

Parameters

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1. The Principles-and-Parameters Framework

Generative Linguistics seeks computationally precise answers to two fundamental questions: What exactly do you "know" when you know your native language, and how did you come to know it?

By 1975 there had been a great deal of progress on the 'What' question: At least in the domains of syntax and phonology, and at least for a limited number of languages, researchers had developed formal symbolic systems that were reasonably successful at identifying linguistic expressions that were, and were not, grammatically well-formed.

The 'How' question had seen less progress, but the findings on the 'What' question had served to clarify the nature and complexity of the problem. It was roughly at this point, in the mid-1970s, that Noam Chomsky first proposed the idea of a syntactic parameter. Soon afterward, Luigi Rizzi advanced the first actual parametric hypothesis, the Null Subject Parameter. According to the emerging "parametric" conception, the diversity of natural-language grammars might be reducible to the interactions of a small set of abstract parameters.

Indeed, from the perspective of explanatory adequacy, the concept of a principles-and-parameters framework has been the single most important advance in the history of Generative Linguistics: 'Principles' capture characteristics that hold true of all natural-language grammars, and 'parameters' express the points of cross-linguistic variation. By hypothesis, both the principles and the parameters are innately encoded (in some fashion) in the child's brain. Together, the principles and the parameters specify the set of all possible natural-language grammars. The task of the child is to select, for each of the parameters, one of the innately provided options. The task is far from trivial, but – depending on the details – it might be feasible.

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2. Different Names for Parameters

Over the years, the term *parameter* has gone in and out of fashion. Proposals about grammatical variation have sometimes gone by different names. Yet, in my own view at least (e.g., Snyder 2021), the differences are largely notational: From a learnability perspective, an approach qualifies as “parametric” if it provides a finite number of innate ‘choice points’, each with a finite number of discrete options.

This characterization clearly encompasses the classic ‘switchbox’ parameters of Government-and-Binding (GB) syntax (e.g., Chomsky 1981, 1986) and Government Phonology (e.g., Kaye, Lowenstamm & Vergnaud 1990). It also encompasses a range of superficially quite different proposals, including the ‘rankings of violable constraints’ found in Optimality-Theoretic (OT) phonology, and the ‘abstract features of functional heads’ posited in Minimalist Syntax. Indeed, Tesar & Smolensky (2000) showed that any rankable set of violable constraints can be translated into an equivalent set of binary switchbox parameters. Similarly, Minimalist Syntax assumes a finite inventory of possible functional heads, each of which has a finite number of associated morphosyntactic features. Moreover, each of the features is either present or absent, and the consequences (either way) are specified innately. Hence, this approach too is “parametric” in the present sense of the term.

3. Parameters in Acquisition Research

Two major points of connection have arisen between proposed grammatical parameters in generative linguistics, and contemporary research on child language acquisition. One of these has been research into the algorithms by which a child could, in principle, use child-directed speech to set parameters appropriately for a given target language. Some of the most influential proposals have been the following: The Subset Principle (e.g., Wexler & Manzini 1987), the Trigger Learning Algorithm (Gibson & Wexler 1994), the Variational Model (Yang 2002), Error-driven Constraint Demotion (Tesar & Smolensky 2000), Cue-based Learning (Dresher & Kaye 1990, Dresher 1999), and Structural Trigger Learning (Fodor 1998, Sakas & Fodor 2012).

The other point of connection has been research testing for “signatures” of parameter-setting in the time course of child language acquisition. As discussed in (Snyder 2007) and (Snyder 2021), parametric models of grammar lead to at least three major types of acquisitional prediction: Ordered Acquisition, Concurrent Acquisition, and Mysterious Acquisition.

Predictions of Ordered Acquisition follow from Brown & Hanlon’s (1970) logic of ‘Cumulative Complexity’. The gist of their idea is that we can think of each surface expression in a given language as having some set of “prerequisites” – that is, points of grammatical and/or lexical information that a child must acquire before the expression becomes part of her linguistic repertoire. Crucially, it may happen that a surface form ‘A’ (e.g., a specific grammatical construction)

has prerequisites that are a proper subset of the prerequisites for another surface form, B.

If so, the strong prediction for children acquiring this language is that only two of the three logically possible orders of acquisition will be attested: A child might acquire A prior to B, or a child might acquire A and B at the same point in time, but there should never be a child who acquires B substantially earlier than A. (More precisely, there should never be a child whose linguistic "repertoire" includes B without also including A: If a child has the knowledge required for B, it follows that she also has the knowledge required for A.)

For example, English has both a DP-Particle construction (as in *David threw the trash out*) and a Particle-DP construction (as in *David threw out the trash*). Under the analysis of Den Dikken (1995), the Particle-DP construction has all the prerequisites of DP-Particle, plus one extra prerequisite enabling the particle to incorporate into the V. This analysis yields a prediction of Ordered Acquisition: A child's grammar should never allow Particle-DP unless it also allows DP-Particle. As it turns out, this is precisely what was reported in Snyder & Stromswold (1997): Children acquire DP-Particle either earlier than, or at the same time as, but never later than, Particle-DP. (The finding was recently replicated, with data from a new set of children, in Snyder, Accepted.)

The second type of prediction, Concurrent Acquisition, can arise in at least two ways. For one, this prediction will exist for linguistic forms A and B if the two forms happen to have exactly the same linguistic prerequisites. The prediction can also arise when A and B have non-identical prerequisites, if there is a single late-acquired prerequisite that is needed for both A and B (and becomes the limiting factor).

A pattern of concurrent acquisition has been reported, for example, by Xu & Wang (2025), who found that for any given child acquiring English, the time point when a child acquires DP-Particle combinations (as discussed above) is the same as the time point when that child acquires "creative" bare-stem, endocentric compounding (as seen, for example, when an English-speaker creates a novel compound like *zoo book* to mean 'book about the zoo'). The proposed explanation is that DP-Particle constructions and creative endocentric compounding both depend on a late-acquired point of information, namely the positive setting of Snyder's (1995) Compounding Parameter.

Finally, a prediction of Mysterious Acquisition arises if one can show that children do not receive direct, unambiguous evidence for a given construction A, but they do receive clear evidence for B, and the prerequisites for B include all the prerequisites for A. (In other words, evidence of B constitutes "indirect" evidence for A.)

For example, Japanese allows a structure known as a Head-Internal Relative Clause (HIRC), and Isobe (2005) has shown that children acquiring Japanese rarely if ever receive direct evidence of HIRC in their input. Nonetheless, according to the analysis of Cole (1987), the availability of HIRC follows from two parametric properties of a language, namely complement-head order and the availability of null pronouns, for which there is abundant evidence in a child's

input. Hence, the prediction of Cole's analysis is that Japanese-acquiring children will all "mysteriously" understand HIRCs as early as one can test them (i.e., by around the age of 36 months), even though few if any children will have heard one before. This is precisely what Isobe found.

Another example is provided by Xu & Snyder's (2017) work on restitutive *again*. Consider the English sentence *The lizard crawled under the rock again*. This sentence can be true and felicitous when the lizard has never before crawled under the rock, as long as it has previously been under the rock; this is the "restitutive" reading. Yet, examination of child-directed English revealed that clear, direct evidence for restitutive *again* is exceedingly rare: A sample of more than 100,000 child-directed English utterances contained exactly zero uses of unambiguously restitutive *again*. At the same time, the fact that English takes the positive setting of the Compounding Parameter (which children know before the age of three) should entail that restitutive *again* is available in goal-PP constructions (like *crawl under the rock*). This is precisely what Xu & Snyder found: By the age of three (i.e., as early as one can test), if a child knows *again* in its basic, repetitive sense, then she also understands *again* in its restitutive sense with goal-PPs.

4. A Critique, and a Proposal

The principal critique of the parametric approach to grammar, especially in the context of syntax, has been that its proponents have not yet discovered many empirically successful "octopus" parameters, meaning abstract points of variation that tie together a sizable number of disparate surface phenomena. One reaction to this critique has been that perhaps we simply need better research methods.

For example, Mark Baker has proposed that to identify the actual parameters at work in Universal Grammar, we need (i) investigation of typologically diverse languages, and (ii) in-depth research on each individual language. Yet, assuming that the parameters exist, and assuming that we follow these recommendations, a purely comparative approach (i.e., an approach based on comparing different 'adult' languages of the world) is going to face considerable challenges. These will include (i) the likely existence of complex interactions between distinct, independent parameters; and (ii) the likely absence of true "minimal pairs" of languages, identical except for one single parameter setting.

My own proposal is the following: To break the code of parametric variation, linguists conducting research on comparative grammar should collaborate closely with their colleagues who study child language acquisition. As discussed in Section 3, any proposed point of parametric variation is highly likely to yield strong, testable predictions for the time course of child language acquisition (i.e., predictions of Concurrent, Ordered, or Mysterious Acquisition). Moreover, in a comparative approach to testing a parametric hypothesis, each new language provides just a single data point (in the sense of an opportunity for two grammatical properties to either co-occur or diverge). By contrast, in an acquisitional approach, every new child provides the equivalent: an opportunity

for two grammatical properties to be acquired together, or acquired separately. This means we can focus on a single, well-studied target language, and study the time course of acquisition in many different children. Insofar as children are 'Grammatically Conservative' (in the sense of Snyder 2007), we can reasonably expect to see each child progressing through a series of ever-closer approximations to the target grammar. In sum, to permit faster, more accurate research into cross-linguistic variation, the insights of the comparative grammarian should be used to formulate explicit hypotheses, which can then be tested by acquisitionists.

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