

Research on the Influence of Human Language on the Formation and Development of Thinking

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Abstract: The Sapir–Whorf Hypothesis has aroused great interest among anthropologists, linguists, and psychologists since its proposal. This article delves into the important role of human language in the formation, development, and application of thinking through the literature review and questionnaire survey. The main target of the study is the 0-50 year-old population whose native language is Chinese. An electronic questionnaire survey was conducted to reveal the close relationship between language and thinking. Research has found that language not only serves as a carrier of thinking but also plays a crucial role in shaping and driving the development of thinking. In this context, this article aims to systematically analyze the impact of language on thinking, in order to provide new perspectives and thoughts for research in related fields.

Keywords: Human Language, Thought Formation, Development of Thinking, The Relationship between Language and Thinking.

1. Introduction

Language and thinking are two fundamental abilities unique to humans that are interdependent and influence each other. Since ancient times, the relationship between language and thinking has been a focus of attention in fields such as philosophy, linguistics, and psychology. With the deepening of research, more and more scholars recognize the importance of language in the formation and development of thinking. Since the ancient Greek philosophers Plato and Aristotle first explored the relationship between language and thought, this topic has continued to attract the attention of many scholars. Modern research has gradually revealed the impact of language on perception, memory, emotions, decision-making, and even worldview through extensive experiments and theoretical analysis. Especially the proposal of the Wolf hypothesis, namely the "linguistic relativity theory" or the "Sapir Wolf hypothesis," greatly promoted the study of the relationship between language and thinking. This hypothesis suggests that the structure, meaning, and usage of different languages largely shape the way users think. This viewpoint is supported by multiple cross-cultural research cases, such as the Australian Pormpuraawans' keen perception of orientation and the unique expressions of concepts such as color and time in different languages. Based on the results of this study, future research directions on the relationship between language and thinking can be predicted, such as further exploring the impact of language on the development of artificial intelligence and how to use the power of language to promote harmony and progress in human society.

2. The Role of Language in the Formation of Thinking

The relationship between language and thinking has always been a hot topic in the fields of linguistics, psychology, and cognitive science. “Through language, thinking can be expressed more intuitively, and language can be said to be an important way and tool for expressing thoughts and ideas” [1]. Language, as the most important communication tool for humans, not only carries the inheritance and exchange of human thoughts and culture but also plays a crucial role in the process of thinking formation. This review aims to explore the role of language in the formation of thinking, particularly in terms of language as a carrier of thinking and shaping thinking structures.

2.1. Language as a Carrier of Thinking

Language is the external manifestation of human thinking, through which people can convey their inner thoughts, feelings, and experiences to others. This viewpoint has been validated in research across multiple fields.

“After birth, not only do people not know how to use language, but they also have no understanding of the entire objective world. In other words, from the perspective of Saussure’s symbol characteristics of “signifier” and “signified,” infants not only do not know the “signifier” of language symbols, but also do not understand the entity “signified” referred to by “signified” in the objective world. Therefore, before children learn to use “signified” to refer to “signified”, they must first have a certain understanding of “signified” itself” [2]. He gradually realizes various objective things that exist through continuous contact and observation of the objective world, such as his hands and feet, bottles, mothers, etc. Then he wants to refer to these things, and the native language learners around him, such as his mother, will tell him the “signifier” corresponding to the “signified.” However, because the “signifier” of the native language itself contains an understanding of the characteristics of the “signified” from a specific perspective, it naturally guides children to understand the signified from this perspective and continuously acquire the native language. He also inherits the conceptual framework of the native language and forms his thinking with the characteristics of the native language. But this process is only his understanding of concrete things, and the “referent” includes not only concrete things but also abstract things. Children not only constantly strengthen their understanding of concrete things, but also gradually learn the “signifier” of abstract things by communicating with others in their learned mother tongue. This abstract conceptual framework also has native language characteristics. “As he gradually acquires his mother tongue, his thinking is increasingly influenced by the conceptual framework of his mother tongue” [2]. This cognitive process from concrete to abstract is a crucial step in the formation of thinking, and language plays a role as a bridge and carrier in it.

In addition, the carrier role of language in the formation of thinking is also reflected in its expression and understanding of thinking content. People use language to transform complex ideas and concepts into communicative forms, thereby promoting a deeper understanding of these ideas and concepts. As Vygotsky pointed out, thinking is conducted through language, which not only expresses thinking but also shapes it.

2.2. The Shaping of Thought Structures by Language

The structure and rules of language, to some extent, shape people’s thinking structures. This viewpoint is supported by research in multiple fields, such as linguistics and psychology. Children from different language backgrounds may have different thinking structures. “The English-speaking people have an abstract and rational thinking mode, which expresses meaning through abstract letters, so English is called phonetic writing. On the contrary, Chinese speakers emphasize visual thinking and are good at analogy, which promotes the characteristic of expressing meaning through radicals

in Chinese. Therefore, Chinese is an ideographic script” [3]. For example, there are significant differences in grammar structure between English and Chinese. English emphasizes subject verb agreement and tense changes, while Chinese places more emphasis on context and meaning. This language difference can affect children's thinking habits. Children in English-speaking countries may be more inclined towards linear thinking, emphasizing logic and reasoning, while children from Chinese-speaking countries may be better at grasping problems as a whole, focusing on comprehension and association.

This difference in thinking is largely shaped by the structure and rules of language. The structure and rules of language not only determine the way people express their thoughts but also affect their perception and understanding of the world. As proposed by the Sapir Whorf hypothesis, the structure and rules of language limit people's ways of thinking and cognitive scope. Although this hypothesis is controversial in academia, it does reveal the important role of language in shaping thinking structures.

In summary, language plays a crucial role in the formation of thinking. It is not only a carrier of thinking but also shapes people's thinking structure through its structure and rules. In future research, we need to further explore the complex relationship between language and thinking in order to better understand the essence and development process of human thinking. At the same time, we also need to pay attention to the differences in thinking among people from different language backgrounds to promote cross-cultural communication and understanding.

3. The role of Language in the Development of Thinking

3.1. Survey Questionnaire Research

With the advancement of globalization, language exchange has become a bridge connecting different cultures and countries. This article conducted a questionnaire survey on the impact of human language on the formation and development of thinking. The survey method was used to design a series of questions related to language use and thinking habits, which were distributed through an online platform. A total of 59 valid pieces of data were collected from the questionnaire, covering multiple aspects such as participants' mother tongue, language usage habits, age distribution, etc. The following survey results and analysis were obtained:

The questionnaire study mainly explores the influence of human language on the formation and development of thinking. Most of the people who filled out this questionnaire were Chinese, accounting for 96.61%. In addition, the use of English as a second language is very common, with 42.37% of participants indicating the use of English. This indicates that, in the context of globalization, multilingual ability has become an important characteristic of modern people. In order to study the relationship between language and thinking, the questionnaire included a question on the influence of language usage habits on thinking patterns (Table 1). Most participants believe that language usage habits have a positive impact on thinking patterns, such as improving logical thinking ability (84.75%), enhancing creative thinking (67.8%), and making it easier for people to understand and accept different cultural concepts (76.27%). However, some participants also mentioned issues of language confusion and communication barriers (22.03%).

Table 1: The Impact of one’s language habits on the way of thinking

Option	Subtotal	Proportion
Improve my logical thinking ability	50	84.75%
It has enhanced my creative thinking	40	67.8%

Table 1: (continued).

It makes it easier for me to understand different cultural concepts	45	76.27%
It brings language confusion and communication barriers	13	22.03%

When asked if there are differences in thinking patterns when using different languages, as shown in Table 2, over half of the participants agreed (52.54%). This indicates that language is not only a tool for communication, but also an important factor in shaping ways of thinking.

Table 2: The question of whether the way of thinking is different when using different language

Option	Subtotal	Proportion
Yes	31	52.54%
No	28	47.46%

Regarding the impact of bilingual or multilingual abilities on cognitive development, 74.58% of participants believe that bilingual or multilingual abilities have a positive effect on an individual's cognitive development (Table 3). This result is consistent with existing research: the impact of second language learning on creative thinking follows a complex cognitive pathway; "The improvement of second language proficiency not only enhances language proficiency, but also promotes the enhancement of various advanced cognitive abilities related to language, including cognitive flexibility and creative thinking"[4]. Indicating that multilingual ability can help improve an individual's cognition, creativity, and adaptability.

Table 3: The impact of bilingual or multilingual ability on the development of personal thinking

Option	Subtotal	Proportion
Yes	44	74.58%
No	15	25.42%

The questionnaire also investigated the factors that affect the impact of language on thinking (Table 4). The results show that factors such as language complexity, frequency and proficiency of language use, cultural background and values, as well as educational methods and environment, all have a significant impact on the relationship between language and thinking. This suggests that when studying the relationship between language and thinking, we need to consider multiple factors comprehensively. "Second language learners are more immersed in two languages and cultural environments, exposed to and absorbing more diverse values, concepts, and norms, thus enriching their conceptual systems and associative abilities" [4].

Table 4: The factors that are thought to affect the impact of language on thinking

Option	Subtotal	Proportion
Complexity of language	40	67.8%
Frequency and proficiency of language use	46	77.97%
Cultural background and values	50	84.75%
Education mode and environment	46	77.97%
Other	3	5.08%

From this, we have come to the following conclusion; Multilingualism is an important feature of modern society and has a positive impact on individual thinking development. Language usage habits have a significant impact on thinking patterns, including improving logical thinking ability, enhancing creative thinking, and promoting cultural exchange. The factors that affect the impact of language on thinking include the complexity of language, frequency and proficiency of language use, cultural background and values, as well as educational methods and environments. Based on the above conclusions, this study proposes the following suggestions: encouraging individuals to cultivate multilingual abilities to expand their thinking horizons and enhance their adaptability. In the educational process, emphasis is placed on cultivating students' language proficiency and cross-cultural communication skills to promote their comprehensive development. When studying the relationship between language and thinking, multiple factors should be comprehensively considered to obtain a more comprehensive understanding.

3.2. The Promotion of Language on Cognitive Development

Language is an important tool for cognitive development. By learning a language, people can understand the world, recognize themselves, and gradually establish a cognitive system towards the world. "Language can not only change people's thinking and cognition, but also shape their brain structure and function" [5]. Meanwhile, language can also promote the development of people's attention, memory, and thinking abilities. As children grow older, their language abilities are also constantly improving. This improvement is not only reflected in the increase of vocabulary, but also in the understanding and application of language structure and rules. Through language learning, children can gradually understand abstract concepts, develop the ability to classify and generalize, and engage in advanced cognitive activities such as logical reasoning. For example, when learning mathematics, children need to understand and apply mathematical language (such as "addition", "subtraction", etc.) to solve problems, and this process is actually the development of children's cognitive abilities.

3.3. The Driving Force of Language on Innovative Thinking

Language is the source of innovative thinking. Through language communication, people can acquire new information, perspectives, and ideas, thereby stimulating the emergence of innovative thinking. In addition, the diversity and flexibility of language also provide vast space for innovative thinking. In scientific research, language is an important tool for promoting innovative thinking. Scientists use language to propose hypotheses, design experiments, analyze results, and write papers. In this process, language not only helps scientists organize and express their ideas, but also promotes communication and cooperation between different fields. Through language communication, scientists can acquire new information, perspectives, and ideas, thereby stimulating the emergence of innovative thinking. For example, in interdisciplinary research, experts from different fields communicate through language to jointly explore new research fields and methods, promoting innovation and development in scientific research.

4. The Influence of Language on Thinking

4.1. The Influence of Advertising Language on Consumer Thinking

Language selection and thinking connection are crucial in advertising, as it can directly establish a connection with consumers' thinking and emotions. For example, the advertising slogan for Dove Chocolate is "Milk rich, silky feeling," which conveys the taste characteristics of the product through "Milk rich," while "silky feeling" creates a smooth and delicate tactile association.

Emotional resonance and thinking shaping advertising language often attempts to stimulate consumers' emotional resonance, thereby shaping their positive thinking about the product. In the above example, the expression "silky feeling" not only conveys the physical characteristics of the product, but also triggers consumers' longing for a beautiful and pleasant experience on an emotional level. This emotional resonance makes it easier for consumers to have positive associations and evaluations of the product. Brand awareness and mindset can form stable brand awareness and mindset in consumers' minds through long-term repeated advertising. When consumers hear or see specific vocabulary or expressions of a brand, they naturally associate it with its specific image and values. For example, when it comes to "Red Bull", many people may associate it with words such as energy, vitality, and passion, which is the influence of advertising language on consumer thinking patterns.

It should be noted that not all advertising language is positive and beneficial when it comes to misleading advertisements and misconceptions. Overly exaggerated or misleading advertising language may lead consumers to develop incorrect thinking. For example, certain health products or drug advertisements may use exaggerated language to promote the efficacy of the product, leading consumers to have high expectations or misunderstandings about it. Therefore, when facing advertising language, consumers need to maintain rational and critical thinking to avoid falling into thinking misconceptions.

Advertising language establishes a connection with consumers' thinking and emotions through selective vocabulary and expression, thereby shaping their perception and evaluation of products or brands. Positive advertising language can stimulate emotional resonance and positive thinking among consumers, while misleading advertising language may lead to incorrect thinking among consumers.

4.2. The Influence of Numerical Systems in Different Languages on Mathematical Thinking

There are significant differences in digital systems among different cultures. The processing of mathematical terms mainly relies on the semantic brain regions in the three elements of language sound, form, and meaning; language reading and writing abilities affect the fluency of oral arithmetic; and reasonable semantic conversion helps solve mathematical problems" [6]. For example, China's numerical system uses decimal, which is a counting system based on 10, while some indigenous people in South Pacific island countries use binary, which is a counting system based on 2. People using different numerical systems may be affected in their counting methods and mathematical abilities. Research has shown that people who use decimal are more likely to master mathematics and calculations because decimal is more closely related to our daily life experiences, such as finger counting. In contrast, people who use binary may have an advantage in certain specific mathematical fields, such as computer science, as binary is the foundation of internal data representation in computers. The interweaving of language and mathematics, the numerical vocabulary and expressions in language will directly affect people's understanding of mathematical concepts and operations. "The mathematical terms in their mother tongue may also lead to obstacles in constructing their meanings" [7]. For example, in some languages, there may not be a word that is completely equivalent to "zero", which may cause difficulties for language users in understanding and using mathematical concepts. Similarly, there may be differences in mathematical terms and expressions in different languages, which can affect the cross-cultural dissemination and understanding of mathematical knowledge.

"The role of language in mathematical cognition is hierarchical and has different effects on different mathematical abilities. By comparing the differences in counting methods, mathematical abilities", and understanding of mathematical concepts among people using different numerical systems, we can see the close relationship between language and mathematics [6]. This reminds us to pay attention to the influence of language on mathematical thinking in education and practice, and

take corresponding measures to overcome these influences and promote the effective dissemination and understanding of mathematical knowledge. In practice, users of different digital systems may require additional effort to understand and adapt to other digital systems, especially in international communication and cooperation.

5. Conclusion

This article delves into the important role of human language in the formation and development of thinking. The findings show that language is not only a carrier of thinking, but also plays a crucial role in shaping and driving the development of thinking. Language usage habits significantly affect logical thinking ability, creative thinking, and cross-cultural communication skills. Bilingual or multilingual ability has a positive impact on cognitive development, enhancing cognitive ability, creativity, and adaptability. In addition, factors such as language complexity, frequency and proficiency of use, cultural background, and educational environment also significantly affect the impact of language on thinking.

Although this article has achieved important results in exploring the relationship between language and thinking, there are still some shortcomings. Firstly, the research sample is mainly focused on Chinese users, and future studies can expand to more languages and cultural backgrounds to enhance the universality and representativeness of the research. Secondly, the sample size of the questionnaire survey is relatively small and mainly relies on self-report, which may have some subjectivity and bias. Future research could consider using larger sample sizes and more objective research methods, such as experimental or neuroscience methods, to more accurately reveal the relationship between language and thinking.

Future research can focus on the following aspects: firstly, further exploring the specific impact mechanisms of different language structures and rules on thinking structures; The second is to study the dynamic changes in thinking development during the process of language acquisition; The third is to examine the role of language in cross-cultural communication and its impact on individual thinking; The fourth is to explore how to use language teaching to promote individual thinking development and innovation ability enhancement. These studies will contribute to a deeper understanding of the complex relationship between language and thinking, and provide strong support for educational practice.

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