

MINIMALIST FOUNDATIONS OF LANGUAGE EVOLUTION: ON THE QUESTION OF WHY LANGUAGE IS THE WAY IT IS

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I describe and assess the Minimalist Program (MP) as an approach to the evolution of language. The MP is less about evolution than explanation, but if its attempt to vindicate a certain idea of ‘design perfection’ was successful, a deeper level of explanation would be achieved than historical narrative and functional explanation affords, and the evolution problem would be solved along the way. Arguably, a minimalist methodology is also a necessary component in any explanatory approach to language evolution, no matter its theoretical orientation. While these are clear virtues, I question the MP’s central explanatory claim, that language can be understood as an optimal solution to the problem of satisfying interface conditions imposed by pre-linguistic cognitive systems.

1. Minimalism and language evolution

1.1. *Beyond explanatory adequacy*

Describing variance in the world’s languages is one thing. Explaining it is quite another. In the generative tradition, this task has taken the form of *deducing* it: the generative linguist has variance follow from (i) the interaction of a universal set of structural principles (laws) with a universal set of parameters and linguistic data, plus (ii) a lexicon specifying idiosyncratic (non-predictable) features of the language in question. If the principles and parameters were known (still a distant goal) and the deduction achieved, a form of ‘explanatory adequacy’ would be reached.

Yet, this would leave the question open why language is the way it is. A familiar answer to this latter question is that language evolved under particular adaptive constraints. There is or was some job that it did optimally, or more optimally at least than anything else did, and its structure reflects that task specification. Thus Jackendoff (2002, ch.8) proposes a gradualist evolutionary story with a number of incremental steps each of which has a rationale with regard to the ‘goal’ of increasing expressiveness in the communication of complex propositions.

Here the answer to our question is a historical, evolutionary, and functionalist one, and it may seem quite natural if we view, as the generative

tradition has done, the language faculty as merely another “organ of the body”, one of many sub-components of an organism that interact in its normal life’ (Chomsky, 2005:1). On the other hand, this answer is more an answer to the question of why language exists rather than why it is the way it is. On a Darwinian view, structures prove adaptive without arising on adaptive grounds: adaptive function does not rationalize origins or design primitives. Necessarily, natural objects will exhibit signs of design and adaptation, but this will be a consequence of evolution, not a cause.^a It is a prevailing logical error that function accounts for genesis, or internal causal mechanisms, hence can be a cause of evolutionary novelty (Hinzen, 2006, Müller, 1990).

1.2. Answering ‘why’-questions, MP-style

Consider that, in general, the evolution of some organismic structure, X, need not actually be essential to understanding its design. For any evolved organic system, the language faculty included, we can distinguish three factors that enter into its growth and development (Chomsky, 2005): (i) external data, (ii) genetic endowment, (iii) general principles of structural architecture not specific to the system and/or the species in question.

Which of these factors is explanatorily dominant with respect to some particular system is an entirely empirical question, with consequences for the instrumental role that natural selection actually played. Furthermore, it is arguably a conceptual necessity that any language organ newly inserted in a primate or pre-linguistic cognitive architecture has to ‘satisfy interface conditions’ imposed by pre-existing cognitive systems with which language will have to interact to be used. One natural such condition is that expressions generated by the language faculty have to be *legible* at all interfaces it forms with existing systems. In addition to (i-iii), then, we can consider a further causal factor, (iv) principles relating to the way the system has to interface with other systems already in place to be usable at all by them.

Suppose now that the language faculty *precisely has* those features it *has* to have to be usable at all – plus features of a *domain-general* sort that are not specific to humans or even organic nature as such – and has *no features besides*. Then we *understand why* it is the way it is. We will not have to look *further* for such an explanation in external factors like adaptational benefits, contingent evolutionary pathways, or brain physiology (Hinzen, 2006). In this sense, any

^a As Walsh et al. (2002) argue, it is a purely statistical notion relevant to the re-grouping of populations with variants already there.

feature in category (iii) that the language faculty plausibly *has* to satisfy in order to be usable at all, or that is not specific to it (category iv), will, in Chomsky's terms, have a 'principled explanation'.

Note that neither an explanation by appeal to (iii) nor to (iv) invokes evolution or history in any intrinsic way. Indeed it could reflect the vision of a super-human engineer handed the task of designing the language faculty from scratch: surely, he would use general principles coming 'for free', and then try building the language system into the brain so as to interface with systems already in place in an optimal way, without any further, redundant structure. The more we can show that the language faculty is the work of an engineer reasoning in some such fashion, the less we will regard path-dependent evolution, the tinkering of Jacobian 'bricolage', as essential to it.

All that would be without being 'anti-evolutionary', indeed because it would simply be a pursuit of a kind of explanation deeper than historical narrative or functional explanation. If some natural object has only properties that are arguably *necessary* (or else not specific to it), this means we are not *puzzled* by its properties any more, and we will feel much less incited to inspect history for the pathways and contingent adaptive pressures that led to this object.^b

The task of principled explanation in the sense that the MP arises with respect to *any* theoretical account of the language faculty. A 'minimalist' theorist, whatever his account of the language faculty, will in each case proceed by asking for the *barest essentials* that are needed for a descriptively and explanatorily adequate account of language and its various components. The more minimal our descriptive apparatus becomes, the less has to evolve for language, hence the explanatory burden is reduced, and questions of principled explanation for the remaining features can be asked.

As has been stressed at nauseam for this very reason, the MP and its explanatory vision is something one can choose to be interested in or not, but it is not a theory one can accept or reject. As a non-theory specific approach to language evolution, it indeed has given room to quite different visions on the minimization task (see e.g. Culicover and Jackendoff's 2005 minimalist vision).

^b If, in discussions of language evolution a 'lack of data' is explored, we can see the MP as making the point that in the specific case of language data may actually not be *needed*, and might not actually tell us much even if found: the system is as such already understood, on what are arguably principled grounds.

In sum, it is a mistake, both to say that the MP is a controversial theoretical account of language evolution, and to say that ‘why’-questions *need* to have a Neo-Darwinian evolutionary (and functionalist) answer (Pinker and Jackendoff 2005). There is no *a priori* constraint to that effect, and the functionalist argument, according to which language was not merely selected, but positively shaped by natural selection for some function and explainable in these terms, must be argued on entirely empirical grounds.

1.3. Functional explanation in practice

How good the prospects for such an argument in the case of language are – even leaving general doubts about the conceptual coherence of functional explanations aside – remains questionable. The more we find that the structural principles of language are domain-general and not specifically human, they won’t be selected for (let alone explained by) the functions that they specifically enable in humans and in the domain of language. And the more we can motivate the structures of language that we empirically find in terms of external constraints imposed on language by an existing pre-linguistic cognitive architecture, the less we will have to explain features special to it that it would otherwise exhibit. As a *system*, language may possibly still be an ‘adaptation’ in some sense, but that rationale won’t transfer to the parts it recruited in evolution for its novel purpose.

Consider again Jackendoff’s (2002:ch.8) detailed attempt to provide a functional rationale for language, the communication of thought. That communication should be of a unique or even special significance in the study of language would be surprising, since any species whatsoever communicates in one way or another. What makes human language special is clearly not that it is a communication system but that it is a linguistic one. Moreover, it is clear that even though virtually anything can be used for a communicative purpose, as Pinker and Jackendoff (2005) concede, the thoughts that can be conveyed by language are of a very special kind: they are propositional thoughts, and there is simply no necessity that thoughts (nor communicated ones or specifically adaptive ones) would ipso facto be propositional, as a look at animal communication systems, or logically possible ones, immediately shows. This raises again the doubt that these special kinds of thought contents may actually be at least partially *due* to language, as opposed to being the reason why it exists.

Yet, it is the latter claim that the functionalist makes. But that language should have evolved ‘for the communication of complex propositions’ is

surprising in the light of the foregoing, since it assumes that *pre*-linguistic conceptual-intentional systems are actually propositionally structured. But what we see is that the derivation of each and every expression that can be used in a self-standing utterance and can express a propositional thought involves transformational syntax (technically, head-, A- and A'-movement). Thus, *the killing of that man*, or *was killed that man*, which do not involve transformations, also do not express a propositional, truth-evaluable thought. If that is of any significance, and it seems to be, it questions the plausibility that thought is fully propositional in creatures lacking transformational (context-sensitive) syntax (presumably, all non-human creatures).

Moreover, as Carstairs-McCarthy (1999) as argued, there are many different syntactic formats that language might have had, without any negative implications for its expressive power or informativeness. E.g., languages might universally not have had two major lexical categories (Nouns and Verbs), but only Nouns, which have argument structures and involve predicational relations as well. In fact they have had no categories at all. In that case, no sentence/Noun Phrase distinction would have evolved, and propositionality in the sense of the ability to think truth-bearing thoughts expressed by sentences, wouldn't have either.

It is thus simply unclear how we can hope explaining language evolution as a gradual increase in expressiveness with respect to the goal of expressing complex propositions. In the absence of language, there is plausibly no such goal set. The explanation is simply circular in the absence of comparative evidence that thoughts of non- or pre-linguistic animals are propositional in nature (has contents of a sort we specifically express by means of sentences). Comparative evidence that there is seems to point in the exactly opposite direction (Terrace, 2005).

Syntactic constraints in general seem largely unmotivated, if not unintelligible, in the light of the putative 'goal' of language, the expression of complex thought.^c Nor need perfectly grammatical expressions be readily usable, which they often are not. Language design, for all we can tell, is not optimized for *use*. The MP vision of design optimality is of a radically different nature: linking pre-linguistic sensory-motor and conceptual-intentional systems

^c Most major syntactic constraints (locality, subadjacency, the Case-filter, the Minimal Link Condition, etc.) forbid the use of numerous expressions that would, were it not for their ungrammaticality, quite interpretable in a communicative context. Syntax is as much a hindrance to communication as an aid to it.

(the prime task of syntax according to Chomsky's version of the MP) *can* well be optimal, in the sense of exploiting a minimal set of grammatical mechanisms and invoking no levels of representations apart from interface levels, without the result being readily usable, as performance factors intervene.

2. Some cracks in the foundations of the MP

2.1. *Interface conditions don't motivate all of syntax*

All that said, the very idea of 'motivating' properties of syntax from the need to 'meet interface conditions' can be objected to virtually on the same grounds on which Jackendoff's functionalism was criticized above. It is to start with a *non sequitur* to conclude, from the fact that a system not satisfying certain interface conditions will therefore not be usable, that the properties that will make it usable will therefore come into existence.

Moreover, consider a pre-linguistic primate or hominid mind that has a rich conceptual-intentional (C-I) system. Then suppose the language system arises as the MP proposes, as a method of *linking* this system to a phonological one. The computational system (syntax), CS, of language, will then be centrally be motivated by the need to meet (in particular) the demands of the C-I system externally imposed on it. But what syntax do we predict this method will induce?

Possibly, none. If human syntax is motivated by interface conditions imposed by outside systems (systems internal to the mind, but outside the linguistic system), then the syntax resulting from and explained by this can only be as rich as these very outside systems. That means that *either* the C-I system involves relevantly structured mental representations, or they are non-syntactic. In the former case, appealing to the C-I system won't explain these structures.^d In the latter, what kind of information will be 'legible' at this interface? Presumably, only information that does not demand a grasp of compositionally interpreted phrasal structures generated by the syntactic system. In the limit, the only CS 'satisfying interface conditions' would be a system having no syntax at all, consisting of lexical items in certain relations alone. Put differently and more positively, if the 'thoughts' a non-linguistic animal can think do not reach up to

^d Even positing merely verbal argument structure there ('who does what to whom' structure), if relevantly like argument structure in language, might be circular, as argument structure may itself be syntactically conditioned (as per Hale and Keyser 2002).

those complex meanings that humans express by means of syntactically complex phrases and sentences, syntax itself will play an explanatory role for what kind of complex meanings we can think, and the entire explanatory vision of the MP will be in jeopardy.

2.2. *The fate of hierarchy in MP*

We shouldn't be surprised then to actually find, if we look at current Minimalist practice, a tendency to reduce syntax as much as possible to no syntax, i.e. to eliminate structural complexity where it is not plausibly 'motivated from interface conditions'. Collins (2002) in particular has reduced the result of combining a verb like *kill* and a noun like *Bill* by the operation Merge to the set {kill, Bill}. The Merge of *Jill* yields the nested set {Jill, {kill, Bill}}, which can now merge with T(ense), and so on. The nested recursive structure that arises is formally similar to the von Neumann construction of ordinal numbers out of a single initial object, the empty set \emptyset , which we may call '1'. Merge yields the set $\{\emptyset\}$, call it '2', to which we can apply the same operation again to get the set $\{\emptyset, \{\emptyset\}\}$, which may be called '3', etc.

Chomsky (2005) has used this very analogy to suggest that one-place Merge applied to a single lexical item, \emptyset , yields the 'minimal language'. His own proposal differs from Collins',^e but even in his version of phrase structure, it is not clear how hierarchy gets off the ground. Just as we would expect, given the general methodology of 'motivating syntax from interface conditions', only nested sets labeled by lexical items and trivially interpreted by some analogue of the successor operation, not categorial projections and ordered hierarchies of them, ever arrive at the interface.

It is unclear here whether we have explained language, or explained it away. Forming phrase structural hierarchies is not only required to license the verb's arguments, but also correlates with emergent semantic effects and novel semantic entailments, none of which seem plausibly purely semantic or non-linguistic. Thus, when a causative verb X combines with its internal argument Y, a novel integrated event forms with an integral participant and a telic

^e Namely, that the results of Merge are not merely sets but labeled ones. However, as a consequence of the 'Inclusiveness' requirement, which makes all structures assembled by CS and delivered at the C-I interface a mere re-organization of lexical features with no other features added in the course of the derivation, the result of the phrasal projection of *kill*, or the label of the resulting set, would be actually identified with *kill*, i.e. be a lexical item again: Merge thus yields the set {kill, {kill, Bill}}.

structure which nothing in the lexical items X and Y as such or their set predicts: e.g., *clearing the screen* intrinsically implicates that *the screen clears*, which in turn intrinsically ends with the *screen clear*.

Phrase structure as minimalized above won't explain why this is so. Traditionally, what syntax construed as above on analogy with the successor function in arithmetic yields is the 'syntagmatic' dimension of language, whereas the hierarchies we have just mentioned – e.g. causative verbs contain subevents, achievements contain accomplishments contain activities contain states – belong to the 'paradigmatic' core of language. While systematic, it has been a moral of the downfall of generative semantics that they are not systematic in the same way that syntagmatic processes are. Another, paradigmatic, syntax is needed.

3. Conclusion

In sum, even if we accepted recent minimalist accounts of Merge that eliminate phrasal projections or identify them with lexical items, then another syntax has to be added to them (for a suggestion, see Hinzen and Uriagereka, to appear). It is no clearer here than in the case of propositionality how this syntax would follow from anything in non-syntactic C-I-systems, or in the structure of the outside world. 'Principled explanation', if wedded to the idea of 'satisfying interface conditions', may be at a far more distant horizon than the current MP suggests, as crucial parts of the core syntax of language may follow from nothing other than that syntax itself.

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