

Cognitive Linguistics and Two-generation Cognitive Science

Yin Wang

Abstract

In the book "Experiential Philosophy- Body-based Wisdom and Challenges to Western Thought", Professors Lakoff and Johnson divided cognitive science into the first generation of cognitive science (based on British-American analytical philosophy and a Priori philosophy) and the second generation of cognitive science (based on experiential philosophy, emphasizing: the experiential nature of the mind, the unconscious nature of cognition, and the metaphorical nature of thinking), expounded the characteristics of the two generations of cognitive science and the differences between the two, and firmly believed that cognitive linguistics is based on the second generation of cognitive science theory, which is a reaction to structuralism and generative schools, thereby clarifying cognitive linguistics. Some basic points of view.

Keywords

Cognitive Science, Cognitive linguistics, Experiential philosophy

DOI: 10.47297/wspctWSP2515-470204.2019XX01

1. What Is Cognitive Science

The four-volume "Invitation to Scientific Cognition" edited by Daniel N. Osherson ⁽¹⁾ (MIT Press published the first edition in 1995 and the second edition in 1997), the first volume "Language", the second volume "Visual cognition", the third volume "Thinking", and the fourth volume "Conceptual foundations". This series systematically introduces the latest research content and directions of

cognitive science from different angles and is a comprehensive series of contemporary cognitive scientific research. The first volume mainly discusses cognitive science from the perspective of language. At the beginning of the first volume Daniel Osherson (1995: xi) pointed out that cognitive science is the study of various forms of human intelligence, including from perception and behaviour to language and reasoning.

Gui Shichun (1998:16) ⁽²⁾ believes that cognitive scientific research focuses on all aspects of cognition, and the most basic is the human intelligent system and its nature.

Yuan Yulin (1998: 16) ⁽³⁾ believes: cognitive science studies cognitive structure and cognitive processes from the perspective of information processing. It is believed that intelligence is a kind of human problem-solving ability. Its basis is symbolic operation. Through the generation, arrangement and combination of symbols, intelligent systems can internalize external events of the system into internal symbols and control them to show intelligence. The essence of all cognitive systems is the symbol processing system. The essence of symbolic operations is calculation.

In the "Dictionary of Thinking" edited by Tian Yun ⁽⁴⁾, cognitive science is defined as: a science that studies the processing of information in the process of human thinking. Academia generally believes that cognitive science is a science that understands the nature of human intelligence and how people think. It uses information technology to study human thinking activities.

Rose (1985) ⁽⁵⁾ pointed out that cognitive science is a new discipline that connects philosophy, psychology, anthropology, linguistics, neuroscience, and computer science. It tries to establish a theory of how the human brain works. Most cognitive scientific research regards the human brain as a system that processes symbols like a computer for information processing.

Lakoff (1999: 10, 15) ⁽⁶⁾ believes that cognitive science is the science of studying conceptual systems, and mainly conducts empirical research on intelligence.

Lakoff takes a broad interpretation of cognition, arguing that cognition includes perceptual experience, mental arithmetic, mental structure, meaning, conceptual system reasoning, and even language. Since the conceptual system and reasoning come from our body, cognition also includes the (five senses) sensory system. Our cognition is unconscious.

In short, cognitive scientific research has a wide range, mainly focusing on the study of intelligence (including natural and artificial), mind, cognition, thinking, information processing, concepts, reasoning, language, etc., so that it must involve philosophy, psychology, logic, linguistics, anthropology, neurophysiology, computer science and other disciplines. Therefore, cognitive science is a comprehensive discipline that intersects with these disciplines, and explores the mysteries of intelligence, mind, and thinking from a multi-disciplinary perspective. It is generally believed that cognitive science can include psychology, logic, epistemology, artificial intelligence, cognitive linguistics, etc.

After the 1950s, a far-reaching "cognitive revolution" broke out. This was a revolution in psychology to get rid of behaviourism, and cognitive psychology based on information processing became the mainstream of psychological research. After the 1970s, cognitive science has continued to make amazing discoveries. In the fields of philosophy, psychology, and linguistics, a series of different points of view have been put forward on the traditional philosophy, information processing theory, and generative grammar, advocating the abandonment of cognitivism, criticizing objectivism in philosophy (including whiteboard theory, dualism, autonomy theory, a priori theory, formalism, symbolism, non-metaphorical reasoning, etc.), abandoning the information processing theory in psychology, emphasizing the study of cognition, mind, and the relationship between physical experience. In 1977, the journal "Cognitive Science" began to be published. In 1979, the first annual meeting of the Society of Cognitive Sciences was officially held. By the 1990s, cognitive science had gradually become a powerful academic trend. The 7th congress was held in the United States in July this year. Lakoff (1957) put forward the philosophy of Experimentalism (the author advocates to translate it as: Neo-empiricism to distinguish it from Empiricism: empiricism). By 1999, Lakoff & Johnson then proposed "The Embodied Philosophy", a new school of philosophy (the author will introduce it in another article).

Lakoff (1999: 10) believes that the true cognitive science (the second generation of cognitive science) originated in the 1970s. He divided it into two generations, which is a very important division. With this division, there is a clear understanding of the different schools within cognitive science, and a deeper and more accurate understanding of the theoretical basis, research content

and direction of cognitive linguistics.

2. Lakoff & Johnson's Division of Two Generations of Cognitive Science

The two professors, Lakoff and Johnson divide cognitive science into: the first generation of cognitive science and the second generation of cognitive science. The first generation of cognitive science originated in the 1950s. Cognitive psychology has become the main direction of psychological research, generative grammar has gradually become the mainstream, and computers have been used in intelligence research. Cognitive science of this generation has accepted most of the views of traditional British and American analytical philosophy (formalist school and daily linguistic school), and its philosophical basis is objectivism. According to this, the attitude of the first generation of cognitive science towards reasoning is the same as that of formal logic (symbolic system operation). It believes that human reasoning ability is independent of perceptual ability and body movement, separates perception from conception, and advocates that reasoning is an autonomous ability (at the same time, it is also believed that language and syntax are also autonomous. They have nothing to do with physical experience, and it makes sense that language symbols are arbitrary), and are non-metaphorical. They also believe that it is this kind of autonomous reasoning ability that makes us human beings and distinguishes us from other animals. Most Western philosophy is based on this view. In that era, Anglo-American philosophy was almost the same as the mainstream thought of that era [□]. The scholars of that era were all trained by the popular English American analytical philosophy theory and were deeply bound by it. According to this, the mind naturally uses the methods of cognitive psychology to conduct research, ignoring that function comes from the research methods of the body and the brain. From a functional point of view, the mind is metaphorically regarded as an abstract computing program that can operate on hardware. The body and brain do not play any essential role in human concepts and reasoning, this is a philosophy that ignores physical experience.

The first generation of cognitive science was deeply influenced by objectivism and adopted a strict dualist view. The main characteristics of the

mind are described based on form and function and have nothing to do with the body. Categories, characteristics, relationships, etc. exist objectively and are independent of consciousness. The human mind and

meaning are only internal representations of the external world. They are objective innuendos of nature, and the categories and logic of the external world can be correctly inferred. It has nothing to do with human physical experience, nervous system, and subjective factors. Cognitive psychology, artificial intelligence, formal logic, and generative linguistics have developed it into thinking is the mechanical operation of abstract symbols, which can be characterized by formal symbols and calculated according to formal rules, and these symbols themselves, just like computer language, are meaningless. Therefore, there are two attitudes towards meaning:

(1) Meaning is the result of symbolic operations, and meaning is obtained entirely based on the internal relationship of symbols.

(2) Meaning is regarded as an internal representation of the external world. Symbols correspond to the external world, and meaning is obtained through correspondence with external things (objects, characteristics, relationships, traditional categories).

According to these two views, the mind will be specifically expressed in the brain. Currently, the brain is hardware, and the mind is software. Just as software requires hardware to operate, the mind must also need the brain to operate. However, the hardware of the brain can operate on any suitable software, and the description of the software of the mind does not play an important role. The mind is separated from physical experience. Thinking is considered non-metaphorical, and imagination is not considered. This is a modern replica of Descartes' view (reasoning is a priori, universal, separated from physical experience, and non-metaphorical). This view of mind is sometimes called philosophical cognition. The first generation of cognitive science is based on it, and it mainly has the following characteristics:

(1) Dualism: The mind and the body are separated, and the mind can be studied independently of the body and brain knowledge, and only the functional relationships represented by symbols can be described.

(2) Symbolism: All intelligent systems must be symbolic systems. The basic unit of human intelligence is symbols. The cognitive process is based on symbols. Various forms of thinking are based on formal operations of symbols,

which can be carried out by a system of rules without having to consider the meaning of symbols. Thinking is symbolic calculation. Simon & Newell put forward the hypothesis of a physical symbol system, which draws an equal sign between the human brain and the computer and believes that the symbols are processed serially.

(3) Arbitrary view of symbols: symbols and meanings are separated, so the view that the relationship between the two is arbitrary will be drawn.

(4) Meaning representation theory: Mental representations are symbolic, and they can obtain meaning based on the relationship between symbols or the correspondence between symbols and the outside world. This has led to a special method of studying semantics - objectivist semantics, including truth-value correspondence theory, truth-value conditionalism, and objectivism theory.

(5) The classical category is defined by the principle of making full use of this key moment.

(6) Non-metaphorical meaning: All meanings are non-metaphorical, and no meaning is based on metaphor and imagination.

All these views on the nature of the mind are not based on physical experience, which is diametrically opposed to the second-generation cognitive science. The second generation of cognitive science appeared in the 1970s. It believed that the essence of the mind came from physical experience. It put forward a sharp and powerful criticism of the first generation of cognitive science based on British-American analytical philosophy and a priori philosophy and challenged it mercilessly. Lakoff & Johnson (1999) believe that linguistic philosophy has had a bad start since Frege, and it is still very bad when it comes to post-structuralism. Analytical philosophy and post-structuralist philosophy are incompatible with the second generation of cognitive science in a series of viewpoints such as mind, meaning, and language. The second-generation cognitive science resolutely opposes analytical philosophy, the hypothesis of symbolic processing in cognitive psychology, and the a priori philosophical hypothesis in generative linguistics.

The second-generation cognitive science is not based on a complete existing philosophical theory, but empirically discovers whether concepts are based on the body, whether there is metaphorical thinking, and whether syntax is independent of semantics. The experiential and metaphorical thinking discovered in its research are completely contradictory to the now established philosophy.

These findings are not pre-existing but are summarized through empirical analysis. The second generation of cognitive science created a brand-new theory—experiential philosophy and used it as the theoretical basis to adhere to the experiential nature of the mind, the unconscious nature of cognition, and the metaphorical nature of thinking. They believe that the second generation of cognitive science has 8 main points of view:

(1) The conceptual structure comes from sensorimotor experience and neural structure. In our conceptual system, "structure" is described as an image pattern and a kinesthetic pattern.

(2) Because the mental structure is linked to our body and experience, it is meaningful in nature and cannot be described by meaningless symbols.

(3) There is a basic level of concept, which mainly comes from the ability of auto sensory schemas, gestalt perception, and the ability to form images.

(4) The structure of our brain has the power to allude to the types of activation (including basic metaphorical abilities) from the sensorimotor area to the higher cerebral cortex area. This kind of innuendo is based on reasoning patterns and can be applied to sensorimotor processing that is directly connected to the body, which allows us to conceptualize abstract concepts.

(5) The conceptual structure contains different types of prototypes: typical cases, ideal cases, conventional social models, social samples, cognitive reasoning points, etc. Each prototype uses a different form of reasoning. Most concepts cannot be described with sufficient necessary conditions.

(6) Reasoning is based on physical experience, and its basic form comes from sensorimotor and other forms of inference based on the body.

(7) Reasoning is imaginative, and the form of reasoning based on the body is insinuated into people's abstract reasoning patterns through metaphors.

(8) The conceptual system is diverse, not completely unified. Abstract concepts are defined by multiple conceptual metaphors that are inconsistent with each other, which is very typical.

The core view of the second-generation cognitive science is "based on embodied" [□]. Its research shows that the understanding of experience plays a key role in all aspects of meaning and in the structure and content of thinking. Meaning is related to the meaningful function we play in the world, and meaning is obtained through the structure of the body and the structure of the imagination. This is in stark contrast to the first generation of cognitive science's view of

meaning (objectivist semantics).

Chomsky mixed Cartesian philosophy and formalist philosophy to form a mixed philosophy. Almost every discovery of the second generation of cognitive science contradicts Qiao's philosophical view [□]: (1) Qiao's accepted the dualist view of "the separation of mind and body". The philosophy of experience believes that concepts are based on physical experience, and concepts mainly obtain meaning through the human body and brain. It is not purely mental, independent of the body, and is not part of innate abilities. Most of the most basic forms of our reasoning rely on the concept of spatial relationships, which are formed through the structure of the brain, the topographic map of the brain, and other physical structures. The concept of physiognomy describes the method by which we construct the characteristics of events, and it is formed through kinesthetic control. Most of the abstract concepts constructed by metaphors are based on experience, and abstract reasoning is not autonomous, not independent of the body's mental abilities.

(2) Experiential philosophy and formalist philosophy are also contradictory because concepts are experiential and not based on symbols. Thinking is based on physical experience, and meaning is fixed through physical experience. Therefore, thinking cannot be based on symbolic operations, and meaningless symbols cannot accurately represent concepts. Meaning is produced through the brain and body, not through the connection between symbols and the world, nor through the so-called set theory model. The experiential view of concepts and conceptual metaphors contradict the traditional truth-value correspondence theory and truth-value conditional theory.

(3) Experiential philosophy believes that syntax is not autonomous. The view of grammatical autonomy believes that grammar is not affected by transfusion, nor is it affected by any part of the brain, by neuronal modules, or by neural transfusion. From a physical point of view, it is impossible. (See Part 3)

In the process of transforming from the first generation of cognitive science to the second generation of cognitive science, the relationship between philosophy and cognitive science has been reversed. During the first generation, philosophy was in a dominant and controlling position, and the basic viewpoints of Anglo-American analytical philosophy were accepted by the first generation of cognitive science. Because during that period, many cognitive scientists received traditional British and American education in analytical philosophy, so

that they consciously or unconsciously accepted the views of analytical philosophy in their hearts. The second generation of cognitive science believes that philosophy must begin with cognitive science based on physical experience. It fully recognizes the limitations imposed by analytical philosophy on cognitive science, and therefore refuses to accept traditional philosophy as an arbitration for scientific debate. The theory of analytical philosophy restricts the development of cognitive science and does not recognize the existence of conceptual metaphors. This has become a famous contemporary example: philosophy restricts the development of science. The two professors, Lakoff and Johnson believe that on the stage of linguistics, people can most clearly see the obvious limitations of a priori philosophy.

Experiential philosophy believes that the body directly mediates the human environment and can perform a series of interactions. There is an evolved material interaction activity layer in the world that can successfully operate various functions. There is an important part of the conceptual system that is compatible with this kind of functional operation. This is the basic hierarchical concept, which can be perceived according to gestalt and characterized by image and kinesthetic interaction. This is one of the most important discoveries in experiential cognitive science. Cognitive science. Tzeltal's classification of animals and plants (using the basic level: genus) is very accurate and conforms to the scientific biological classification, while the classification of the following "species concepts" is relatively poor, with only 50% accuracy.

The experience system of the basic level concept continues to evolve to be suitable for interaction with the external environment, partly for survival, partly for development, and partly by accident. The basic level of conceptualization is the cornerstone of experiential philosophy. The development of science and technology has continuously expanded our ability to perceive basic levels, such as telescopes and microscopes. There are two key discoveries about the concept of experience and the ability to imagine: one is the existence of perceptual reasoning and kinesthetic reasoning, and the logic of demonstrative explanations of perception and kinesthetic movement can be obtained from the nerves; the other is conceptual metaphor, which allows us to use one empirical domain to conceptualize another empirical domain and map the reasoning structure of the origin domain (map) to the destination domain.

The second-generation cognitive science holds the view that "meaning is

based on physical experience", placing meaning in the conceptual system of the body and the unconscious, which contradicts the entire foundation of analytical philosophy. Since Quine's holism of meaning is based on analytical philosophy, the second-generation cognitive science also contradicts holism of meaning. Quine negates the unconscious nature of cognition and experience-based thinking, meaning, and reasoning. The second-generation cognitive science completely disagrees with his view.

Experiential philosophy resolutely opposes the strict "subject-object" dichotomy. Disembodies realism, also known as external realism, creates a gap between the two. At this time, the understanding of objective reality is either through the object itself or through the conscious structure shared by people that can be understood by most people. This is all wrong. Experiential philosophy believes that we are connected to the world through the interaction between the body and the world. What makes science possible is our experience, not a priori; it is our imagination, and we should not avoid it.

The distinction between the first generation of cognitive science and the second generation of cognitive science has nothing to do with the age in which individuals conduct research. In essence, it is the distinction between "non-experiential" and "experiential", and it is the distinction between accepting or not accepting British and American analytical philosophy.

3. Cognitive Linguistics Based on The Second Generation of Cognitive Science

When domestic scholars introduce cognitive linguistics, some scholars focus on their empirical view, and some scholars focus on their rationalist tendencies, because some scholars include Qiao's generative grammar in "Cognitive Linguistics" from a macro perspective. When the author interviewed Professor Langacker, a famous American cognitive linguist, and his doctoral student Ms. Anne Sunnich last year, when they're asked whether the philosophical basis of cognitive linguistics was empiricism or rationalism, or both, they all categorically said that we are empiricists. When the author asked Professor Lakoff the same question, he believed that the philosophical foundation of cognitive linguistics is neither empiricism nor rationalism, but another brand-new philosophical

theory— "Experiential philosophy". The author then asked Professor Lakoff: Is experiential philosophy somewhere between empiricism and rationalism, or a theory of both? He also gave a negative answer. After reading the book "Philosophy in the Flesh—The Embedded Mind and its Challenge to Western Thought", we know that the experiential philosophy he advocates is indeed different from these two schools of philosophy in many ways, but it has its own new theory, and it is a completely new theory (radical new). This is an unprecedented philosophical theory (this is philosophy as it has never been seen before), and it is indeed a powerful challenge to traditional western philosophy, as can be seen from the above discussion.

The philosophical basis of structuralist linguistics is the Anglo-American analytical philosophy that was popular in the intellectual world at that time, and it is consistent with the views of the first generation of cognitive science. The philosophical basis of Chomsky linguistics is a mixed philosophy (Cartesian philosophy + formalist philosophy), which is also very similar to the philosophical theories adopted by the first generation of cognitive science. Although it does not completely overlap, most of them are the same. The philosophical view of the second-generation cognitive science contradicts the philosophical view behind Chomsky's language theory. The views of the two on the topic of grammatical autonomy are also completely opposite. The second generation of cognitive science believes that the construction of grammar:

- (1) Not independent of meaning, but to express meaning;
- (2) Not independent of communication, but consistent with communication strategy;
- (3) Not independent of culture, but often consistent with the deepest level of culture;
- (4) Not independent of the body but comes from the perceptual kinesthetic system.

Although the first and second generations of cognitive science both study the mind and believe that language and cognition exist in people's minds, there are a series of fundamental differences between the two regarding the source of the mind, the method of representation, and the conclusions drawn from the research content. Cognitive linguistics is part of the second generation of cognitive science. It is based on experiential philosophy and is a reactionary response to structuralism and generative grammar. When the author visited

Professor Lakoff and Professor Langacker, famous cognitive linguists from the University of California, Berkeley and the University of California, San Diego, they all said to me: We are the counterrevolutionaries to the Chomskyan Revolution. Cognitive linguistics is an important part of the second-generation cognitive science, and its research results are also the development of the second-generation cognitive science.

The second-generation cognitive science examines language from the broadest scope, including all aspects involved in learning a foreign language, such as semantics, pragmatics, speech and behavior structure, processing constraints, etc. It also includes grammaticalization—the mechanism of language change, mainly how lexical items become grammatical components. Therefore, the research content of the second generation of cognitive science is much broader than that of Chomsky linguistics. From this point of view, Chomsky has only studied a small part of language. Chomsky believes that linguistics is the study of the essence of "language", that is, "pure syntax", a set of parameters that all languages have, which are naturally mastered by normal people, but as a result, Qiao's theory has only discovered a fairly small part of the core of formal structure, and has not yet touched many features of most languages, such as narrative system, classification word system, courtesy system, spatial relationship system, physiognomy system, lexical process system, these will be studied by many other linguistic schools.

Since cognitive linguistics belongs to the second generation of cognitive science and is based on the recent philosophy of experience, and the second generation of cognitive science is the most cutting-edge research today, therefore, cognitive linguistics is also the most cutting-edge discipline in contemporary language research. If the generative school is a revolution in the descriptive school, cognitive linguistics is a revolution in the Chomsky revolution. It revolutionizes the application of the theory of experiential philosophy to language research, puts forward a series of brand-new points of view, and opens a new world for language research. Cognitive science has injected new vitality into language research. In recent years, it has developed rapidly, its team has continued to grow, and it has become more and more generally recognized. It has gradually become the mainstream school of linguistics research. Many scholars at home and abroad have begun to study cognitive linguistics in an all-round way, and various works and papers have

sprung up, and the number has soared. A strong trend of "cognitive linguistics" has swept from North America and continental Europe to the world, and the study of cognitive linguistics has been continuously pushed to a new climax. We can predict that cognitive linguistics will be of great use in the 21st century.

References

- [1] Osherson, D.N., 1995. *An Invitation to Cognitive Science*. Cambridge, Massachusetts: The MIT Press.
- [2] Gui Shichun, *Cognition and Language*, *Foreign Language Teaching and Research*, 191 (3).
- [3] Yuan Yulin, *Language is Cognitive Research and Computational Analysis*, Peking University Press, 1998.
- [4] Tian Yun, *Dictionary of Thinking*, Zhejiang Education Publishing House, 1996.
- [5] Rose, F., 1985. *The Black Knight of A.I. Science*, Vol.6, pp. 46-51.
- [6] Lakoff, G. & M. Johnson, 1999, *Philosophy in The Flesh – The Embodied Mind and its Challenge to Western Thought*. New York: Basic Books.