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Universal Grammar

The mystery of the origins of language is a question that has surely been pondered ever since language came into being. The ability to create language is a huge part of what defines us as human beings. It is by far one of the most useful tools we have, for it enables us to understand and communicate with one another in ways infinitely more complex than any other species'. While we are far from completely understanding how or why we have this amazing ability, over time people have come up with explanations for parts of it. The idea of language invariably comes up in the study of the mind. This is not simply because language is our most common way of expressing what occurs in our minds; it is rather because language is so intertwined in the mind itself that it is impossible to separate out. An innate part of the human mind is Universal Grammar, certain linguistic rules that enable people to learn any naturally-occurring human language by filling in the already-present foundation. Although cognitive science and linguistics, the specific fields in which most research relating to Universal Grammar takes place, are relatively new, the search for a language mechanism and an understanding of the human gift of speech has been present for centuries. Because of the progress that has been made in the past several hundred years, there is now scientific evidence for the presence of Universal Grammar.

An idea called linguistic determinism proposes that all conscious thoughts are determined, or at least strongly influenced and restricted, by the ability to express said thoughts in words. Only since understanding of those without language has been possible has it been shown that thought actually can exist without language. Children, long before they learn to speak, are capable of thinking at least to a certain extent, as much as could be

expected considering their early stage in life. Experiments have demonstrated that babies can remember numbers of objects and will be more interested when the number of objects present is different from what they were expecting.[1] Thought is also present in deaf people to whom language was never available; deaf adults with no language are often able to do arithmetic, play games with rules, and participate in other activities involving thinking.[2] Even speaking people often think without words, though it is sometimes difficult to realize this, as whenever thoughts are being closely paid attention to they tend to be in words. But whenever someone cannot think of the right word for what he wants to say, or remembers a statement he heard without knowing the exact wording, he is having thoughts without language. There are other people who, because of brain disfunctionalities, are still completely able to think, but have lost the ability to speak.

A variety of language deficiencies can result from different types of damage done to the brain. People with Specific Language Impairment (SLI) acquire language slowly, have trouble speaking, and make grammar errors that do not fix themselves through time. SLI tends to run in families and so it is believed to be hereditary, although no specific gene has yet been found for it. A similar disorder is Broca's aphasia, which occurs because of damage to a region of the brain called the anterior speech cortex, or Broca's area. It results in great difficulty articulating sentences and even individual words, as well as the omission of many functional words, such as *the* and *is*. Wernicke's aphasia, caused by damage to the posterior speech cortex, or Wernicke's area, enables a person to produce seemingly grammatical sentences without much meaning. People with Wernicke's aphasia often use wrong words or long descriptions because they have trouble recalling the correct words. None of these three disorders causes impairment in other aspects of normal intelligence.

Oppositely, there are some disorders that cause severe retardation but have no effect on language ability. Williams syndrome, a genetic disorder that causes mental retardation and a unique physical stature, also results in fluent linguistic ability, despite the incapacity to perform simple tasks. People with hydrocephalus, the accumulation of fluid in spaces in the brain, are often mentally retarded, but sometimes have the unexplained characteristic of being able to speak very well.[3] This suggests that there are certain areas of the brain devoted specifically to language, which would explain why damage to other forms of intelligence does not always affect language ability.

Whether there exists a "language organ", a part of the brain specific to the learning and use of language, is debatable. It is fairly certain that some parts of the brain are used more for language than are others. In most people, language is controlled by the left hemisphere of the brain, which controls the right side of the body.[*] An example of this fact is that when two words are heard simultaneously, one in each ear, the one in the right ear (corresponding to the left hemisphere) is comprehended better. If someone's brain is paralyzed in the right hemisphere, he is still able to speak, but if it is paralyzed in the left, he is not. Even users of sign language, which would seem to be more physical than linguistic, have been shown to use the left hemispheres of their brains in their use of language. There are also some specific areas of the left hemisphere, particularly the aforementioned Broca's and Wernicke's areas, that are normally used for language. However, the brain is made to be able to compensate for abnormalities in life, so if there is damage to the left hemisphere or if a child learns no language while his brain is in the typical period of development during which language acquisition takes place, the right

[*] There are, however, exceptions to this: in about 32 percent of left-handed people and 3 percent of right-handed people, language is in either the right hemisphere or both the left and right hemispheres. (Pinker, 306.)

hemisphere can take over the left's job of controlling language, although it is not quite as proficient. The apparent specialization of certain areas of the brain to language is strong evidence that humans have the innate capacity to learn language; other animals that communicate use far more primitive methods.

The communication naturally occurring in other animals is far simpler than even that of a small human child. There are a finite number of ideas that can be represented in these systems of communication, and many of the signals are instinctual rather than voluntary. They are also for the most part induced by present circumstances: "When your dog says *GRRR*, it is likely to mean *GRRR, right now*, because it does not appear capable of communicating *GRRR, last night, over in the park*."[4] Other animals do not have a way of adapting their communication to new circumstances. For example, bees can communicate to other bees the distance to sources of food, but if the distance is vertical or if the bees are made to walk instead of fly (and are therefore not able to calculate the distance properly), they are unable to let their fellow bees know this. Some animals have different warning signs for different predators, but they would not be able to communicate the presence of a new kind of predator. Attempts have been made to teach chimpanzees human language in the form of sign language or picture symbols, but it remains unclear whether they are actually using language or simply performing tasks that they have been taught to do. This suggests the natural specificity of language to humans, because the chimpanzees have been unable to master language as well as three-year-old human children despite being much more proficient than the children at other tasks.

One of the most amazing and special parts of human language is its creativity. Unlike many other actions that humans are capable of, language is not limited by external

stimuli. It can be used to express ideas regardless of their location in time and space or interaction with the speaker. One situation can incite multiple completely different linguistic comments from someone; situations influence, but do not determine, the sentences produced. Many parts of it are in fact rather arbitrary. The sounds of words are not related to their meanings, or else all languages would be much more similar. Nor do similar-sounding words necessarily have similar meanings. A speaker is capable of communicating incredibly specific information to a listener with a small number of words, even if the listener has no knowledge whatsoever of even the type of information before he is told. A stranger could come up to you and say "the glorious star burning with ice cream resurrected the swimming chipmunk", and you would know what he meant, despite the fact that you had not been trained to hear the statement and had never heard it before.

In this respect, language is like any learned skill with some degree of complexity, such as, for example, building houses. One can build a house, and he will always end up with a house, but it will be a different type of house depending on how he learned to build it; in the same way, a speaker of a language can say a sentence but it will be a different type of sentence depending on what language he speaks. He can paint the walls of the house purple, an aspect which he was never taught, and people will still know that they are walls even if they have never seen purple walls before because they are a specific type of a general part of a house. Similarly, speakers of a language can create new sentences and other speakers will understand the sentences because they are specific forms within broad guidelines. However, there is a limit to this analogy: a person who has seen thousands of houses cannot necessarily build one, while a person who has heard thousands of sentences

will be able to produce comparable sentences of his own; thus language differs from other abilities that are learned.

For humans, speaking comes naturally and seems simple, for we are able to pick it up without even trying, and soon we can understand and produce an infinite number of intricate sentences without effort. In fact, the nature of grammar is far more complex than it seems and is not even completely understood. Multiple attempts have been made to try to represent human grammar from scratch, but none of them can completely explain it. It is clear that sentences are not formed linearly – that is, words are not added on one after the other based only upon the previous word, and changes in the form of a sentence are made by changing words based on their meanings and not their linear positions. Some sentences can be interpreted even though they are not grammatical, while others are perfectly grammatical but have no logical meaning. Other sentences are grammatical but could be interpreted with multiple different meanings. There seem to be grammar rules, the ones taught in school, but then there always seem to be exceptions that have to be accounted for, and even then there is some ambiguity. Most people would not be able to state the rules, yet they obviously know them on some level because they produce understandable sentences that follow the rules. The problem, then, is that grammar makes sense and is consistent, so the examples that we learn as exceptions must just be part of more complicated rules, for which we necessarily have had some method of learning.

One theory of language acquisition used to be that children simply imitate the language they hear around them. While this is certainly partly true, children use many incorrect forms, so they could not have heard them from other people. For example, young English-speaking children will say *goed* instead of *went*, or *mans* instead of *men*. This

shows that they are picking up rules, not individually remembering every form of every word. They learn by overgeneralizing rules they do know until they pick up the more subtle modifications of the rules. It has also been shown that children learning language do not pay attention to, or even understand, grammatical corrections told to them directly; they learn the proper forms only from listening to regular speech. They first learn content words, such as nouns, and then other words that help them form complete sentences. This is not how adults speak, even to babies, so children must be picking up on specific parts of language at a time.

There is no way that children could speak merely by copying what they hear, because they are able to form types of sentences that they have never heard, and apply grammar to words that they do not know. The "poverty of stimulus" argument maintains that there is not enough linguistic information available to children for them to learn a language only through hearing it, so some of the information must already be present in their minds. For example, it is not obvious from hearing speech that sentence formation is based on structure and not something else, such as the numerical position of words in a sentence. Some sentence structures are very uncommon, but young children will be able to recognize them as correct regardless of the fact that they have never heard them before. There must be some way that they are differentiating between impossible structures and rare ones, even though the only evidence they have of language has been correct forms, so they have never heard incorrect ones. The solution to this would be that from only hearing proper sentences, people set preexisting parameters based on what they have heard, and therefore assume that anything else is incorrect. There are certain mistakes that children never make in their speech, because they have been listening to other people talking and

have determined some rules without experimenting for themselves. What is remarkable is that without evidence for how to set the parameters, children will actually set them themselves.

It has been shown that in the absence of a real language, children, when exposed to an incomplete language, will create grammar and make it into a language, called a creole. A pidgin is a form of language developed by people from different language backgrounds to communicate. It does not have grammar rules because it was created quickly and spontaneously out of necessity, so sentences can have ambiguous meanings that have to be inferred from context. When children are raised hearing a pidgin instead of a real language, they will add in their own grammar and it will become a language within one generation. This has occurred in communities of deaf people creating sign language as well. Deaf children who never learned sign language will make up signs and use them for communication with each other, and then younger deaf children of the age at which language acquisition takes place will add grammar, structure, and consistency to the signing and it will become a complete language.[5] This could not possibly occur unless children had some innate mechanism in their minds to use grammar.

Several hundred years ago, however, before such studies and observations had been made, there was great doubt as to how language was acquired. The scientific fields were far more general and intermixed overall, so there was little effort dedicated solely to the study of language. Even so, the discoveries made so long ago serve as a basis for the current more specific areas focused on the workings of language and the mind.

In the 1500s, the physician Juan Huarte came up with the idea of three distinct levels of intelligence. The lowest is the type of intelligence present in the smarter of

animals – learning through connecting information received through the senses. This is the intelligence present in, for example, dogs, who perceive the world through their senses and act on impulses, restricted only by reflexes learned from previous incidents that they have experienced and are not actually thinking about. The middle level is the intelligence possessed by humans; it is the ability to create completely new thoughts in the mind, which, although sometimes triggered by the senses, are not based solely on outside experience. Humans are able to express thoughts that they have never heard before because these thoughts originated inside their minds. The highest level, then, is absolute creativity, the creation of concepts not only never experienced, but also never thought of by anyone and not inducible from any external sources. Simply having the second level of intelligence qualifies one as a human, and language is one of the main factors in making this distinction, as there is no scientific way to categorize this quality.[6]

René Descartes, a philosopher and mathematician of the 1600s, believed that the workings of the mind were beyond the reach of any physical explanation. "He felt that he had demonstrated that understanding and will, the two fundamental properties of the human mind, involved capacities and principles that are not realizable by even the most complex of automata."[7] Descartes claimed that it was not possible for something as complex as the mind to come from mere organs of the body, which is why it would be impossible to reproduce the qualities of the mind in any nonliving thing. What was especially puzzling was the creativity, the aspect that was Huarte's second level of intelligence. It seemed unlikely that anything that functioned mechanically could create ideas that had not already been presented to it in some form. Language, Descartes asserted, was the only way to determine whether a mind was present, considering that many

animals, while appearing to be as capable as humans at performing certain tasks, are not able to use language. Descartes also argued against linguistic determinism and the use of words as a means of reasoning, for he was of the opinion that truth could be arrived at only through observation. These proposals were very controversial, and some people criticized them as unrealistic, reasoning that anything humans do must be controlled physically; however, in many ways Descartes's ideas could be quite feasible. Especially after Newton's theory of gravity, which claimed a mysterious force as a fundamental part of physics, there was the possibility of a similar explanation for language.

Exploration into such hidden forces of language was attempted in the Port-Royal Grammar, a work published in 1660 which asserted that grammar and thought were in many ways the same. It stated that grammar could be broken down into smaller and smaller parts, from sentences to clauses to phrases to words, and that hidden within those units were ideas. It also proposed the ideas of deep and surface structure of language. Deep structure is the internal thought being expressed in a sentence, including any unstated implications. Surface structure is the facts represented with the words and syntax of a sentence. An important aspect of linguistics is explaining the rules used to transform the deep structure into the surface structure, for a single deep structure can have many different spoken representations. Another notable fact about the Port-Royal Grammar is that it was written in French, a common vernacular, rather than Latin, the language that was used by the educated and was generally believed to be the only usable language for scientific discourse. This was one of the first major challenges to the superiority of certain languages over others.

Thomas Hobbes, another 17th century philosopher, made a different argument that also relied on the equality of languages: he claimed that language was the format of thought. A big question of the time was how thoughts were represented in the mind; it was agreed that ideas were the basic unit of thought, but it was rather unclear what an idea was. An idea was something that represented an entity in a way understandable to the brain, just as an image represents something in a way recognizable by the eyes. Some people proposed that thoughts were represented by images, but that left the problem of how to represent things for which there was no associated image. Hobbes's proposal was simply that words were the units of thought, for words were ambiguous and a word could be made for anything. This did not necessarily mean that every idea could be represented by only one word, thus it allowed for the same thoughts to be had by speakers of different languages. Hobbes's suggestion was attacked by some people but intriguing to others.[8]

The propositions of such people as Hobbes led to the fear that words of any language were limiting creative though and its expression. This problem drove scientists to learn more about how language works in order to prevent such limitations. Philosophical grammar was a method that searched for the hidden principles behind language rather than just recording patterns of usage. It was prevalent especially during the Romantic period of the 18th century, when people were interested in the deeper aspects of human nature. It alleged that to observe grammar as they would history was not what linguists should be doing, and that instead they should seek to learn the causes and techniques of it. Philosophical grammarians did not believe in prescriptivism, the practice common among grammarians of making up rules for grammar to resolve ambiguous cases or situations in which there were multiple accepted uses. They were more concerned with watching all of

these uses and figuring out why they occurred. One of their ultimate goals was "the possibility of developing a 'rational grammar,' one which would go beyond description to achieve a rational explanation for phenomena."[9] Around the time the Romantic Movement lost popularity, philosophical grammar was disregarded because it was considered too vague and confusing to be of use in obtaining information. Into its place came a much more concrete system, with the hope that a simpler system would be more useful.[10]

Structural linguistics, which works by breaking down language into classifiable units, was the first attempt at understanding the mechanism behind abstract language in general by looking at specific examples and data. This way of study only looks at the obvious present grammar of speech, and not so much at the actual meanings of the words. Structural linguists believe that everything about language can be known from observing and analyzing regular speech. Language cannot be understood through studying the mind, nor can knowledge of the mind provide an explanation for language. There is no consistency among unrelated languages, and the elements making up languages are arbitrary. A more extreme version even claims that syntax and sentence formation are separate from language, and that language consists almost completely of words. It has been argued that this approach will not lead to much more evidence than is already known, and that it is more worthwhile to study where this structure actually comes from.[11] Even so, it was a widespread practice in the 19th century and into the 20th.

Structural linguistics and philosophical grammar are similar to two more modern approaches to studying language – the Externalized (E-language) and Internalized (I-language) methods. E-language, the method far more popular until very recently, observes the properties of bits of language and attempts to make rules to account for these

properties. It also takes into account the circumstances of the occurrence of the sentences, such as who the listener is and what was said previously. I-language tries to learn about people's knowledge of language, and it does so by using not so much what people say, as whether and why something could be said at all. This process, it is argued, will lead to a deeper understanding of how language is actually created within one's mind. So in fact, in modern times we are still using the same methods to ponder the same puzzles as did people centuries ago.

Though much has been learned since the concept of a language mechanism was first looked into, the fundamental ideas of this question are the same. The discovery of Universal Grammar has brought the search one step further, but it is still far from complete. It has been concluded that in order for such a complex skill as language to be grasped as quickly and effortlessly as it is, there must already be some information present in the brain that can be applied to language without being learned. There is direct evidence of a language mechanism unique to humans, from the ability of children to create new grammars to the inability of other intelligent animals to reproduce our languages. Although we do not know exactly how this Universal Grammar works, we know that it plays a key role in the past, present, and future of the study of language and the mind.

[1]Endnotes

[1] Steven Pinker, *The Language Instinct* (New York: HarperPerennial, 1995) 69.
[2] Pinker, 68.
[3] Pinker, 51.
[4] George Yule, *The Study of Language* (Cambridge: Cambridge University Press, 1991) 17.
[5] Pinker, 36-37.
[6] Noam Chomsky, *Language and Mind* (Harcourt Brace Jovanovich, 1972).
[7] Chomsky, *Mind*, 6.
[8] Marcelo Dascal, "Hobbes's Challenge" (Tel Aviv University).
<http://www.tau.ac.il/humanities/philos/dascal/papers/hobbes-challenge.htm>
[9] Chomsky, *Mind*, 15.
[10] Chomsky, *Mind*, 20.
[11] Chomsky, *Mind*, 21.

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