WHAT KIND OF GRAMMAR DID EARLY HUMANS (AND NEANDERTHALS) COMMAND? A LINGUISTIC RECONSTRUCTION[a]

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Here I pursue a linguistic reconstruction of the earliest stages of grammar, following a precise syntactic theory. This reconstruction arrives at the initial stages of grammar which are in consort with crosslinguistic variation attested in the expression of various syntactic phenomena, including transitivity and tense marking. Interestingly, in making an argument for the antiquity of language, Dediu & Levinson (2013, p. 11) express their hope "that some combinations of structural features will prove so conservative that they will allow deep reconstruction." I propose that the earliest stages of syntax as reconstructed here provide just such a conservative platform from which all the subsequent variation could arise, and which could have been commanded also by our cousins and the common ancestor. The reconstruction is at the right level of granularity to exclude some hypotheses regarding the hominin timeline, and to support others. It leads to specific and testable hypotheses which can be explored in e.g. anthropology, neuroscience, and genetics.

1. Introduction

One of my goals is to find connections and common ground between the recent proposals in Dediu and Levinson (2013) (D&L) regarding the antiquity of language and the syntactic reconstruction of syntax proposed in Progovac (2015, and previous work, e.g. 2009). I believe that this is exactly the kind of interdisciplinary dialogue that is necessary in order to shed light on language evolution: we need to rely on linguistic theories and linguistic variation to reconstruct the stages of language evolution, and we also need to cross-fertilize these findings with various other types of evidence coming from e.g. genetics, skeletal morphology, cultural artifacts, neuroscience, etc. Linguistic reconstructions are needed because the data from genes and bones alone cannot

[a] I am grateful to Dan Dediu (personal communication 2015), for very useful feedback on the first draft of this paper.

tell us with any precision what kind of language e.g. early humans or Neanderthals may have commanded, and thus do not lead to further and more precise hypothesizing. D&L (p. 11) are aware of this, and express their hope "that some combinations of structural features will prove so conservative that they will allow deep reconstruction." I propose that the earliest stages of syntax reconstructed in Progovac (2015) provide just such a conservative grammatical platform that D&L are looking for.

2. What Can the Bones and Genes Tell us?

D&L review a number of recent findings suggesting that at least *H. heidelbergensis* had some form of language, based on the comparative evidence among its descendants: *H. sapiens*, Denisovans, and Neanderthals, as also suggested by Finlayson (2009, 116) (but see Berwick, Hauser, & Tattersall, 2013, for criticism of this view). According to D&L (p. 10), "language as we know it must then have originated within the ~1 million years between *H. erectus* and the common ancestor of Neanderthals and us." D&L (p. 5) conclude that Neanderthals and Denisovans "had the basic genetic underpinning for recognizably modern language and speech, but it is possible that modern humans may outstrip them in some parameters (perhaps range of speech sounds or rapidity of speech, *complexity of syntax*, size of vocabularies, or the like). If we adopt the widely accepted uniregional hypothesis regarding human origins, then the linguistic reconstruction I follow leads to the conclusion that human grammars are at least more complex (as they are hierarchical) than any grammar commanded by the common ancestor, *H. heidelbergensis*, as explained below.

In addition to genetics, D&L also review evidence from the skeletal morphology, the morphology of the vocal tract, infant maturation, Broca's area, brain size, and cultural artifacts, and they conclude that all the evidence is consistent with their proposal. If this is on the right track, then the question to be addressed is the following: what kind of grammar characterized *H. heidelbergensis* or Neanderthals? Moreover, one also needs to hypothesize about what kinds of pressures contributed to the innovation and evolution of more complex grammars, and how our brains evolved to be able to support first the simpler grammars, and then the more complex grammars. The only way to arrive at specific and testable hypotheses regarding these questions is to pursue a reconstruction based on a linguistic theory and on linguistic variation. Neuroimaging experiments can then be designed to test such specific hypotheses (as in e.g. Progovac, Ofen, Crabtree, Angell, and Liddane, In Preparation).

3. What Can Linguistic Theories Contribute: Reconstructing Early Stages of Grammar

The reconstruction proposed in Progovac (2015, and work cited there) is based on the influential framework of Minimalism and its predecessors, as outlined in e.g. Chomsky (1995). In this syntactic framework, modern sentences and phrases are treated as hierarchical constructs, consisting of several layers of structure, built in a binary fashion. The following is the partial hierarchy of projections involved in the construction of a typical sentence:

(1) TP > vP > SC/VP
[where TP is a Tense Phrase layer; vP a transitive (higher) verb Phrase; VP the basic Verb Phrase, and SC a Small Clause. For the relevance of using both SC and VP as labels for the inner layer, see Progovac (2015).]

To derive a sentence such as *Deer will eat fish*, we first assemble the most basic, inner layer, the SC/VP *eat fish*. At this point in the derivation, it is still not determined if the fish is going to be the eater or the eaten, and thus there is really no subject/object differentiation. On the other hand, superimposing the transitivity layer (vP) enables the grammatical differentiation between subjects and objects (as in *Deer eat fish; Eat fish (by) deer*). The TP layer, in this case headed by *will*, is then superimposed over the vP layer, to create three layers of syntactic structure. Sentences and phrases in this framework can exhibit additional layers of structure.

Importantly, the layer upon which the whole sentence rests is the inner, foundational, SC (*eat fish*) layer, which is reconstructed as the initial stage of grammar. The logic behind the proposed reconstruction is straightforward: while VP/SC can be composed without a vP or a TP layer, a vP or a TP can only be constructed upon the foundation of a VP/SC. Moreover, while imposing an additional layer of structure upon the foundational SC necessarily results in a hierarchical, layered construct, the SC itself can be a flat, headless, paratactic creation. That is exactly the kind of proto-grammar that this reconstruction arrives at: a flat, tenseless, intransitive two-slot mold, consisting of just one verb-like and one noun-like element, and in which the subject/object distinction could not be expressed grammatically.

As we begin to wonder if this kind of grammar is feasible at all, consider that we find “living fossils” (in the sense of Jackendoff, 2002) of such grammars in

various constructions in present-day languages. One example would be verb-noun compounds, such as English: *cry-baby*, *kill-joy*, *tattle-tale*, *turn-coat*, *scatter-brain*, *tumble-dung* (insect); Serbian *cepi-dlaka* (split-hair; hair-splitter), *ispi-čutura* (drink-up flask; drunkard), *vrti-guz* (spin-but; fidget), *jebi-vetar* (screw-wind; charlatan); and Twi (spoken in Ghana) *kukru-bin* (roll-feces; beetle). These are essentially small clauses created by two-slot grammars, with just one verb and one noun, without a possibility for distinguishing subjects from objects. If we compare e.g. *turn-table* and *turn-coat*, we observe that the first describes a table that turns (table is subject-like), and the second describes somebody who turns his/her coat, metaphorically speaking (coat is object-like). But, grammatically speaking, these two compounds are identical.[b]

4. What Can Language Variation Tell us?

The unspecified role of the noun in this two-slot grammar can be characterized as the absolutive role, as such roles are not directly sensitive to the subject/object distinction. Absolutive-like roles are found not only in languages that are classified as ergative-absolutive, but probably in all languages, in some guise or another, including in the compounds above. Human languages in fact differ widely with respect to how they express transitivity, and this reconstructed absolutive-like basis provides the common denominator, the foundation from which the variation can arise. The reconstruction offered above is thus synergistic with the findings in linguistic typology, the field concerned with language variation. What makes this synergy possible is the precision of the reconstruction, and the consideration of specific linguistic data.

In ergative-absolutive languages, such as e.g. Tongan (spoken in Tonga; Tchekhoff, 1973), there is special case marking for an additional, second argument, typically agent, and this case marking is called ergative, resulting in structures comparable to: *Eat (by) deer*.$_{\text{ERG}}$ *fish*. On the other hand, intransitive structures comparable to *Eat fish* in Tongan are vague/unspecified with respect to whether the fish (absolutive) is eating or being eaten (see also Gil, 2005, for Riau Indonesian). In nominative/accusative languages, such as Serbian, there is

[b] In addition to being illustrative of a most rudimentary grammar, it is intriguing that verb-noun compounds in many languages specialize for derogatory reference and insult when referring to humans, and are often crude or obscene. In medieval times alone, thousands of such compounds were used, certainly many more than nature needs. Such abundance, indeed extravagance, is usually associated with display and sexual selection, the force that has also created the peacock's tail.

special case marking for objects (accusative), and here one encounters a transitive structure of the kind: *Deer eat fish*.$_{\text{ACC}}$ or *Fish*.$_{\text{ACC}}$ *eat deer*. There are also languages which make use of the so-called serial verb constructions, where two small clauses get strung together to express semantic transitivity. One illustrative example is *Dog catch, fish eat*, from Anyi-Sanvi, Niger-Congo, meaning roughly "dog catches it: fish gets eaten" (Van Leynseele, 1975, 191-2).

It is of great significance that these different strategies for expressing transitive meanings all share the common ground or foundation, and all can be reduced to the initial absolutive-like small clause. The different strategies are just different solutions to the same problem: the problem of having only a two-slot grammar, able to fit a verb and only one noun, but desiring to describe a transitive event, which requires two nouns. Given the reconstruction results and the attested variation in transitivity, it is now possible to formulate specific hypotheses regarding the hominin timeline, as well as regarding the timing of the emergence of different stages of grammar. Again, what makes this possible is the precision of the syntactic reconstruction considered here.

5. The Potential and the Limits of Two-Slot Grammars

Even though disarmingly simple, the beauty of this two-slot grammar is in its ability to combine not only two words, but also two flat small clauses, paratactically, as illustrated in the following AB-AC formulaic "living fossils" from English and Twi (spoken in Ghana) (see also serial verb constructions mentioned in the previous section):

(2) Monkey see, monkey do. First come, first serve.
Come one, come all. Card laid, card played.
Like father, like son. So far, so good. Easy come, easy go.

(3) Wo dua, wo twa. (You sow, you reap)
Wo hwehwea, wo hu. (You seek, you find)

Just like the compounds of Section 3, these two-by-two formulae can support an abundance of tokens, demonstrating that even these simple grammars have an amazing creative and expressive potential.[c]

[c] Especially rich in such paratactic AB AC formulae is Hmong, spoken in China and northern Southeast Asia (Martha Ratliff, p.c., 2015). Of note is, perhaps, that such symmetric, parallel combinations would have been easy to fit onto simple melodies, and to develop musical protolanguage from. Such paratactic structures rely on prosodic glue to hold them together, and if

What all human languages and constructions undoubtedly have in common is the paratactic platform, that is, the ability to combine two words or two small clauses paratactically, essentially the properties of the reconstructed flat, binary, two-slot stage. All the complex hierarchical phenomena, including transitivity and subordination, have alternative routes, as well as precursors, in parataxis (Progovac, 2015). This is therefore a deep, conservative property of human language, the foundation upon which all else rests.

6. Drawing some Conclusions about the Grammatical Abilities of our Ancestors

There are certain scenarios for the evolution of grammar/syntax that are inconsistent with the approach pursued here, which means that this reconstruction is at the right level of granularity to engage the questions regarding the hominin timeline. For example, a great degree of crosslinguistic variation in how human languages build upon the foundational paratactic stage suggests that the hierarchical stage did not emerge in all its complexity and in a uniform fashion only once (in Africa), but instead multiple times, and independently, either within Africa, or after the dispersion from Africa. If it had emerged only once, before *H. sapiens* spread out, it would be difficult to explain why there is so much variation across languages of the world in how they express transitivity (by ergative, accusative, serial verb, or other means), or in whether or not they grammaticalize tense/aspect/mood systems, to name just some parameters of variation.

Under the uniregional hypothesis scenario, this reasoning leads to the conclusion that *H. heidelbergensis*, our common ancestor with Neanderthals and Denisovans, did not command hierarchical syntax, but most probably only the basic, paratactic, two-slot platform. This would be consistent with the slightly smaller size of the H. *heidelbergensis* brains, in comparison to either humans or Neanderthals. Neanderthals would have, in that case, inherited this paratactic grammar, but could not have inherited any hierarchical grammar from *H. heidelbergensis*. Of course, there always remains the possibility that Neanderthals developed their own kind of hierarchical syntax, or some other complexity, independently. On the other hand, Neanderthals could have stayed

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there was musical protolanguage at any point in human evolution, then it would have been most useful in these earliest stages of grammar.

with the grammar they inherited from H. *heidelbergensis*, the paratactic two-slot grammar. Even though grammatically simple, this kind of grammar has an amazing creative potential for expressing a variety of meanings (see Section 5). If it was there at that juncture, it would have allowed H. *heidelbergensis* and Neanderthals, among many other communicative opportunities, to hurl insults at each other in the form of flat compounds (e.g. *crybaby, hunchback*), as well as to express eternal wisdoms and observations in the *form* of AB AC formulae (e.g. *You seek, you find; Monkey see, monkey do*).

Consistent with these considerations, it is likely, even though not certain, that the paratactic proto-syntax stage already characterized the *H. heidelbergensis* species, which would place the emergence of the proto-syntactic stage to at least as far as half million years ago. In fact, my proposal also cannot exclude the possibility that *H. erectus* also had some form of proto-syntax, especially considering that their brain doubled in size relative to that of the Australopithecus, who lived sometime between 4 million years ago and 2 million years ago. There was nothing else at that juncture that would have required as much brain capacity as the early stages of language, accompanied by an increase in expressive abilities and vocabulary size.

However, the linguistic considerations explored here, as they stand now, are not capable of choosing between the uniregional and multiregional hypotheses about human origins. It has been established that *H. erectus* traveled out of Africa around 1.7 million years ago, spreading to Europe and Asia. According to the much less accepted multiregional hypothesis, the local *H. erectus* populations in Africa, Asia, and Europe differentiated into *H. sapiens* independently, by a process of parallel evolution, as well as some admixture among the populations (e.g. Stone and Lurquin, 2007; Finlayson 2009). If this hypothesis turns out to be correct, or a weaker version of it (Harris 2015, 163-164), then, under my approach, one would have to say that *H. erectus*, prior to the migrations out of Africa, already commanded the foundational paratactic grammar, and that the more complex hierarchical grammars emerged separately in different geographical locations, after the dispersion. On this scenario, the hierarchical grammars could have emerged much earlier than with the uniregional hypothesis, given that the dispersion took place much earlier, around 1.7 million years ago.[d]

[d] There may be another scenario for the timeline, which would also allow for an earlier timing for hierarchical syntax. Namely, it is possible that hierarchical syntax emerged independently among

References

Berwick, R. C., Hauser, M. D, & Tattersall, I. (2013). Neanderthal language? Just-so stories take center stage. *Frontiers in Psychology* 4. doi: 10.3389/fpsyg.2013.00671

Tchekhoff, C. (1973). Some verbal patterns in Tongan. *The Journal of the Polynesian Society*, 82.3, 281-292.

Chomsky, N. (1995). *The Minimalist Program*. Cambridge, MA: MIT Press.

Dediu, D., & Levinson, S. C. (2013). On the antiquity of language: The reinterpretation of Neandertal linguistic capacities and its consequences. *Frontiers in Psychology*, 4, 397. doi: 10.3389/fpsyg.2013.00397.

Finlayson, C. (2009). *The Humans who Went Extinct: Why Neanderthals Died out and we Survived*. Oxford: Oxford University Press.

Gil, D. (2005). Isolating-monocategorial-associational language, in H. Cohen and C. Lefebvre (eds.), *Handbook of Categorizaton in Cognitive Science* (pp. 347–379). Amsterdam: Elsevier.

Harris, E. E. (2015). *Ancestors in our Genome: The New Science of Human Evolution*. Oxford: Oxford University Press.

Jackendoff, R. (2002). *Foundations of Language: Brain, Meaning, Grammar, Evolution*. Oxford: Oxford University Press.

Progovac, L. (2009). Sex and syntax: Subjacency revisited. *Biolinguistics* 3.2-3: 305-336.

Progovac, L. (2015). *Evolutionary Syntax*. Oxford: Oxford University Press.

Progovac, L., Ofen, N., Crabtree, M. R., Angell, W., & Liddane, R. In preparation. Neural correlates of syntax and proto-syntax: An fMRI study. *Journal of Neurolinguistics*.

Stone, L., & Lurquin, P. F. (2007). *Genes, Culture, and Human Evolution: A Synthesis*. Blackwell Publishing.

Stringer, C. (2007). The origin and dispersal of *Homo sapiens*: Our current state of knowledge, in P. Mellars et al. (eds.), *Rethinking the Human Revolution: New Behavioral and Biological Perspectives on the Origin and Dispersal of Modern Humans* (pp. 15-20). University of Cambridge: McDonald Institute for Archeological Research.

Van Leynseele, H. (1975). Restrictions on serial verb constructions in Anyi. *Journal of West African Languages*, X, 189–217.

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different populations in Africa, and that, as these different populations migrated to different parts of the world, they brought with them these diverse hierarchical grammars. Stringer (2007, 17) mentions that there might have been an African version of multiregionalism.