Language and Consciousness;

How Language Implies Self-awareness

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The relationship between language and consciousness has been debated since ancient times, but the details have never been fully articulated. Certainly, there are animals that possess the same essential auditory and vocal systems as humans, but acquiring language is seemingly uniquely human. In this essay, we investigate the relationship between language and consciousness by demonstrating how language usage implies the self-awareness of the user. We show that the self-awareness faculty encompasses the language faculty and how this self-awareness, that is uniquely human, enables us to create social realities through utilizing the social character of the language. We conclude that it is self-awareness that empowers humans to form collective intentionality and to structure societies. Establishing the relationship between self-awareness, language and society sheds light on connections between philosophy of mind, philosophy of language and philosophy of society.

Introduction

Although primates and other creatures have ways of communicating, it is generally agreed that "language" appears to be radically different from any nonhuman system of communication [1, 2]. Language, uniquely human, is related to mental processes like thinking, planning, interpretation, and finally to consciousness.   It is also more than a fabric of sentences associated with one another through linguistic rules that can be computationally generated through a mechanism of conditioned response [3, 4]. Regardless of this uniqueness, the relationship between language and consciousness has seen much debate in many disciplines including linguistics, philosophy, and psychology [5]. There is no consensus as to whether such a relationship even exists and at what level of consciousness, if any, language becomes a necessity for conscious experience. There are of course different levels of consciousness, ranging from unconsciousness to the state of reflective self-awareness. There are also different levels of language usage ranging from imitation to engagement in sophisticated conceptual debate. Therefore, in addressing the relationship between language and consciousness different levels of language abilities and consciousness have to be considered.

Language has different aspects and manifestations; examples range from communication through writing to computer-assisted communication for non-verbal persons such as Stephen Hawking. Language in any of its forms, written, spoken, hand-gestures, computer-assisted, etc., is a tool used to create mutual agreements. A mute person who can use his gestures to make a transaction with another person possesses language; however, someone with ample verbal skills, in a foreign country, with no knowledge of its specific hand-gesture meanings or spoken word, might be regarded as possessing no language skills.

Signaling, Report and Language

Our use of language, in general, has two different aspects: language as a reporting medium, ("*it is going to rain soon*"), and language as a creating medium ("*let's open our umbrellas*"). The first aspect, reporting, is the prominent feature in the communicative systems of non-human species. Examples are found in the honeybees' waggle dance, or in any animals' alarm calls in which the instances of the reporting are judged by the spectators, who then infer certain messages. A bird's fright call can be interpreted as an alarm for a predator approaching. This level of communication, although potentially informative, is unintentional and based on automatic responses; parties cannot layout a dialogue and convey their mutual understanding. This signaling level of communication is, of course, present in human communication. For example, an infant signals hunger or pain by crying, or an adult produces an undifferentiated noise like "ouch!".

Slightly more sophisticated is 'referential communication (RC)' which involves the ability to report and communicate specific information about certain aspects of the environment. A good example is the different alarm calls made by Vervet monkeys in Kenya. These calls go beyond a simple danger signaling and referentially distinguish among various types of potential predators [6]. Again, although the conveyed message can be more specific than in *signaling*, RC is still a one-way medium. A cat that stands next to the door and meows to convey its need to go out or a dog which comes to you and barks to grab your attention, although asking for a specific reaction, are only expressing their inner desires and are not open to negotiating. Similar to signaling, RC can also be used to coordinate collective behaviors in herds of animals. As Vervet monkeys hear a specific alarm call and correspond their response to that specific call.

Again, while RC goes beyond the communication of automatic emotions in signaling, it is not sufficient to maintain a stream of communication. It remains a one-way tool. The communicative parties cannot use it in their interactions to communicate their mutual understanding of each other's inner thoughts and intentions. This is specific only to language.

RC of course is used on a reporting level in human communication, e.g. a young child stating: "here is my ice cream". While being on the path to language, RC is not yet language. Even though RC can be detailed and sophisticated in principle, this mode of communication is still confined to present events and environment. There is no discussion of past events or plans. In addition, no metaphors or abstractions can be created at this level; only direct one-to-one correspondences are constructed to describe current states of affairs and symbols. Such isomorphism can, however, provide a limited arithmetic ability to the pre-linguistic agent[1]. For example, by constructing a correspondence between the numbers of objects to its fingers, a baby can keep track of the number of the ducks in the yard, while still being pre-linguistic.

This notion of language as a reporting medium is in a sense, similar to the picture theory of language presented in Wittgenstein's *Tractatus* [7]. If language is thought of as a picture of the facts, then language is no more than an isomorphism between the facts and the sentences. Current artificial intelligence (*AI*) algorithms are able to construct such isomorphism. *AI* algorithms are currently used to recognize and report the objects in a picture (*object recognition*), or characters in a text (*optical character recognition* (OCR)) with high accuracy. Technology allows us to "talk" to a Smartphone, ask simple questions, and hear a reply. Again, however, an essential aspect of the language is absent in such tasks.

The way we communicate using Language

In using language, there are several implicit assumptions. The following assumptions enumerated below, demonstrate that by satisfying certain conditions, an agent can use language to convey intentions to the listeners in a solid manner. Absent those assumptions, what is transmitted is similar only to the utterances parroted by a bird, trained through conditioning, or by a machine using an algorithm.

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[1] Agent in the sense of one who acts (and not in the sense of one who represents another).

A command to my 4-year-old niece to bring me a red teaspoon brings an internal dialogue while searching through the cutlery: "*No; this is not red ... this one is red ... but it is not a teaspoon ...*", before returning with a red teaspoon. What makes such a simple act special? What differentiates my niece's behavior from a parrot that fetches a green plastic ring on demand? In the latter, no understanding of the language is attributed and the parrot's act is categorized only as an instance of classical conditioning.

The way humans use language to communicate seems to be based on the following assumptions:
I) (A) knows the language spoken
II) (A) knows that the other party (B) knows the language spoken
III) (B) knows that (A) knows the language spoken.

Let us see how these requirements are met in the above example: my niece knows the language and knows what terms like "red" and "teaspoon" mean (condition I). She knows that I know the meaning of those terms (condition II), and she knows that I know that she knows the meanings of those terms (condition III). Condition III is the part that makes my niece ponder selecting the red teaspoon, since she knows that I know what "red" and "teaspoon" mean and not only does she know this, she knows that I expect her to know. In short, when I asked for the red teaspoon, I knew that she understood what I meant and based on her understanding of my knowledge of same that I would notice if she brought me a green fork instead.

Similar steps can be recognized when I attempt to converse with the only other person on a *Robinson Crusoe* island. The path I would take to build a language starts by making a sign or an abstract sound, say "zek" for a fruit growing there (condition I). Then I would convey this sound to the other person so he knows what it refers to (condition II). I can do that by pointing to the fruit and repeating "zek", "zek" … so the other party notes what the sound refers to, and we can continue to build a code that we both understand. It is essential in this process to convey to one another that we are aware of the fact that the other party knows that we know the conventions (condition III) so that our communication is consistent. This enables us to use the resulting language with the confidence that the hearer will recognize the intentions and meanings we have in mind.

Example 2:

In this example, the reciprocal essence of language exchange and the importance of condition (III) is emphasized:

A) "Hey Bill. let's meet up at 5:00 p.m. in the coffee shop across the street."
B) "Sure Alex, I will see you then."

Here the verbal exchange is deemed successful if Bill and Alex show up at the coffee shop at 5:00 p.m. In doing so, they demonstrate not only their understanding of their own commitment but also that they understand the other party's expectation. Each party knows that the other understands the commitment. Meaning, if either Alex or Bill realizes that the other party has forgotten about the arrangement or had a mishap, condition III is no longer met and, there is no reason for the first party to honor the original commitment.

To label a verbal exchange, a conversation, the following properties are necessary: (hereafter we use this notation "$K_A p$" to be read as "Agent A knows p.")

I) The parties (A & B) know the basic semantics (L). ($K_A L$, $K_B L$)

For example, I cannot have a conversation about the recent changes in governmental monetary policy with my 4-year-old niece since she does not understand the underlying terms.

II) Each party knows that the other party understands the semantics. ($K_A K_B L$, $K_B K_A L$)

For example, in a conversation between a physicist, who tries to discuss the complexities of quantum physics, and an attorney both need to use terms that they presume the other person knows. Talking with someone in a language not mutually understood is fruitless.

III) The parties know that their counterparts understand what they mean. ($K_A K_B K_A L$, $K_B K_A K_B L$)

They can now honor their mutual understanding and continue to communicate the next exchange of sentences. At this stage, we can deduce that both parties are aware of the content of the conversation, understand one another, and are not just exchanging meaningless terms. For example, in a conversation between a biologist and a software engineer, when the biologist talks about a mouse he should make sure that the engineer knows that he is referring to the rodent and not the hand-held computer pointing device.

To highlight the importance of these properties, consider this situation:

In a circle of friends, Joe announces that he and Helen are getting married. By making this announcement Joe's friends know that they cannot approach Helen for a romantic relationship. Bill, Joe's 5-year-old nephew, is there and finds the time appropriate to announce his affection toward Juliet, 20 years his senior. Bill says the exact words uttered by Joe; but this time everyone laughs. What is the difference?

In the situation just described, it can be assumed, that although Bill has his own idea of what is being discussed, the others do not presume that he knows what he is talking about, and therefore neither condition II nor III are met and the group will still consider Juliet approachable for romantic relationships. In contrast, Joe knows that the other members of the group have gotten the message that he and Helen are engaged and they all know that Joe knows that they have gotten that message and therefore, assume that Helen is no longer available.

We see therefore that any language exchange has the following elements: Two agents, A and B, and content $p=$ "*Let's meet up at 5 p.m. in the coffee shop across the street*" or "*pass me the salt, please*". To comprise successful language exchange and a conversation three conditions must be met:

I) *A* knows (is aware of/can understand what is meant by) p, $(K_A p)$; *B* knows p, $(K_B p)$.

II) *A* knows that *B* knows p, $(K_A K_B p)$; *B* knows that *A* knows p, $(K_B K_A p)$ –and therefore both are aware of what the content is.

Moreover, to guarantee the success of the exchange, it is necessary that:

III) *A* knows that *B* knows that *A* knows p, $(K_A K_B K_A p)$; *B* knows that *A* knows that *B* knows p, $(K_B K_A K_B p)$.

Only under these conditions, can they fulfill p, relay their mutual understanding and continue to the next step.

From mutual understanding to self-awareness

Since the whole point of language is two-way [2] communication and establishing mutual understandings, the goal in the conversation is compatibility between the speaker's and audience's meaning. This goal is fulfilled through condition (III). If this condition is not met, it will eventually unfold that the parties' intentions and understanding are inconsistent. Among the three conditions discussed, condition III is the chief part that keeps the conversation "alive and going". From this condition, it can be deduced that by engaging in a conversation, the parties not only should know the language (condition I), but also, by the transitivity of that knowledge, have an awareness of the language they use.

Self-awareness of the language user results from condition (III) by considering that when A knows that B knows that A knows p, or symbolically $K_A K_B K_A p$, due to transitivity relation A also knows that A knows p, i.e. $K_A K_A p$. This means that is A is self-aware of p, the content of the user's speech. Language usage, at the level described above, entails self-awareness of the users; it is not a conditioned response, or an utterance without comprehension. This is what makes language different from the 'signaling' and other levels of communications. Language is grounded in the self-awareness of the users and it is this self-awareness that binds the speaker committed to what he says.

Making commitments: the valor of language

The distinctive aspect of the language from other means of animal communication is the unique potency to create and communicate a commitment (as in $p=$ "*let's meet at 5:00 p.m.*") that is understood mutually. As discussed in the previous section, the fulfillment of the resulting commitment is rooted in the speakers' self-awareness of the content of their speech (condition (III)). The commitment of the speaker to his statement comes from his awareness of the other party's understanding, and the expectation this understanding creates. Since the speaker knows that the listener is aware that the speaker is aware of what he is saying, it follows that he is self-aware of his own statement.

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[2] A newborn communicates its hunger or pain through his crying pattern; a dog communicates its joy by wagging its tail. These are examples of emotional communication, inferences from reflexive responses and not a case of language use.

Self-awareness is the essential element of our cognitive abilities that enables us to use language at a level unattainable to other non-human creatures. We use language, not just as a tool for higher-capacity communication, but with an aspect inaccessible to them; we use language to communicate our mutual understanding and to create commitments. Such mutual understanding and commitments can range from a simple construct on how to refer to objects (naming) to higher structural complexities in language as how to refer to past events, future plans, the creation of fiction, and to higher functions of language, such as making promises or apologies, and other speech acts [8].

The underlying peculiarity of our cognitive system that gives us the potential to use language is our self-awareness; a recording tape, or a parrot, can produce exactly the same statement but does not create any obligations since these things lack self-awareness. Humans' self-awareness is the substrate for their language capacity. Externalization of language and its expression through the sensory-motor system is a peripheral process. Children acquire language if they are exposed only to signs and not to sound-signs [9, 10]. This strongly suggests that the auditory and motor system is secondary to language acquisition. A locked-in syndrome patient who is able to use signs to communicate with others still possesses language faculty without the use of usual sensory-motor interface. Stephen Hawking, for example, used language even though he did not use any "sound with meaning".

It follows from the relation between self-awareness and language that non-human animals and pre-linguistic babies, while being cognitively aware and sensitive to their surroundings in many remarkable aspects, are not self-aware; there is no organized agent, to experience their own experiences, whether joyful or suffering.

The social power of language

As mentioned above, language has two aspects: as a reporting medium and as a creating medium. While the first aspect is present, at certain levels, among some other creatures, the second aspect exists solely among humans. Humans can create contracts such as "*if you give me some milk, I will provide you with some bread*". Through this aspect of language, humans have been able to create various social realities, such as marriage, money, and war [11]. Nevertheless, we should elaborate on how exactly language enables its users to establish social relations.

The social character of the language comes from its power to create communicative mutual understandings. In considering the relationship between language and self-awareness, it is appealing, and true, that what makes a statement into a commitment, and a promise into an obligation, is the self-awareness of the speaker. The social power of language is rooted in the self-awareness of its users.

When communicating about the state of world affairs in a conversation, the speaker is not just conveying a belief or an intention but also conveying that he or she is self-aware of their own understanding. When a self-aware speaker uses language to convey information to a listener, in order to make an opinion about the state of world affairs credible, the speaker is expected to be committed to what he stated. It is, therefore, the self-awareness of the speaker on what they have communicated that makes them committed to their utterances.

It is therefore implicit in language use that the speaker, when using language for a social purpose, for example, conveying some truth about the environment to the hearer, is accordingly committed to that truth. This commitment is a key feature of the language involved in social commitments and is rooted in the intentionality of the speaker. In essence, the speaker has a self-awareness that the receiving party will be aware of what the speaker means and is trying to convey[3] (Condition (III)).

Self-referentiality of promises originates as follows: one does not just promise to do something, rather, one promises to do something because he or she is self-aware of the promise that has been made. . This self-awareness of the promise explains why anything that affects the self-awareness of the speaker, perhaps the influence of certain drugs, can affect the speaker's commitment. In the absence of self-awareness, while uttering the exact same words, there would be no commitment, no public undertakings and no publicly recognized obligation.

To conclude, the power of language in creating communicative mutual understanding is rooted in the self-awareness of the users. The self-awareness, solely a human gift, is what grants language the capability to create promises, commitments, or agreements in social practice among people, and to form collective intentionality within a group.

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[3] Deception, sarcasm, humor, and other more complex forms of language use in relation to the speaker's self-awareness will be discussed elsewhere.

Concluding remarks

The question addressed in this work is what makes language different from the means of communications that other non-human creatures employ, and the relationship between language and consciousness. We discussed that the discerning capability of language that delineates it from other means of communications is its power to make commitments between the users. Furthermore, we showed this property of language is grounded in the self-awareness of the speakers. This makes the outward expression of language (vocal, written, gestural …) a secondary matter. Acquiring language, therefore, requires self-awareness. This cognitive capacity, unique to humans, enables us to form contracts and commitments among each other. The contracts range from something as simple as how to refer to an object (naming) to something as complex as how to structure a society and how to rule a country. With this extra cognitive ability, humans have been able to accomplish things that no other being can carry out. Humans can create plans, ideas, and methods, and convey those to each other through language. Language not only has enabled humans to communicate but also to create and share conventions.

The main aspect of language, absent in other forms of communication, is creating communicative mutual understandings. By the spread of such mutual understandings among a group of people, a body of collective understandings can form, commonly known as culture. Language is the tool that has enabled us to create our social realities like money, society, and culture; and in the final analysis, these all are rooted in our gift of self-awareness.

Human languages, regardless of their linguistic differences, are just open encryption codes among their users that enable them to communicate their intentions and decipher others. For an agent with self-awareness and thus language ability, communicating in any language is just a matter of learning that encryption system. That is why humans can learn any languages, regardless of parental language and birthplace.

The self-awareness of humans has granted us language ability. Through language usage and its power to make mutual agreements, humans have been able to make social contracts, collective intentionalities and social realities, and thus structure societies and cultures. Without self-awareness, none of those would be possible and human life would not be much different from that of other animals.

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