to some key conceptions, such as unity of human and nature, links between life, health, and vitality, self-so, simpleness, and non-action. The antipodes in the Western ideas are embracing these oriental enlightments (Clarke, 2000). Lacertosa (2017) paid special attention to the transcultural philosophical analysis. He undergoes some critical passages of Heidegger and the related problem of [...] (you) and [...] (wu) in terms of the interpretations and translations, whose handling profoundly involves cultures identities and the transfer between distinct cultures. Translating problems is in reality cultural problems. A cross-cultural analysis of Daodejing renders profound importance for scholars and the general readers. This small book entails great ideas, which is a reflection of the ancient Chinese pictures, whose interpretation invites the intercultural perspectives. Chinese philosophy is growing and developing under the oriental lands, foreign to the West. The Western view of the Daoism will be a new perspective to the Chinese philosophy (pp. 324-339). Lee and Kanazawa (2015) elaborated the connections of Totemism and Daoism. Human beings are living with nature; they depend on each other, interacting on each other. The relation between them is one of the topics of social science. The admiration of the natural beings, such as animals and plants involves totemism, whereas the priority of nature in the Daoism puts the Daoist into the nature lover, mental dependence on the natural world (pp. 278-285). George T. Crane (2013) attempted to tackle the popular American social problems based on the ancient Chinese philosophies of Confucianism and Daoism. The oriental worldview can inject some new blood to the American culture. The translating of Confucian and Daoist concepts into the West will to some extent assist in solving the key problems in the American society. Cultural identity and diversity have a rather big influence on the understanding of the social problems. Cultural analysis is a broad and vague interpretation, which is root of students’ view about the world. The six traditional tour sectors, like food, clothing, accommodation, travel and trip, shopping, and entertainment, are options for the students to make heated debate. Their daily preferences, tastes, and haunts will assist them to fully understand the implication of Daoist value.

Physically, mountains and rivers are a complementary pair, like fire and water. Together, they embody both time and space. Mountains rise toward the sky, whereas water descends into the earth. Mountains are high; rivers, low…. Mountains and rivers together signify the whole cosmos (Allan, 1997, p. 54). Time is the x, space is y. Mountains are y, rivers are x. Figure 11 is manifesting this point. Mountains (fire) are men, yang; rivers are women, yin. Or the opposite, they are interdependent.
Daoism and Literature

Sure, Daoism has a profound impact on literature. Lu Venya (2012) compared the key terms of Tolstoy’s non-resistance to evil by violence, wise non-doing and Taoism counterparts, illustrating their organic interrelations, highlighting the influence of Daoism on Tolstoy’s works and worldview (pp. 88-99). The marriage of literature and philosophy is a brand new perspective. The feature of organic can be explored in these two fields. Non-aggressiveness of the Daoist core concept can exert influence on novels (Boulet, 2006, pp. 925-945, 21). This essay offers information on the literary style, language, ideology of enlightenment, and Taoism presented by author Peter Dale Scott in his book *Minding the Darkness*. It also includes views of several authors, including Roger Mitchell and Scott MacPhail on the book. In his book, Scott uses the figure of his dead father F. R. Scott, politician and poet, as a representative of the secular enlightenment ideology.

As Figure 12 shows, we can put it like this: Daoism = Traditional China’s liberal arts = {literature, history, philosophy}

Discussions

- Daoist literature?
- Daoist culture in our study and work of tomorrow?
- Daoist history for today’s reflection
- The beauty of philosophy, mathematics, and literature
- Creativity in teaching and learning/critical thinking
- Studies of literature, history, philosophy in college and university education and mathematics learning
- Chinese mathematics and mathematicians: hobbies and interests v. academic studies
- Case study: *Yuanpei* pilot program in Peking University

Conclusion

*DDC* is a philosophical works as well as a literature. It is of religion and mathematics. Students in the course of ideology and political science can bury themselves on this manual, getting along with the cases in their daily life. Where there is a *DDC*, there is a way. Ways are following nature. We are born in nature, and to die in nature, where the changing is nature and non-changing is also nature. It is going as it is with no respect to
MATHEMATICAL ANALYSIS OF THE FUNCTIONS OF DAO’S FOLLOWING NATURE

others’ observation, but humans will observe nature (Wan, 2018, p. 21). Nature is all, all for living things. The world is witnessing a whole soul era, requiring rising general education, putting some core perceptions to the fore. Chinese education can pay special attention to creativity in math, as well as some issues, like mathematics and computer science and DDC, mathematics and imagination, and mathematics and science.

References

