

# The Schema Analysis from the Perspective of Pluralistic Mind

Jianhua Xie

School of Marxism, Taiyuan Normal University, Jinzhong, 030619, China

geshilao@163.com

## Abstract

Traditional theory holds that knowledge is the justified true belief, and its basic units are concept, judgment and reasoning. Pluralistic mind proposes another unit (psychological schema), which is regarded as the basic unit of knowledge. From the perspective of pluralistic mind, explain the rationality of mental schema. A mind that can enrich and create multiple schemata with different representation systems has a better chance to avoid illusion than a mind with only one representation system. In the mind, multiple schemata can avoid the illusion of a single specific schema. The mind can think through different schemata. If there is no alternative schema, it is impossible to distinguish between illusion and comprehensive a priori truth. Faced with such a problem, that is, whether there are restrictions in principle on what human beings can understand. A diverse mental structure is an excellent strategy to avoid these limitations.

## Keywords

Pluralistic Mind; Schema; Cognitive Adaptability.

## 1. Introduction

The pluralistic mind believes that the cognitive ability of the mind is not limited to the linguistic cognition of humanism, it also includes pre-human animal cognition, post-anthropological machine cognition, and cyber cognition (Xie 2020:28; Xie 2021: 119-133). The pluralistic mind uses the "psychological schema" as the understanding unit of the core knowledge system, folk theory and scientific theory. As such, schema is an idealized unit of domain scale understanding (Nieh et al. 2021:80-84). The schema is an idealized domain scale understanding unit. Each schema has its own internal ontology to represent the objects, attributes, relationships, events and processes of its content domain, as well as its own reasoning rules about the properties and transformations of these.

Mental pluralism advocates that the subject understands the world through psychological schemata in different content fields. Cognitive ability is to use some special-purpose systems to detect and track the world and interact with different parts and aspects of the world. At the same time, cognition produces a view that is not completely unified. The schematic architecture makes some non-uniformity possible in principle. Such non unity is not only the expression of human current ignorance, but also the predictable and lasting product of a specific type of cognitive architecture.

In a system of understanding and belief, human beings need comprehensiveness and consistency. On the one hand, human beings want to understand as much knowledge as possible. Hawking said: "it may be that in order to describe the universe, humans must adopt different theories in different situations." But there are also some things that are not suitable for human mental understanding. They are beyond the scope of knowledge, such as the picture of the universe in a trillion years. If there is a comprehensive understanding and knowledge system, it is in a limited sense. This comprehensive knowledge system includes everything that human beings can understand in principle, or at least everything that human beings currently

understand through schema. Through the representation of different things by a large number of schemata, the cognitive structure of schemata can be more comprehensively understood. Acquiring a new schema is more powerful than acquiring a single belief. Schema provides a method to represent and infer the transaction state in its domain. Relying on the complementary relationship with language and thinking, through social communication, the scope of schema used by human beings is further expanded. On the other hand, schema is idealized. Schemata produce specific types of representation and reasoning rules. Having multiple schemas can lead to inconsistency. Schemata with different representation systems and reasoning rules will produce inconsistent beliefs and judgments. The understanding system of schema has the internal tension between comprehensiveness and consistency. When weighing comprehensiveness and consistency, comprehensiveness usually trumps consistency. The human mind evolved from the mind of pre-human animals. It is generally believed that the mind of non-human animals is mainly composed of a pile of closed instincts and characteristic skills. This is an excellent strategy. This may be the only biologically feasible strategy to evolve intelligent animals. The question is whether this is still an excellent strategy for animals like humans who have the ability to speak and reason clearly. There are two different problems. The first problem is the often seen disconnect between the discussion of the human mind and the non-human animal mind. Some scholars believe that the animal mind is mainly composed of a pile of closed instincts and excellent skills, and admit that human cognition is the product of evolution. They talk about the human mind. It is as if humans were designed from scratch as universal reasoners. This is unrealistic. Second, if we say that human reasoning ability, language ability and language like thinking ability are increased on the basis of a set of more specialized old abilities, then there are still problems with the new abilities. Whether different understanding fields have been adopted for new and more complex thinking and reasoning abilities. For those who are no longer limited to the developmental channelization ability of natural selection products, is this still an excellent design strategy.

## 2. The Cognitive Adaptability of Schema

### 2.1. Generation of Cognitive Adaptability

Why does the mind of simple organisms exist or at least rely heavily on an excellent skill kit? This is a question worth exploring.

First, the accumulation of different traits of animal cognitive adaptability is the result of variation and selection. This is the most important. Cognitive characteristics are also consistent with this. This does not make organisms produce an excellent strategy, but it does make it possible for organisms themselves to obtain an excellent strategy.

Second, the cognitive adaptability of animals is the product of evolution and development, accompanied by special and effective neural circuits. Therefore, cognitive features are often fast. When it comes to some important choices, such as avoiding predation, fast is excellent. At this time, speed is often more important than accuracy. When detecting predators, the cost of pseudo positive is lower than that of pseudo negative. Clouds sweep overhead many times, and animals can hide many times. However, an animal cannot miss the predator who tracks it at one time. Careful consideration is beneficial to some things. However, animals cannot carefully consider whether the source of stimulation is really caused by predators.

Third, the cognitive adaptability of animals is excellent in the specific purpose mechanism. Precisely because they have specific purposes, each is useful only in limited circumstances. Therefore, accumulating individual adaptability to do different useful things is a reasonable evolutionary meta strategy.

Fourth, the cognitive adaptability of animals has a certain elasticity. Intergenerational feeding needs its own special cognitive mechanism, which is lacking in most species. Most animals have

no parental protection and need to be able to adapt quickly. They need a basic set of excellent skill kits. These skills are the product of early development. At the same time, they may also carry out more complex learning.

Fifth, some mechanisms of cognitive adaptability of animals are too specialized to be learned through nurture. This seems to be particularly evident in the types of perception and behavior associated with mating. Animals of most species are born with the ability to identify potential mates and know when they are ready to breed. This may be because members of a species are sensitive to physiological, behavioral and chemical cues unique to heterosexual members of the same species. For most species of animals, if they do not have innate mechanisms to guide, it will be very difficult to learn how to mate. Courtship and mating behaviors of some species are quite complex. The mechanisms that produce these behaviors are still innate.

The above description: from the evolutionary process of variation, the cognitive adaptability characteristics of specific purpose can be separated; The accumulation of these cognitive adaptive characteristics is obtained from the process of evolutionary selection.

## 2.2. Enrichment of Cognitive Adaptability

The multiplication of individual cognitive adaptive characteristics is an evolutionary strategy. This strategy can be imprinted on simple animals. In the past, philosophers and biologists often looked at the mind of human and animals in a binary way: non-human animals have instinct rather than rationality, while human beings have rationality but few instinct. This dichotomy masks the huge differences between the minds of different non-human species. At the same time, it also distorts the human mind. This shows an untrue evolutionary history.

The human mind, like animals, does not lack a mechanism for a specific purpose. These mechanisms are the product of channelization and selection of development. Moral philosophy often recognizes this. Moral philosophy criticizes individuals whose behavior is dominated by "desire". However, the mechanism of specific purpose, from blink reflex to avoidance reactions such as aversion and incest avoidance, is not all desire. Human beings are not entirely rational animals. Human irrational cognitive mechanism still plays an effective role.

On the one hand, evolution has superposition. Ancestral traits may be lost. Humans have no tail and are not as sensitive to external hormones as our ancestors. Some features also lose their function and exist in residual forms, such as appendix and coccyx. But in general, new features and old features are mixed together. For example, three visual systems owned by human beings have the ability to extract depth information from multiple clues. This is confirmed by evolutionary psychology: landmark mutations have given humans unique characteristics and led to the loss of purpose specific instincts for millions of years.

On the other hand, evolution is blind. Evolution does not make large-scale modifications between schemas. Evolution will not start from scratch. Evolution is limited by the range of gene mutations. These genes can produce organisms that can survive and reproduce throughout development. This evolutionary limitation limits the range of changes in sexually reproducing species: if a genetic change makes an individual organism more successful, but the genetic change is not reproductive compatible with other heterosexual individuals, the mutation will not be transmitted. It is now known that mutations do not need to be as small and gradual as Darwin imagined. However, evolution is still a gradual and gentle process. The process of losing features without adaptive advantages may occur on a scale of hundreds of thousands of years. Perhaps future generations will gradually reduce dedicated channelization mechanisms. However, this process may take thousands or tens of thousands of years.

Losing some cognitive adaptive characteristics also faces loss. For example, humans use aversion response with high efficiency. The mechanism of aversion is highly flexible. This mechanism can avoid infectious sources, such as feces, wounds, skin diseases and parasites. This mechanism is triggered by many stimuli and works quickly. It is hard to force yourself to

touch things you hate. Sometimes, disgust is not caused by things that are not really dangerous. Most slippery things are not dangerous. Leprosy may be a typical disgusting disease that afflicts humans. At the same time, leprosy is one of the lowest infectious diseases.

Precise knowledge of biomedicine can provide a more accurate understanding. People can grasp which kinds of things have biological hazards, their operation mechanism, and their safe treatment procedures. Such knowledge can help us suppress unfounded aversion, and even stimulate aversion by editing to a certain extent. However, such knowledge does not lead to the disappearance of disgusting reactions. This is an excellent mechanism. Aversion can be learned. Disgust can be deeply influenced by what humans learn. Disgust itself is a deep-rooted mechanism and a useful mechanism. Disgust can save people from new sources of infection from which they cannot respond quickly with scientific knowledge.

The evolutionary example of human sexual instinct is also very effective. Human sexual instincts are far more open than the fixed reproductive processes of insects or birds with mating rituals. However, human sexual instinct is an important motive for human reproduction. From the perspective of biomedicine, people can more accurately understand human reproduction. However, a creature with only a scientific understanding of reproduction has no internal motivation to practice reproductive behavior. Scientific understanding can have a big impact, such as identifying suitable spouses and their reproductive possibilities. People's ability to identify these spouses depends to some extent on specific biological mechanisms that are sensitive to biological changes, such as pupil dilation, increased blood flow to lips and genitals, and age cycles and interest behaviors. Humans can ask each other, "would you like to have children with me?" When discussing the core elements of natural selection, such as avoiding danger and breeding offspring, evolution provides a set of very effective tools. This is difficult to change, and the lack of these mechanisms will seriously damage mankind.

Human ability to detect and respond to social cues is also unique. This is very important for a social species like humans. Some people, such as people with autism, are impaired in these abilities. People with autism can be understood through social reasoning. However, they still can not fully achieve the mature normal cognition that most people have. For other normal people, learning more about social communication through the research of social psychology may make human beings better at communicating with others. However, this cannot be a viable alternative to human social cognitive expertise.

### **3. The Amplification Advantages of Schema**

Although learning plays a vital role in the human mind, the human mind still needs excellent skill kits. Human beings' more flexible cognitive types will appear in the form of many different schemata. On the one hand, it is an excellent strategy to improve understanding and intelligence. On the other hand, this is determined by human biological heritage.

#### **3.1. Limited Cognition in Limitless World**

Some non-human species also have some schematization capabilities. A small part of the world that human beings perceive with their senses at a certain time is also quite complex. No creature on earth can accept all the information in its surroundings. When compared with all facts and events, human mind and its ability are very limited.

To produce understanding, the limited embodied mind must represent the world in an abstract and idealized way. This is the process of compressing the chaotic complexity into a limited number of concepts while ignoring other concepts. In order to be useful to organisms, these concepts are very prominent for organisms and their interests. These concepts must be good enough to track real patterns, in the world, or at the interface between organisms and the environment. As the mind grows stronger, "interest" may be disconnected from biological needs,

and tracking may increase accuracy. For example, an interest in opera or physics. But even so, the form of understanding is bound to be specifically affected. For example, what interests do organisms happen to have, what laws in the world are significant to these interests, and what laws can organisms perceive, conceive and act through.

The unit of understanding should be the laws tracked by them, or the way organisms perceive and act on them, or the personalization of their related interests. Understanding should appear in the schema of corresponding scale. Gravity is a single basic force and a candidate for a single theory. Gravity is the unified feature of some laws of object motion. The law of gravity is often encountered. If other contents and gravity are mixed into a schema, it will not only make the cognitive work too complex, but also blur the understanding of the real law. But people use more than one gravitational schema, some are theoretical schemata and some are not. People have an intuitive understanding of falling objects. This is a good strategy. Although this understanding is not as accurate and projective as general relativity or even classical mechanics, it is better for catching falling vases or avoiding falling from cliffs. Even in the context of different energy levels, people may need to describe the phenomenon of collision. On the one hand, this is because the particles themselves behave differently. On the other hand, this is because the best way to observe, imagine and act on particle collisions varies from environment to environment.

The first reason why human beings have a diversified schema: the world needs it. There are many real models in the world. The most effective modeling method is continuous modeling. There are usually some methods to combine them, such as vector algebra, merging congeners and so on.

### 3.2. Non-fundamentality of Schema Integration

In some cases, one may think that many patterns may be derived from a single, more basic thing. Gravitation was once thought to consist of two distinct sets of principles. One is about the principles of celestial bodies circling in the universe, and the other is about the principles of objects falling on the ground. Both electromagnetic force and strong and weak force can be included in quantum theory. Many physicists expect a unified field theory that combines gravity with the other three basic forces into a single theory. However, this is not an argument about psychological possibility.

Can the universe create creatures with omniscient unity? If there is such a creature, do they think about the world according to the best theory that humans now have, or a unified theory? Maybe it is impossible. Organisms that think in a unified way, thinking only in this way, may not be produced by natural selection. Organisms that gain universal understanding may have to be recognized like humans. First, organisms need to learn the schema of many specific phenomena. Then, they use reasoning and experimental methods to obtain more general knowledge. Without a variety of schemata, it is impossible to get a more general theory. Even for scientific purposes, more specific diagrams such as electromagnetic force, particle collision, nuclear cohesion, planetary orbit and trajectory are still needed. More basic theories can explain more specific theories as special cases. However, for the laws captured by more specific theories, more basic theories may still be useless. Biological processes may be the result of potential physical processes. However, neither biological evolution nor tricarboxylic acid cycle can jump out of the physical equation. Using quantum mechanical terms to infer the origin or metabolism of species is a very bad method.

Moreover, a creature that thinks only in general basic physical terms will not be able to interact well with its environment. Foraging or avoiding danger will become an impossible heavy task. Such a task is meaningless for an animal without a feeding and predation schema. Some fields are not special cases of physics, mathematics, ethics and aesthetics, and organisms cannot think about them in the terms of these disciplines. Organisms cannot think of everything they can

think of. In short, the pursuit of the ideal of unity has nothing to do with psychology. Unity is an achievement based on a pre-existing schema. A schema is unified in the sense of capturing the causal or component basis of other phenomena. When thinking or interacting with the world, schema is not necessarily a substitute for other phenomena. For an organism, it is important to be able to effectively track significant patterns rather than basic patterns. Moreover, most significant patterns are not basic. Being able to understand more and more basic theories enables humans to think about new things and think about them in an enlightening way. However, this does not diminish the importance of thinking about them in other ways.

## 4. The Real Mode Application of Schema

### 4.1. Supply Application of Real Model

Psychological schemata track the “real patterns” of nature, such as the gravity between two objects. It is attractive to think of this model as “objective” and “independent of human beings”. Moreover, there are some important ways to make this description meaningful. One is to compare the quality attribute of an object with an attribute similar to edible. Edible is a related property of an organism, which refers to whether an organism can eat an object. Meat is a potential food for lions; Nectar is a potential food for butterflies. Edible is neither food nor predator. Similarly, what is dangerous, passionate, or suitable for mating depends on what kind of organism the object is. Therefore, some characteristics, including those most important in biology, exist neither in organisms nor in objects in their environment. In a sense, these characteristics exist in the interface between biology and environment.

James J Gibson, the founder of ecological psychology, called such characteristics “supply”. Gibson believes that nectar is “supplied” to butterflies in a way that butterflies can use (Gibson 1966). Exploring supply allows organisms to avoid mistakes. Supply is objective. This is because supply does not depend on any biological tendency or its feeling about it. Supply is not objective. This is because supply is only in the object to which they belong. Supply is not innate. Supply is not basic, and supply may not appear in the main theoretical terms of science. However, both metaphysically and scientifically, supply is equivalent to gravity.

On the other hand, from the perspective of psychology, the concepts and schemas used by human beings to think about supply are very different from those used to think about a world composed of objects and attributes. An organism can detect and respond to supplies without imagining them as things or attributes attached to things. Human beings can regard edible or dangerous as the characteristics of things. However, animals lack human like concepts and even object oriented ideas. They can also find and respond to supply. Animals do things such as eating food and avoiding danger. Mosquitoes are sensitive to differences in the content of carbon dioxide in the air. Mosquitoes use these differences to determine the location of mammals to obtain blood food. Mosquitoes do not use objects and attributes to characterize these. Mosquitoes just have a circuit like psychological schema in their tiny ganglia, so that mosquitoes can run on the track of supply. Most of human unconscious cognition is also included in supply testing. For example, humans simply record whether a particular surface provides a stable foothold and adjust the step path accordingly. However, many conceptual thinking of human beings also tend to supply people. Humans regard the chair as a comfortable area, or the fountain as a thirst quenching area. When there is a reliable connection between the characteristics of the environment and human targets, the supply detector can also recognize the real pattern. These real patterns involve human specific needs, desires and abilities.

## 4.2. Idealization Application of Real Model

The goal of schemata may be to track real patterns, but some schemata fail. And those who are successful in biology do better in tracking reality, and they can not fully track reality. In other words, the schema is idealized. The idealization of human classification separates a set of features by ignoring other features. However, human beings have not solved the idealization of deformation, such as treating objects as particles or remapping the wavelength of light onto the color palette. When human beings face different situations, deformation idealization may make mistakes. However, in other cases, these deformed features can make it easier to understand and reason. From a biological point of view, neither the cognitive system generated by evolution nor the cognitive system generated by learning forms is as organized as science. Both the cognitive system generated by evolution and the cognitive system generated by learning are formed in the process of aggregating into a good enough schema. This is not optimized for precise purposes.

Sometimes, in order to make the problem easy to deal with in calculation, it is necessary to simplify the assumptions and idealize the deformation. An accurate schema can be calculated in principle. However, this may not be the case for every real mind. Some people can understand Newtonian mechanics, but they can not understand Einstein's theory of relativity. Some people cannot understand any form of mathematical physics. Most people have more intuitive schemata, which can enable humans to predict the trajectory of falling objects and thrown football. This is a good strategy for the human public. This is also a good thing for mathematical physicists. Mathematical physics is more suitable for rocket science, but not for avoiding walking and wrestling. There are different cognitive and practical factors in the applicability of a schema. Different schemata of the same phenomenon can be applied to different purposes. It is a better strategy for subjects to have more schemata.

It is a wonderful thing for organisms like humans to be built up to form a schema that is useful to them. It provides a more accurate understanding of the theoretical schema. These schemata contain a lot of information that human beings have to deal with. This includes providing schemata, such as ways to know how to move around the world and how to manipulate objects with specific types of bodies. This also includes core schemata, such as: what is good (or bad) food, what is dangerous, who is a friend or enemy, and so on. Each schema is useful for the specific purpose of the world's unique cognition and practice. Human beings also have the ability to refine their interests into knowledge that has nothing to do with biological instinct. Humans have discovered more precise and universal patterns in nature. Moreover, human beings are less and less bound by the reality model, and the schema is more and more objective. Human beings have gained interest in many things. What humans can form interest seems to be very open. However, in order to expand interest in a variety of ways, human beings need to form schemas in multiple fields.

## 4.3. Comprehensive Application of Real Model

The formation of multiple domain schemas will bring schema redundancy. Schema redundancy will bring both expected and unexpected benefits. A multiple method of schema redundancy has its unique advantages. When an organism is in the face of injury, redundant systems will make the organism more resilient. However, the functions of redundant systems are not exactly the same. For example, the redundant perception system that extracts depth information responds differently to different clues. Redundant cognitive systems may represent common goals in different ways, so as to give different inferences and decomposition modes. The conflict between the two systems with the same goal provides a driving force for more in-depth empirical and theoretical research. This is true for the world phenomena and cognitive systems they want to track. Redundant systems can improve understanding.

Assuming that an organism is using idealized schemata in a specific field, it is naturally beneficial that it has rich schemata. On the one hand, the idealization of schema classification means that a variety of schemas are needed to cover different aspects of the world. On the other hand, even a single schema of a target area can be supplemented by another schema. In this way, different systems are used. Different schemata can make up for each other's limitations. The result is a better understanding of reality. This is not in the form of a broader or more accurate schema, but a comprehensive measurement of the world in the form of multiple perspectives.

In extreme cases, any given schema may be affected by illusion. Illusion is produced by the way it processes and represents information. In the human visual system, the generation of standard visual illusion is such an example. In this case, most schemata may be forced to produce illusion. For example, it is a deep-rooted assumption of human beings that every physical object has a definite position at any time. This hypothesis has been edited into classical physics and encoded into the core object system and folk physics. This assumption also exists in many special-purpose schemas. However, in the face of some problems of quantum mechanics, this assumption is problematic. In this extreme case, the system that characterizes an object as having a certain position will make mistakes.

Humans can avoid these illusions. Humans can measure the line segments of this pair of standard visual illusions and confirm that they are equal in length. With enough intelligence and training, individuals can also understand the description of electronic behavior in quantum mechanics and avoid the assumptions of intuition and classical schema. Human beings can transcend the limitations of a given schema. Human beings can have multiple schemata and use them to comprehensively measure the world more accurately. If human beings can only think about physical objects through the core object system, or through classical physics or quantum mechanics, then human beings will lack some cognitive flexibility.

Kant believes that perceptual ability always organizes feelings according to Euclidean geometry. This is an empirical proposition about perceptual psychology. However, he continued to use the conclusion in a priori argument that space must have Euclidean geometry. Although this argument is correct, its conclusion and at least one premise are wrong. Kant's hypothesis is that the "world" in science is what he calls the phenomenal world: the world explained through the classification of perceptual form and understanding. Therefore, if form and classification force human beings to represent the thought or experience of any possible object in a specific way, for example, in Euclidean space, then any phenomenon object will have this attribute. This is the inevitable truth about the phenomenal world. Therefore, if human beings are forced to think about physical objects in Euclidean terms and cannot think about them in any alternative terms, then the human phenomenal world must be Euclidean.

This argument is so influential that it makes mathematics go backwards to some extent. As one of the earliest non Euclidean geometries, Johann Carl Friedrich Gauss did not continue the idea of non Euclidean geometry. Because Gauss is a Kantian, he believes that Kant has proved the comprehensive transcendental truth that space is Euclidean. However, other mathematicians J. bolyais, Georg Friedrich Bernhard Riemann and Nikolas Ivanovich Lobachevsky continued to study this idea and found consistent non Euclidean geometry. Even if Kant is right, human beings can only perceive things from a specific geometric perspective, but human beings can still think in another geometric term. By the beginning of the 20th century, Einstein put forward the view that space is not Euclidean based on experience. This view was later confirmed.

This is not to prove that Kant's view on space geometry is wrong, as many previous scholars have done. What I want to point out here is that if human beings are Kantian Cognitives, they may not be able to imagine a substitute for Euclidean geometry. Kant's mind cannot specifically think or imagine the possibility contrary to the perceptual form and rational classification. Perhaps, there are other cognitive worlds that cannot be recognized by human cognitive



structure. For example, superhumans can feel the feeling nature of five-dimensional space-time (Xie 2021: 119–133).

## 5. Conclusion

A mind that can enrich and create multiple schemata with different representation systems has a better chance to avoid illusion than a mind with only one representation system. The illusion caused by a particular schema can be avoided from necessarily appearing in the mind. The mind can think through different schemata. If there is no alternative schema, it is impossible to distinguish between illusion and comprehensive a priori truth. A somewhat disturbing question is whether there are restrictions in principle on what humans can understand. Diversified cognitive architecture is an excellent strategy to avoid these limitations as much as possible.

If there is a comprehensive understanding and knowledge system, it is in a limited sense. This comprehensive knowledge system includes everything that human beings can understand in principle, or at least everything that human beings currently understand through schema. Through the representation of different things by a large number of schemata, the cognitive structure of schemata can be more comprehensively understood. Acquiring a new schema is more powerful than acquiring a single belief. Schema provides a method to represent and infer the transaction state in its domain. Relying on the complementary relationship between language and thinking, through social communication, the scope of schema used by human beings is further expanded.

The more human beings understand the environment, the more they can deal with problems in an appropriate way. To interpret all the data, humans need a variety of schemas. A theory that covers all data does not exist. Different theories provide insights that other theories cannot provide. These insights are different from the interpretation of scientific data. However, there is a similar principle: when encountering difficulties, human beings are willing to pay the price of confusion or paradox without losing a powerful cognitive tool.

## Acknowledgments

This paper is supported by Program for the Philosophy and Social Sciences Research of Higher Learning Institutions of Shanxi (grant number 2021W093), project name: The Reflection and Reconstruction of Anthropocentrism Consciousness.

## Declaration of Conflicting Interests

The author declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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