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# Some thoughts concerning Language as a Scientific Topic

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## Introduction

Language is about the most important topic when it comes to understanding humans and the history of our species. This is a very active scientific field in many dimensions. I think it is of utmost importance, to keep the scope of thinking wide-open because many important issues are not fully covered yet. I mention the following five points:

## Language and symbolic processing

When trying to understand the nature of human thinking, for me it is very important to capture its dual mode of operation. On the one side, we operate within the potential of a powerful neural network, as do most other highly developed species. At the same time, we have available something like a digital computer-like machinery in our brain, which makes humans superior to all other animals. To me, this "machinery" seems to be an emulation of a digital system on our biological neural networks. This emulation process is possible and quite good understood.

## The language of "neural systems"

Asking for higher level information processing in our human ancestors (before having a language available) and in other highly developed species (such as primates), obviously the thinking took and takes place in form of "multi-sensoric film-like structures", that could be manipulated in the sense of putting films together to see results of different strategies in something like a powerful simulation machine. Of course, this powerful simulation machine is at the core of the power of our brains. And the old form of using it is still available to humans and is very powerfully used by many. Language here concerns abstractions, represented by "specific multi-sensoric imaginary".

## Emotions and feelings

Emotions and feelings are dimensions of our brain activity that we all experience, but where we have no idea whatsoever, how they are brought about by nature or how we would ever bring them about in machines. While they are obviously present in animals, their physical realization is far away from our present level of understanding. Still, concerning having such personal experiences (sometimes called "qualia" in philosophical discourses on the issue), there is no problem in our "brain simulation engine" to deal with those feelings, create those feelings and make use of them. We, as a species, had them available as imaginary information in earlier times and, of course, we have them available today, too. Using words, we can bring about them with words much more efficiently than by mere thought processes.

## Chomsky's thesis on the origin of language

Concerning the history of spoken or written language, there is good arguments to accept a thesis by Noam Chomsky, hypothesizing that the invention of words, as we use and speak them now, was not in the first place happening for communication among people, as is believed broadly today, but for generating a kind of powerful script language to better empower our brain simulation engine to do what we want, based on multi-sensorical images, activated via words. Inventing language was like improving the "operating system" for the digital machinery, emulated on our neural network. Only later, after this device was strongly developed for processing our own digital machinery, it was then also eventually used for communication with others. Of course, in this process, it has multiplied its powers.

## Developing "intelligent" language processing systems

It remains a big challenge to develop information systems that are really powerful in dealing with language. Systems to speak with, systems that can read books and can really understand them. Obviously, we need deep representations, deep ontologies in the sense of knowledge processing and artificial intelligence, if we ever want to get to that point. Translation, based on statistics, which is the standard today, can help in certain restricted and limited situations, but is far from full language capabilities in their full complexity.

These are only five of more issues that need further intensive analysis by scientists. A lot of interesting questions are waiting there, that might be attacked by young scientists. I motivate them to do so and look forward to promising insights.