# A Comparative Study on The Sapir-Whorf Hypothesis and Quine's Holistic View of Language

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**Abstract.** The Sapir-Whorf hypothesis and Quine's holistic view of language are two of the most important philosophical theories of language in the 20th century. Despite having separate fields of study, they are conceptually and methodologically identical. Despite the two theories' extensive histories of discussion, there are few studies that compare them. In this thesis, the general framework of the two theories is described, and the coherence of the two theories is shown through comparison studies that highlight how the behaviorist and relativist tendencies of the two are similar. This coherent analysis leads to the root of the commonality of the two theories: the spirit of thoroughgoing empiricism. The comparative study of the two theories can also portray the development trend and characteristics of the philosophy of language in the 20th century, so as to have a more comprehensive understanding of the development of the philosophy of language after the "linguistic turn.".

**Keywords:** The Sapir-Whorf Hypothesis; Holism; Ontological Commitment.

## 1. Introduction

The relationship between language and thought has been a major issue in the history of philosophy. Languages are generally regarded as an external manifestation of thought in respect of ancient Greek philosophy. Plato believed that language was the external symbol of thought, and that an over-reliance on words would lead to forgetfulness and thus further away from truth [1]. According to his "mimesis"(imitation theory), language is the imitation of ideas, and is thus subordinate to thought. Aristotle recognized the relativity of language by observing that peoples have different languages and scripts, but he also believed that the mechanism of inner experience is common to all human beings, and that language and script are only external symbols of the mechanism of inner experience [1]. Medieval scholars inherited the ancient Greek philosophers' view of language and believed that there was a universal spiritual language [1]. Roger Bacon clearly stated that the universality of language is greater than its relativity [1]. The universality of language was a popular view of language before the Age of Enlightenment.

With the dominance of German idealist philosophy throughout the Age of Enlightenment, there arose a subversive understanding of the nature of thought. According to Kant, persons gain knowledge of the outside world through innate kinds of intuition rather than passively taking in external inputs. Kant himself referred to this concept as the Copernican Revolution. From this point on, philosophy began its journey into subjectivisation: people began to think of perception as a subjective faculty, not simply as an external stimulus. The relationship between language and thought was also re-examined. Humboldt pointed out that "Language is, as it were, the outer appearance of the spirit of a people; the language is their spirit and the spirit their language" and argued that the languages of the peoples of the world formed a relatively independent world [2]. The subsequent "linguistic turn"-language itself became the core of philosophical study- in the field of philosophy pointed out more clearly that language is a filter over our thoughts, as Wittgenstein said, "The limits of my language mean the limits of my world" [3].

Based on this line of reasoning, Sapir and Whorf developed the Sapir-Whorf hypothesis, sometimes known as the linguistic relativity (or, as some could say, linguistic determinism) proposition. They claimed that language severely restricts how people think and that as languages change, so do the images of the world that are presented to people [1]. Sapir and Whorf's research is

certainly characterised by subjectivity after the "linguistic turn", but they focused on empirical research rather than the theoretical clarification as the European philosophy of language tradition did, which provided brand new empirical materials for the study of philosophy of language.

Similarly, Quine's empiricist view of language can be echoed in philosophical terms by the Sapir-Whorf hypothesis. At the centre of Quine's philosophy of language is his holistic view of language, which holds that "meaning" in the traditional European view of language should not be studied as an isolated object. In other words, Platonic meaning as an idea entity should not be the object of philosophy of language [4]. That language has meaning as a whole coincides with the Sapir-Whorf hypothesis.

This thesis will explore the connection between the Sapir-Whorf hypothesis and Quine's philosophy of language, demonstrating the rapprochement between the two, leading to a comprehensive review of the direction of philosophy of language in the twentieth century.

## 2. Theory Descriptions

### 2.1. The Sapir-Whorf Hypothesis

The Sapir-Whorf hypothesis argues that native language shapes thinking, and that people who speak different languages have different perceptions of the world and different ways of thinking. The idea is based on Whorf's observation that people are more likely to exercise caution when near warehouses that are marked with gasoline drums than when they are near warehouses that are marked with empty gasoline drums [5]. In fact, because they are loaded with explosive gases, empty gasoline drums are more likely to result in accidents than gasoline-filled drums. This provides compelling evidence that words can affect perceptions and, in turn, behavior [5]. Sapir, following in the footsteps of his teacher Boas, argued that unwritten languages, despite their formal differences from European languages, are also systematic and logical [6]. The recognition of the systematic and logical nature of unwritten, non-European languages led to the establishment of the ideological and independent nature of the world's languages, where Sapir and Whorf's ideas converged: all the languages around the world are ideological and relatively independent, and language is somehow determinative of thought [6]. This hypothesis is known as the Sapir-Whorf hypothesis, and the part of the hypothesis that highlights the relative relationship between languages is known as linguistic relativity, and the part that emphasises the deterministic relationship of language to thought is known as linguistic determinism. Sapir argued:

"Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the 'real world' is to a large extent unconsciously built upon the language habits of the group. No two languages are ever sufficiently similar to be considered as representing the same social reality. The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached... We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation [7]."

Whorf verified the theory using the Sapirian theoretical framework by looking at Indian languages. The English language's syntactic structure dictates that a declarative sentence must have a subject and a predicate, with the subject designating the object of the action and the predicate designating the action itself. For example, in the sentence "A light flashed," the word "light" designates the object of the action while the word "flashed" designates the action itself [5]. Hopi, on the other hand, does not have a subject-predicate structure; a complete statement is expressed by a verb, such as the above-mentioned statement, which is directly expressed as rehip(flash) in Hopi, and the subject of the action and the action itself are integrated [5]. These two linguistic forms have a direct impact on the observations of speakers of the two languages: English speakers tend to observe the action, while

Hopi speakers tend to observe the state of affairs [5]. The difference in the tendency to observe, in turn, forms different worldviews; Whorf believed that the subject-predicate sentence pattern represented by English forms a dichotomous worldview, in which the observed world has more subdivided constituent parts, while the subject-predicate integrated sentence pattern represented by Hopi forms a holistic worldview [5]. The different worldviews also imply different forms of logical thinking, resulting in very different cultural backgrounds.

The universality of the Sapir-Whorf hypothesis can be seen in a wide range of phenomena in daily life. Perhaps the best-known example is the fact that Inuit language has far more words to describe snow than any other language. Widely cited is also the example of colors: people from different cultures perceive and react to colors in a way that is influenced by their native language. For example, the color red symbolizes good luck for Chinese people, while for Westerners it symbolizes bad luck. In China, there are many auspicious words for the color red, whereas in English, red often symbolizes warning, danger, and other negative imagery. An interesting phenomenon that has arisen from this is that the candlestick charts of the Chinese stock market use the color red to represent an upward trend, which is the exact opposite of the Western stock market.

In this relativistic view of language, intercultural translation seems to be difficult, and the Sapir-Whorf hypothesis suggests that since there is no such thing as a textual meaning which is completely neutral between two languages, i.e., an "idea"-like ontological meaning entity, the goal of translation can never be to move towards a perfect translation. Translation is in fact a reconstruction of the original text in the language used by the translator. Therefore, a perfect rendering of the original text is impossible. As opposed to conventional essentialism, this. By extension, the Sapir-Whorf hypothesis would not only apply to cross-linguistic translation but would also apply to interpersonal communication within the same linguistic context because lexical meaning can be reformulated and comprehension in a single language can also be seen as an act of interpretation [8]. In other words, it seems that communication in one language context also fails to achieve full comprehension.

### 2.2. Quine's Holistic View of Language

Quine's philosophy of language can be summarized as holism. The term "holism" was pioneered by the South African philosopher Jan Smuts and means "global dependence" [9]. Holism in the philosophy of language can be understood as the idea that the meaning of a sign depends on its role in the language, and that it is thus structural [9]. Structural identity, or holistic identity, means that an identity is structural if it is shared by at least two or more things and is not unique to that thing [9].

The logical empiricism that predominated in Europe divided a declarative sentence's nature into analytic and synthetic categories, with analytic designating a statement that is true on its own without relying on facts and synthetic designating a statement whose truth-value depends on the external state of affairs. Additionally, according to logical empiricism, every meaningful assertion is comparable to a logical construction built using nouns that are specific to one's own personal experience. Quine made these two views the two dogmas of empiricism and criticized them. Taking his critique of logical empiricism as a starting point, Quine developed his holistic view of language.

Quine began his critique with the notion of "analytic". He rejected the following possible interpretations of the meaning of analytic: 1. analytic is directly concerned with meaning, 2. analytic stands for definition, and 3. analytic is the synonymy of words [4]. According to Quine, after Frege's distinction between reference and meaning, the theory of meaning should be strictly distinguished from the theory of reference, and meaning itself should not be studied as an entity as it was before the Age of Enlightenment, but rather as an intermediary, or even as something to be discarded [4]. Due to the need to define a word based on its specific use, analytic should also not be considered a definition [4]. Similarly, definition as "interpretation" - a refinement or supplement to the defined word - should not be considered a definition either. Definitions make sure that the word's unique context is kept, but they do not assure that the defined word has a stable synonym [4]. Similarly, analytic should not be understood as the interrelation of terms, since the interrelation of terms only guarantees epistemic agreement, and epistemic agreement is not a sufficient condition for analytic

[4]. For Quine, analytic resides in a certain semantic rule. To say that a statement is analytic is in fact to say that "statement S is analytic for language L", which means that analytic is only one of the semantic rules of a language and does not involve a metaphysical discussion of the language itself [4].

Reductionism, or treating claims as direct accounts of recent experience, is Quine's second objective in his critique. Each statement is an independent individual, and the accumulation of experience can either increase or decrease the likelihood that a statement is true. The value of claims lies in their corroboration and denial [4]. In this way, a statement is labeled as an analytical proposition when it reaches its limit when examined in light of experience. The problem with this categorization, according to Quine, still lies in the division of the truth of a statement into linguistic and factual components, and if this artificial division were discarded, propositions from a strictly empirical standpoint would not be classified as analytic and synthetic propositions [4]. In other words, the distinction between analytic and synthetic propositions is merely a reductionist insistence [4].

In this context, Quine rejected declarative sentences that have meaning alone. He sees human knowledge as an artificial whole. As he puts it, "Or, to change the figure, total science is like a field of force whose boundary conditions are experience [4]." Quine called this "field of force" the "web of beliefs," which is centered on logic and the laws of science [10]. The web of belief remains in contact with empirical observation only at the edges [10]. It has a certain stability that prevents core paradigms such as logic from changing at will. Because most factual changes are only marginal to changes in empirical evidence, the web of beliefs can respond to challenges from empirical facts through internal adjustments [10]. For Quine, the system of human knowledge constructed by language is just such a whole with variable margins and a stable core.

It is simple to see how strongly relativistic Quine's comprehensive theory of language is since knowledge systems are webs of beliefs based on personal experiences, and experiences are always subjective. His claim about the indeterminacy of translation shows his relativistic stance: Arbitrary languages L1 and L2 make up D, which is the collection of all translation-related observational truths. For any translation theory T1 about L1 and L2, there exists a theory T2 that is incompatible with T1, and which can be equally well supported by D [11]. This theory is elucidated by a thought experiment: a linguist who travels to a tribe far from modern civilization to study the tribal language observes the natives pointing to a rabbit and uttering "gavagai". The question is whether gavagai was the English word for rabbit [11]. Quine argued that this is not the case. In the case of observing a single referential act, it is impossible to determine whether the meaning of gavagai is a rabbit, a part of a rabbit, or successive occurrences of a rabbit in space and time [11]. The immediate manifestation of this uncertainty is the unpredictability of the behaviour of others, which, as publicly observable objects, are the only events that can manifest certainty.

To summarize, the indeterminacy of translation includes three kinds of cases: the indeterminacy of reference; the indeterminacy of the meaning of statements; and the indeterminacy of scientific theories [12]. This kind of indeterminacy relationship is progressive, and together they constitute the relativity of the theoretical system.

## 3. The Comparison between the Sapir-Whorf Hypothesis and Quine's Holistic View of Language

The similarities between the Sapir-Whorf hypothesis and Quine's holism have been shown above: the recognition of the holistic feature of the language system, the recognition of the relative independence of the language system and the denial of perfect translation. Despite the many apparent similarities between the Sapir-Whorf hypothesis and Quine's philosophy of language, the coherence between the two needs to be identified more carefully: the former is a study of linguistics grounded in the empirical sciences, while the latter is a study of the philosophy of language. This is not to say that philosophy needs to be strictly demarcated from the empirical sciences, but rather that the distinction between the two fields of study needs to be recognized in order to make an objective

assessment of the relationship between the two. There are two general points of connection between the Sapir-Whorf hypothesis and Quine's philosophy of language: one is that both have a strong behaviorist bent; the other is that both recognize the relativity of language and thus reject the Platonic entity of meaning.

### 3.1. Behaviorist Tendency

Psychologist B.F. Skinner argued that states of mind are unobservable private states, and their results can only be observed through behavior. Behaviorism rejects mind entities. Skinner believed that only specific external stimuli and their responses needed to be considered in order to provide a complete description of behavior and its actors' relevant instances, and that there was no need to postulate the mind [13]. This pattern of behavior is known as the stimulus-response mechanism (S-R).

Quine supported behaviorism. He explicitly expressed his affinity for behaviorism, arguing that Skinner and he were on the same page when it came to ridiculing mental entities. Quine's endorsement of behaviorism comes from two points.1. Ontologically, behaviorism provides reliable empirical evidence, whereas the explanatory nature of mind entities is weak.2. Empirical tendency: behaviorism specifically examines empirical facts relevant to behavior that are available in everyday life. It suggests that linguistic experience is socially accessible [14].

Quine's behaviorist theory of meaning is his original contribution. Quine specifically gave the theory of meaning a totally empirical aspect by incorporating behaviorism into it. It is important to note that meaning still has a strong metaphysical leaning even with Frege and Russell. His invention of the idea of stimulus meaning helped him achieve this. Stimulus meaning is the meaning produced by the stimulus of a certain utterance S to a certain speaker A at time T modulo N seconds [15]. Stimulus meaning and stimulus are related and distinct from each other. It is impossible for two subjects to have the same stimulus based on individual differences, but the stimulus meaning is similar to the strong conditional, which indicates that once the stimulus condition is formed, the speaker will make a positive or negative response to a certain sentence, so two subjects can have the same stimulus meaning under different stimuli [15]. It can be seen that the behaviorist theory of meaning uses exactly the S-R mechanism, where the theory restricts both stimulus and response to linguistic behavior.

In addition, behaviorist S-R processes were used in the tests to support the Sapir-Whorf hypothesis rather than the identity theory. The latter equates brain states, which are examined through bioelectrical changes in the nerves, with mind states, such as language, if the existence of the mind is acknowledged. Dyah Werdiningsih, guided by the Sapir-Whorf hypothesis, illustrates the influence of the external environment on the language choices of children by examining the linguistic behaviors of children in Malang city [16]. Malang city has two spoken languages, Bahasa Jawa (BJ) and Bahasa Indonesia (BI), and there is a clear tendency for people to choose between the two languages [16]. BI is more formal and is the official language popularized in schools, while BJ is considered outdated and impolite [16]. The study found that children use both BJ (including BJ Ngoko, BJ Kromo, and BJ Kromo Inggil variants) and BI when conversing with parents, grandparents, friends, etc., while they only use BI when conversing with teachers, religious people, neighbors, etc [16]. According to this trend, the use of BJ will gradually decrease in favor of BI, which is consistent with the industrialization and urbanization of Indonesia [16]. This is closely related to the phenomena of industrialization, urbanization and migration [16]. At the same time, language choices reflect children's different behavioral orientations: the use of BJ represents closer relationships and more varied social behaviors [16].

This study illustrates the correlation between environment, language and behavior. Dyah's study is a strong test of Sapir-Whorf's hypothesis that these three relationships are at the heart of the language problem: the environment determines language and language determines behavior, and Dyah's study follows the same behaviorist guidelines: he strongly correlates language with behavior, and he illustrates the deterministic influence of language on behavior through language choice.

Clearly, both the Sapir-Whorf hypothesis and the Quine's holistic view of language choose behaviorism as the methodology. Why behaviorism? The reason for the Sapir-Whorf hypothesis is obvious: chronologically, the 1830s, when the Sapir-Whorf hypothesis was formulated, was the time when behaviorism was prevalent, while identity theory became popular after. So both Whorf's original experiments and later experiments on the hypothesis followed this behaviorist experimental paradigm. The reasons for Quine's choice of behaviorism are even more thought-provoking: by Quine's time, mind-brain identity theory was much more prevalent and was a powerful critique of behaviorism. One reason for choosing behaviorism is that behaviorism treats publicly observable verbal behavior as an object of study, an object of study that serves as ample empirical evidence. The brain states explored by identity theory are not publicly observable, and the legitimacy of this experience rests entirely on the assumption that brain states are identical to mind states. As an empiricist, Quine would not accept such a non-empirical assumption as a premise for all research.

In conclusion, the behaviorist tendencies of the Sapir-Whorf hypothesis and the Quine's view of language re-emphasize the common position of both: thoroughgoing empiricism.

### 3.2. Relativist Tendency

In addition to emphasizing the deterministic role of language in thought (linguistic determinism), the Sapir-Whorf hypothesis also emphasizes the relativity between languages, that is, linguistic relativism. Whorf's study of Hopi has already illustrated this relativism: considering the example of "flash" mentioned above, the English and the Hopi are not just two different language usages, but two different language systems, and thus two different systems of thought. Similar examples can be found in various places involving translations between the two languages. Take the translation of signage in many Chinese tourist attractions as an example: when reminding tourists to pay attention to environment, the signage shows "Warm and beautiful environment rely on everyone to create", while for English speakers, "Keep Clean" can more accurately serve as a warning [17]. The two reflect the different thinking models of Chinese and English: Chinese focuses on euphemisms, while English pays more attention to the accuracy.

Similarly, Quine's holistic view of language has a relativistic tendency. In the case of "gavagai", the relativity between the linguist's and the native's references, which creates indeterminacy in translation, is also a reflection of the relativity of the two language systems.

The relativity tendency in two language systems is clearly expressed in both the Quine's theory of language and the Sapir-Whorf hypothesis. However, there is still another level of relativity between the two theories that is worth pointing out. Sussan Haack, in her overall analysis of the various propositions of relativism, concludes that while Quine's relativity propositions are intended to reveal the relativity between reference and theory, the Whorf's hypothesis is an illustration of the relativity between metaphysical commitments and version, depiction, descriptions [18]. She argued"It is tempting to describe Quine's thesis as akin to Whorf's" [18]. But there are clear differences: Quine's question of reference is relevant only for analytical hypotheses, whereas Whorf's concern is with how language speakers make sense of the world through their native language [18]. That is, whereas Whorf's relativism is concerned with the relativity between two language systems. Quine not only noticed this, but was also concerned with the fact that, within a language system, the reference is also relativistic to the system as a whole. This kind of relativity based on Quine analysis of the indeterminacy of the reference. Based on this, Haack refers to Quine's proposition of relativity as deep relativity and Whorf's proposition as shallow relativity [18].

It is important to note that despite the differences between the two, Haack still found it "tempting" to correlate Quine's theory with Whorf's hypothesis. This correlation leads her to attribute the term "metaphysical commitment" to Whorf. If the author's understanding is correct, Haack is trying to show that Whorf's approach to language is also similar to Quine's proposition of "ontological commitment": every concept in a scientific theory, though itself a symbol in human language, functions to refer to an object in the objective world outside of language; This correspondence needs to be realized in the form of a "commitment" that unfolds the entire theoretical system. Quine argued

that the use of words is all about using words as bound variables, and existence is the value of a bound variable [19]. A bound variable is a variable that is bound by the quantifiers (∀ and ∃), e.g., in the expression ∃xP, x is the bound variable [19]. Thus, Quine obtained a set {x ∣ V(Fx)=T} of variables x that make the proposition true [19]. Quine's theory is intended to solve metaphysical problems such as "Pegasus does not exist". Specifically, the proposition "Pegasus does not exist" contains the notion of "Pegasus", which, according to the positivist view, must have a reference. The proposition "Pegasus does not exist" itself contains the proposition "Pegasus exists", and thus becomes a paradox. Considering existence as the value of a bound variable allows people to discard the metaphysical setting of predicates as "universality", thus transforming the problem into how predicates act on the truth-value of a proposition. Existence is logically expressed as a second-order predicate, i.e., ∃x∀y (y is so-and-so ↔ y=x) as expressed by Russell [19]. An existential proposition is true when x is in the set that makes the proposition true. The application of second-order predicates is consistent with the basic position of the holistic view of language: the existential setting that underlies language relies on the composition of two variants x and y. Commitment to this pair of variants constitutes ontological commitment. It can be shown that for any holistic (relativist) view of language, ontological commitment constitutes its existential foundation. The holistic (relativist) perspective of language opposes Platonist conceptual entities, which negates the possibility of universality as previously stated. This is the rationale for this.Such a theoretical genealogy also places the Sapir-Whorf theory. According to Whorf, ontological commitment ensures the language system's subjectivity and relativity. Quine's theory of deep relativity, although though it was developed later than Whorf's shallow relativity hypothesis, serves as the theoretical foundation for it, according to the conclusion.

## 4. Conclusion

Quine's comprehensive theory of language and the Sapir-Whorf hypothesis are found to be coherent by the comparative analysis. Both have a tendency to be behaviorist in approach and relativist in their theoretical characterisation, which reflects their coherence. The most crucial aspect of all these parallels is thoroughgoing empiricism. The two have distinct areas of study: the former is the language study of empirical science, while the latter is the study of philosophy. However, the theoretical convergence of the two reveals a feature of human inquiry into language in the twentieth century: empirical science and philosophy support each other. Linguistics provides empirical facts for philosophical development that can be analyzed, while philosophy provides methodological and ontological support for linguistics.

Philosophy's closeness to linguistics also reflects a trend in the development of philosophy in the twentieth century. This trend is the convergence of philosophers' attention on the problem of human language after the "linguistic turn", but also a determined trust in empirical science. The starting point of philosophy was experience, no longer metaphysical presuppositions. The spirit of rationalism, represented by Descartes, seems to have become something else in this era: reason no longer refers to an entity, but to a methodological characteristic. As mentioned in the introduction above, such a development is a continuation of the process of subjectivization of the 18th century. It may be added at the conclusion that this trend is also a corollary of the flourishing of empirical science.

The rationalism represented by Descartes did not disappear in the history of philosophy. The critique of the popular view of language by rationalists represented by Chomsky in the second half of the twentieth century took the thinking about the philosophical problems of language to the next stage. The debate between rationalism and empiricism will continue. Furthermore, it is worth noting that the explanatory power of behaviourism has gradually declined with the introduction of functionalism and the development of brain-mind identity theory.

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