

Language, Thinking, and Concepts: The Enlightenment of Cognitive Science on Philosophy of Mind

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Abstract

This article analyzes the key theories and discoveries about language, thinking, and concepts in cognitive science, and explores their impact on traditional philosophy of mind and their enlightening significance for establishing a new theory of philosophy of mind. The article points out that cognitive science reveals the shaping role of language in thinking, the unity of intuition and logic in thinking, and the constructivist characteristics of concepts. These all pose challenges to the relevant views of traditional philosophy of the mind. Cognitive science has driven the transformation of philosophy of mind from static to dynamic, from precision to relativity, and from a priori to experience. This is conducive to building a more scientific mental model and also makes the theory of philosophy of mind more closely related to the actual situation of cognitive processes.

Keywords

Cognitive science; Philosophy of Mind; Language; Thinking; Concept.

1. Introduction

In recent years, the discovery of cognitive science has posed challenges to traditional philosophy of mind. The purpose of language has been reconsidered, and the core of thinking has been investigated further. The mechanism of notion generation must now be extensively examined. It encourages philosophers of the mind to reevaluate their long-held beliefs about the philosophy of mind. This article seeks to present an overview of cognitive science connected to language, thinking, and concepts, and discuss their implications for developing new philosophical theories. Therefore, the research question is: How does cognitive science inspire the development of philosophy of mind?

The article reviews existing literature and summarizes the core viewpoints and important findings related to language, thinking, and conceptual theory in cognitive science. Meanwhile, combining with traditional philosophy of mind theory, it analyzes the impacts posed by cognitive science to it. On this premise, based on cognitive science inquiry, it gives motivation for developing new philosophical conceptions of the mind. The purpose of this article is to accomplish an organic intersection and combination of cognitive science and philosophy of mind to foster a constructive interaction between the two in the study of mind and consciousness.

2. Literature Review

2.1. The Function of Language

Language, as a symbolic system, has been endowed with greater significance in cognitive science research. Language is not only a tool for expressing thinking, but also the foundation for shaping thinking. The cognitive linguistic school believes that language profoundly influences and regulates the unique conceptual system of human beings, shaping their thinking patterns. In the perspective of Sapir Whorf's theory of language relativity, language structure

and its usage norms can affect the thinking patterns of individuals who use this language [1]. Based on this theoretical foundation, Boroditsky et al. conducted a classic study examining the impact of using words with spatial directional meanings on thinking [2]. They found that people who use language that expresses time as a spatial direction concept (such as Chinese “before/after” indicating the order of time) exhibit different strategies in spatial thinking when dealing with spatial relationship tasks, influenced by the concept of time. This supports the relative influence of language on thinking. In terms of comparing the differences in the impact of different languages on thinking, Tardif conducted research on Chinese and English and found systematic differences in narrative order between them [3]. The Chinese habit is to first propose the theme and then describe the details in detail. Set a background introduction in English first, and then express the core point. The difference in word order structure reflects and affects the default order of thinking for users of these two languages. In terms of word order strategy, the two languages reflect different thinking styles. In addition, Kasper examined its impact on communication methods from the perspective of pragmatic norms [4]. He found that Chinese emphasizes euphemism and subtlety, while English is more direct and explicit. It can lead to two language users adopting different strategies when expressing their opinions. This means that Chinese language users need more additional context to judge the emotions of their counterparts. In contrast, English speakers express their personal stance more directly. Through these studies, it can be seen that language can transmit information, construct meaning, and influence the thinking process.

Language not only affects the thinking process, but also drives conceptual development. Vygotsky emphasizes in his sociocultural theory that language is an important tool to support higher-level cognition [5]. Language provides possibilities for the internalization and organization of concepts. Taking infants as an example, the acquisition of language vocabulary enables them to name objects, thus forming a generalized concept about that object. As their vocabulary increases, babies can categorize different things into a vocabulary category, thereby forming abstract conceptual knowledge. Gopnik and Meltzoff's “vocabulary explosion” study indicates that 1-2 years old is the fastest period for infant vocabulary acquisition [6]. They found that the rapid increase in infant vocabulary is highly correlated with the formation of categorical concepts. When babies are able to use a word to correctly refer to different individuals in a certain category, it indicates that they have a certain understanding of the conceptual category. The study also found that the order of vocabulary acquisition also reflects the process of conceptual development. For example, babies usually learn action words first, followed by object nouns. It reflects the development from the concept of action to the concept of things. It can be seen that language, as an important tool for conceptual development, can organize higher-level conceptual systems and promote the process of individual conceptual development from concrete to abstract.

2.2. Research on Thinking

Cognitive scientists have deeply analyzed the thinking process and its laws through experiments and related theoretical research. They realize that thinking is not limited to logical reasoning at the conscious level, and unconscious processes also play an important role in it. Meanwhile, different cultural backgrounds can also lead to differences in thinking strategies. Among them, Kahneman's dual process theory elaborates in detail on the different characteristics of fast thinking and slow thinking [7]. This theory suggests that human thinking processes involve two different cognitive patterns. One is a fast and intuitive process. This thinking pattern is automated and unconscious, allowing for quick judgments but also more prone to biases. The process relies on heuristic rules and past experience for probabilistic reasoning, pattern matching of information, resulting in fast thinking speed but low accuracy. The other is a slow analytical process. This type of thinking is more autonomous and allows for

logical reasoning, but requires more time and cognitive resources to be invested. This process follows logical rules for thinking and allows for careful analysis of problems. However, this requires more effort and is relatively slow. To confirm the dual process theory, Stanovich and West conducted a series of cognitive experiments to test the degree of dependence of participants on intuition and rules when reasoning under different conditions [8]. The results support the dual process theory and confirm the existence of fast intuitive thinking and slow analytical thinking. Two processes can work in parallel, jointly driving the completion of complex thinking tasks. The dual process theory reveals that logical thinking under conscious control is only a part of human thinking. A large amount of cognitive activities actually occur at the unconscious level. Quick intuition provides possible directions, while slow analysis verifies. The synergy between the two enhances the effectiveness of human thinking. This theory provides an important theoretical foundation for the study of thinking in cognitive science.

Furthermore, cognitive science also reveals the role of intuition in thinking. Intuition is an unconscious process of acquiring information that does not rely on language thinking [9]. Numerous studies have shown that intuition plays an important role in expert level thinking. Specifically, psychological experiments have found that expert level chess players have stronger intuitive thinking compared to beginners. They can quickly judge the situation of the chess game through intuition, without the need for a lot of forward and backward calculations [10]. In addition, Klein also found in his research on the decision-making patterns of fire captains that in times of time constraints, fire captains mainly rely on intuition to make quick judgments, rather than logical analysis [11]. This intuition actually stems from their long-term practical experience accumulation. When encountering similar situations, a large amount of past experience can provide intuitive support. In the application of intuitive and logical analytical thinking, Kahneman and Klein believe that intuitive thinking can quickly grasp the core of complex situations, while logical analysis is better at details [12]. Yet, intuition does not exclude logic, and the two can complement each other. Complex problems require a combination of intuitive judgment and rational analysis. Intuition provides the overall impression and possible theoretical models, while logical reasoning can verify these models and find the optimal solution. The combination of intuition and logic can elevate human thinking to a higher level.

From the perspective of individual thinking strategies, there are also certain differences in thinking strategies among individuals in different cultural backgrounds. For example, there are differences in some basic strategic tendencies between Eastern and Western thinking. This difference comes from the different traditions and values of the two cultural circles. Nisbett et al. found through a series of cognitive experiments that compared to people in Western countries, Easterners place more emphasis on interrelationships in their thinking processes and tend to use dialectical reasoning rather than linear reasoning [13]. This cultural difference can be traced back to the influence of ancient philosophical traditions and social norms. At the same time, Ji et al. used eye tracking technology to record the eye movement trajectories of people from both East and West watching complex images. It was found that Easterners pay more attention to observing the overall image, while Westerners focus on local details [14]. This also supports the overall tendency of Eastern thinking. Varnum et al. analyzed the dialectical thinking characteristics of "middle way" and acceptance contradiction in Eastern thinking from the perspective of Buddhist and Taoist cultural traditions [15]. They clarified that this thinking strategy is the result of long-term influence from both religion and philosophy. It is undeniable that there are cultural differences in thinking strategies as social and cultural products. Individuals acquire the default way of thinking in their cultural circle through the process of socialization, which becomes an unconscious cognitive preset. It affects individual strategies for processing information and solving problems. Nevertheless, with the trend of globalization, the collision of thinking between different cultures is also promoting the

integration of thinking patterns. Creative thinking that goes beyond traditional modes may become the direction of future development.

2.3. Concept Formation Mechanism

Concept formation is a crucial link in the cognitive process. Cognitive science research has shown that concept formation is a positive construction process. Prototype effects, the use of language symbols, and socio-cultural factors all have significant impacts on it. The psychological experiment of prototype effect reveals that the formation of concepts is based on typical cases. It reveals that the formation of concepts is not based on the essential characteristics of things, but on the classification and recognition of typical examples that best represent the concept, namely prototypes. Rosch first proposed this viewpoint in his prototype theory. She believes that concept formation is not about discovering the common essential features of things, but about finding the prototype instance that best represents the concept and classifying it based on it [16]. To this end, Mervis and Rosch designed a psychological experiment on classification recognition to validate this theory [17]. They found that participants responded the fastest to the most typical category members. As an example, regarding the concept of birds, participants judged that sparrows were significantly faster than atypical birds like ostriches. This indicates that the organization of conceptual knowledge in the human mind is not based on essentialism of things, but on fuzzy classification of different instances based on the similarity of prototypes. The prototype is stored in memory as a typical case. When encountering similar new instances, people rely on prototypes for quick identification and classification. This discovery poses a challenge to the traditional theory of conceptual essence, revealing that the cognitive process of conceptual formation is a relatively dynamic construction process that is influenced by the cognitive environment. It provides a new perspective for people to re-examine the essence of concepts and minds.

Meanwhile, language as a semantic symbol of concepts, influences people's understanding of concepts. Lakoff and Johnson pointed out in their study of linguistic metaphors that metaphor is not just a rhetorical device, but can also shape people's understanding of abstract concepts [18]. For example, the metaphor "time is money" can influence people's conceptualization of time. Boroditsky's empirical study directly demonstrated that different languages lead to consistent differences in the conceptualization of event time among users [19]. For learners, the process of learning a new language is also a process of generating new concepts about the world. Comparing different languages helps people form a more three-dimensional and dynamic understanding of concepts. Therefore, language learning is to some extent an improvement in conceptual abilities.

The formation of concepts is not only influenced by language, but also by social and cultural factors that constrain their formation. Like language and thinking, different social and cultural backgrounds can lead to prior differences in the formation of concepts. Vygotsky's theory of knowledge development states that children acquire concepts through social interaction, and concept acquisition is a product of the socialization process. Concepts reflect specific cultural cognitive patterns [20]. A series of cross-cultural comparative studies have found that Easterners and Westerners have consistent biases in the classification of many basic concepts [13]. This seems to originate from the habitual patterns of conceptual classification in different cultural traditions. Individuals grow up in specific socio-cultural environments, and obtain commonly used conceptual models in that culture through observation, imitation, and language use. This "conceptual cultural preset" deeply influences an individual's worldview and cognitive patterns. Just as language is not a natural product, concept acquisition is not spontaneous. They all have clear social, historical, and cultural origins. It inspires people to learn the importance of other cultures in order to acquire new concepts and update their way of viewing the world.

3. The Enlightenment of Cognitive Science on Philosophy of Mind

3.1. The Mental View of Language

3.1.1. Language Shaping Specific Thinking Patterns

Cognitive science reveals the shaping effect of language acquisition on mental development. Different language environments can lead to changes in thinking strategies. People who use English rely more on logical reasoning. People who use Chinese pay more attention to overall intuition [13]. This indicates that language structure and acquisition can shape specific thinking patterns. Meanwhile, language also provides the possibility for abstract thinking. The generation of concepts is closely related to the acquisition of linguistic symbols. Without the generalization function of language, it is difficult for thinking to reach a high level of logicity. All of these demonstrate that language is the fundamental prerequisite for mental activity. The mind is not an independent entity, and its operation must rely on language as a medium. Therefore, in the study of philosophy of the mind, a linguistic relativistic view of the mind should be adopted, acknowledging the decisive role of language in the mind. Language not only expresses the mind, but also serves as the source of mind generation. It laid the foundation for people to construct a new type of language philosophy.

3.1.2. Pragmatic Norms Shaping Mental Understanding

The pragmatics school reveals the importance of context and pragmatic rules in understanding meaning [21]. Just like the negative meaning in irony does not come from literal meaning, but from the effect of pragmatic suggestion. Many semantic content comes from pragmatic norms such as contextual reasoning and assumptions. This indicates that contextual pragmatics plays a positive role in mental understanding. Mind is not just a simple semantic analysis, it is actually a holistic pragmatic processing process. The intellectual role of pragmatic norms inspires the study of philosophy of mind. The mental function of language goes far beyond conveying propositions. Pragmatic norms also play an inherent role in meaning generation. It provides a theoretical premise for researchers to construct a new type of linguistic philosophy of mind. Therefore, the cognitive processing of pragmatic norms should be incorporated into the research perspective of philosophy of mind.

3.2. The Mental View of Language

3.2.1. The Unity of Intuition and Logic Drives the Development of the Mind

Traditional philosophy emphasizes rational logical thinking and underestimates the role of intuition in the mind. However, the dual process theory suggests that fast thinking systems rely on intuition to make efficient judgments [7]. This suggests that scholars should not view intuition as a secondary mental function. In fact, intuitive thinking has the overall advantage of parallel processing of information and can grasp the essence of problems. Logical thinking is better at breaking down problems for precise reasoning. The two have different advantages and complement each other. Intuition provides a global perspective on the problem, while logical reasoning ensures local precision. Both are indispensable and work together to promote the comprehensive development of the mind. It is worth mentioning that valuing intuition does not necessarily mean negating logic. The two should be viewed dialectically, achieving a high degree of unity between reason and intuition. This also makes researchers understand that in philosophical exploration, logic should not be emphasized one-sided, but rather the combination of intuition and reason should be emphasized. Intuition is also an important component of the mind, and intuition and logic should be dialectically unified and mutually reinforcing.

3.2.2. Cultural Diversity of Thinking Enriches Mental Horizons

Traditional philosophy believes that thinking patterns are universal and cultural factors do not have an impact on them. However, cognitive science has found that different cultural backgrounds have formed diverse thinking strategies [24]. From the perspective of differences between the East and the West, cultural norms have challenged the universal concept of thinking. The cultural differences in thinking strategies inspire people that different cultures have generated their own reasonable and adaptable thinking patterns. People cannot simply negate another culture with one cultural way of thinking. The cultural diversity of thinking requires people to adopt an open and complementary attitude. In communication and understanding, people should not only recognize the limitations of their own thinking culture, but also appreciate the wisdom of thinking in other cultures. The complementary integration of different thinking patterns is an important topic in contemporary mental research. This open view of cultural diversity in thinking will enrich the perspective of contemporary philosophy of mind and promote cross-cultural communication and understanding. Therefore, the results of cognitive science thinking research inspire scholars to adopt a dialectical perspective on the relationship between intuition and logic, as well as an open attitude of respecting cultural diversity in thinking. It provides important reference for the development of contemporary philosophy of mind.

3.3. Conceptual Mind View

3.3.1. Concept Matrix View of Accepting Dynamic Networks

Prototype theory holds that concept formation is a dynamic network matrix rather than a fixed precise definition. The conceptual core is composed of prototype members, while the edge members are relatively vague [17]. The concept network will update and expand with experience. Its connotation is not precisely defined, but a relatively stable network structure composed of core and edge areas. This network will constantly update with people's rich experience. The concept matrix view of this dynamic network challenges the traditional static view of the accuracy of conceptual connotations. It can better reflect the dynamic characteristics of conceptual development. This also provides a basis for people to flexibly apply concepts in practice. Prototype theory provides a dynamic and experiential conceptual framework for the philosophy of mind that goes beyond tradition. This has driven the shift of philosophy of mind from static to dynamic, and from a priori to an empirical important theory.

3.3.2. Adopting a Constructivist Conceptual View

The discovery that concept formation has experiential sources and cultural dependence suggests that philosophy of mind should adopt a constructivist concept view. Constructivism emphasizes that concepts are not innate or subjectively arbitrary. It is actively constructed by people in a specific cultural context, based on rich experience, through active cognitive activities [16]. It reflects not the essence of the world, but the result of people's construction of world cognition. The connotation of the same concept may also vary in different cultures. The new nature of concepts has challenged the view in traditional philosophy that concepts are eternal and unchanging. This suggests that philosophy of the mind needs to abandon the priori concept of concepts and acknowledge their experiential basis and cultural normativity. When using concepts, one cannot stick to traditional precise definitions, but should adopt a flexible attitude and explain the connotation of concepts based on the background. The constructivist perspective of concepts provides new theoretical resources for philosophy of mind. It enables philosophy of mind to consider more the social and cultural context of knowledge when exploring cognitive processes, rather than just emphasizing the mental mechanisms within individuals.

4. Conclusion

The research results of cognitive science have had a profound impact on traditional philosophy of mind. The study of philosophy of mind has thus opened up a new direction. This article concludes that philosophy of mind should focus on psychological processes such as language, thinking, and concepts, and construct a new type of psychological theory that conforms to cognitive scientific discoveries. Cognitive science has driven the transformation of philosophy of mind from a static, precise, and prior traditional paradigm to a relative, experiential, and dynamic new paradigm. This provides important insights for constructing a new theory of contemporary philosophy of mind.

Facing the future, the philosophy of mind needs to continue to draw on the latest achievements of cognitive science to form a more comprehensive and scientific understanding of the essence of the mind. The relationship between cognitive science and philosophy of mind is complementary. Cognitive science provides rich empirical findings. Philosophy of mind reflects unique theoretical thinking and reflective abilities in dealing with these discoveries. The mystery of the mind will also be further revealed in the collaboration between the two disciplines.

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