

# Rules and universals in the history of Generative Grammar

Cameron Morin, David Adger

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We have written this brief post as additional material for a recent lesson titled "What do all languages have in common?" published by TED-Ed (Morin, 2020). The format of that lesson was a five-minute video introducing a general audience to the history and basic ideas of Generative Grammar (GG), one of the most important theories of human language, which stemmed from the work of Noam Chomsky (1928–). GG has had a tremendous impact in scientific work on language and the human mind, but seems to be comparatively little known by the general public, which was part of the motivation for the video. The format of the video is ideal for a bite-sized overview of some of the ideas developed in GG aimed at the general public, but can of course mean that ideas are simplified, or common terms are used in ways that are accessible, but don't quite reflect the technical idea exactly. Our plan here is just to add some comments about concepts like "innate", "rules" and "universals", which hopefully are still accessible, but more precisely link to the concepts in GG. We think of this as an appendix to the animated lesson.

Early versions of GG are known as the Standard Theory (roughly in the 1960s) and the Extended Standard Theory (roughly in the 1970s). In these frameworks, the idea was that many of the rules that you might find in any human language had to fit a certain set of constraints, and these constraints were innate. This meant that the range of possible languages is genetically restricted, and that there were logical possibilities for language that were biologically impossible. In these theories then, children, when they are acquiring a language, figure out the rules of their language by learning them (so the rules aren't themselves innate), but their learning is guided by what can be a possible rule (so the kinds of rule they can learn are innately constrained). The constraints are, in these theories, what constitutes Universal Grammar (UG), one of Chomsky's fundamental ideas. Universal Grammar is not a set of grammatical rules that are universal to human beings, it is the way that human brains are innately organised so as to only allow certain kinds of grammatical rule in the first place. In these early versions of GG, Universal Grammar allowed an infinite number of possible grammars, as long as they all met the constraints (like you can have an infinite number of odd numbers, but none are divisible by 2).

The focus on recorded samples of language as data in the video lesson may suggest that the main empirical source for the development of generative syntax in GG was observation (like it is in say astronomy); however, the notion of data here should be thought of in a

much wider sense. In Chomsky's view, data which is used to build theories of language can come from anywhere: experiments, recorded samples of conversations, electronic collections of writings, etc., but crucially, the main source of data in GG has always been testing hypotheses (like in say chemistry). The first step is the formulation of a hypothesis which makes predictions about how the grammar of a given language works, then that hypothesis is tested against the patterns of the data at hand. Much of this data was collected through simple behavioural judgments (here's a sentence: does it mean the same as this other sentence? Would it mean the same if you change word order like this? Is it still acceptable if we change the word order in a different way? etc.—see Adger (2015)), but sometimes also through more formal experiments as are standardly used in psychology.

The video discusses the rise of a new approach to generative grammar, the Principles and Parameters framework (P&P), that came into its own in the 1980s. Rather than just constraining how grammatical rules could look, P&P was far more ambitious. It attempted to provide a theory of what the universal constraints were plus the limited ways in which languages could vary within those constraints. This meant that, in P&P, unlike in earlier theories, there is actually only a finite number of possible grammars. A consequence of this was that the idea of *learning* a language, in its common sense meaning, more or less vanished. When a child hears sentences, they don't try to hypothesize rules. Rather, P&P suggested, those sentences trigger the child's mind to close off or open up a set of possible grammars, and as more and more sentences are encountered, the number of grammars that are usable shrinks down, so that the child ends up with just the right grammar (or grammars if multiple dialects or languages are being acquired).

The gradual restriction of universals by researchers in the P&P framework brought to the fore the notion of Recursion, which is discussed in the video. Recursion is not strictly speaking a principle or rule of grammar itself. It is, though, a property of certain rules. Recursion is a pretty vexed term in linguistics, and whole books have been written about it, but simplifying here, there are two relevant notions of recursion (there are more though!). One is the embedding of a particular kind of phrase inside another phrase of the same kind, such as a Sentence inside a Sentence like this:

Cats who eat frogs think they are tasty

Here we have the sentence *they are tasty*, as well as the sentence *who eat frogs*, both embedded inside the whole sentence. Not all languages allow this kind of embedding. Daniel Everett has claimed that the Amazonian language Pirahã doesn't, for example. So our sentence above would have to be expressed, in that language, by three separate sentences. Something like: Some cats eat frogs. Those cats think this: Frogs are tasty.

The other idea of recursion we mention here is the embedding of phrases inside other phrases in general, irrespective of what kind of a phrase they are. If all human languages have grammars that have recursive rules in this second sense, then all sentences will have a hierarchical structure. Notice that even if Pirahã lacks recursion in the first sense, it's not clear if it lacks it in the second. This is one reason why generativists do not usually accept the objection, formulated by Daniel Everett, that Pirahã shows that some languages have grammars that are not characterised by recursion.

There is an important idea about what we mean when we use the term "universal" in discussing language. When Chomsky or other researchers in generative grammar talk about universals of language, they are talking about universal constraints on grammars, not about properties of languages. There are universals of language in the second sense: they are what researchers into linguistic typology investigate (e.g. all languages have vowels, or all languages have nouns, or if a language puts the verb before the subject, it is likely to put a noun before its possessor), and they are fascinating and important, but they are observations about languages. Universals in the GG sense are hypotheses about grammars. There is a relationship between these, but it is indirect, and has to be carefully tested through detailed analysis of languages to understand how their grammars work.

In the 1990s, and since, researchers in Generative Grammar have tried to explore the idea that the Principles of P&P theory can be much simplified. One idea is that the part of a grammar that builds sentences can be reduced to a very simple recursive rule, called Merge, and that the complex ways in which languages work are a result of how the structures built by this rule link to other systems in the human mind, such as those that involve pronouncing (or signing), and those that involve using sentences to convey thoughts. This new approach is known as the Minimalist Program. Adger (2019) discusses how this one rule of Merge can capture variation in languages.

Generative Grammar has been, and continues to be, an important theory that tries to capture what human language is, and how it works to connect sound to meaning. Many researchers in linguistics take alternative perspectives as discussed in the video, but GG is still a central approach in how we try to understand a core part of what being human is: language.

## References

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