Productivity

Productivity, or creativity, is a key feature of human language that enables us to generate new meanings by producing novel expressions and utterances. This means that we can combine linguistic signs to form sequences **that have never been produced before**; and even if they are not entirely new, they can still be innovative in that they are not simply drawn from memory. This entails that we can create always new sentences, and texts: we are not bound to an already existing repertoire.

What's even more impressive is that not only can we create such utterances effortlessly, but listeners also have little difficulty in understanding them. This is because we **share the same grammar knowledge**, and we have therefore access to the rules necessary to encode and decode any new message.

Another important aspect of the productivity of language is that speakers can invent new words to express new ideas and refer to new objects and events. For example, consider the vast number of English words that have been coined in recent years to talk about computers and the Internet. Even words like "selfie" or "boomer" are relatively recent additions, and they have not been used throughout the entire history of human language.

In contrast, animal communication systems are typically non-productive and do not allow for the creation of new signs for new meanings. As a consequence, these systems are limited to expressing a small set of possible meanings, and they are not able to generate new expressions in the same way that human language does.

Recursion

Recursion is a property directly correlated to the productivity of human languages. Recursion is what allows linguistic elements to be **combined repeatedly**, producing an infinite variety of sentences of indefinite length. In other words, recursion is the process of embedding a linguistic unit within another to make it longer.

Using recursion, a simple sentence like "Mark is tall" can be expanded endlessly by applying the rules of coordination. So, for example, we can generate the sentence "Mark is tall and strong"; and then "Mark is tall and strong and handsome". And so on.

In contrast, animal communication doesn't allow for such a high degree of recursion, as the possible combinations of signs are limited and mostly predetermined.

The implications of this property are significant. Although the **human brain is finite**, the recursive nature of language allows us to produce and understand an **infinite** number of sentences.