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Some remarks on goals and achievements of theoretical linguistics

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This commentary starts by discussing the future of theoretical linguistics in the context the rise of Large Language Models (LLMs). While comparative linguistics will likely persist due to universal interest in linguistic diversity, it is indeed questionable whether Chomskyan generative linguistics will continue as before. Its key contributions are mid-level generalizations, but its claims about innate linguistic knowledge have not been supported. One problem with Chesi's article is his focus on computational efficiency as this diverges from the Chomskyan goals. The commentary lists six core theoretical goals of linguistics and relates Chesi's article to these six goals. In particular, the conflation of theories (language-specific descriptions) and frameworks (general tools) has often created confusion. Ultimately, the text concludes that generative linguistics' decline does not doom the discipline.

KEYWORDS: comparative linguistics, mental *vs* social languages, evolution of linguisticality, communicative efficiency.

What has theoretical linguistics achieved, and will it survive after the evident success of Large Language Models (LLMs)? Cristiano Chesi (*this issue*) considers this question from the perspective of mainstream generative grammar (the Minimalist Program), touching upon a wide range of topics.

From my perspective, it would be a great pity if comparative theoretical linguistics did not survive, because people will always be interested in differences and similarities between languages. As linguistic diversity is dwindling, small languages are getting more attention everywhere, and popular culture is creating new languages such as Klingon and Dothraki. Thus, I trust that people will always wonder (and form ideas) about linguistic diversity, even if current social and academic trends may point toward a reduced future role of traditional (non-LLM-based) linguistics. But whether 'generative' theoretical linguistics is worth developing further is a question that I am less sure about. In a way, it has already ended, because 'generative linguistics' is primarily defined as a way of doing linguistics in Noam Chomsky's footsteps. Chomsky was active as a linguist between the 1950s and the 1990s, but mostly as a philosopher (of language or linguistics) afterwards.

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The discourse in linguistics is still filled with buzzwords going back to Chomsky, and Chesi's paper has quite a few of them, e.g.

– poverty of the stimulus
– observational/descriptive/explanatory adequacy
– I-language/competence
– formalization
– learnability
– innate knowledge

What have these concepts contributed? What have we actually learned from the many discussions over the years? Are there any robust findings coming from generative linguistics, in addition to the large number of ideas and proposals that are no longer discussed (and remembered only by older linguists)?

It appears that the main lasting contributions are 'mid-level generalizations', of the sort discussed by Peter Svenonius and Roberta D'Alessandro (see Svenonius 2016; D'Alessandro 2019). Some of these are cross-linguistic generalizations not unlike the Greenbergian universals, while others are salient conceptual distinctions that had not been made before. All of these are widely recognized, but there is no shared theoretical understanding of them. In the 1980s, the idea of the principles and parameters program was that cross-linguistic similarities might be explainable in terms of Universal Grammar (UG) and a set of innate parameters, but this idea has largely been given up (see Newmeyer 2004; Haspelmath 2008; Boeckx & Leivada 2013). Generative linguistics has certainly led to a lot of additional descriptive breadth (Baker 2021: 161), while it is less clear that it has led to additional depth of understanding (Haspelmath *to appear*).

But worldwide comparative linguistics is not Chesi's focus, and he is more concerned with some of the classical ideas of Chomsky's, as exemplified by the buzzwords listed above. However, these terms are not always very clear, and it seems to me that linguists would profit from a simpler set of concepts for the basic theoretical goals. Below, I list a few theoretical goals for which there seems to be a very broad consensus.

(1)
(i) describing mental languages
(ii) describing social languages
(iii) describing universals of social languages (Greenbergian universals)
(iv) explaining universals of social languages
(v) explaining the ease of language acquisition
(vi) explaining the evolution of 'linguisticality' (= the capacity for language)

But what exactly is a 'theory'? How do we recognize the 'best' descriptions and explanations? The answers to some basic questions seem to be unclear, though Chesi tries to start at the beginning, with the need for a complete descriptive theory ('X') for language L:

> *Language Problem*
> Is theory X capable of generating and recognizing all and only the sentences Ss
> belonging to language L?

Descriptive grammars are not usually called 'theory'; for example, my grammar of Lezgian was not called 'A theory of Lezgian' (Haspelmath 1993). But descriptive grammars solve (large parts of) the 'Language Problem' for the language they describe, so in this sense, they can be called 'theories'. This usage goes back to Chomsky (1957: 49) ("A grammar of the language L is essentially a theory of L"), and it is still current, as I discussed in Haspelmath (2021: 8). From this perspective, description and explanation cannot really be separated, and the three 'descriptive' goals require theories as well (as also discussed by Dryer 2006).

Chesi seems to come from computational linguistics and is more concerned with computer-like abstract systems than with human mental capacities, so he does not even consider the distinction between (i) describing a mental language and (ii) describing a social language. *De facto*, linguists are engaged in describing social languages (i.e. languages understood as sets of social conventions), because it is perfectly normal for linguists to ask multiple speakers/signers when they are unsure about acceptability judgements. And the judgements they get are judgements of social acceptability, not 'introspective' data that allow them direct access to speakers' mental structures (or I-languages).[1] Many linguists see their goal primarily as that of describing mental (or 'cognitive') languages, but this goal does not seem very realistic. LLMs have shown us that correct language use is possible even without human minds, and second language speakers are often quite capable of using a language in ways very much like people who learned the language as children. Thus, languages are primarily social entities and logically independent of mental representations. Chesi pays lipservice to Chomsky's notion of 'I(internal)-language', but psychological concerns do not play a significant role in his paper.

Now how do we go to the next level, to human language in general, beyond the level of particular languages such as Lezgian, Italian, or English? In Chesi's paper, all the examples are from English, as if

the distinction between particular languages and language in general did not matter. In theoretical linguistics in general, the term 'theory' is often used for general frameworks that are hypothesized to represent innate knowledge; trying out such frameworks on particular languages and hoping that they might correspond to what humans are born with is a common strategy. Highly general ideas such as the central role of a 'merge' operation or the 'T-model' (involving 'Logical Form' and 'Phonetic Form') are not primarily intended to serve goals (i)-(iii) above, but are intended as hypotheses about innate knowledge, perhaps contriubuting to goals (iv)-(vi). There is little independent evidence for this, and describing one language at a time by means of a framework is not a good way of testing a far-reaching hypothesis, so the idea that these structures are innate must remain at a speculative level.

For many linguists outside the Minimalist community, the key idea of reducing grammatical machinery to its bare minimum has always seemed trivial, because all of science obeys Occam's Razor. And 'descriptive adequacy' in the sense of trying to 'capture more data with fewer instructions' is likewise uncontroversial: Every descriptive grammar tries to formulate general rules (of phonology and morphosyntax) and does not limit itself to listing. So what is it that is special to the Minimalist Program? I never understood this, and Chesi's paper does not really throw light on it. Chesi appears to basically equate 'descriptive adequacy' with minimum description length, a well-known notion from mathematics that has sometimes been discussed by typologists in the connection of 'complexity measures' (e.g. Dahl 2020), but that has never played a role in Chomsky's thinking, as far as I am aware. According to Chomsky (1965: 24), a grammar "is descriptively adequate to the extent that it correctly describes the intrinsic competence of the idealized native speaker." This seems to refer to mental grammars, thus going beyond Chesi's abstract characterization.

And when Chesi talks about 'computational efficiency', he seems to take the perspective of computer science, not the abstract 'efficiency' notion that Chomsky uses (e.g. in Chomsky 2005). Counting the number of bytes that a Python program needs is not something that generative grammar has done over the last decades. Over the last decade,[2] a notion of communicative efficiency has become more and more prominent (e.g. Gibson *et al.* 2019; Levshina 2023), but its relation to computational efficiency remains unclear. It appears that a lot of progress has been made in goal (iv) (explaining language universals) with reference to communicative efficiency (e.g. Hawkins 2014), but it is not clear that generative grammar at the Minimalist stage has any explanatory mechanism left that could help us achieve that goal.

Chesi does talk about goal (v) (language acquisition, or learnability), for which Chomsky has made an argument from the 'poverty of the stimulus'. Surprisingly, Chesi talks about the 'Poverty of Stimulus Hypothesis', even though the earlier literature discusses 'poverty of the stimulus' in the context of the 'innateness hypothesis'. But what exactly is meant by 'innateness' (or by 'explanatory adequacy')? It is clear that a lot of the prerequisites for the human capacity for language (or 'linguisticality', as it has been called it in analogy to 'musicality'; Haspelmath 2020) are present at birth or develop independently of particular cultures. Thus, there are a lot of 'innate prerequisites', just as there are for music, marriage, and group bonding, to name a few other ubiquitous human behaviours. What is highly questionable is whether specific notions of morphosyntax, phonology or semantics are innately given, i.e. whether the categories of grammar with which linguists work can be regarded as 'natural kinds' (see Haspelmath 2018).

Goal (vi) (the biological emergence of 'linguisticality') has recently become prominent in Chomsky's thinking (e.g. Berwick & Chomsky 2016), but Chesi does not mention it at all. Maybe this is because there is no relation to LLMs, but there would be another good reason: Language is a quirk of one particular species, and biologists are best at identifying adaptive developments when they occur repeatedly across a range of taxa. If human language were like the wings of bats, i.e. if we found very similar independent developments across the animal kingdom (just as we find wings also in birds and pterosaurs), we might have greater hopes of explaining its emergence.

Chesi seems to think that a 'fully explicit (formalized) theory' is an important desideratum, which again is understandable from a computational linguistics background. Proponents of computationally oriented approaches such as HPSG have long complained that Chomsky's ideas were insufficiently formal(ized).[3] By contrast, it seems to me that the biggest problem is the lack of distinction between theories and frameworks. For example, when he formulates his 'Language Problem', Chesi treates a 'theory' as having a particular language L in its scope. Then in his §2.3, he talks about a 'Minimalist theory', which seems to refer to a formal framework. But frameworks are not the same thing as theories (Haspelmath 2010), unless one assumes that the frameworks are innate. And assuming or hypothesizing that the various ingredients of generative analyses (e.g. the rich functional sequences of the 'cartography' approach) are innate is a high-risk strategy. Generative linguists rarely see their proposals as speculative, and they even teach them in introductory classes as if they were scientifically established (not just socially

established, among a group of linguists). I see this as a much bigger problem of the enterprise than the lack of formalization.

Chesi reflects on the possible 'end of (generative) linguistics', but what exactly is 'generative linguistics', if not linguistics as carried out and approved by Noam Chomsky and his followers? And why should the end of one scholar's long career be of particular concern for an entire descipline (such as linguistics)? Some authors have claimed that it was only because of Chomsky that linguistics became so prominent (e.g. Newmeyer 1980), but as early as 1988, Jackendoff observed that linguistics was not as well-respected among cognitive scientists as it was 20 years earlier. Chomskyan/generative linguistics has been very influential, but there was a lot of great linguistics before, and there will be linguistics afterwards. Whether it will be as generously funded in the future as during Chomsky's heyday is another question, but the level of funding for a discipline does not necessarily correspond to the breadth of its achievements and the depth of its scientific insights.

Note

[1] See also this blogpost: <dlc.hypotheses.org/2433>.
[2] Until the 1970s, Chomsky seemed to entertain the idea that competing grammars could be evaluated by counting the number of elements of a description (by some kind of 'evaluation metric'; see Newmeyer 2021), but this was never actually implemented, and the idea played no role after 1981.
[3] See also this blogpost: <dlc.hypotheses.org/1698>.

Bibliographical References

See the unified list at the end of this issue.