Short remarks on the common hierarchical structure recently found in all languages by Guglielmo Cinque

It is argued that structural properties shared by a large number of studied languages cannot be a mere result of coincidences but must have been acquired („learnt") and proved useful in the course of evolution. Bodily and cognitive boundary conditions and limitations as well as efficiency requirements are claimed to lie the basis of the observed regularities.

Most interestingly, certain core properties appear to be shared by a great number of very different languages as claimed by Guglielmo Cinque in a recent book[1]. This is taken as prove or at least strong evidence that these structures are innate and not learned.

My first claim is that this contrast is a rather artificial one and, with referring to innate predispositions alone, not much is gained for an in-depth understanding.

Any feature, which can be transmitted by inheritance, is itself the product of a learning process, albeit on a much longer time scale, through evolution. This certainly includes a good deal of chance but in the end the result is not a mere product of coincidence. The resulting structures were selected amongst others because they fulfill certain needs; - in the case of human language, requirements are without doubt put forward by communication's demands and purposes. This goes far beyond a narrow concept of „functionalism" as it rests on the history accumulated over many generations and is not meant to work at the level of the (single) individual.

It suggests itself that there must be an underlying reason why some structures are more useful for communication than others (maybe extinct ones).

Here one has to bear in mind that evolution is a „tinker"; some accidental feature forms a starting point and in a „hypercyclic" fashion this leads to certain consequences which themselves in the end possibly add further weight to the initial condition and thus contribute to establishing and possibly freezing it[2]. This is how universal grammar came into existence like the material shape of our body.

So, what is desirable is an account of why selection (should have) produced the observed regularities.

At the bottom level it appears to be obvious: we use building blocks „words" because otherwise we would be completely overwhelmed by the computational demands of combinatorial explosion.

The next level: dividing the tokens between some expressions for ‚actions': „verbs" and some others for ‚(embodied) entities': „nouns" seems a natural thing to do for any agent actively moving in our 3-d world. The same holds true

for the distinction between subject and object, and also for the fact that adjectives and adverbs are handy in describing further detail.

(„Function words" or their equivalent knit together somewhat bigger junks. Regularities at the surface level differ because different languages split different parts and facets of the world into different distinct concepts and words. They have an evolution of their own leading to the languages as we know them and their grammars.)

...How does this extend and what could it mean to the observation that adverbs and grammatical words follow a fixed order with only a limited number of distinct semantic basic patterns?

Several lines of argument might shed some light on this issue:

- concepts are stored as schemata, which can be nested
- a very basic schematic blueprint is based on geometry (e.g. time relations are expressed analogous geometrical ones)
- men can hold approximately 7 items in memory at one point in time, this also limits nesting levels
- the fundamental (cognitive) process in the brain is a cyclic one, linking these three principal steps in the succession: „plan", „action", „quality control".

The first three points are more or less non-disputed common knowledge, the forth claim is the subject and result of a lengthy study in preparation[3]. Let us assume for the moment, that it holds true. Some idea about how such a „consumption analysis loop" could work and be responsible for many things including our pleasure in beauty can be found in a recent „skywriting" publication[4].

Looking at the order: mood, tense, modality, aspect and voice one could argue that it reflects some progression from a „closer" to a „wider" connection when starting from the verb.

- Active / passive voice is directly connected with the immediate meaning of the verb, these are two different actions
- the state of progress can (should) nicely come next; this poses the most direct information relevant to the basic „consumption analysis loop" (for understanding via some sort of duplication in a system similar to the recently discovered ‚mirror neurons' for actions[5])
- whether ‚possible' or ‚necessary' extends the frame without brake
- when the whole happens (or happened) further complements the embedding into a wider background
- and whether the statement is meant as a question or as a declarative message closes the circle by connecting to the current context established by speaker and listener

It might be argued that scrambling the succession would produce discontinuities. Such a „feeling" itself would suggests that this ordering is deeply rooted inside our cognitive set-up.

Admittedly, the obvious overall conclusion is that this ordering, a mental predisposition for it, was frozen a long time ago at the very beginning of languages, when men started to use the very first words or rather even before. Limits of capacity in working memory did (and does) not allow for straight forward further additions.

Adhering to a well defined order means that „slots" in a schema (about 40 basic models) can be addressed with high efficiency. This makes it easier and faster for the consumption analysis to sort out what has been said, - and what has been omitted (!).

References:

1.   Guglielmo Cinque, Adverbs and Functional Heads, Oxford University Press, 1999

2.   Manfred Eigen, Peter Schuster, Naturwissenschaften **64**, 541-565, 1977; **65**, 7-41, 1978

3.   Knud Thomsen, work in progress, 200?

4.   Knud Thomsen, Cogprints ID 857, 2000

5.   Vittorio Gallese, Luciano Fadiga, Leonardo Fogassi, and Giacomo Rizzolatti, Brain **119**, 593-609, 1996