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The Semantic Universal of Quantifiers

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Abstract: This topic is going to discuss semantic universals for quantifiers. Semantics, sometimes referred to as semantics, is the study of denotation, meaning, or truth, as well as the study of linguistic meaning from a linguistic perspective. The meaning of the language unit itself is known as semantics, or semanteme, which emphasizes the objective presence of meaning and the requirement that it be distinct and part of the linguistic meaning. Consider the quantifier "all" and “some” as an illustration. By "all birds can fly," this research imply that all birds possess the capacity to soar. Because everything that is true for a bigger group will also be true for any subset of that group, the quantifier "all" has a monotonic feature. Put differently, the adage "all birds can fly" remains true even if this paper expand the set of birds to include other bird species. By "some birds can fly," this paper imply that there is at least one species of bird that is capable of flying. Because it is true for every bigger group that contains the smaller one, the quantifier "some" is also monotonic if it is true for the smaller group. Research on quantifier semantic universals offers important new perspectives on the structure and function of language. Researchers have found similar patterns and principles that underpin the semantics of quantification by studying quantifier behavior in a variety of languages and circumstances. The concept of monotonicity, which asserts that all quantifiers are monotonic, is one significant discovery.

Keywords: quantifiers, some, any, semantic

1. Introduction

According to [1], a semantic universal is any subset of meaning that is represented in some way in all languages. Semantic universals are the fundamental ideas or structures that underlie word meaning and semantic category organization in languages that are shared by speakers of various languages. It is thought that all languages have these ideas, irrespective of their unique vocabulary or syntax. Currently, all quantifiers are monotonic according to the quantifier monotonicity principle. The link between a quantifier's meaning and the set of objects it applies to is known as monotonicity. Therefore, this topic is going to discuss semantic universals for quantifiers. Semantics, sometimes referred to as semantics, is the study of denotation, meaning, or truth as well as the study of linguistic meaning from a linguistic perspective. The meaning of the language unit itself is known as semantics, or semanteme, which emphasizes the objective presence of meaning and the requirement that it be distinct and part of the linguistic meaning. Meaning is the meaning of a linguistic unit as it is incorporated into a person's subjective ideas and feelings. It is a verbal meaning that is not exclusive to any one person. Linguistics, logic, computer science, psychology, cognitive science, natural

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language processing, and many other disciplines are all involved in semantics. Generality in language and expressiveness in language. Likewise known as "linguistic generality." Typological regularities in language, characteristics shared by most or all languages. The mid-20th century saw the rise of explanations of linguistic generality, which had their roots in the universal rational grammar of the 17th century. One can differentiate between three opposing categories: (1) formal generality, subjective generality, and both. While the latter refers to the different restrictions on grammatical rules and the formal presentation of rules, the former relates to the elements, structures, and rules shared by all languages; (2) Disembodied and embodied generalities. The former establishes the occurrence of certain linguistic features independently of other features, such as the fact that vowels and consonants differ in all languages; the latter links the occurrence of certain linguistic features to the occurrence of other features, such as a language with fricatives must have vowels and a language with front vowels must have back vowels; (3) absolute generality and tendentious generality. Whereas the second speaks of a generalization that exists as a trend with occasional exceptions, the former speaks of a generality that is inherent to all languages. In addition, all of the language generalizations that were previously discussed are generalizations, and linguistic generalizations are universal.

2. Literature Review

The study of the meaning and structure of words, including sense analysis, semantic fields, and the structural links between words and meanings, is the primary emphasis of structural linguistics, which was founded in the United States in the first part of the 20th century and gave rise to structuralist semantics. Lexical semantics, another name for this kind of semantic study, focuses on the relationships between words, including homophones, antonyms, synonyms, and so on, to identify subtle distinctions between them. A theoretical area situated between early structural linguistics and later formal semantics, genetic semantics is a subfield of semantics in genetic linguistics that flourished in the 1960s and 1970s.The phoneme differentiation theory of genetic phonology is opposed by genetic semantics, which is based on the morpheme analysis method of structural semantics and contends that morphemes make up the deepest structure of language and that various syntactic and lexicalization processes form surface sentence forms. Since the 1970s, the theoretical discipline of formal semantics has grown. It started out as Montague's study of English using mathematical logic, but linguists and philosophers worked together to make it become a separate field of study.

According to [2], the influential extended quantifier theory was proposed by [3] based on Montague's theory and Mostowski's mathematical inspiration. Since then, generalized quantifier theory research has advanced quickly. Furthermore, the investigation of the semantic characteristics of determiners is the primary emphasis of [4] contributions. Regarding logic, the inferential language proposed by [5] addresses quantification in natural language. The logical forms of English allomorphic quantifiers are identical in logical semantics, although they differ in practical usage. There are semantic distinctions between every and each, between any and every/each, and between all and other perfect quantifiers despite their shared characteristics. Although every, each, and any all express a separative sense, every has a separative sense, any has a separative sense, but every has a separative sense. All has both a separative and a collective sense, but every, each, and any only have a separative sense. Everybody's semantics are from "each" to all, everyone's meanings are from "each" to all, and everyone's semantics are from "any" to all. Each can be used for two object ranges or three object ranges; every is typically used for three or more object ranges. Any has the most colorful semantics, with non-determinism, irrelevant quantity, free selectivity, and uncertainty. Semantics that are the most colorful are those involving uncertainty, free will, irrelevance, and non-existence. Pragmatically speaking, allomorphic quantifiers have a variety of values, referents, references, and domains that can change depending on the circumstances.

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3. Methodology

Quantifiers are a class of words used to differentiate between various objects referred to by countable nouns. They are also referred to as unit words and classifiers. Classifiers, like "块" for "三块糖" and "头" for "两头牛" in Chinese, are frequently employed when nouns are counted or particularly mentioned (for example, when they are used in connection with counting words or indications). Chinese for "three people" and "two cows" is "head." Classifiers should not be confused with noun categories, which are often categorized based on factors such as lexis rather than the definition of the word. Many East Asian languages, such as Chinese, Japanese, Korean, Vietnamese, Malay, Burmese, Thai, and Hmong, as well as Bengali and the Munda language group in the western region of East and Southeast Asian languages, have classifiers in their grammar. Classifiers are present in many Central American languages, including Classic Maya and its several variations, as well as in Native American languages spoken in the Pacific Northwest, particularly in Tsim languages. A relatively limited number of West African languages and a few Amazonian languages, most notably Jagua, also include classifiers. Comparatively, classifiers are entirely absent from numerous North Asian languages (Uralic, Turkic, Mongolian, Manchu, and Palaeo-Siberian), many indigenous languages of southern and southern North America, indigenous languages of Australia, and many other languages. Due to linguistic interaction with South Asia, the languages of the southern islands may differ taxonomically, although many distant languages, like Malagasy and Hawaiian, do not. Chinese, Persian, Japanese, Korean, Southeast Asian, Southern Island, and Mayan languages are used by the classifier. Another particularly noticeable aspect of American Sign Language is classifiers.

Consider the quantifier "all" as an illustration. By "all birds can fly," this research imply that all birds possess the capacity to soar. Because everything that is true for a bigger group will also be true for any subset of that group, the quantifier "all" has a monotonic feature. Put differently, the adage "all birds can fly" remains true even if this paper expand the set of birds to include other bird species. On the other hand, let's think about the quantifier "some." By "some birds can fly," this paper imply that there is at least one species of bird that is capable of flying. Because it is true for every bigger group that contains the smaller one, the quantifier "some" is also monotonic if it is true for the smaller group. The claim that "some birds can fly" remains valid even if this research increase the variety of birds in the collection. All quantifiers in natural language follow the quantifier monotonicity principle. It guarantees that a quantifier's meaning will always be consistent and predictable, even if the size or make-up of the set it applies to changes.

Although natural languages differ greatly from one another, certain linguistic characteristics are believed to be shared by all or nearly all natural languages. Here, this research examine universals in the context of quantifiers at the semantic level, which are defined by the attributes of amount, conservativity, and monotonicity. According to Wu Chuanfeng Language is a carrier of entities that have certain commonalities that people inevitably display in their perceptions[6]. This paper will examine if complexity differences may account for these universals. Based on a straightforward yet expressive language, this research produce an enormous variety of quantifiers and calculate their complexity as well as whether or not they follow these common characteristics. This research discover that quantifiers that meet semantic universals have a shorter minimal description length, indicating that they are less complicated[7].According to Grace Zhang, the focus on the semantic characteristics of quantifiers in natural language and its ability to handle a broad variety of quantifiers are two unique features of generalized quantifier theory. It is capable of handling both fuzzy and so-called logical quantifiers, for instance. This makes a significant addition to the harmonious coexistence of formal and natural languages. Moreover, it is simple to accept and comprehend the generalized theory of quantifiers: A quantifier, or a set of sets, is represented by NP while a set of

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sets is represented by VP. The extended quantifier theory's four semantic universals and monotonicity sufficiently capture the semantic characteristics of quantifiers in actual language[2].

4. Results

Let's say this research have the statement "All girls can dance". This statement means that all girls have the ability or habit to dance. Given the monotonicity of the quantifier "all", the truth of the statement does not change as the total number of girls increases. And if this paper consider only the girls in the class, the statement remains true because all the girls in the class can dance. If this paper expand it to include girls in the whole school, the statement is still true because all girls in all schools can dance. I conducted an experiment to confirm this idea. This experiment uses every, no, some, at least two, some but not all to confirm that all quantifiers are monotonic. Quantification theory should provide a clear model for the logical meaning of the following language particles. 'all', 'all' and 'some'. This paper do not claim that this theory can explain every aspect of the correct use of these words, but this research agree that it does a good job of highlighting the logically important features and making them clearer than they need to be: The "quantifier" interprets the colloquial use of "all", "every", "no", "some", "some", etc. in a way that eliminates ambiguity and the clutter of imprecision. Quantifiers first apply this level of discourse to a clear and general algorithm"[8].The two universals that have probably had the biggest impact on quantification are Barwise and [9] U1 and U3, which are shown in (25) – (26). In the previous paragraph, this research looked at a consequence of (26) in the context of conservativity; here, this research focus on the more asserted notion that determiners in all languages function on common noun denotations to produce generalized quantifiers (GQs)[10].(25) Universal NP-Quantifier [3]Syntactic components known as noun-phrases are found in every natural language, and their semantic purpose is to represent generalized quantifiers throughout the discourse domain.(26) Universal Determiner [3]Basic expressions known as "determin-ers" are found in all natural languages. Their semantic purpose is to assign a quantifier that resides on A to common count noun de-notations, or sets. I tested some girls at a school on their love of fruit. Firstly, take the word every, for example. When this research assume that all girls love fruit, i.e., that every girl loves fruit, then every girl is a subset of those who love fruit. This means that all the girls in the school must love fruit, whether it's pears or apples or something else, or whether different people have different fruit preferences. In other words, every means that all the girls in the school like fruit, no matter what kind of fruit it is. Secondly, some girls love fruit, so the relationship between girls and fruit is intertwined, which means that most girls don't love fruit, or almost all girls don't love fruit. All girls don't like fruit, and very few girls like fruit. Half of the girls love fruits, and a lot of girls don't love fruits. But this doesn't mean that some girls love apples, because fruit is many different things, and fruit doesn't just mean an apple, it could be a pear. These examples demonstrate the application of the principle of monotonicity of the quantifier "some" to describe the semantic universality of the girls' love of fruit in a school. Different quantifiers can be used to describe the prevalence of girls' love of fruit, whether in different quantitative ranges or in different proportions.

5. Conclusion

In conclusion, research on quantifier semantic universals offers important new perspectives on the structure and function of language. Researchers have found similar patterns and principles that underpin the semantics of quantification by studying quantifier behavior in a variety of languages and circumstances. The concept of monotonicity, which asserts that all quantifiers are monotonic, is one significant discovery. According to this concept, the truth of the quantified assertion either stays constant or rises as the list of items being quantified grows. It has been demonstrated that this concept is ubiquitous across a variety of quantifiers and circumstances. Furthermore, cross-linguistic variance

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was found in the study of quantifier semantics. Although there are common concepts, quantifier interpretation and usage might vary depending on the unique qualities and restrictions of a given language. Gaining an insight into these differences contributes to a fuller comprehension of the complexity and diversity of human language. All things considered, the study on semantic universals for quantifiers emphasizes how crucial it is to look into the underlying patterns and principles that control the semantics of quantification.

References

[1] *(Talmy) by L. (2017, October 1). Cognitive semantics (Volume I): conceptual construction systems. BEIJING BOOK CO. INC. http://books.google.ie/books?id=gTRXEAAAQBAJ&printsec=frontcover&dq=%E8%AE%A4%E7%9F%A5%E8%AF%AD%E4%B9%89%E5%AD% A6&hl=&cd=1&source=gbs_api*

[2] *Barwise, John and Robin Cooper (1981). Generalized quantifiers and natural language.Linguisticsand Philosophy4 (2): 159–219, doi:10.1007/BF00350139*

[3] *Zhang, Grace. (1998). Generalised quantifier theory and its application to fuzzy quantifiers. Contemporary Linguistics. 24-30.*

[4] *Keenan and Stavi.(1986). Low dose ion implant monitoring: r. o. deming and w. a. keenan. solid st. technol. 163 (september 1985). Microelectronics Reliability, 26(6), 1197.*

[5] *van Bent hem, J. (1982) T he logic of semantics. In F. L andman & F. Veltman(eds) . Varieties ofForm al S eman tics (Pr oceedi ngs of t he F our th A ms terdam Collo quiu m) . Dordrecht: ForisPublications, 55- 8 0.*

[6] *Wu, Chuanfeng. (2000). Semantic commonality and cognitive factors in first and second language acquisition. Journal of Inner Mongolia Normal University: Educational Science Edition, (1), 71-73.*

[7] *Szymanik, J. (2016, February 19). Quantifiers and Cognition: Logical and Computational Perspectives. Springer. http://books.google.ie/books?id=NtObCwAAQBAJ&printsec=frontcover&dq=2021+van+de+Pol,+Iris%3BLodder,+Paul%3Bvan+Maanen,+Leendert%3BSteinert-Threlkeld, +Shane%3BSzymanik,+Jakub&hl=&cd=1&source=gbs_api*

[8] *VENDLER, Z. (1962). I.—EACH AND EVERY, ANY AND ALL. Mind, LXXI(282), 145–160. https://doi.org/10.1093/mind/lxxi.282.145*

[9] *Barwise, John and Robin Cooper (1981). Generalized quantifiers and natural language.Linguisticsand Philosophy4 (2): 159–219, doi:10.1007/BF00350139*

[10] *von Fintel, K. & Matthewson, L. (2008). Universals in semantics. The Linguistic Review, 25(1-2), 139-201. https://doi.org/10.1515/TLIR.2008.004ewg*